

Situation Report for COVID-19: Afghanistan, 2021-01-18

[Download the report for Afghanistan, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.72 (95% CI: 0.61-0.82)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Afghanistan is not shown in the following plot as only 0 deaths have been reported to date**

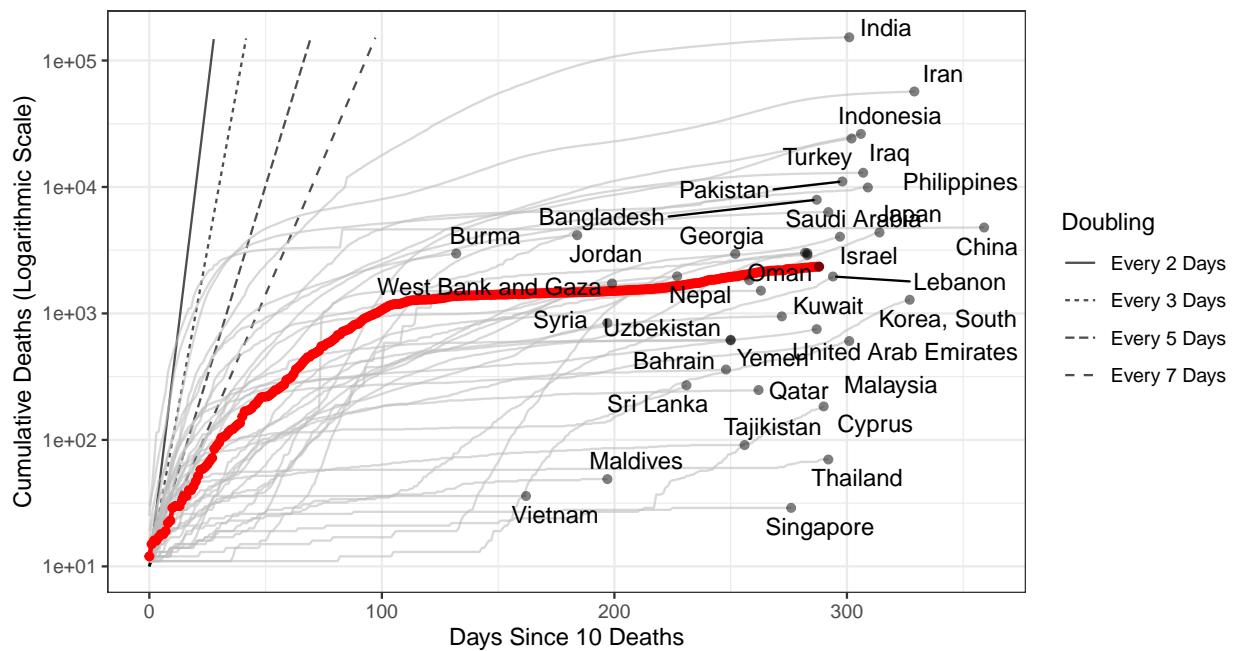


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 126,703 (95% CI: 119,163-134,243) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

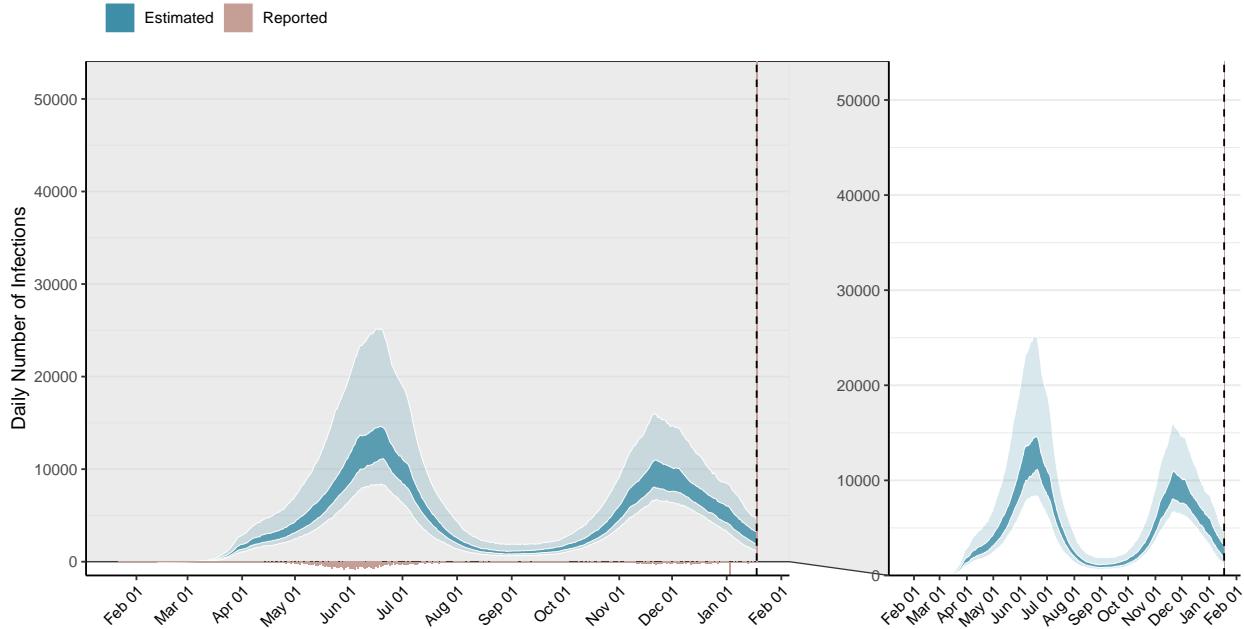


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

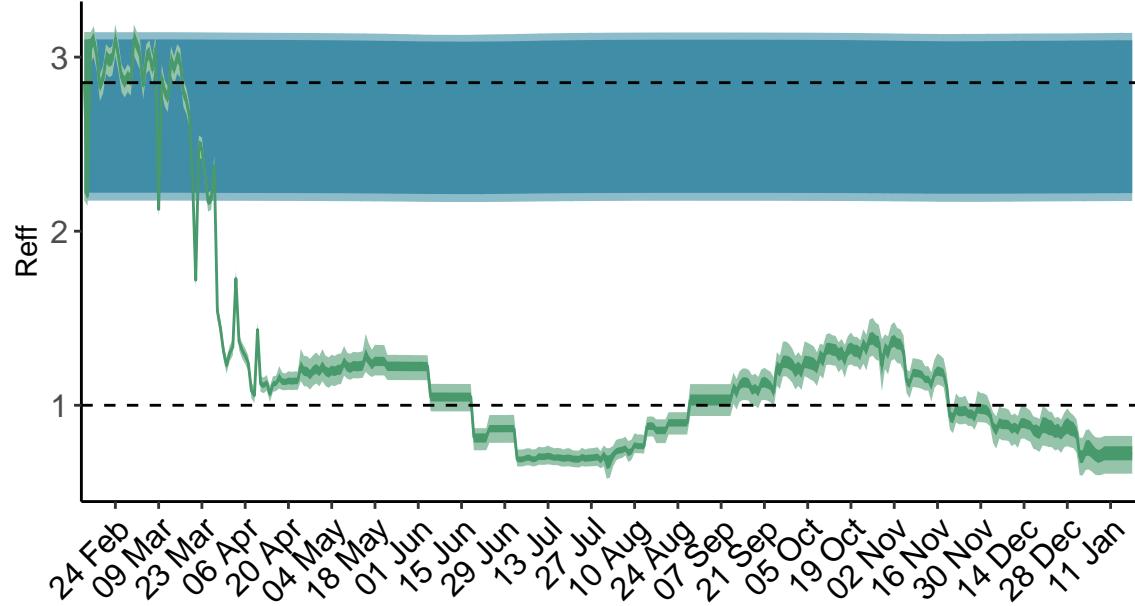


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Afghanistan is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

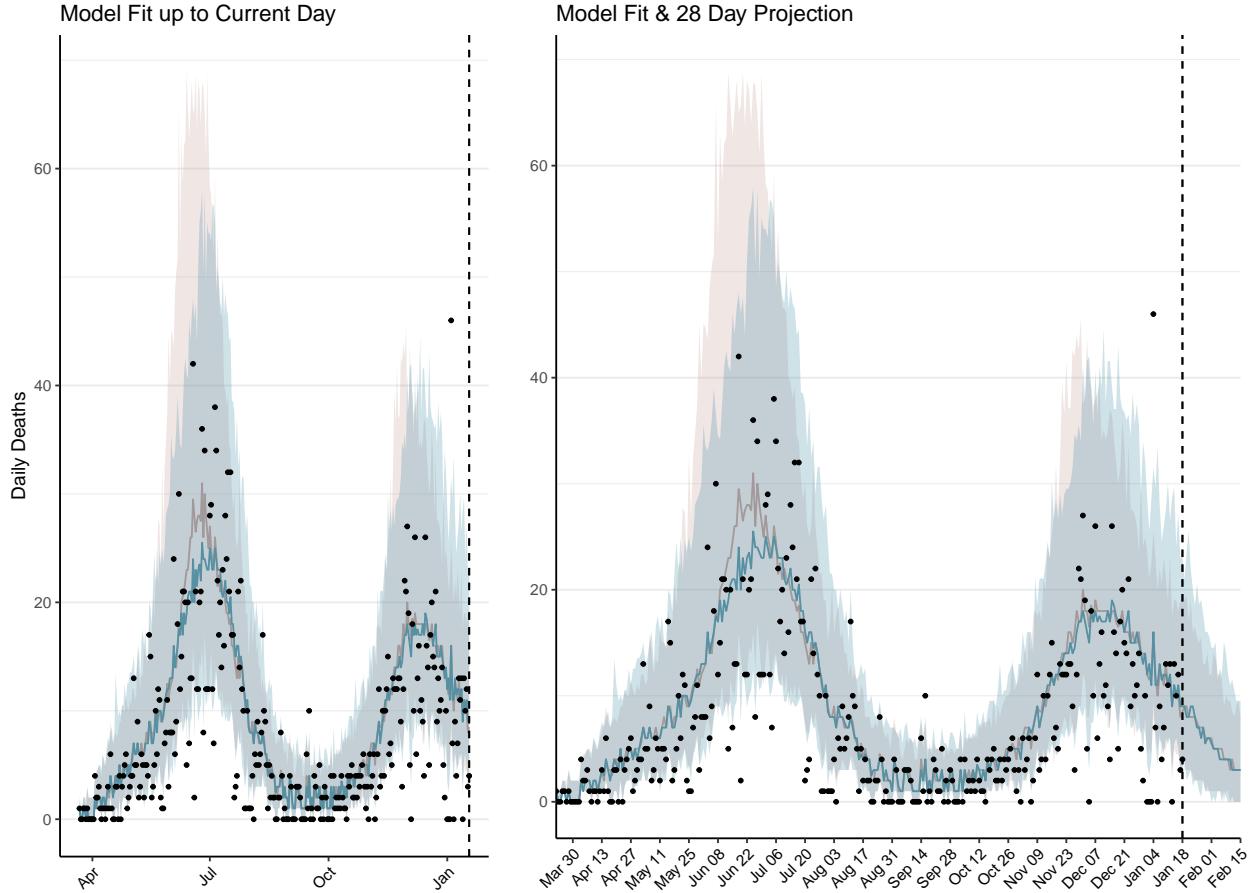


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 351 (95% CI: 329-373) patients requiring treatment with high-pressure oxygen at the current date to 113 (95% CI: 102-124) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 151 (95% CI: 142-159) patients requiring treatment with mechanical ventilation at the current date to 52 (95% CI: 48-57) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

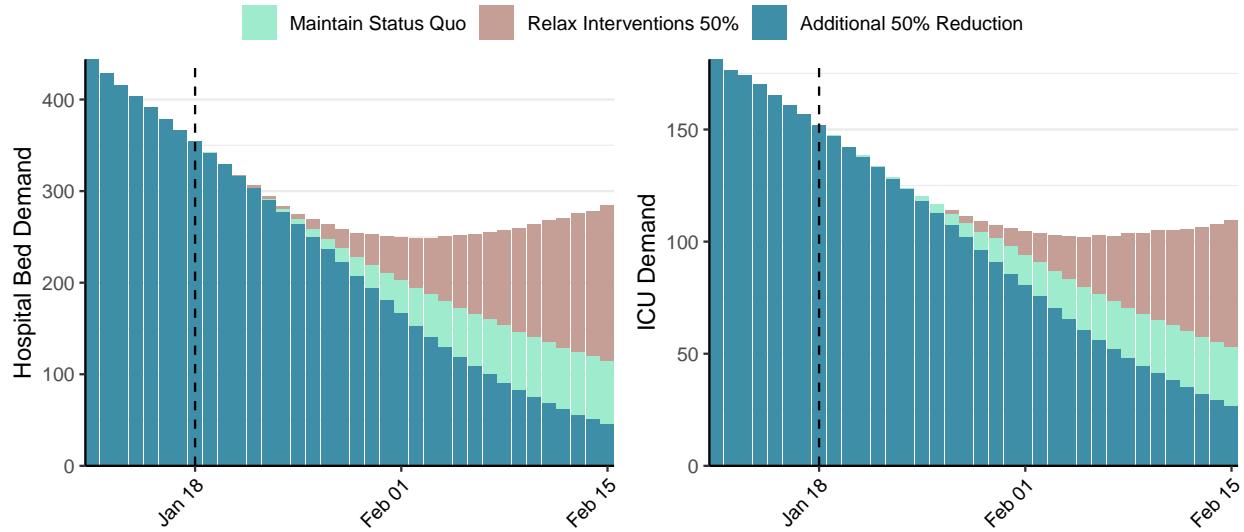


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 2,536 (95% CI: 2,346-2,726) at the current date to 85 (95% CI: 75-94) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,536 (95% CI: 2,346-2,726) at the current date to 4,013 (95% CI: 3,494-4,532) by 2021-02-15.

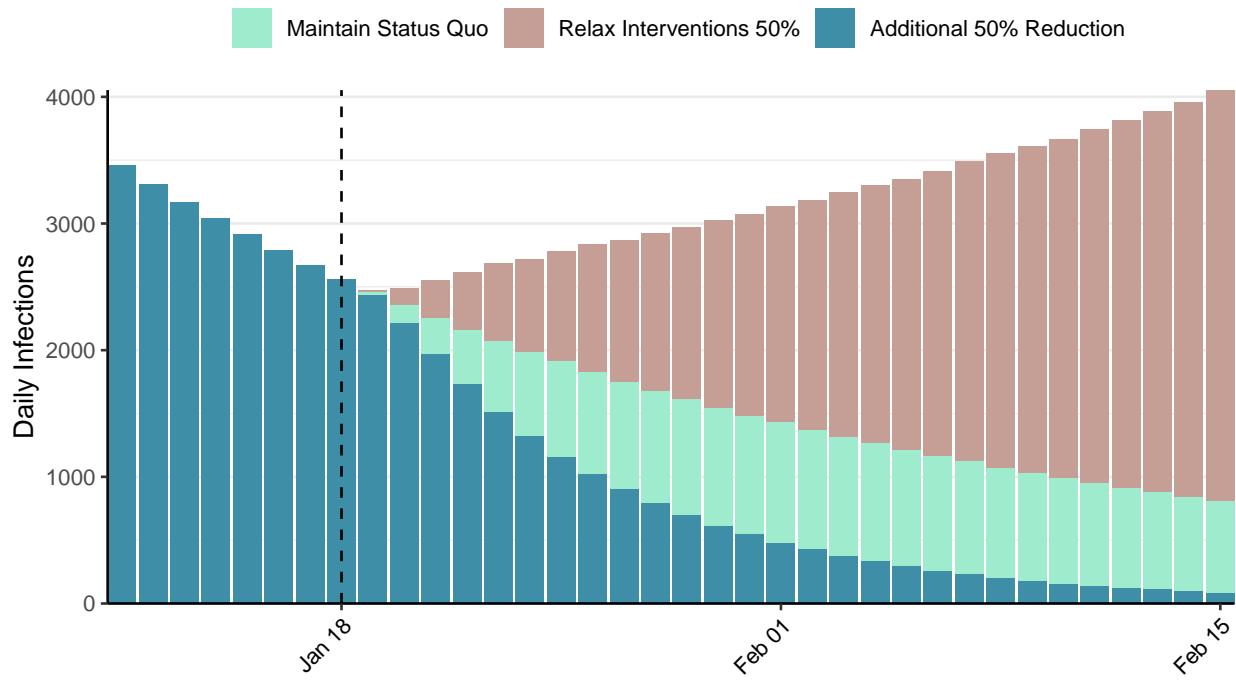


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Angola, 2021-01-18

[Download the report for Angola, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.36 (95% CI: 1.12-1.59)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Angola is not shown in the following plot as only 0 deaths have been reported to date**

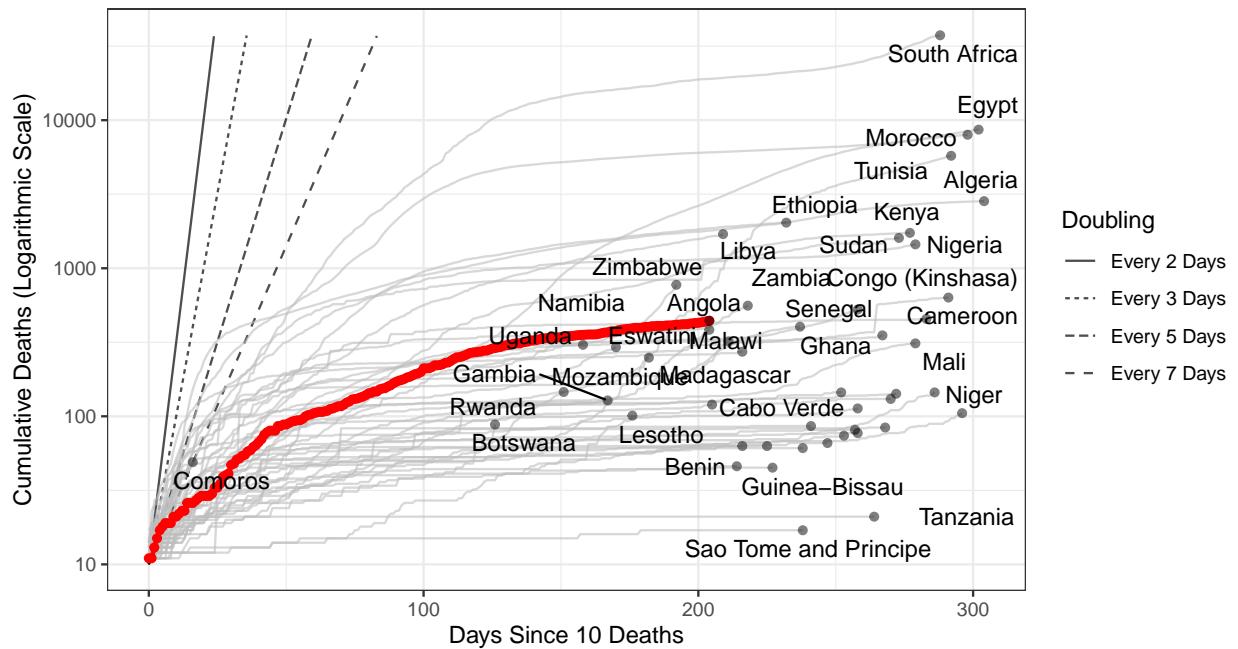


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 61,024 (95% CI: 55,405-66,643) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

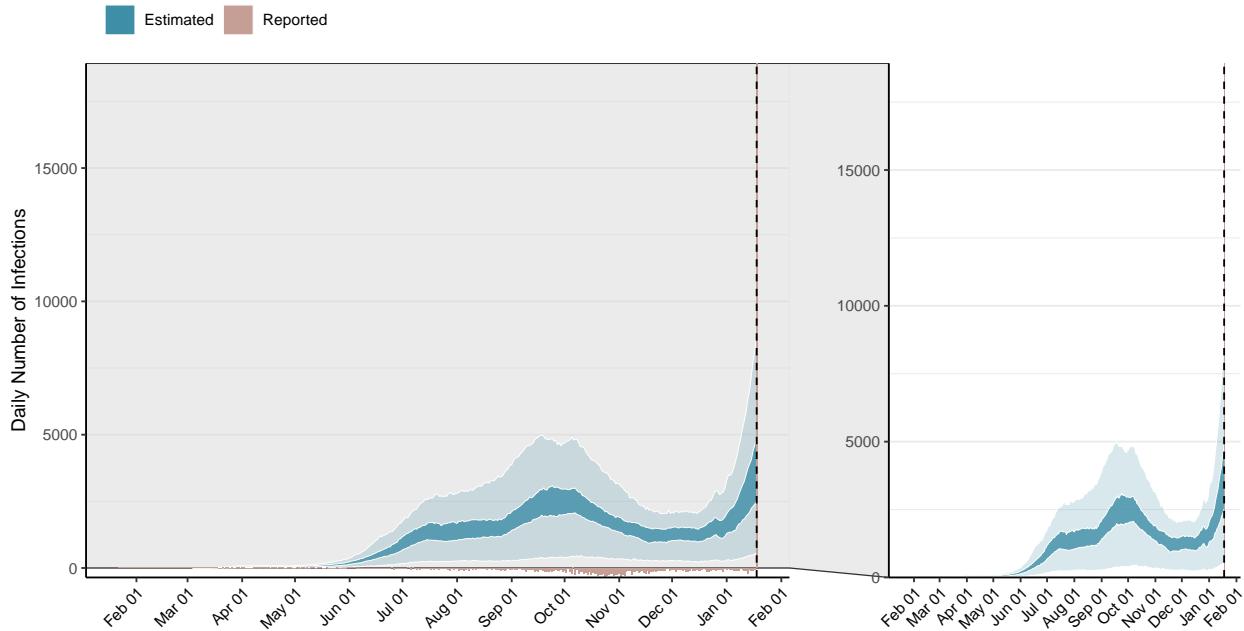


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

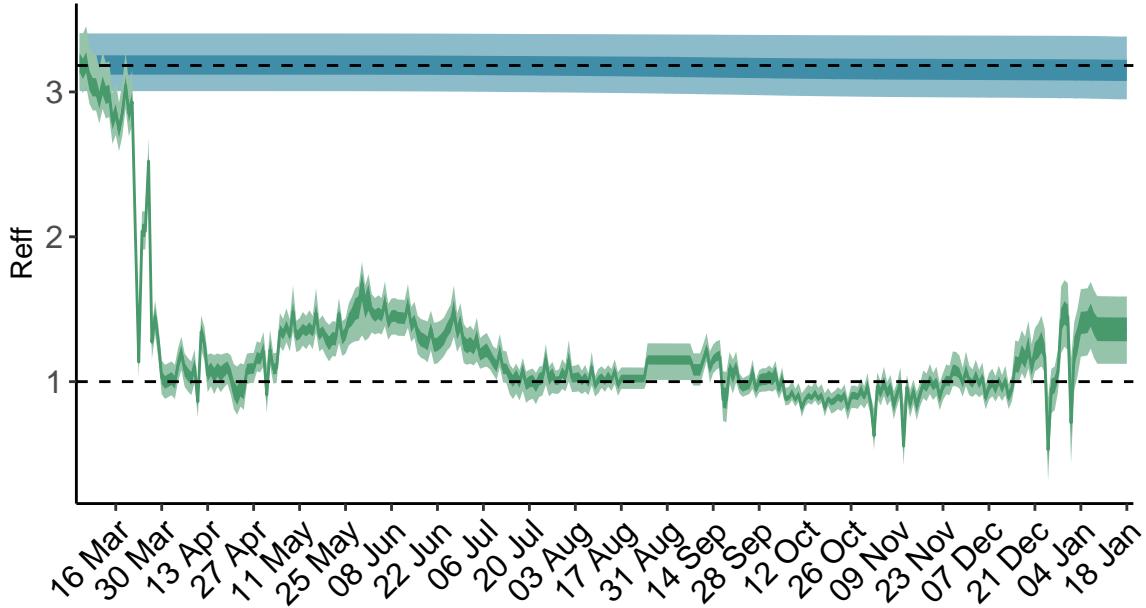


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Angola is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

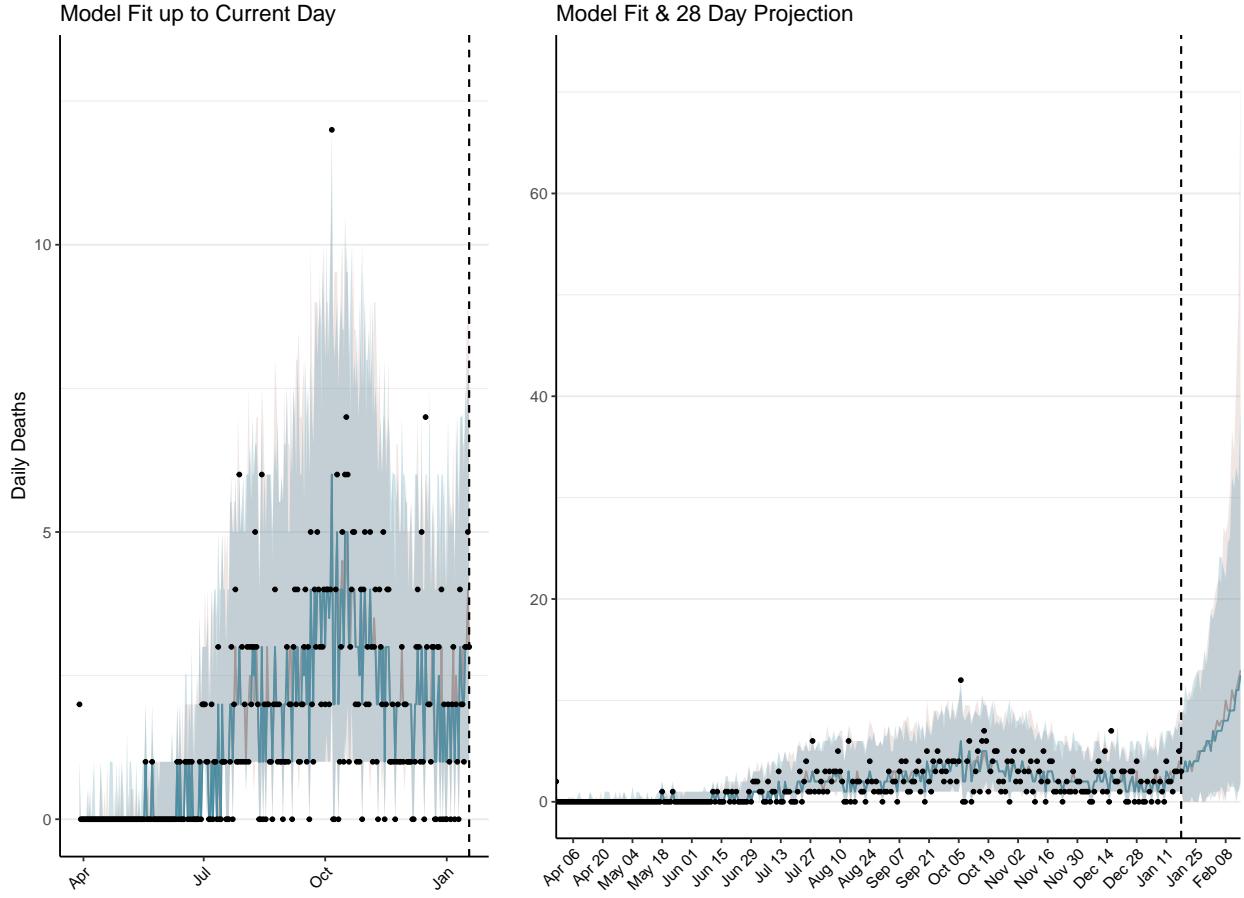


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 170 (95% CI: 154-185) patients requiring treatment with high-pressure oxygen at the current date to 744 (95% CI: 634-854) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 62 (95% CI: 56-67) patients requiring treatment with mechanical ventilation at the current date to 261 (95% CI: 225-296) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

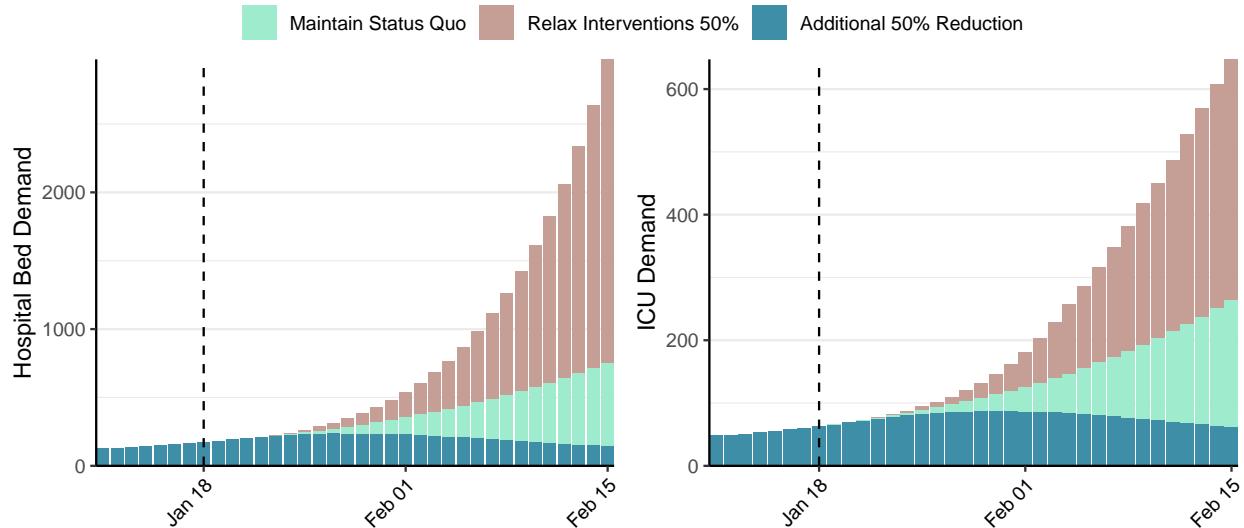


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 3,876 (95% CI: 3,456-4,296) at the current date to 1,094 (95% CI: 923-1,266) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,876 (95% CI: 3,456-4,296) at the current date to 119,346 (95% CI: 99,595-139,098) by 2021-02-15.

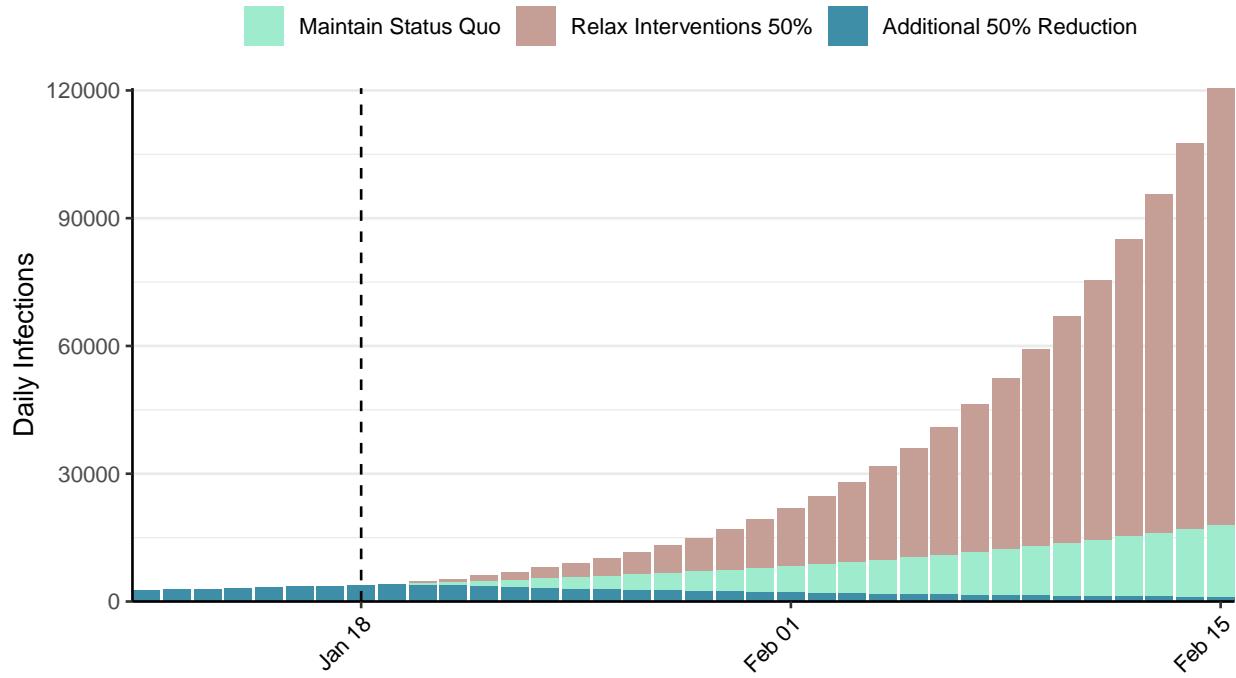


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Albania, 2021-01-18

[Download the report for Albania, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.13 (95% CI: 0.96-1.41)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Albania is not shown in the following plot as only 0 deaths have been reported to date**

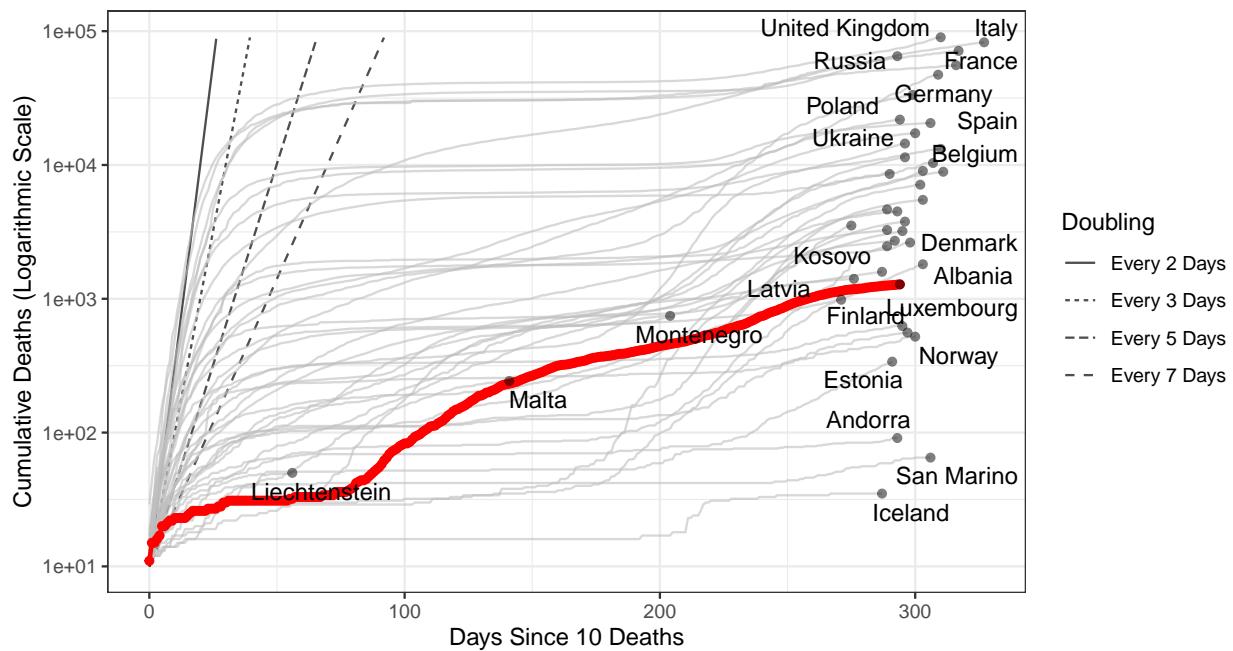


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 78,983 (95% CI: 74,473-83,492) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

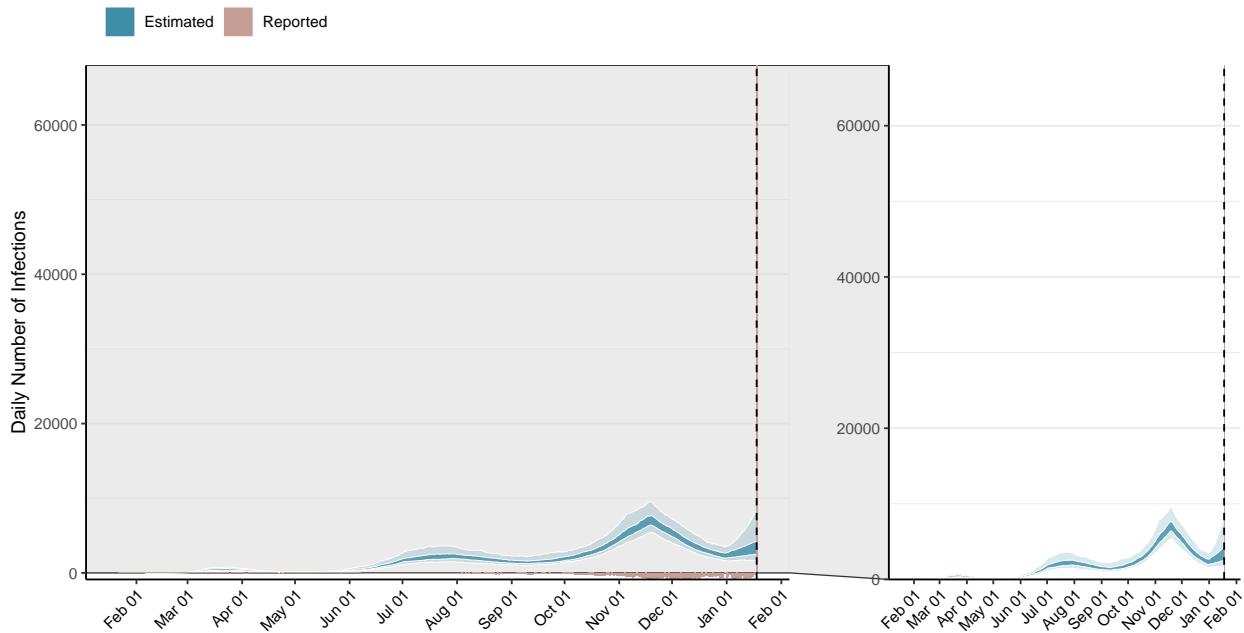


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

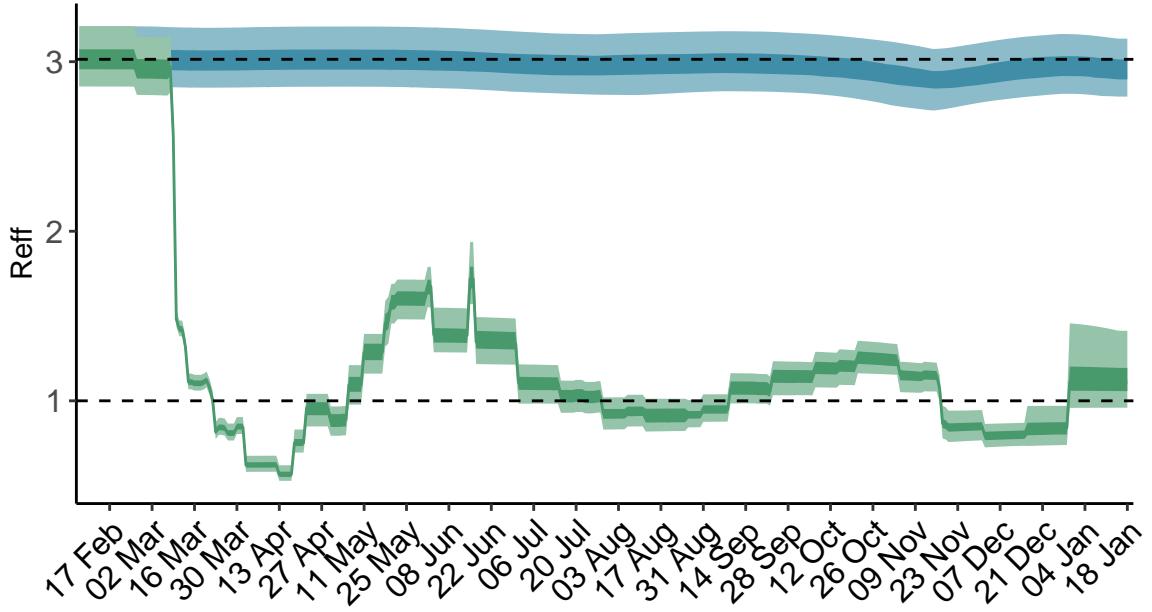


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Albania is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

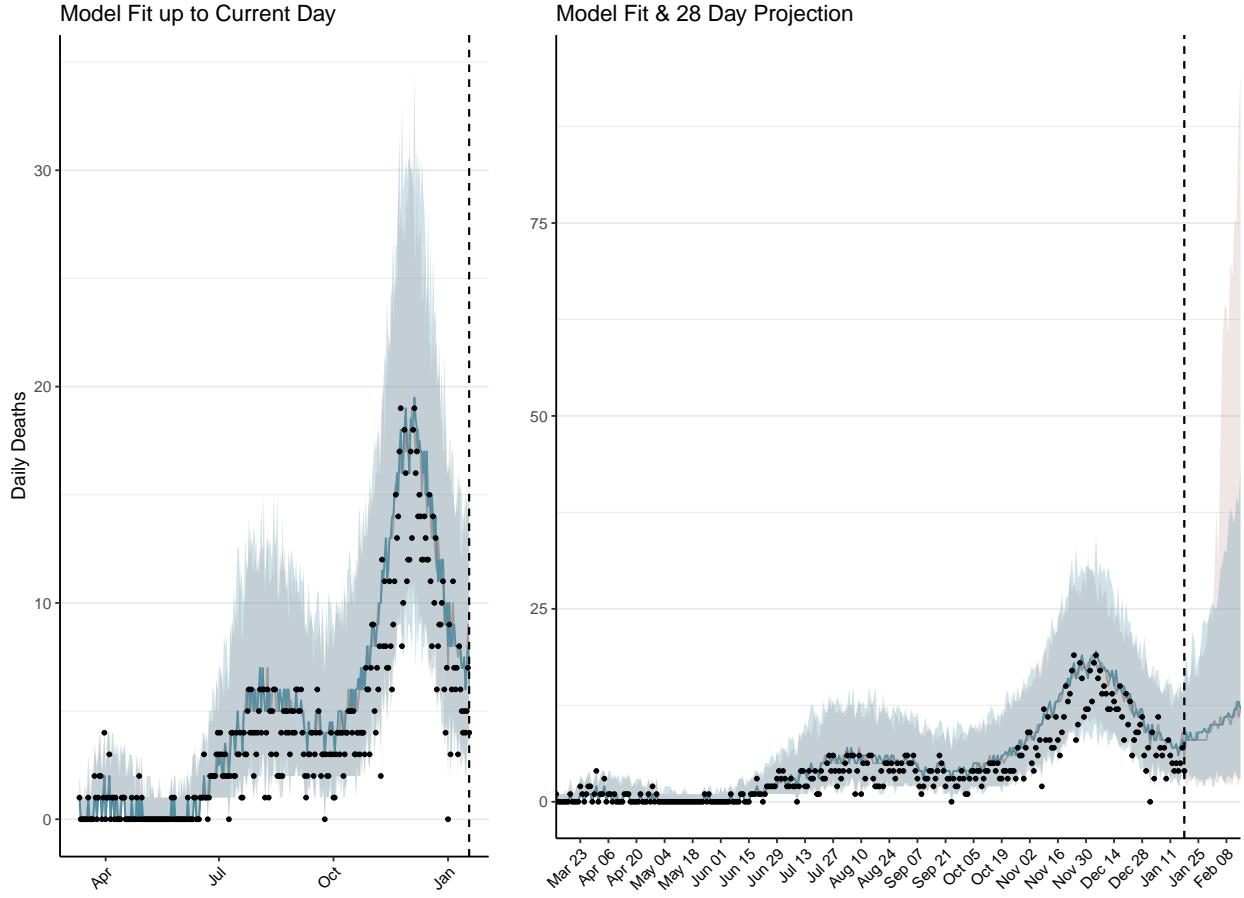


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 317 (95% CI: 297-337) patients requiring treatment with high-pressure oxygen at the current date to 623 (95% CI: 527-719) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 123 (95% CI: 116-130) patients requiring treatment with mechanical ventilation at the current date to 209 (95% CI: 185-233) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

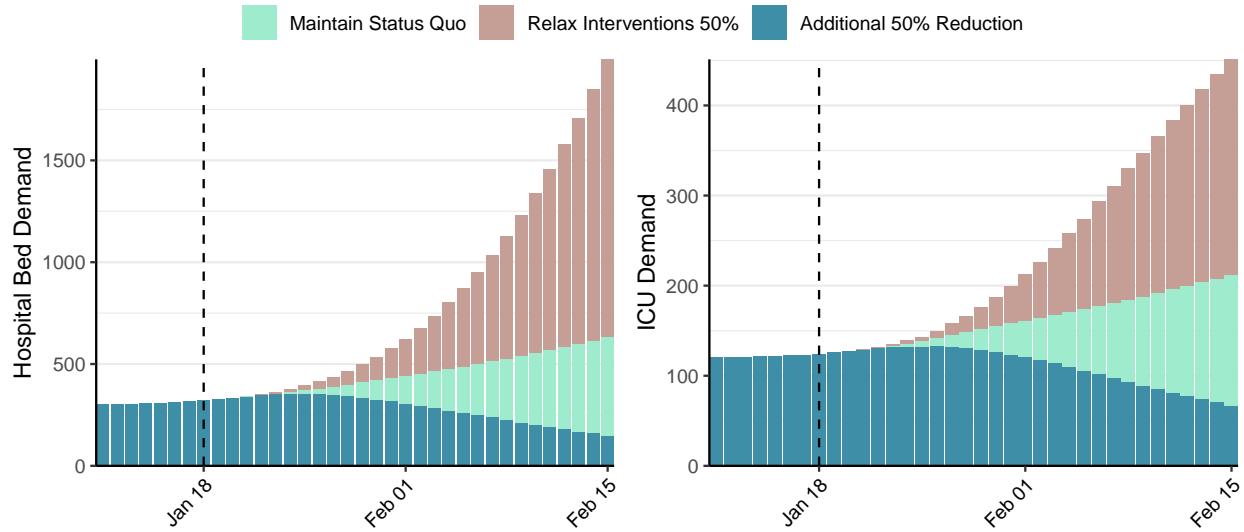


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 3,592 (95% CI: 3,267-3,917) at the current date to 566 (95% CI: 464-669) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,592 (95% CI: 3,267-3,917) at the current date to 33,038 (95% CI: 28,635-37,442) by 2021-02-15.

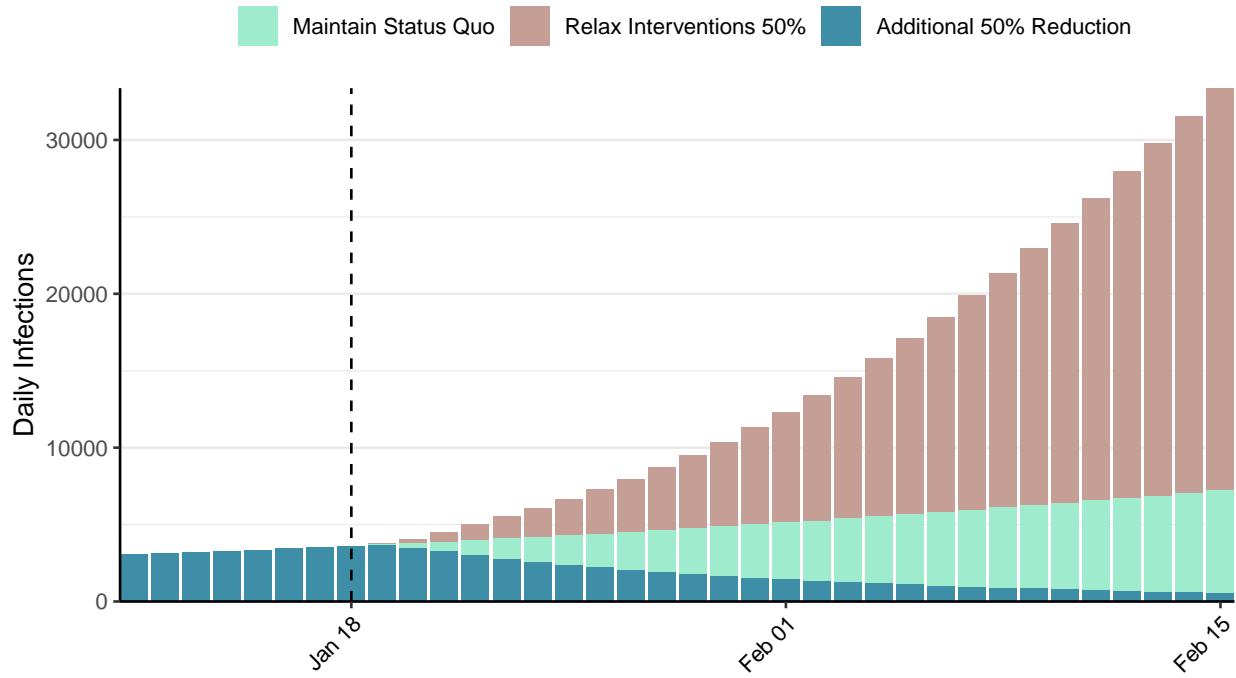


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Argentina, 2021-01-18

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Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.85 (95% CI: 0.67-1.11)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Argentina is not shown in the following plot as only 0 deaths have been reported to date**

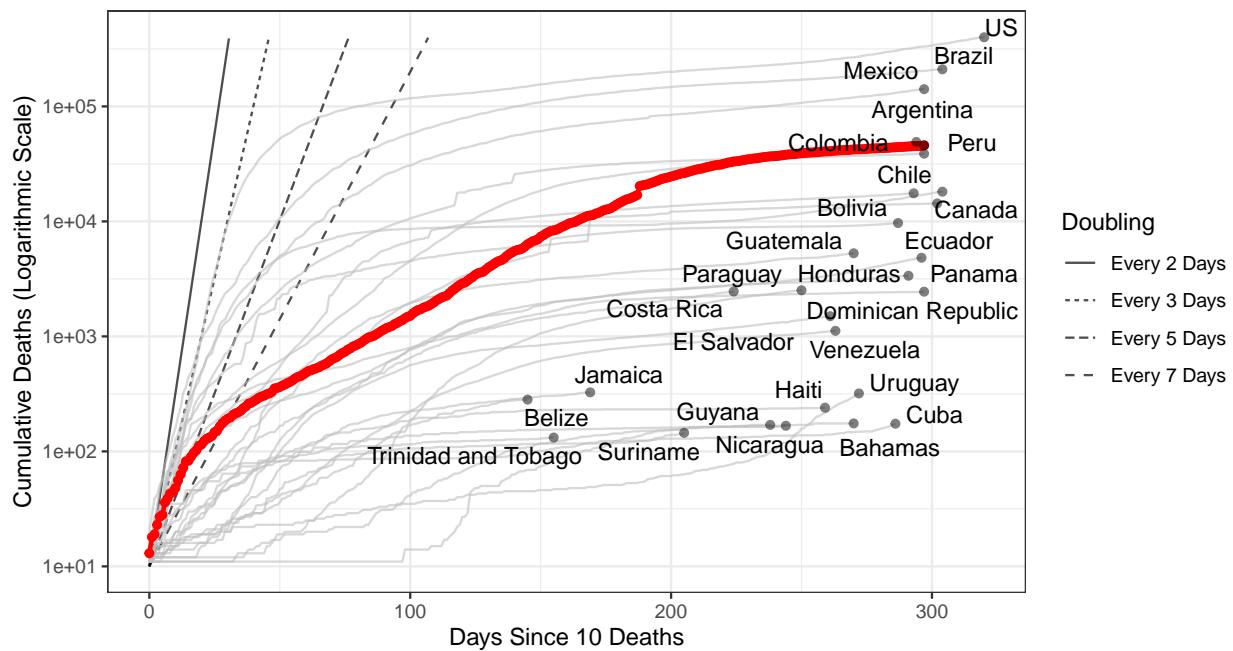


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 994,870 (95% CI: 942,180-1,047,561) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

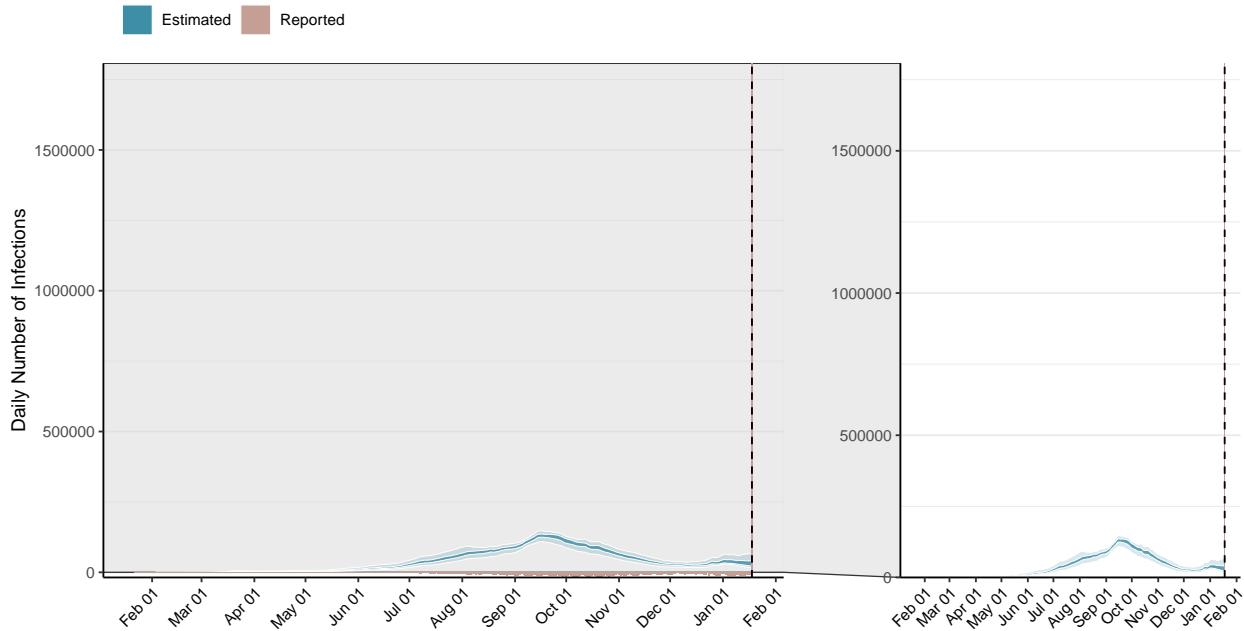


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

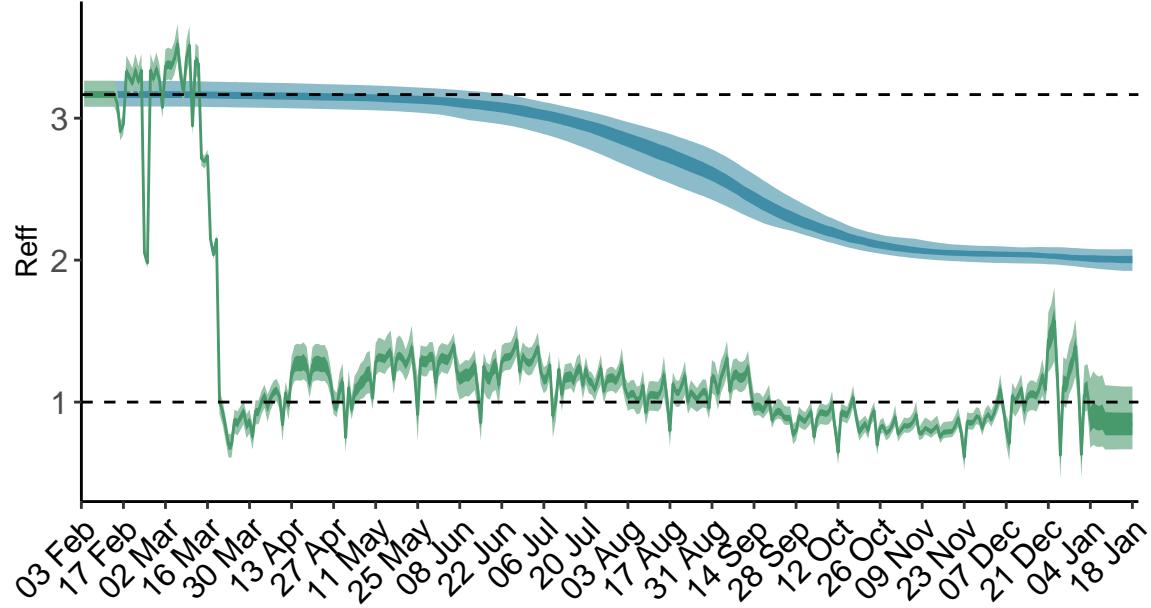


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Argentina is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

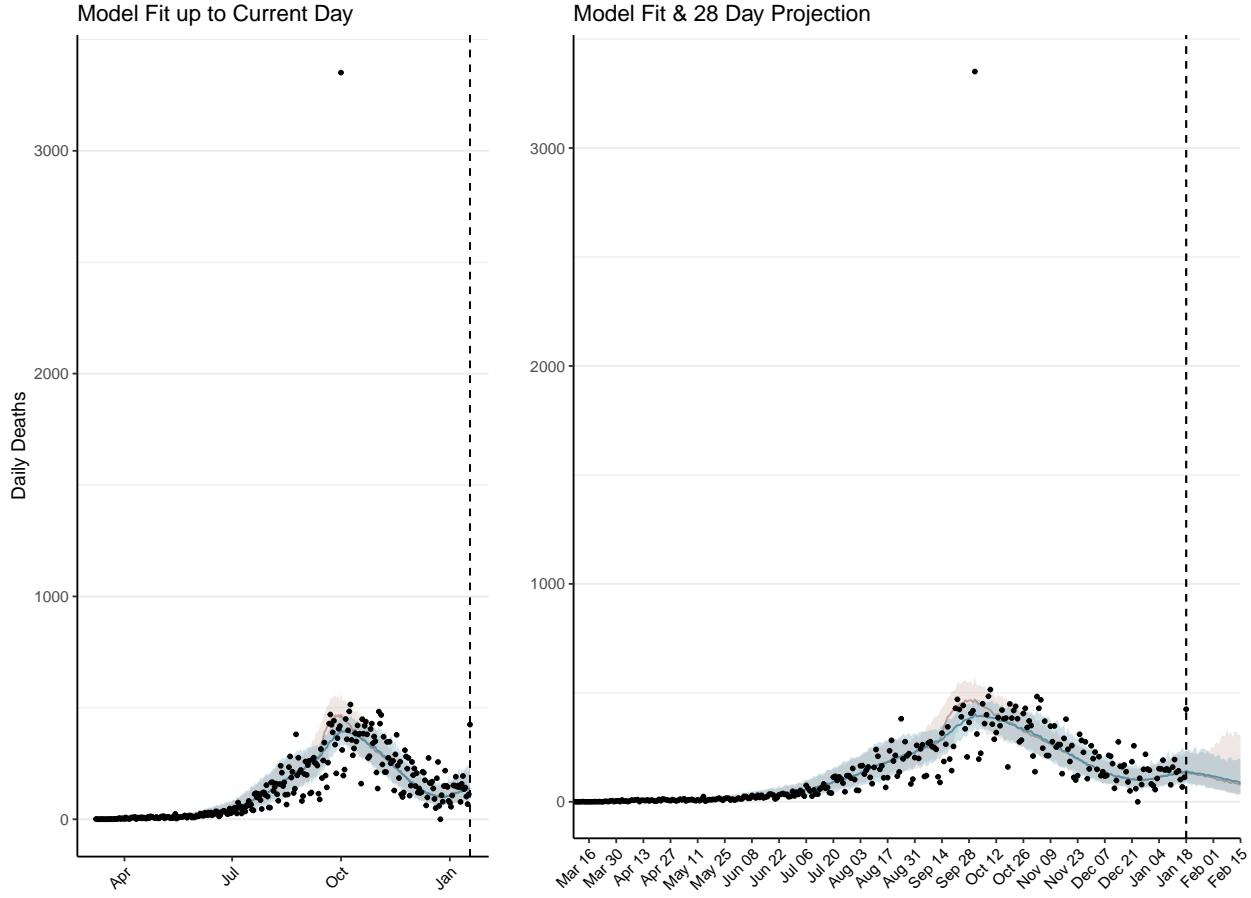


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 4,692 (95% CI: 4,426-4,959) patients requiring treatment with high-pressure oxygen at the current date to 3,233 (95% CI: 2,755-3,710) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 1,626 (95% CI: 1,539-1,713) patients requiring treatment with mechanical ventilation at the current date to 1,161 (95% CI: 1,015-1,306) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

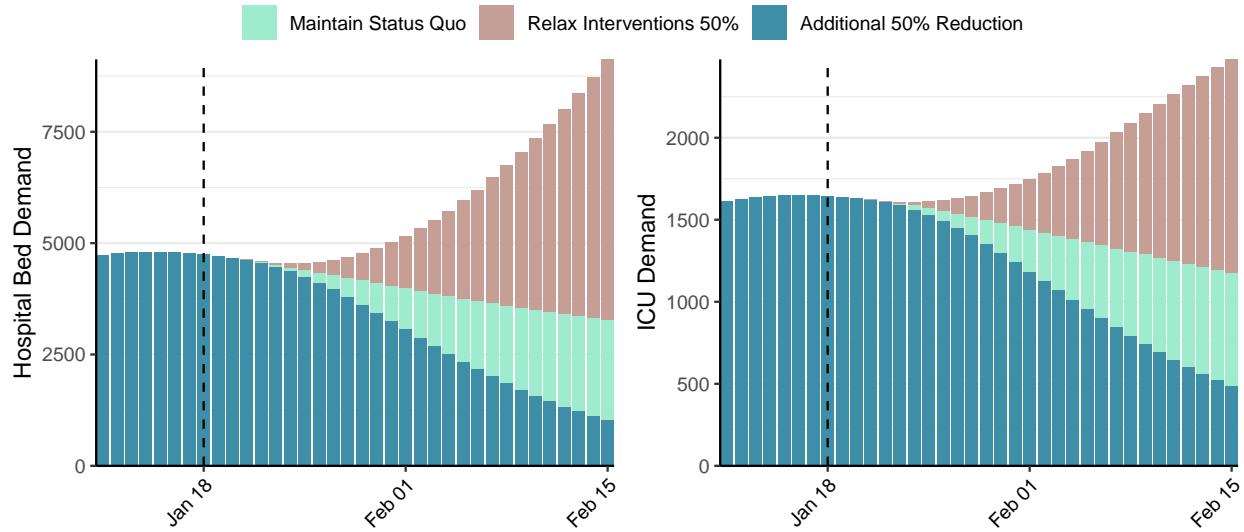


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 31,605 (95% CI: 28,952-34,258) at the current date to 1,978 (95% CI: 1,627-2,330) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 31,605 (95% CI: 28,952-34,258) at the current date to 103,479 (95% CI: 84,803-122,154) by 2021-02-15.

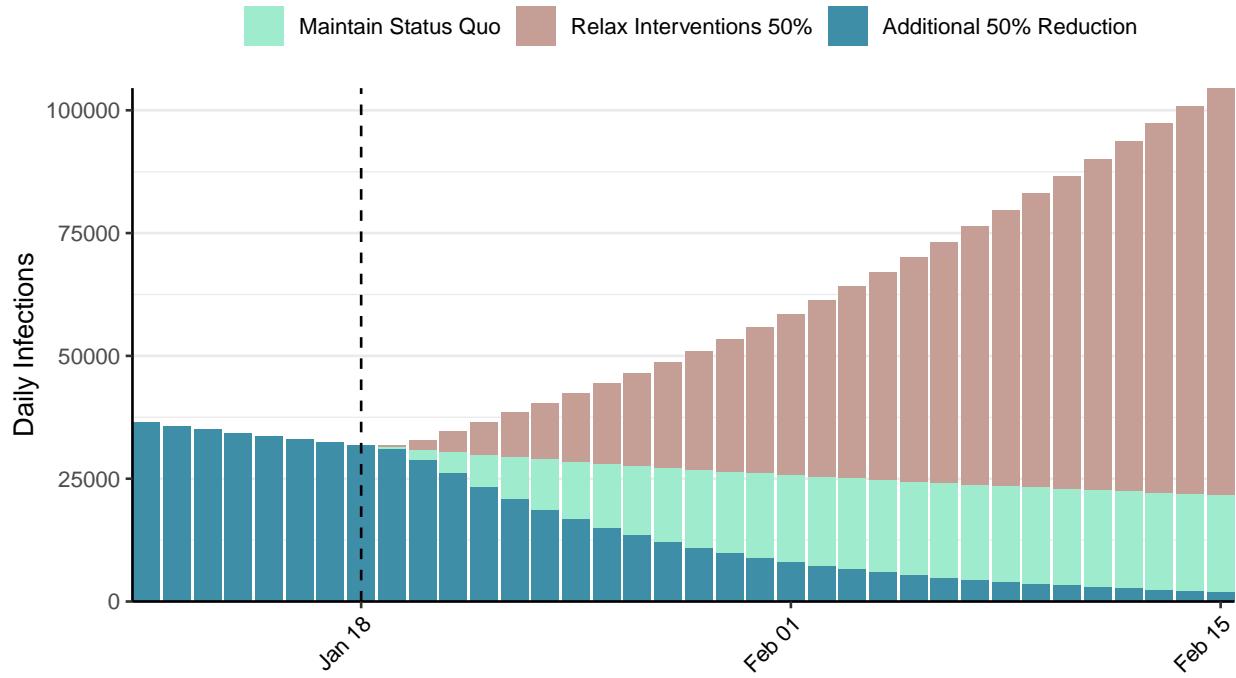


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Armenia, 2021-01-18

[Download the report for Armenia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.81 (95% CI: 0.6-1.02)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Armenia is not shown in the following plot as only 0 deaths have been reported to date**

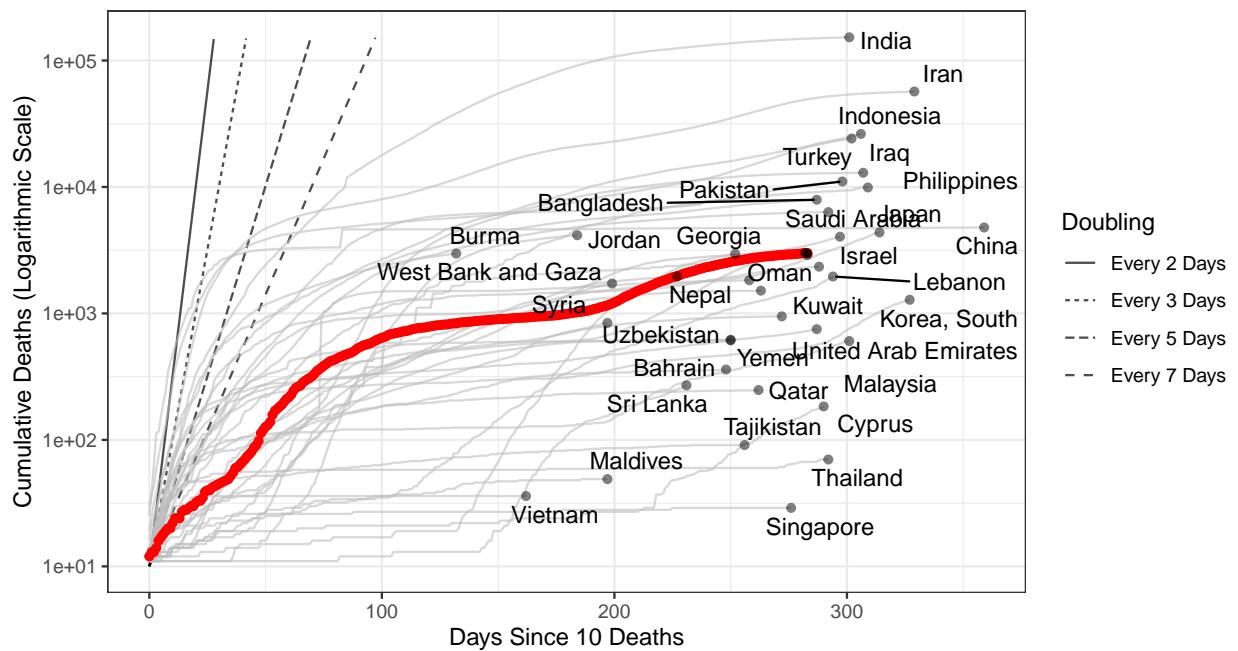


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 90,654 (95% CI: 86,544-94,764) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

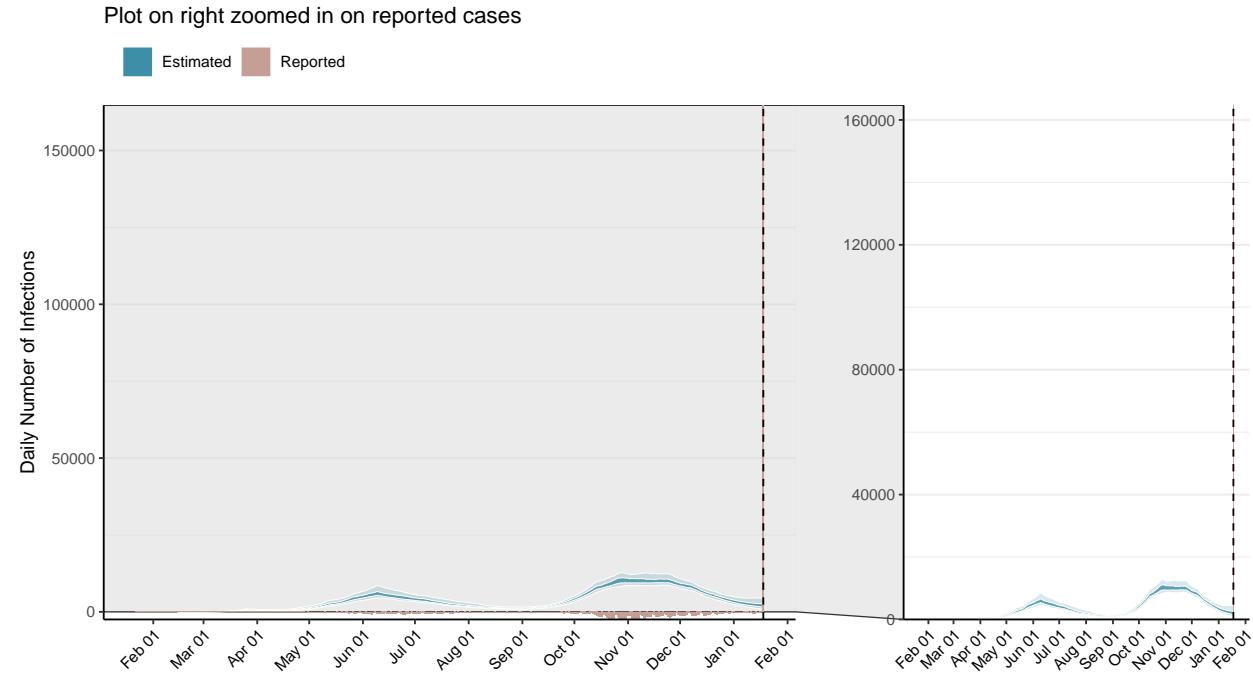


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

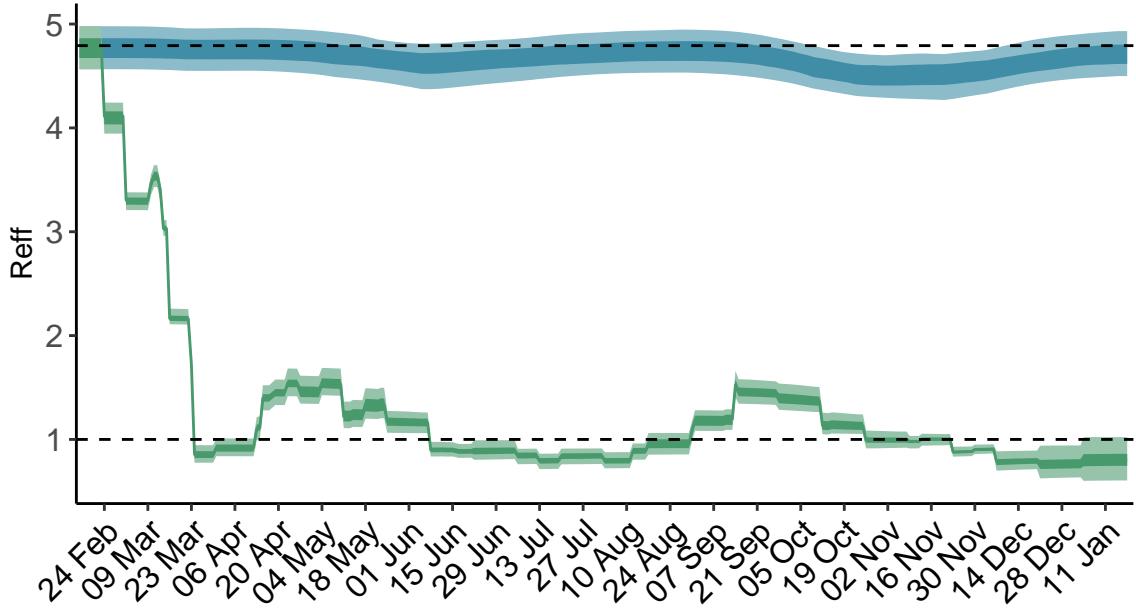


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Armenia is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

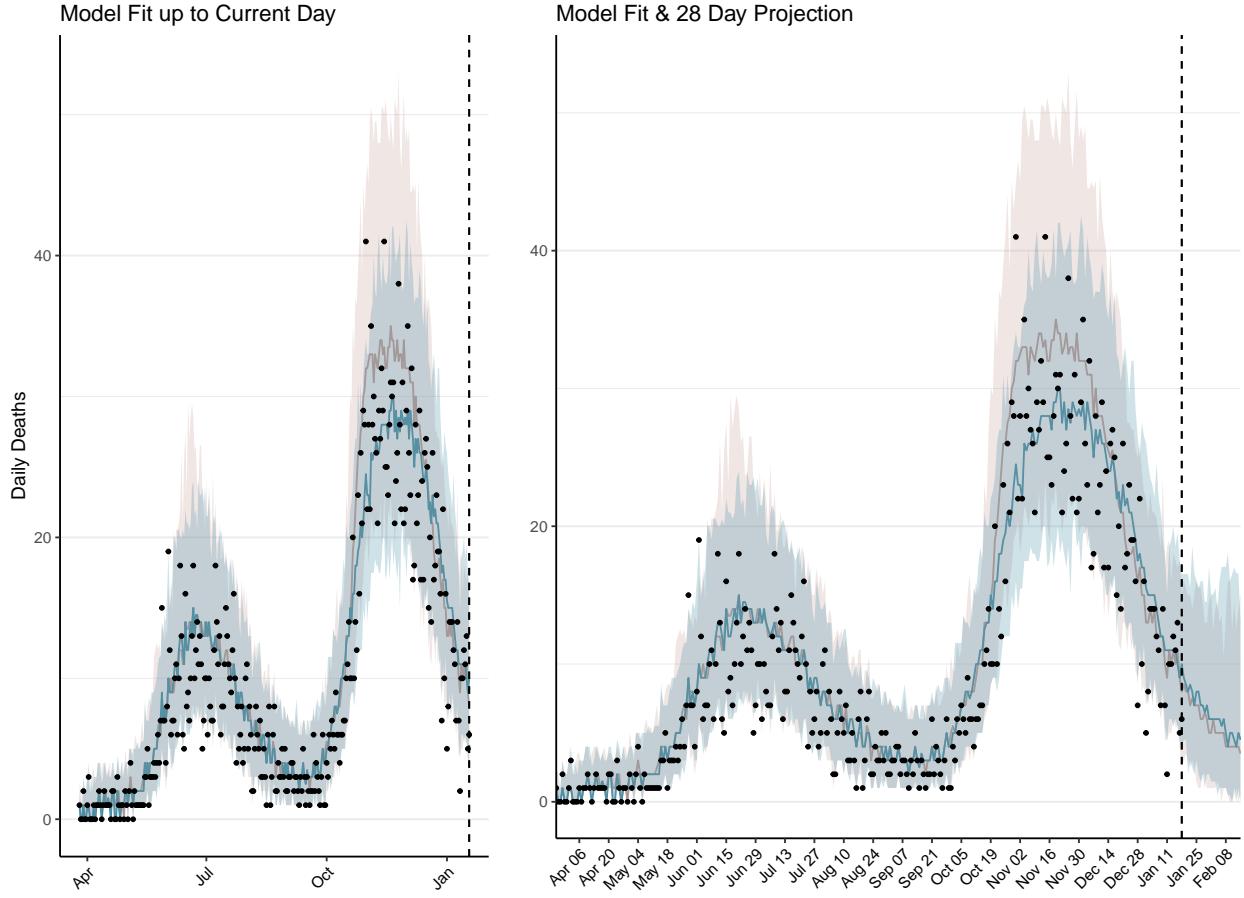


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 313 (95% CI: 297-329) patients requiring treatment with high-pressure oxygen at the current date to 158 (95% CI: 134-182) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 126 (95% CI: 120-132) patients requiring treatment with mechanical ventilation at the current date to 63 (95% CI: 55-71) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

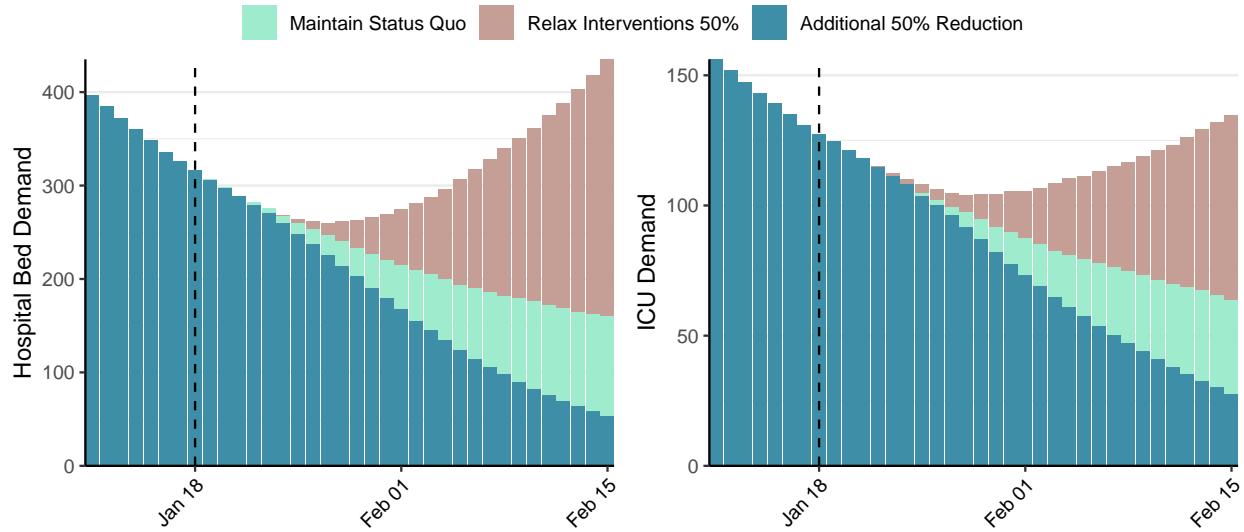


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 2,124 (95% CI: 1,936-2,312) at the current date to 113 (95% CI: 92-134) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,124 (95% CI: 1,936-2,312) at the current date to 6,069 (95% CI: 4,787-7,352) by 2021-02-15.

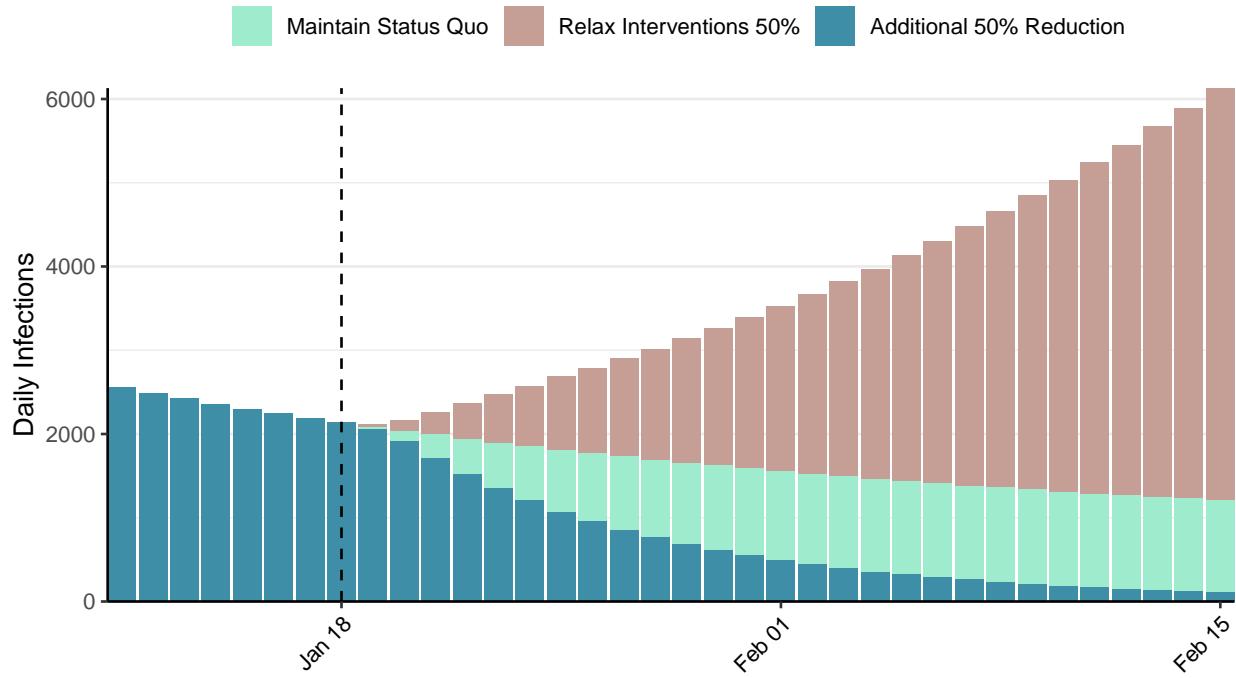


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Azerbaijan, 2021-01-18

[Download the report for Azerbaijan, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.59 (95% CI: 0.51-0.67)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Azerbaijan is not shown in the following plot as only 0 deaths have been reported to date**

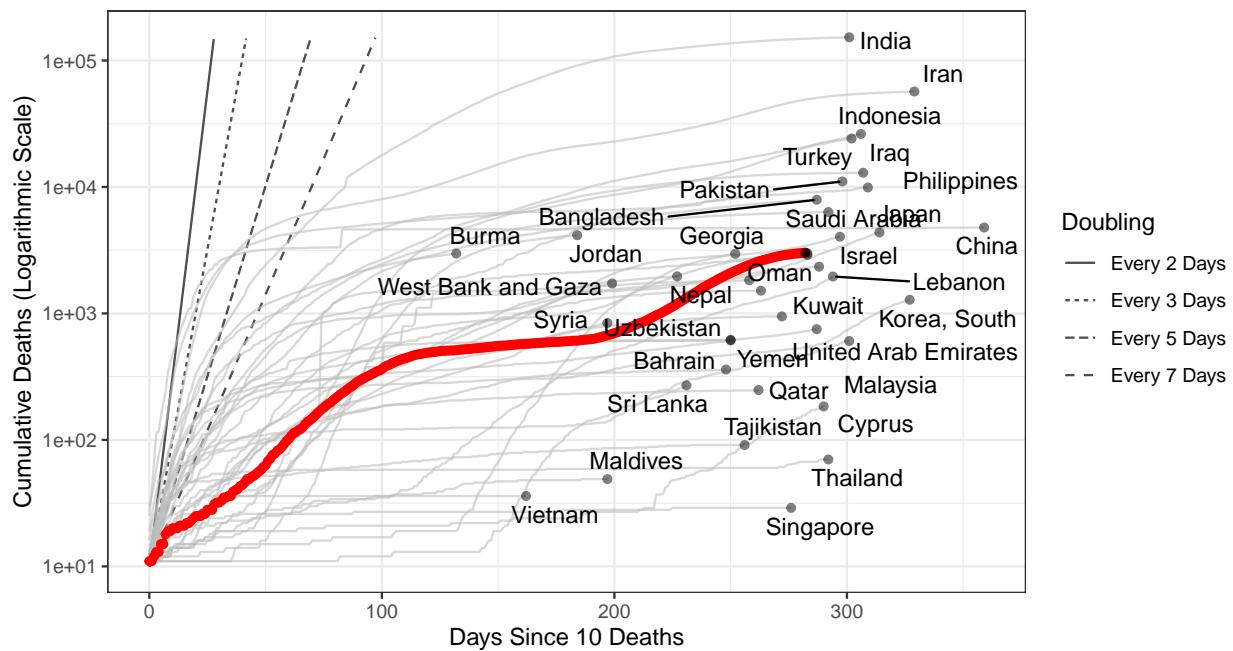


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 127,057 (95% CI: 122,294-131,821) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

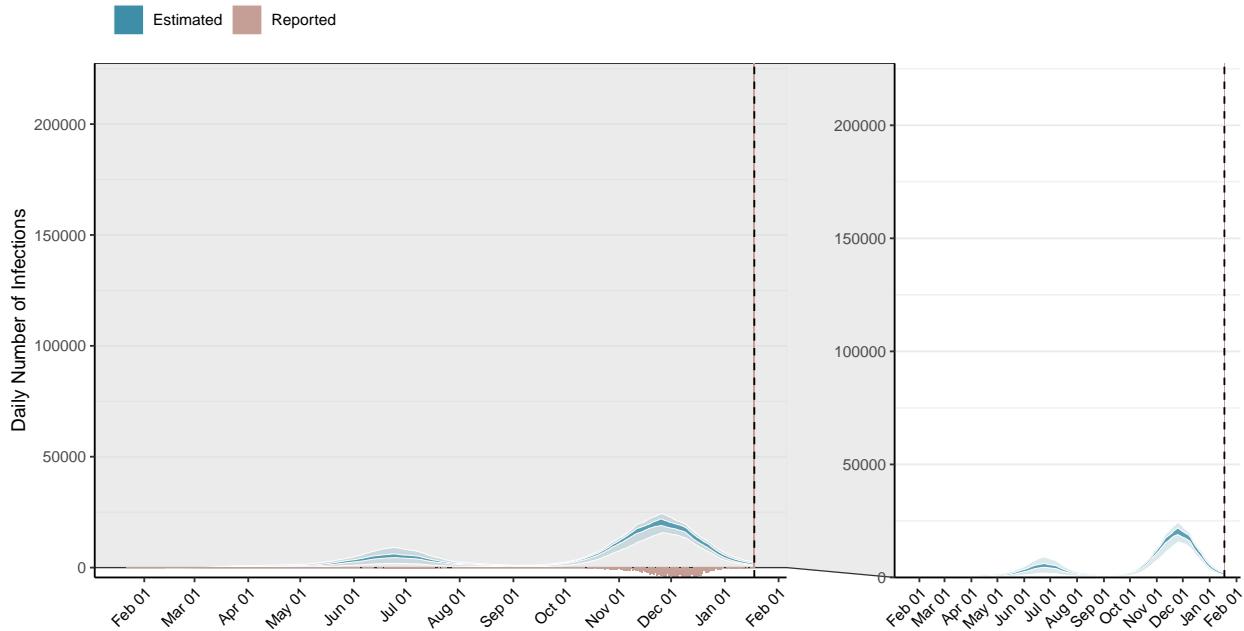


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

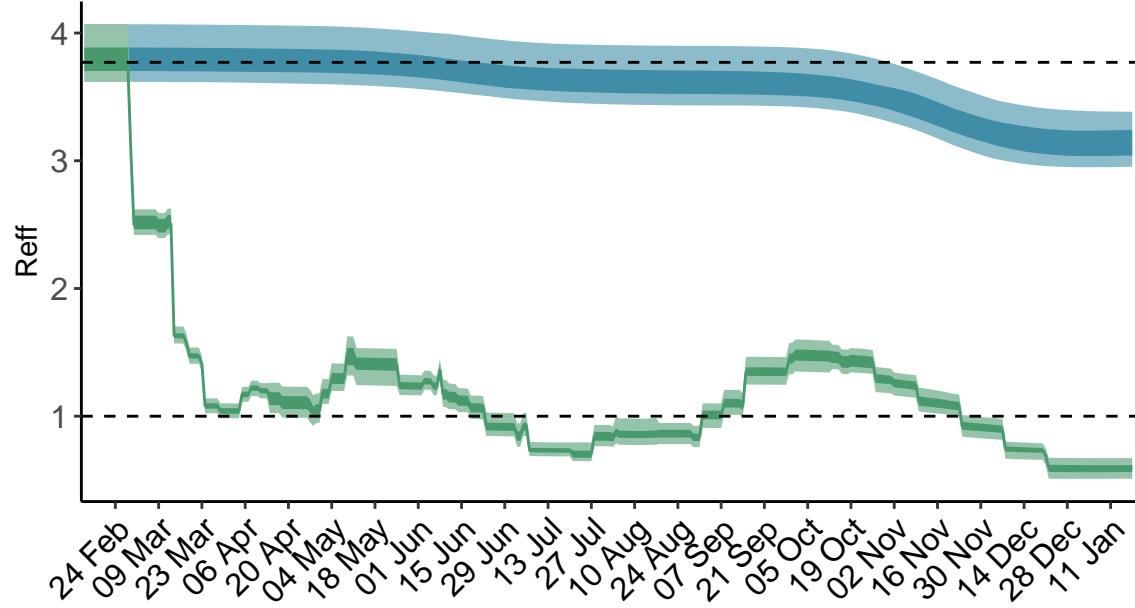


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

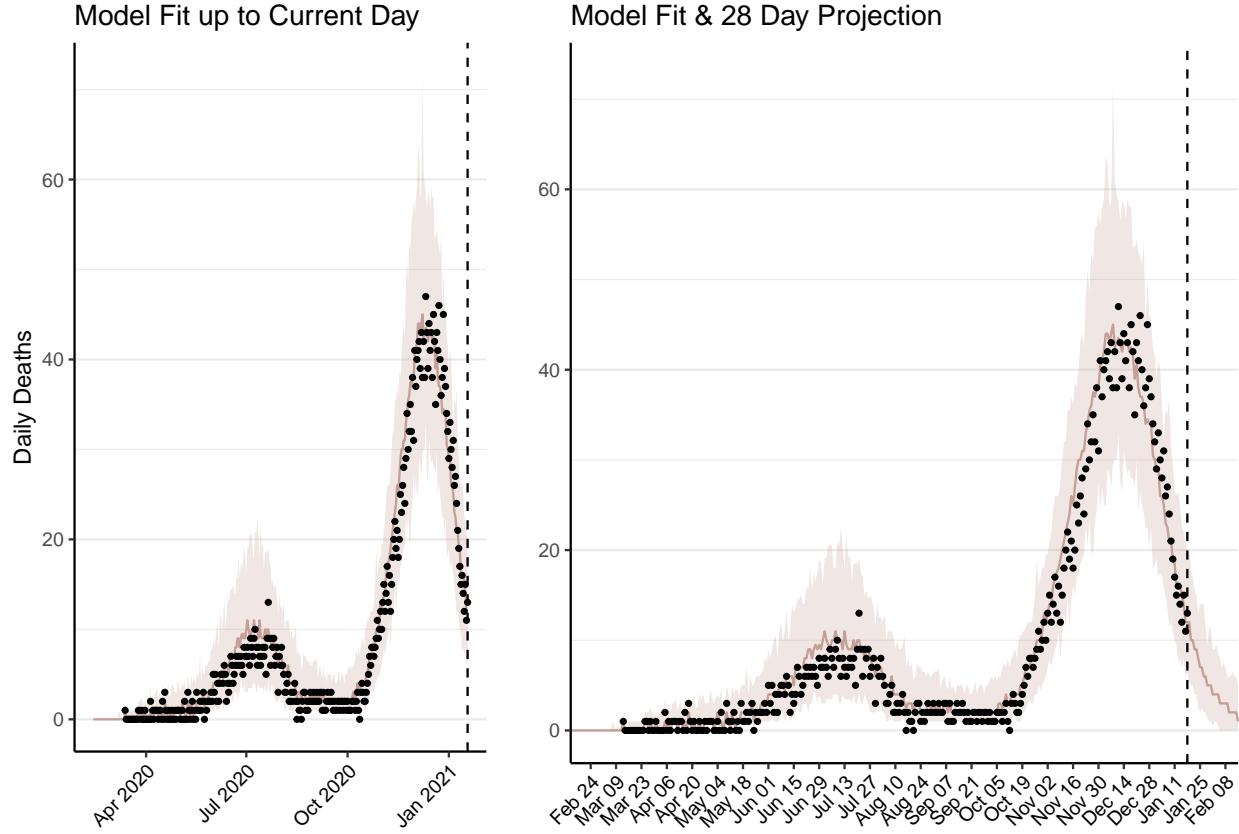


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 382 (95% CI: 367-398) patients requiring treatment with high-pressure oxygen at the current date to 59 (95% CI: 54-64) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 186 (95% CI: 179-193) patients requiring treatment with mechanical ventilation at the current date to 32 (95% CI: 29-34) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

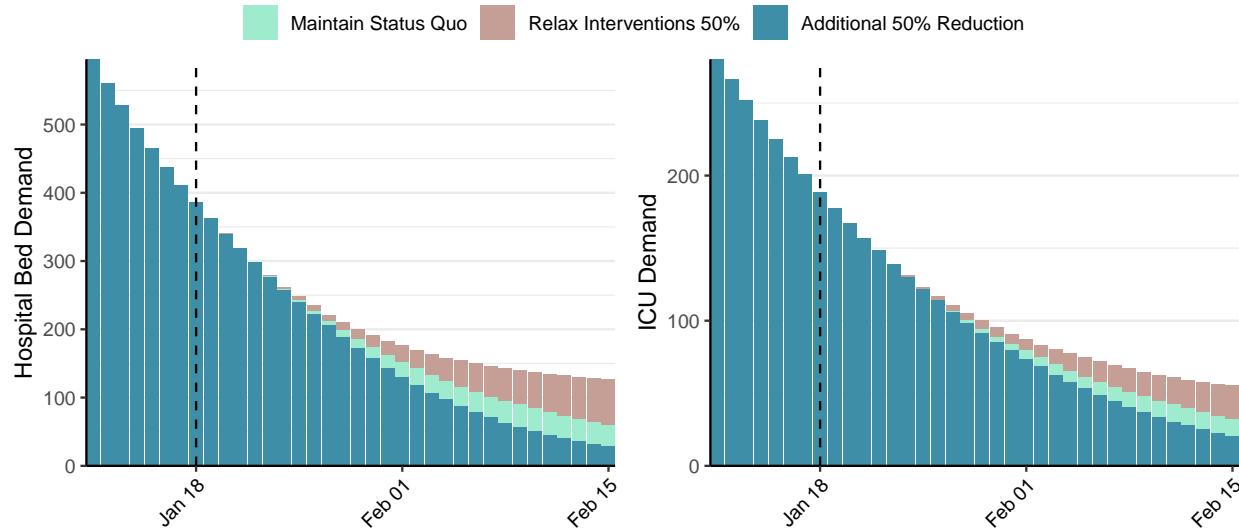


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 1,524 (95% CI: 1,433-1,614) at the current date to 28 (95% CI: 25-31) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,524 (95% CI: 1,433-1,614) at the current date to 1,047 (95% CI: 931-1,164) by 2021-02-15.

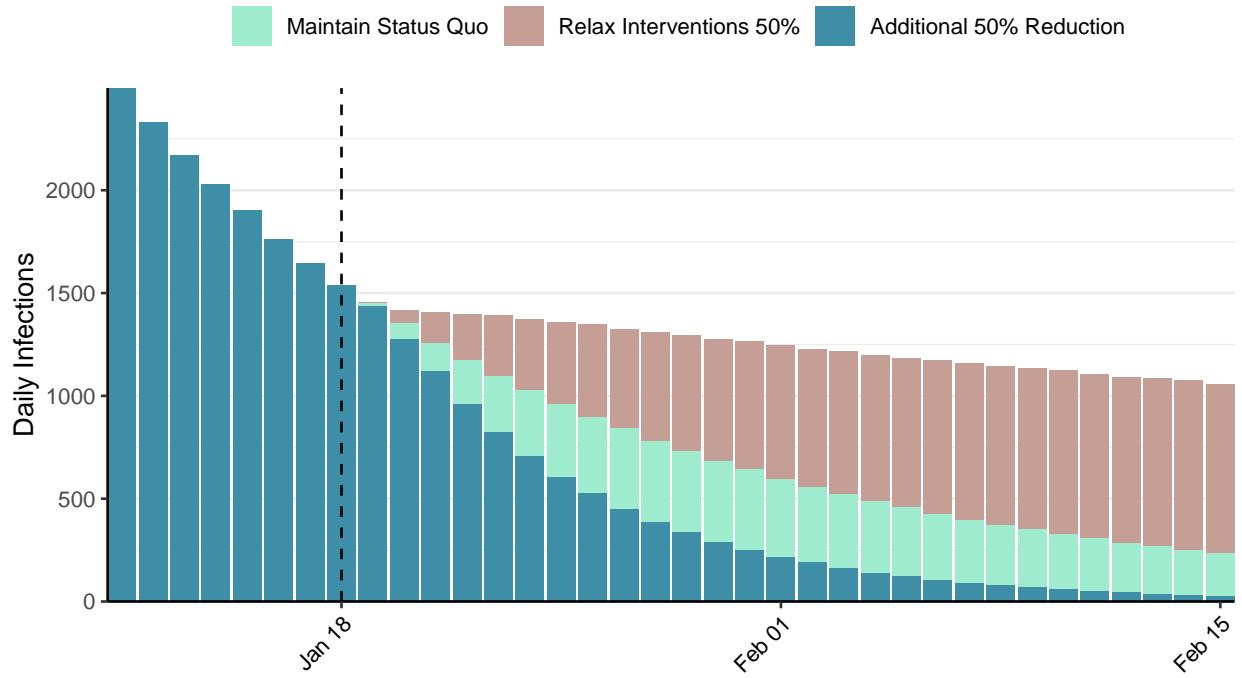


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Burundi, 2021-01-18

[Download the report for Burundi, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.96 (95% CI: 0.58-1.47)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Burundi is not shown in the following plot as only 0 deaths have been reported to date**

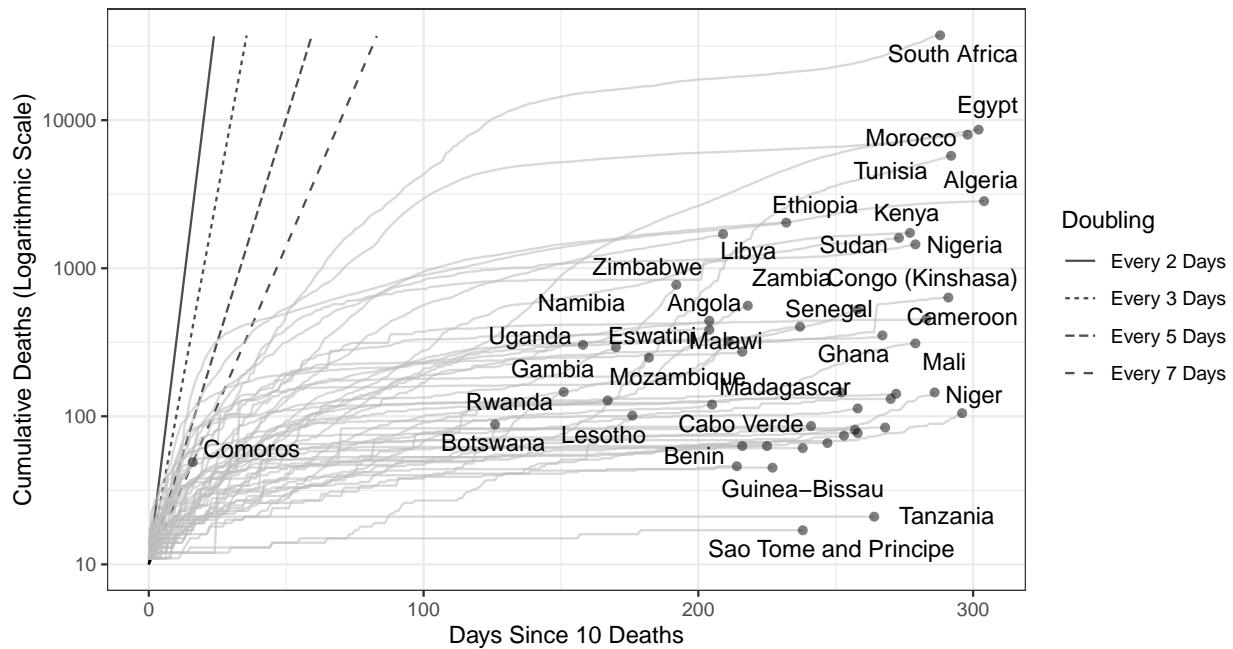


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 1 (95% CI: -1-3) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

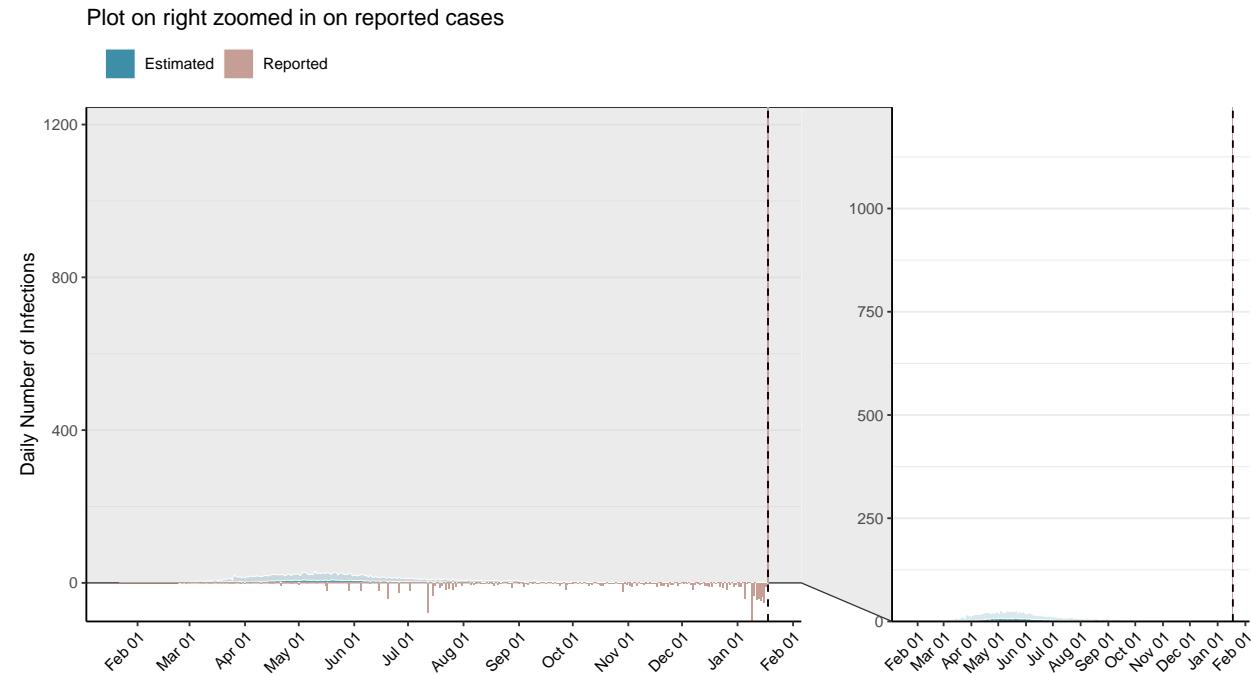


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

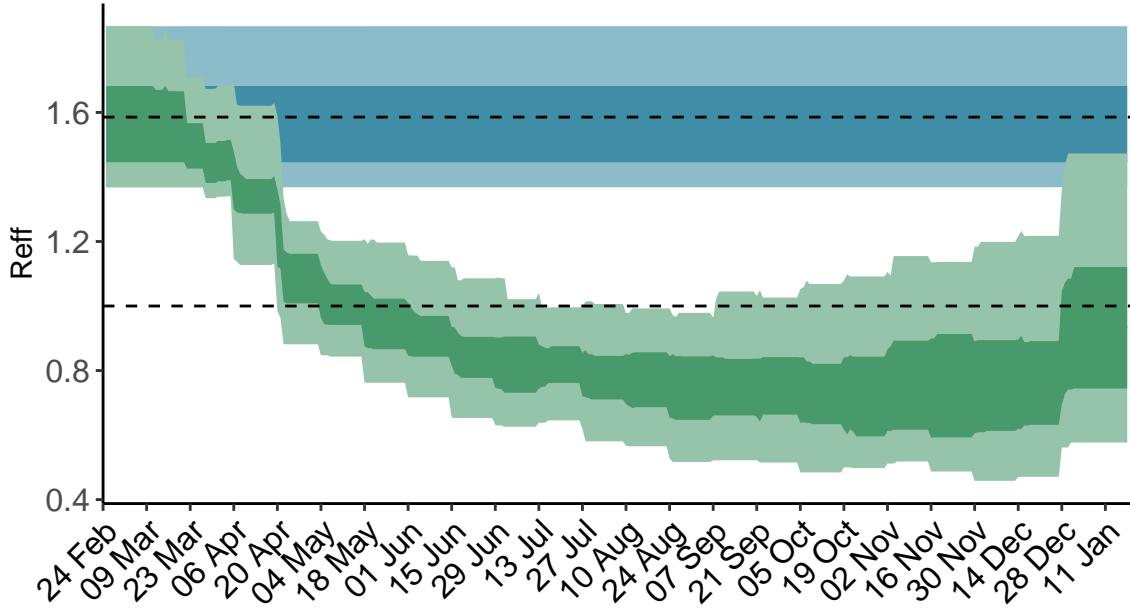


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

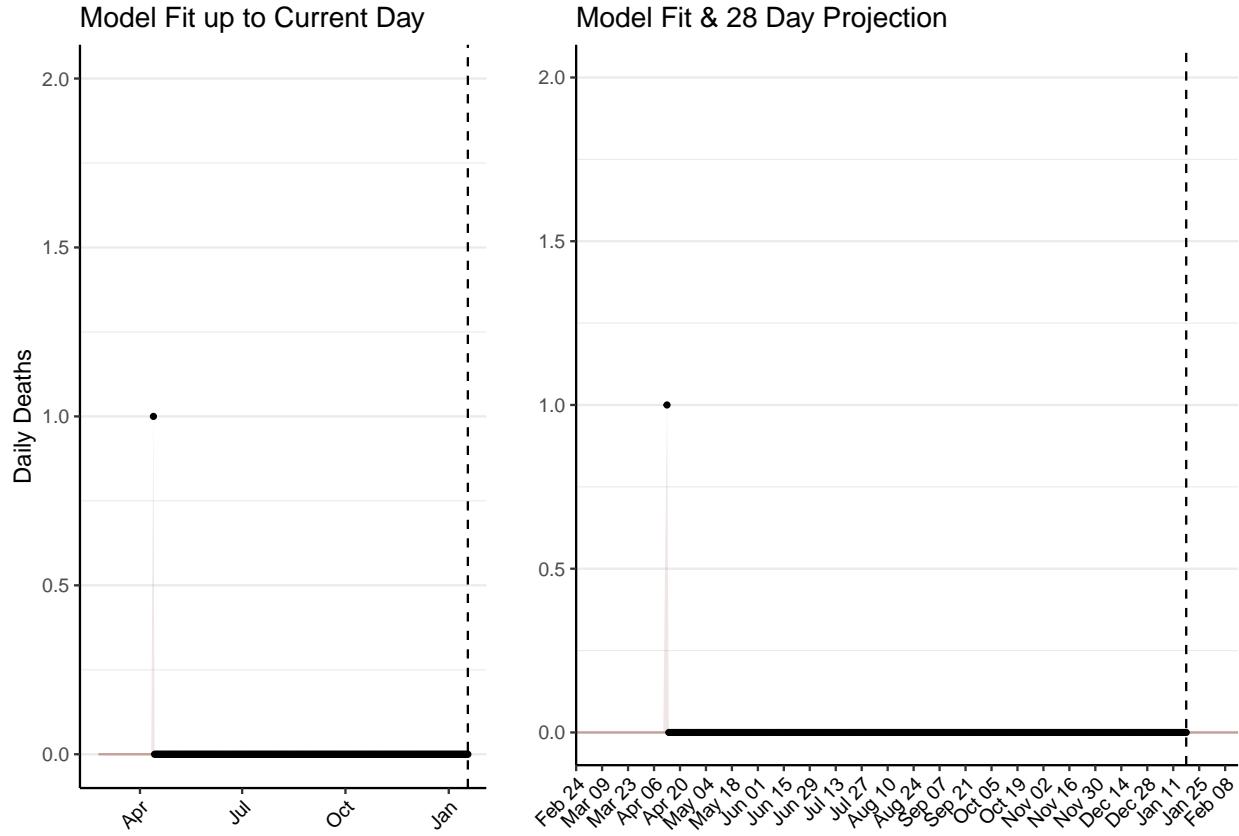


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 0 (95% CI: NaN-NaN) patients requiring treatment with high-pressure oxygen at the current date to 0 (95% CI: NaN-NaN) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 0 (95% CI: NaN-NaN) patients requiring treatment with mechanical ventilation at the current date to 0 (95% CI: NaN-NaN) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

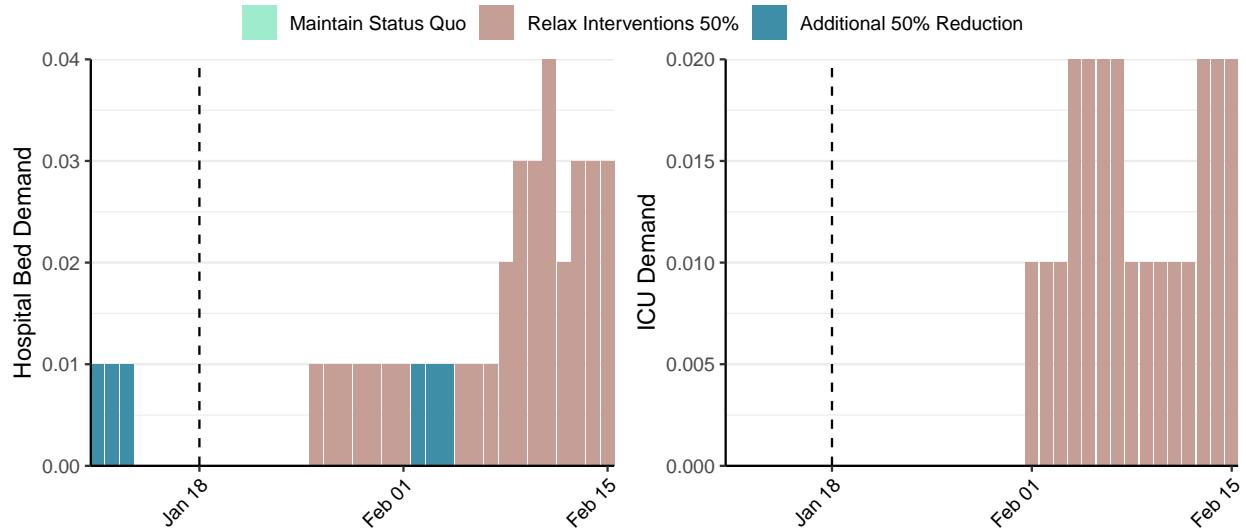


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 0 (95% CI: 0-0) at the current date to 0 (95% CI: 0-0) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 0 (95% CI: 0-0) at the current date to 2 (95% CI: -2-5) by 2021-02-15.

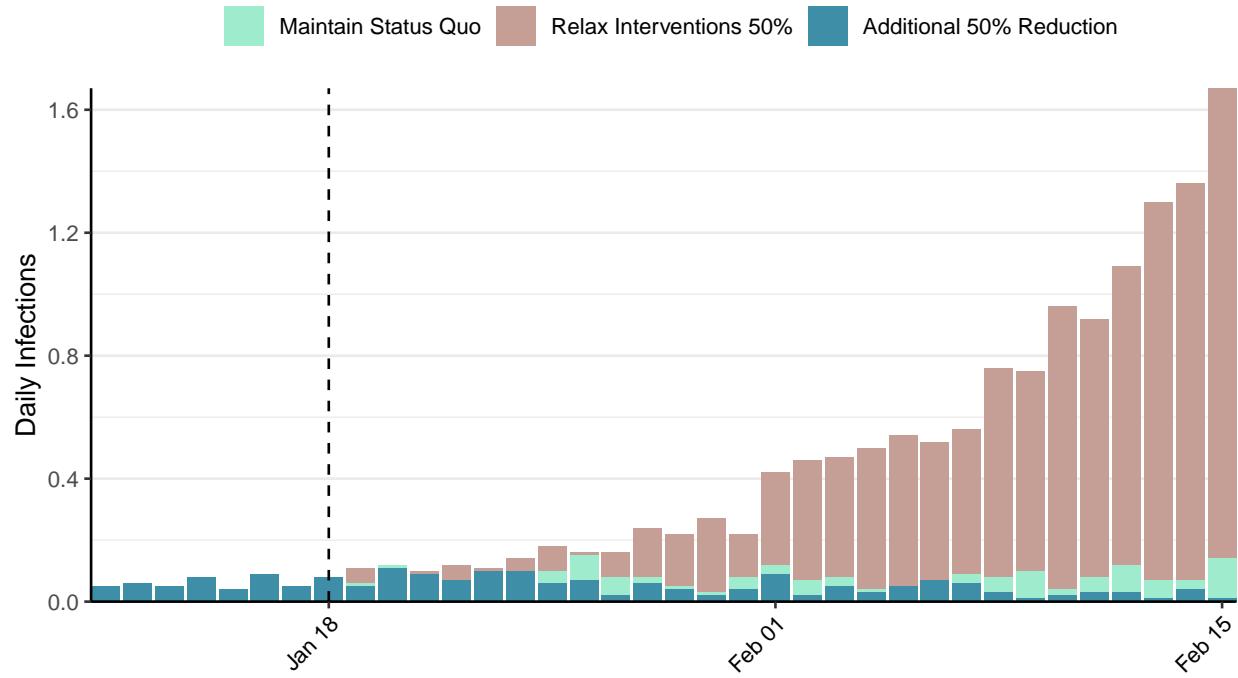


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](#) - <https://covidsim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Benin, 2021-01-18

[Download the report for Benin, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.65 (95% CI: 0.43-0.95)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Benin is not shown in the following plot as only 0 deaths have been reported to date**

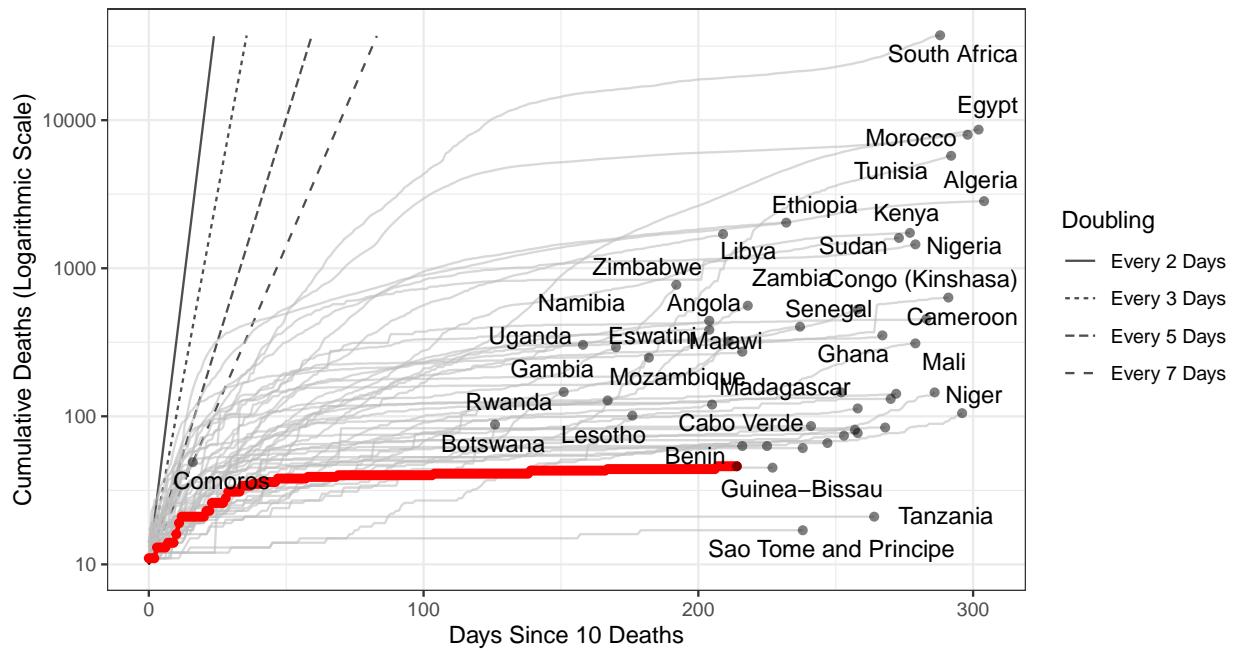


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 211 (95% CI: 147-276) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. Benin has revised their historic reported cases and thus have reported negative cases.**

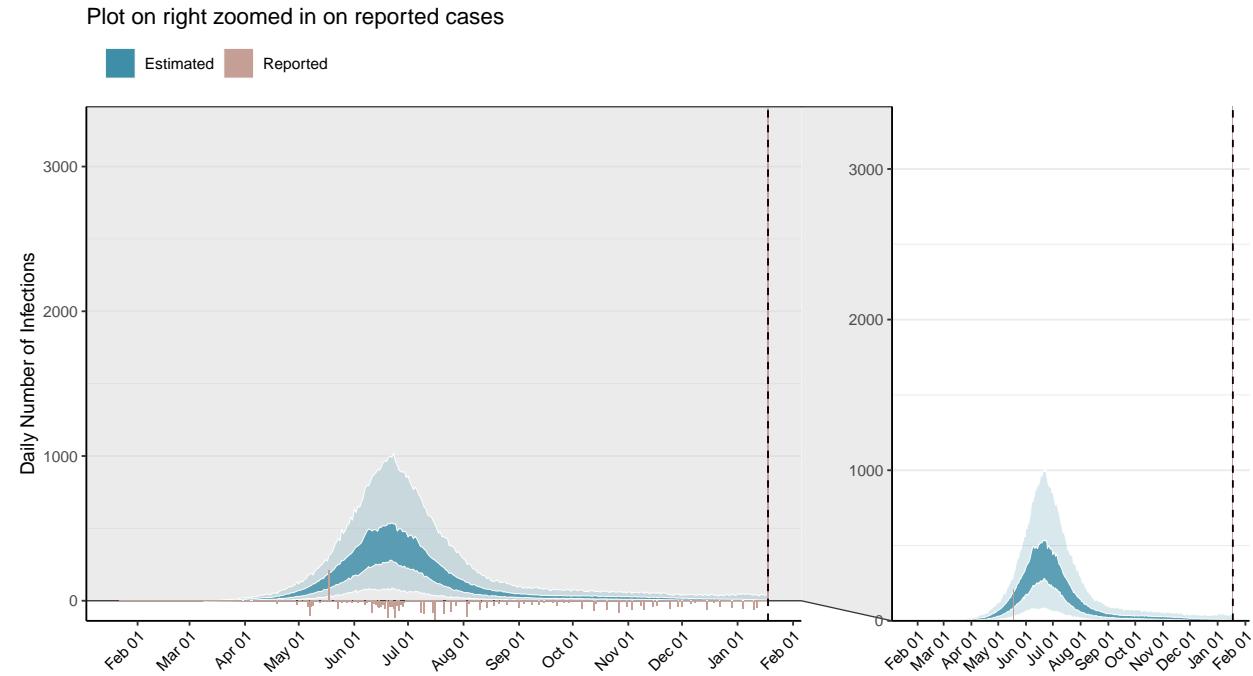


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

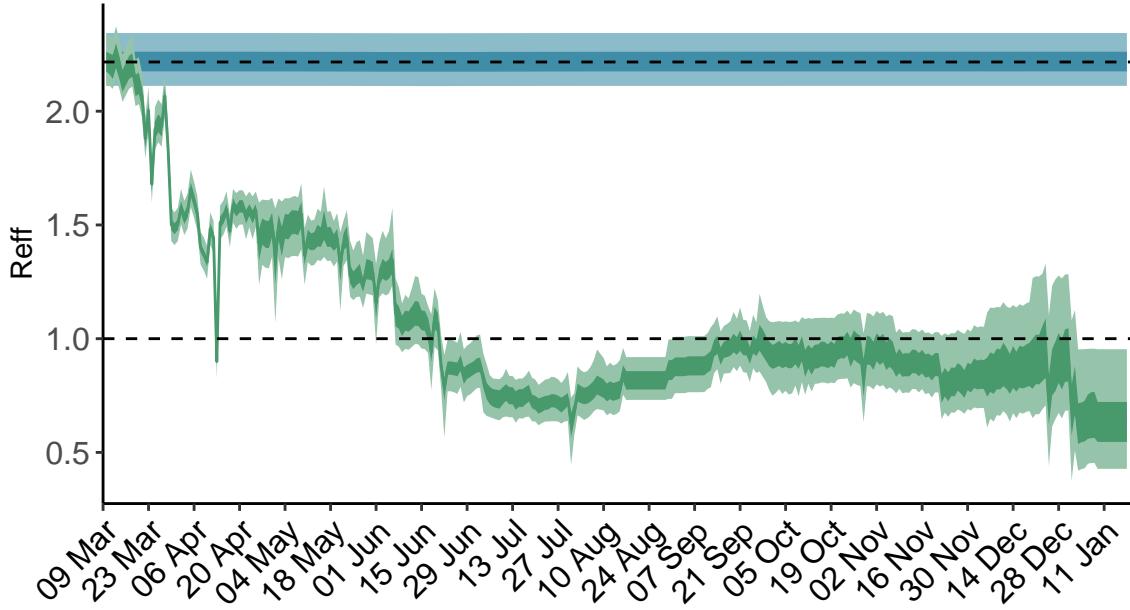


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

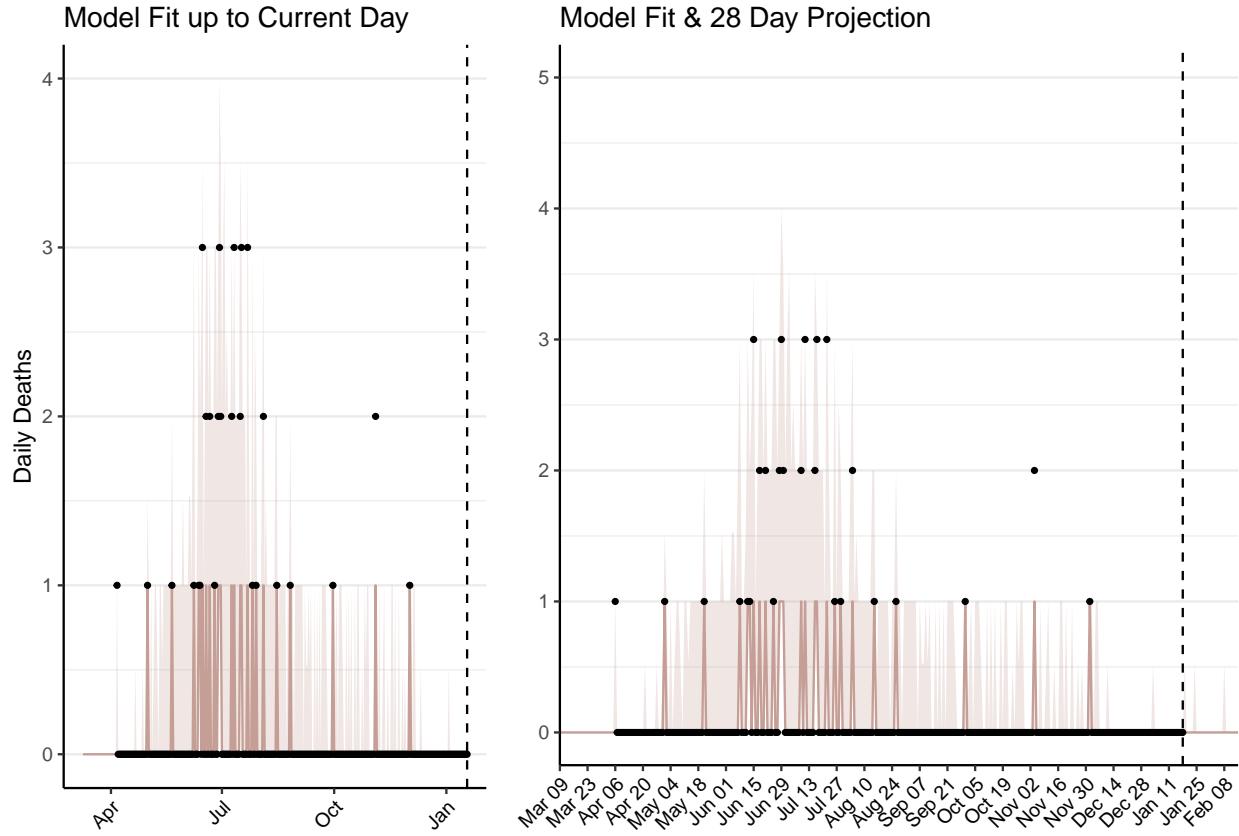


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1 (95% CI: 0-1) patients requiring treatment with high-pressure oxygen at the current date to 0 (95% CI: 0-1) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 0 (95% CI: 0-0) patients requiring treatment with mechanical ventilation at the current date to 0 (95% CI: 0-0) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

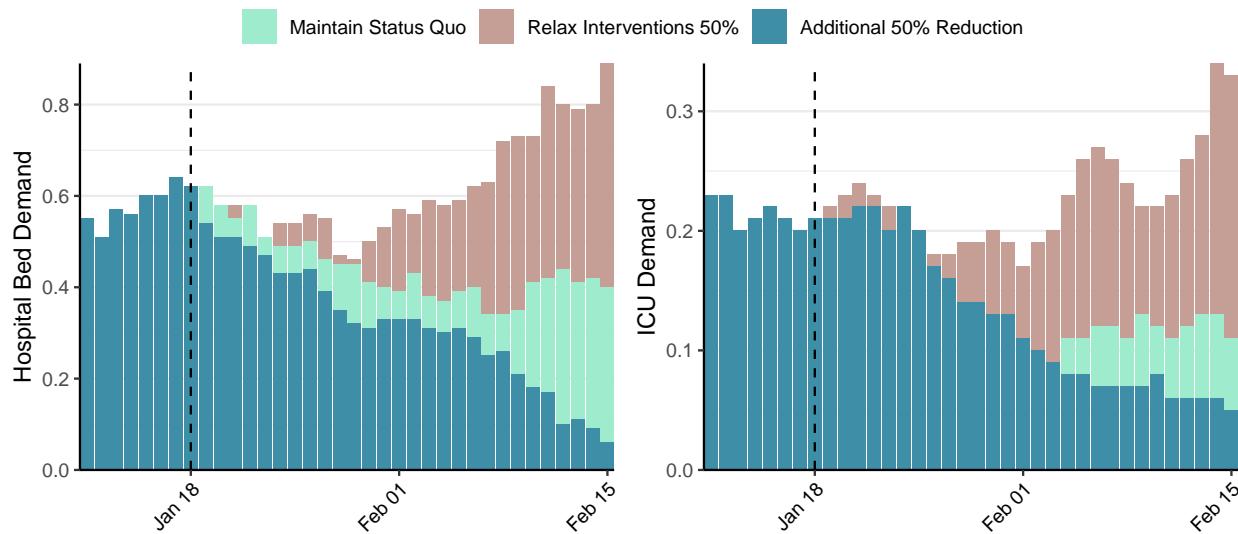


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 5 (95% CI: 3-8) at the current date to 0 (95% CI: 0-1) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 5 (95% CI: 3-8) at the current date to 18 (95% CI: 4-32) by 2021-02-15.

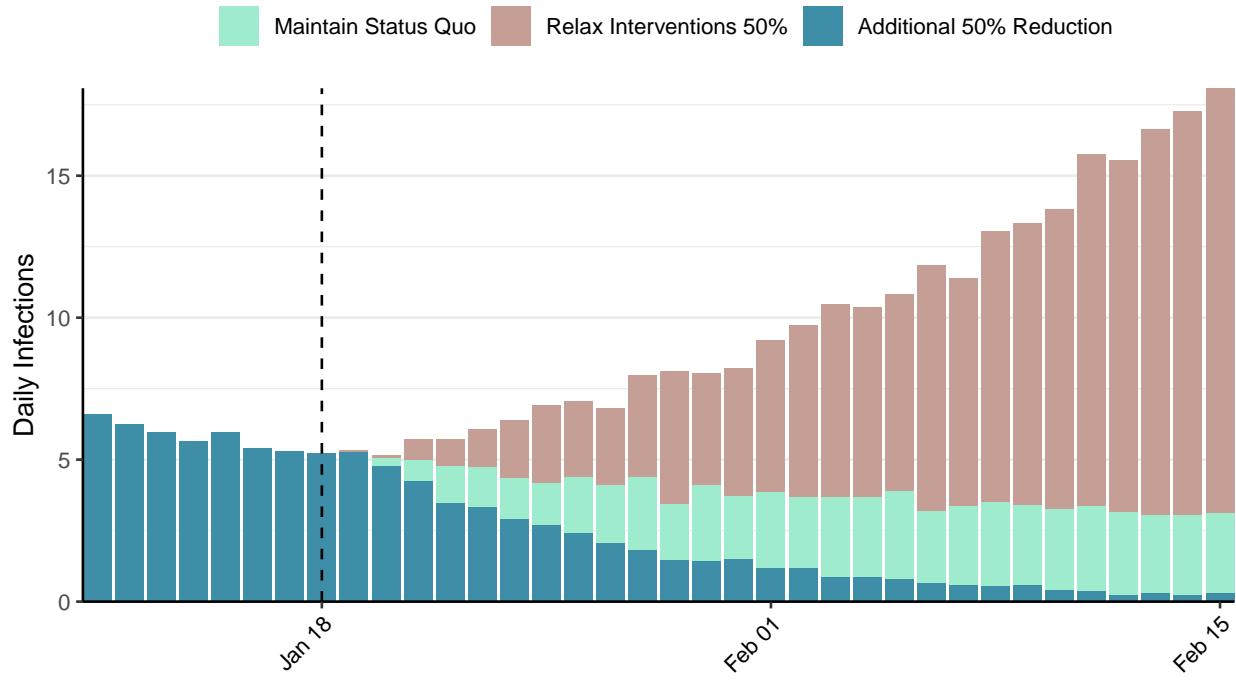


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](#) - <https://covidsim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Burkina Faso, 2021-01-18

[Download the report for Burkina Faso, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.16 (95% CI: 1.01-1.37)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Burkina Faso is not shown in the following plot as only 0 deaths have been reported to date**

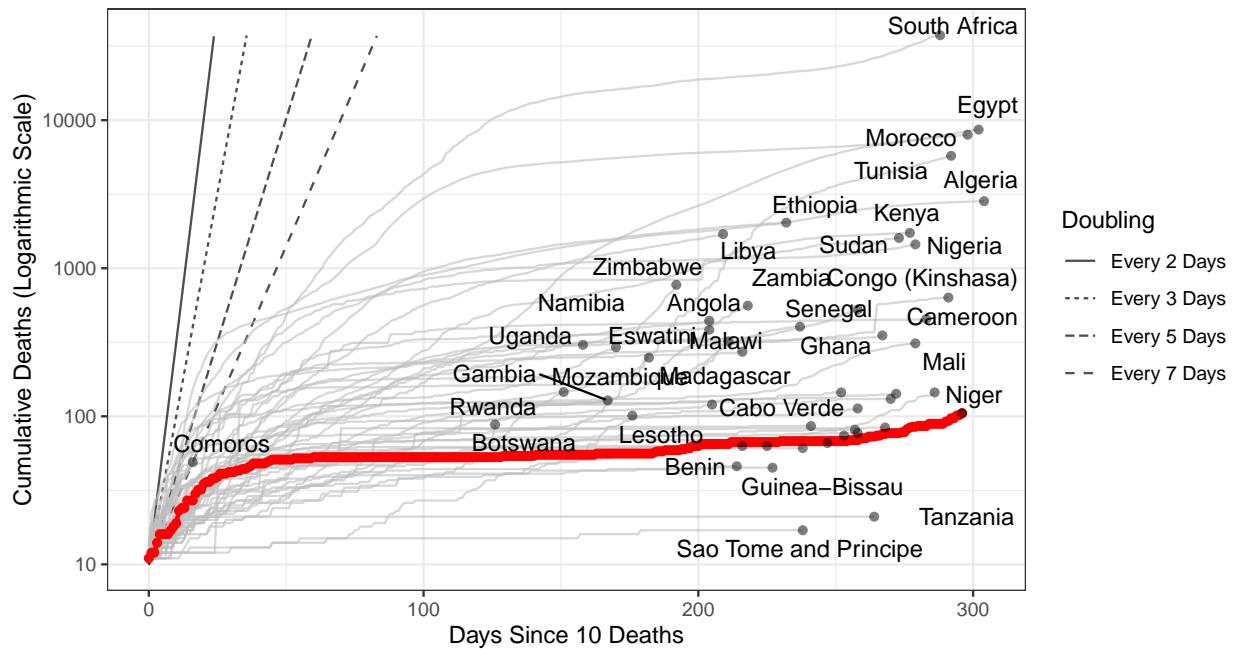


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 41,618 (95% CI: 37,911-45,325) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

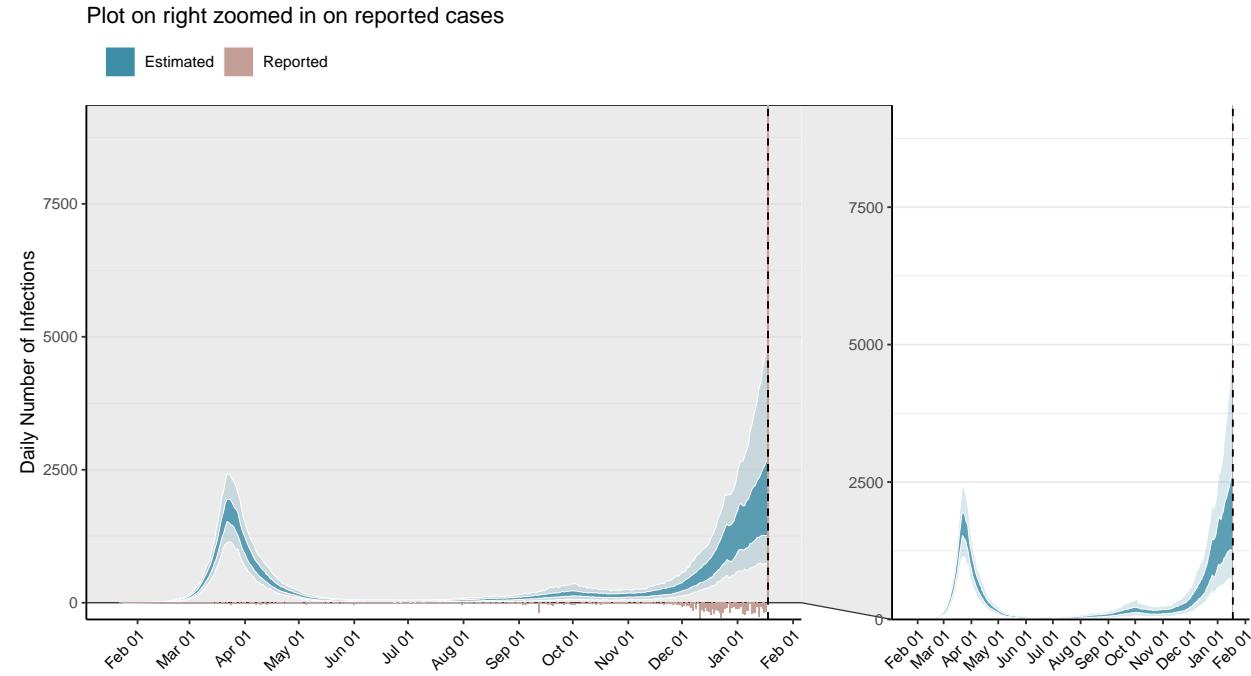


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

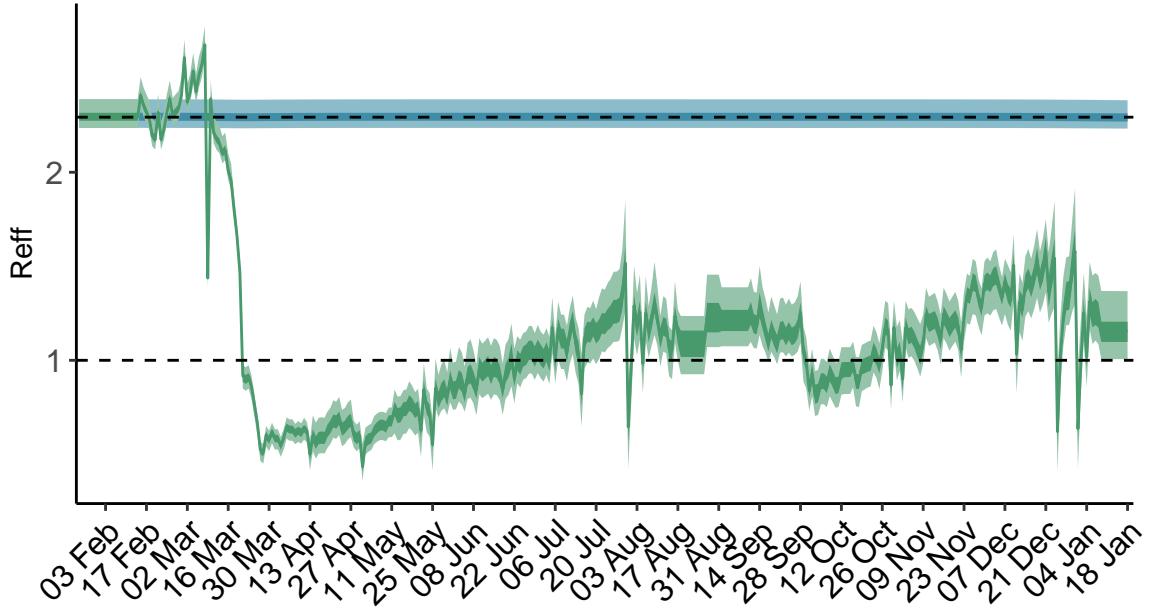


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Burkina Faso is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

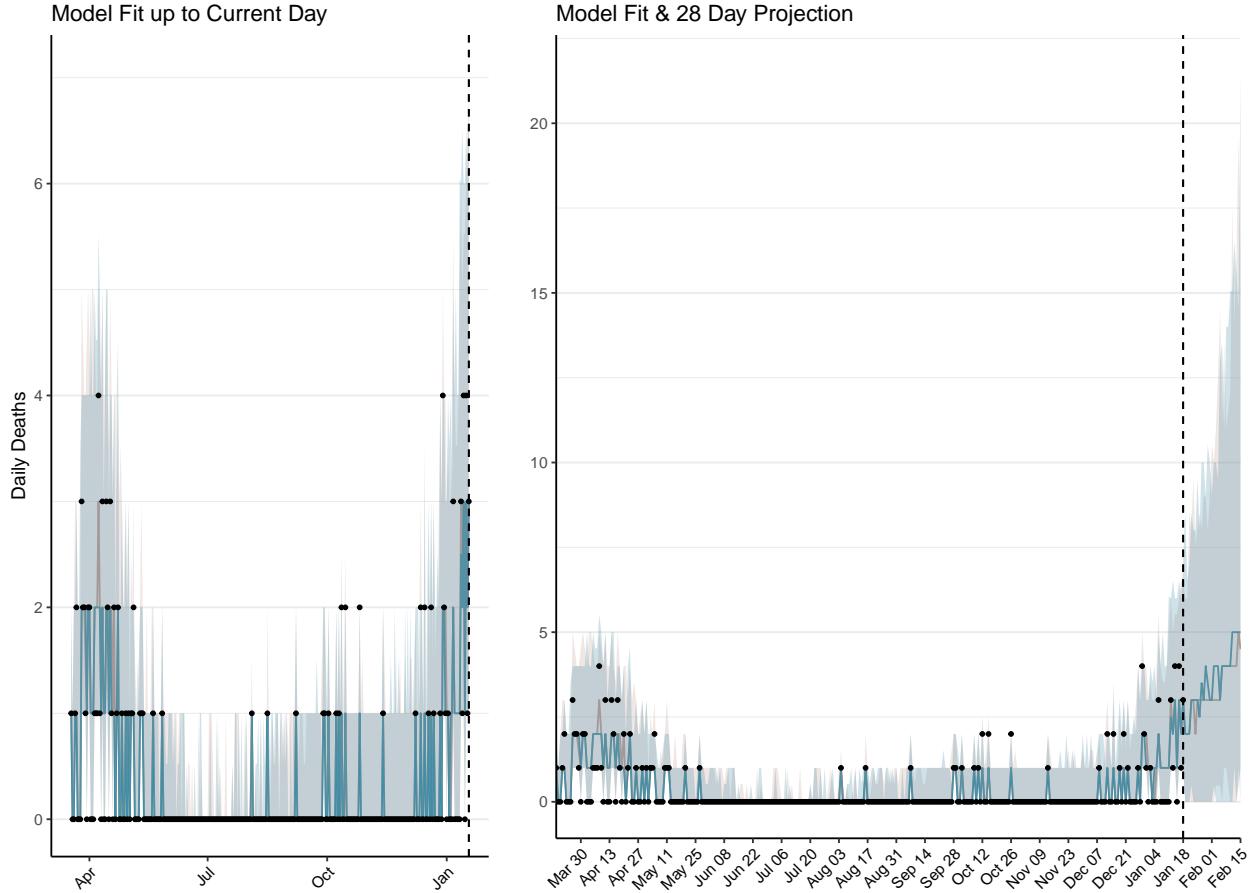


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 116 (95% CI: 105-127) patients requiring treatment with high-pressure oxygen at the current date to 262 (95% CI: 217-306) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 44 (95% CI: 40-48) patients requiring treatment with mechanical ventilation at the current date to 94 (95% CI: 80-108) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

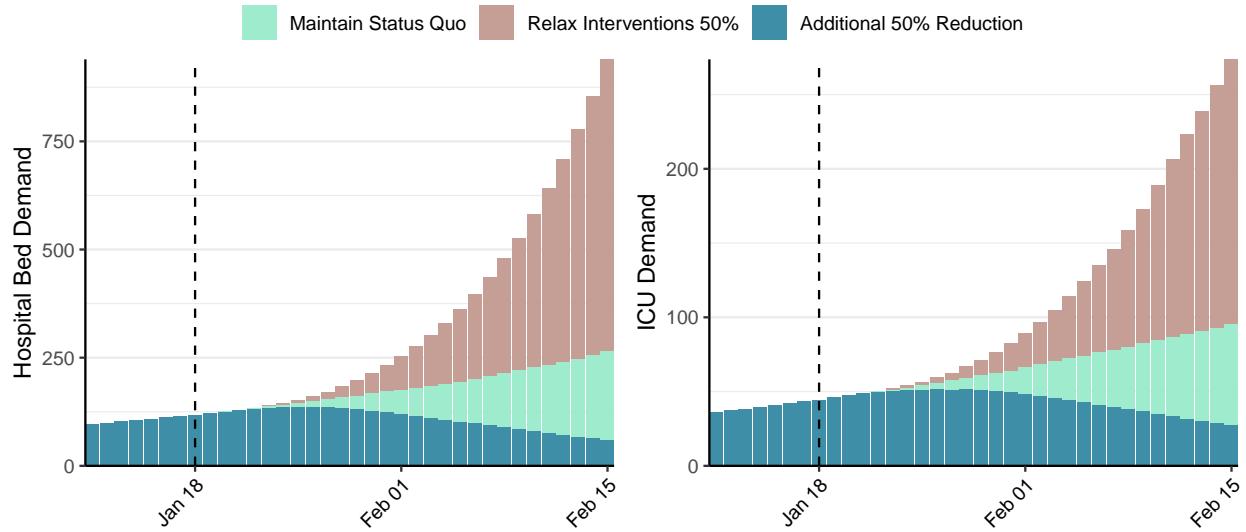


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 2,133 (95% CI: 1,901-2,364) at the current date to 344 (95% CI: 280-408) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,133 (95% CI: 1,901-2,364) at the current date to 31,219 (95% CI: 24,344-38,094) by 2021-02-15.

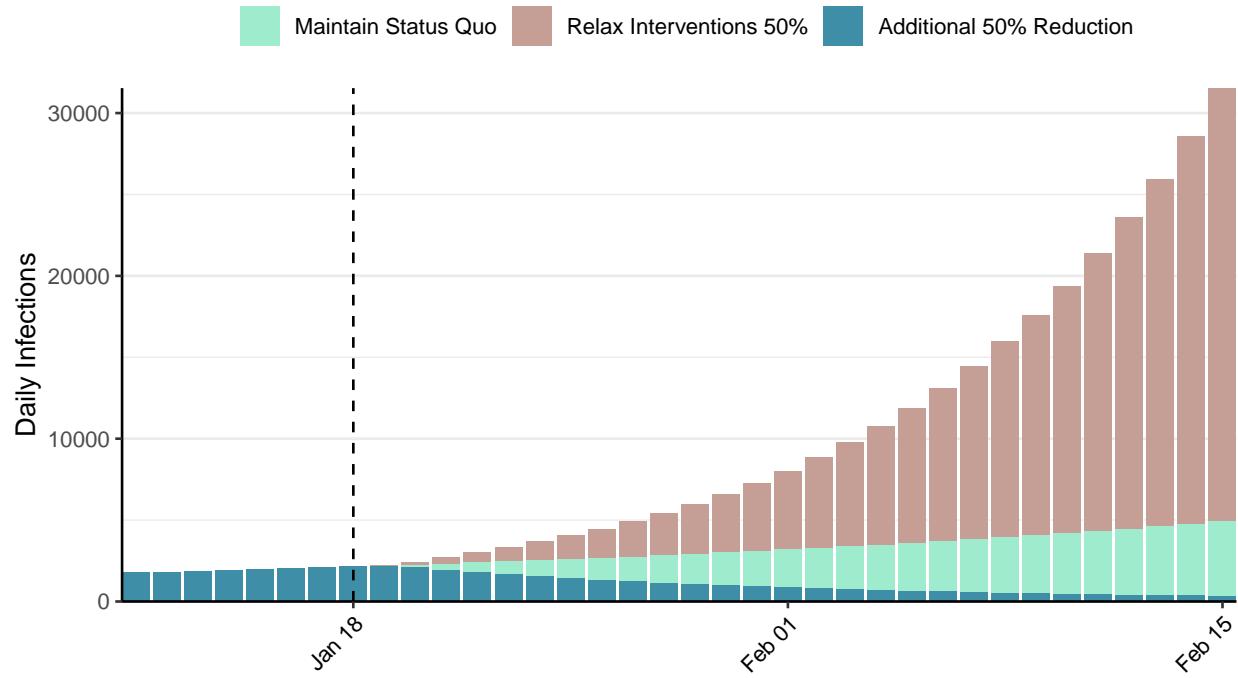


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Bangladesh, 2021-01-18

[Download the report for Bangladesh, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.78 (95% CI: 0.67-0.9)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Bangladesh is not shown in the following plot as only 0 deaths have been reported to date**

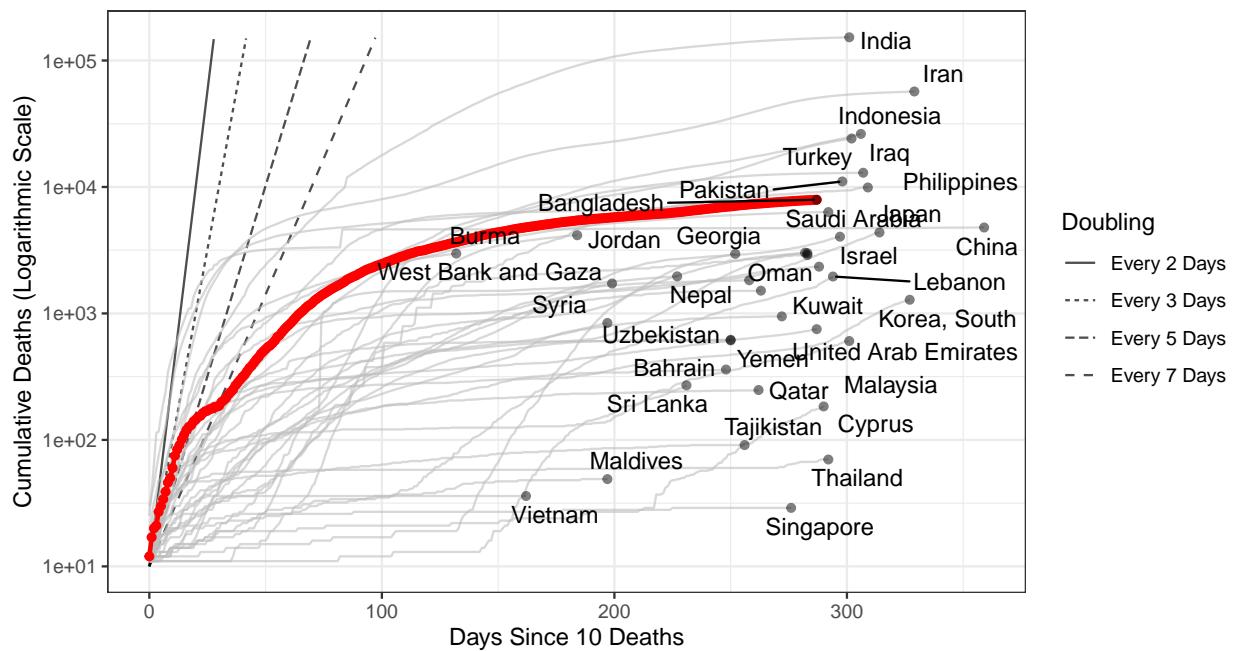


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 205,928 (95% CI: 195,017-216,838) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

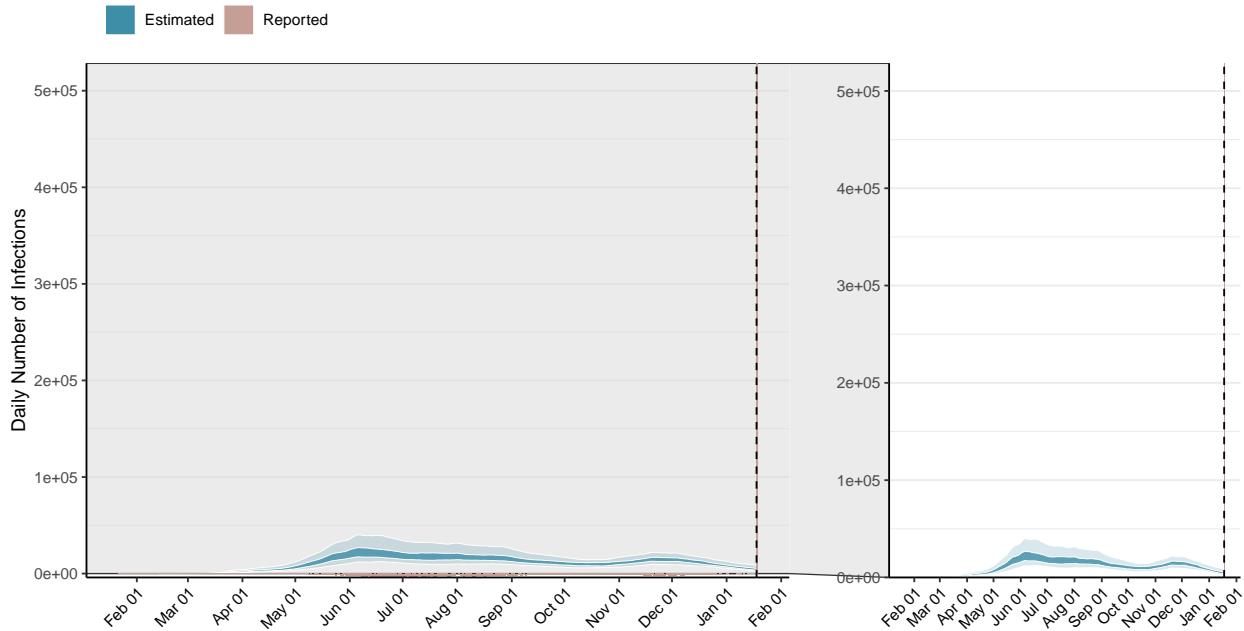


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

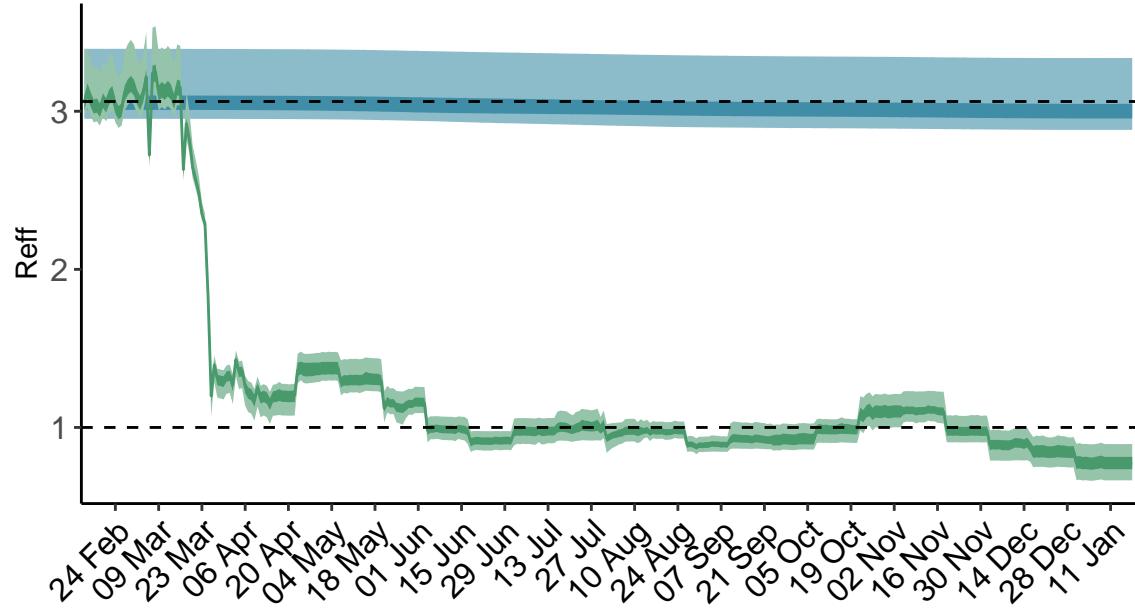


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

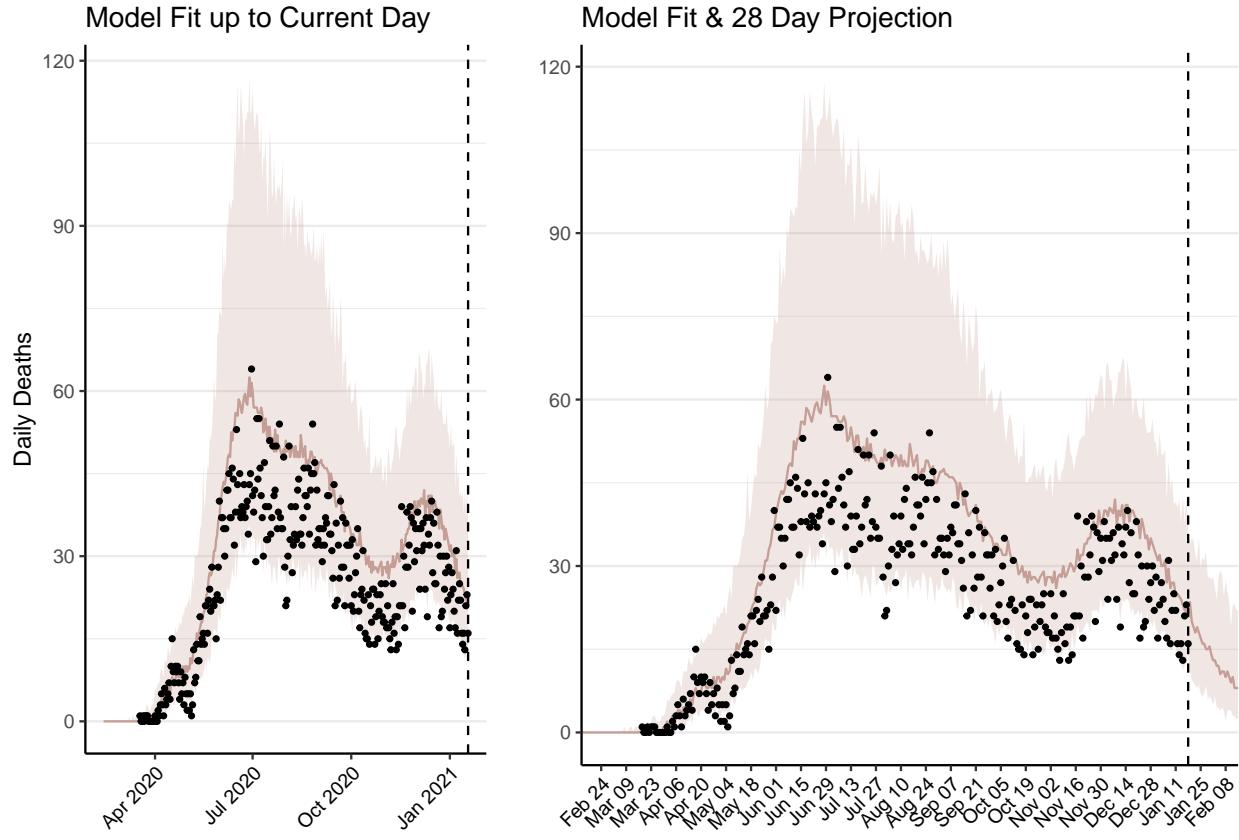


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 744 (95% CI: 701-786) patients requiring treatment with high-pressure oxygen at the current date to 309 (95% CI: 275-343) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 306 (95% CI: 290-323) patients requiring treatment with mechanical ventilation at the current date to 131 (95% CI: 117-144) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

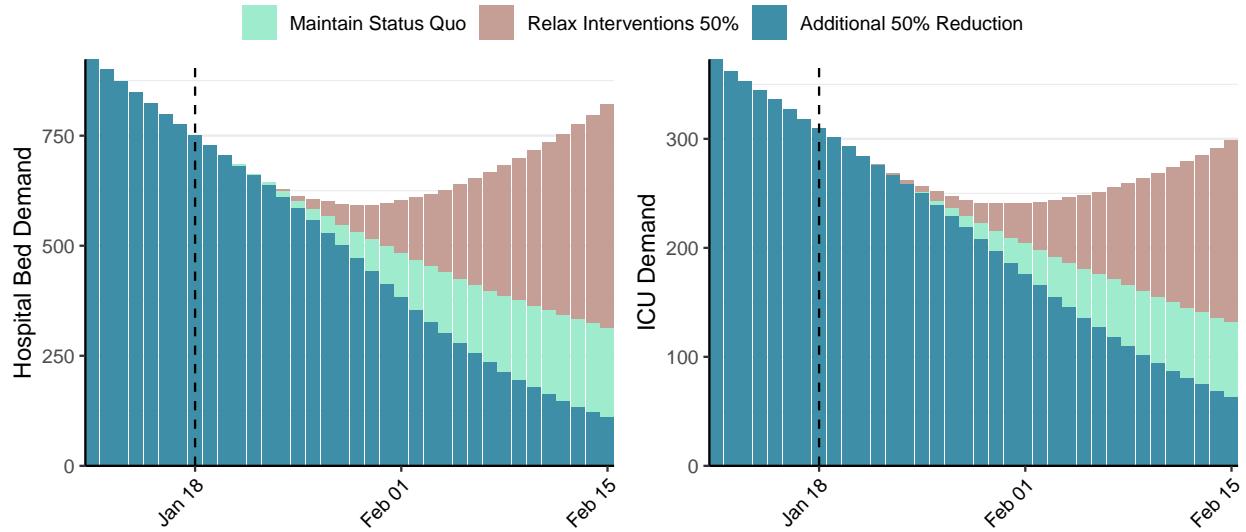


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 4,633 (95% CI: 4,283-4,984) at the current date to 191 (95% CI: 167-216) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 4,633 (95% CI: 4,283-4,984) at the current date to 10,181 (95% CI: 8,569-11,794) by 2021-02-15.

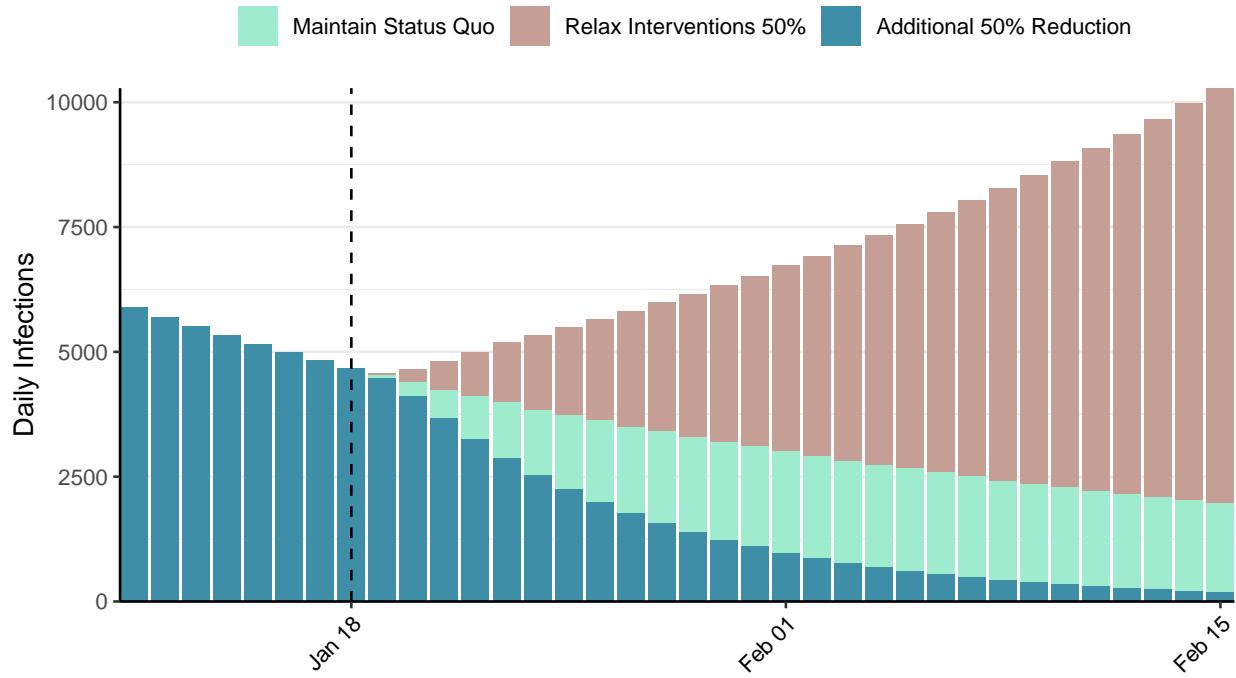


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Bulgaria, 2021-01-18

[Download the report for Bulgaria, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.84 (95% CI: 0.69-1.01)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Bulgaria is not shown in the following plot as only 0 deaths have been reported to date**

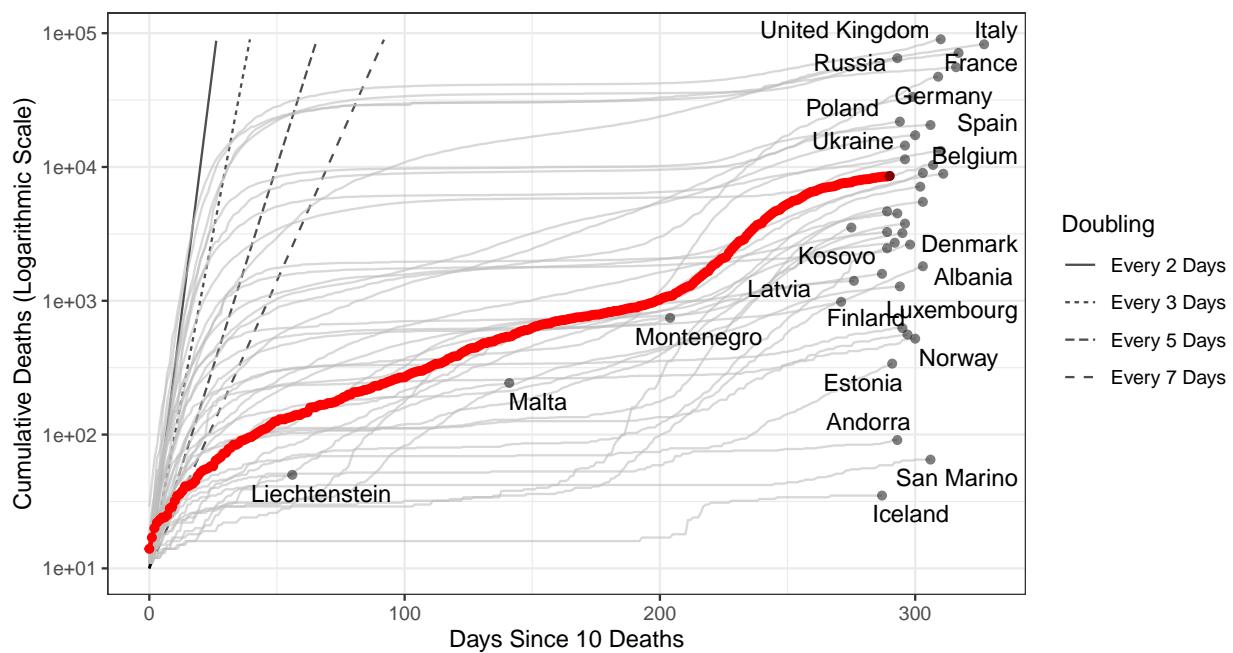


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 396,564 (95% CI: 378,858–414,269) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

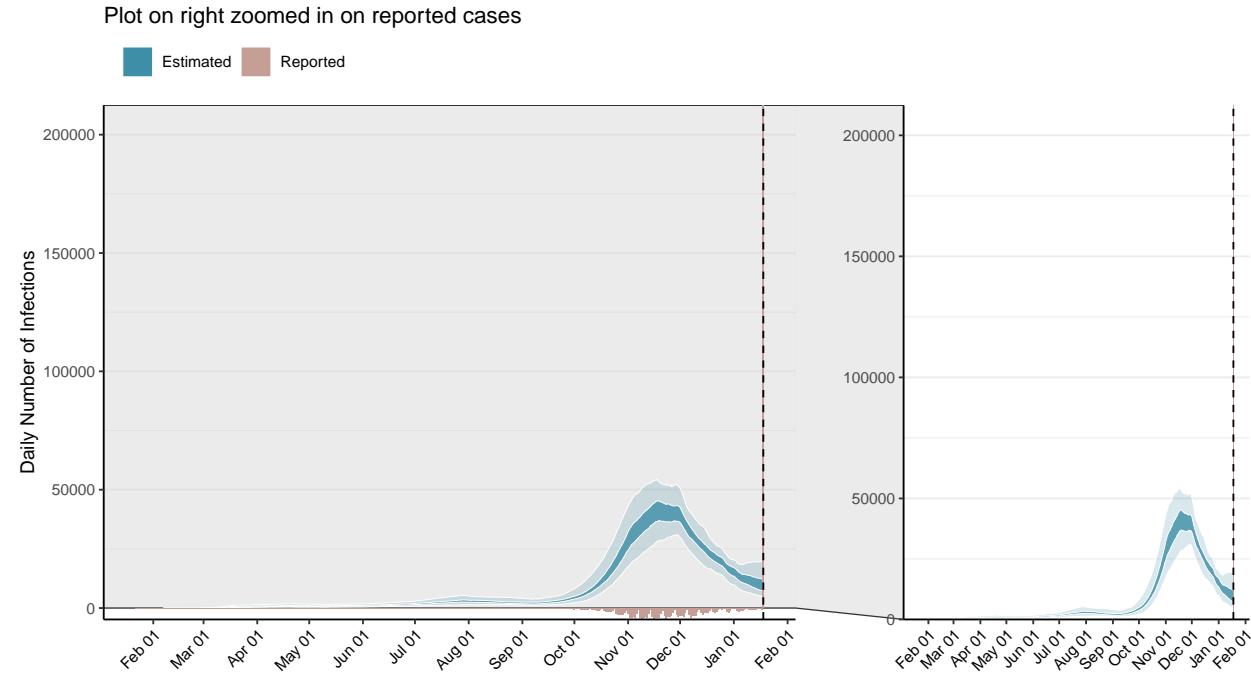


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

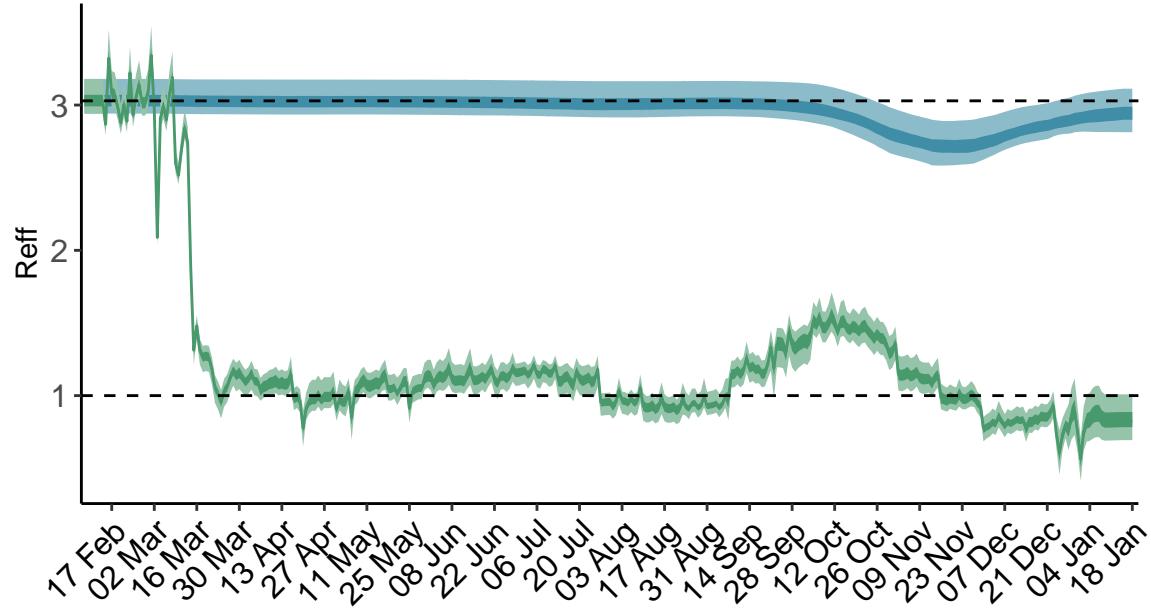


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Bulgaria is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

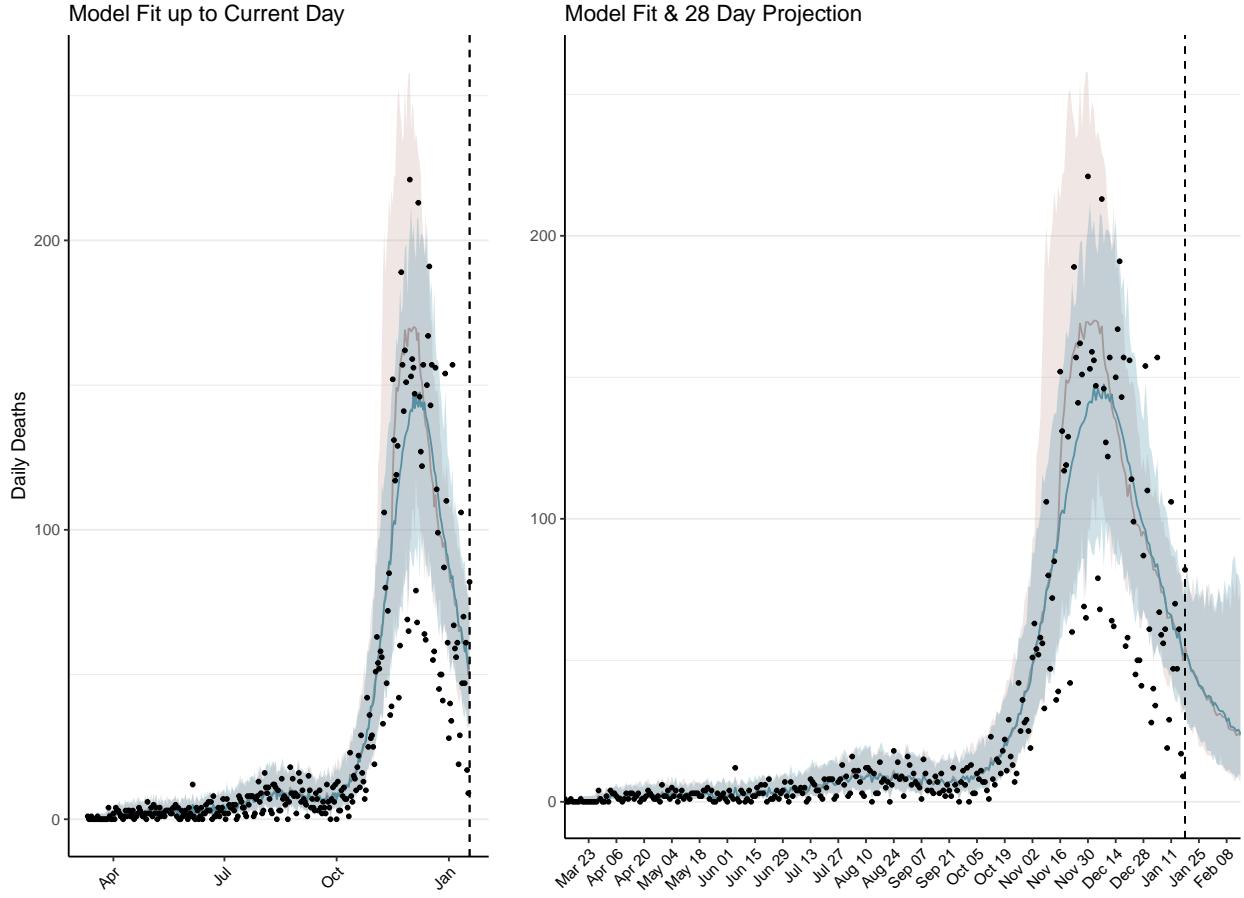


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1,736 (95% CI: 1,649-1,824) patients requiring treatment with high-pressure oxygen at the current date to 949 (95% CI: 823-1,075) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 698 (95% CI: 666-730) patients requiring treatment with mechanical ventilation at the current date to 372 (95% CI: 327-417) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

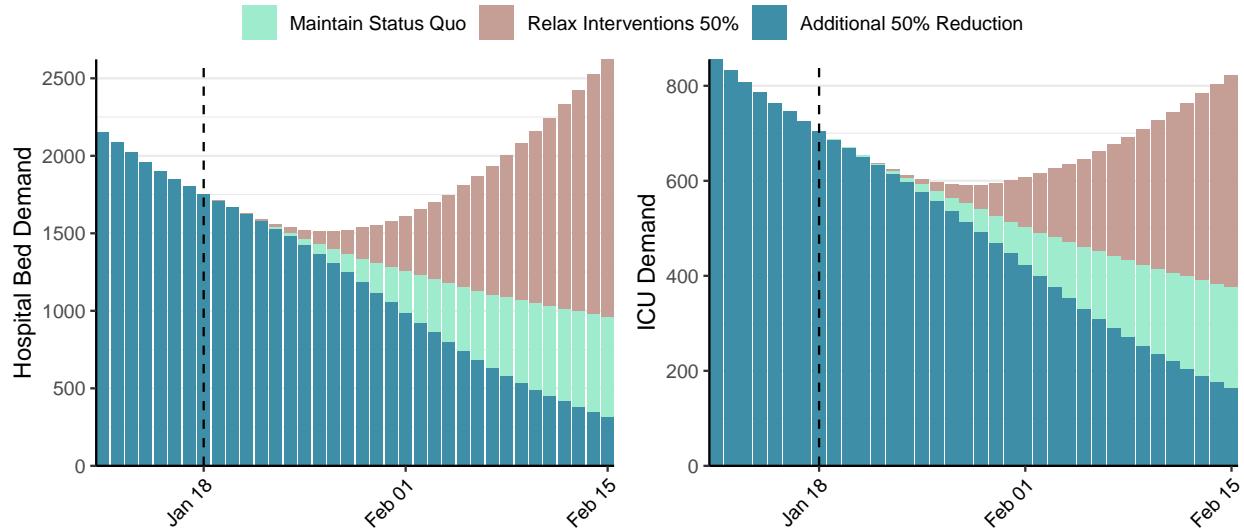


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 9,798 (95% CI: 9,004-10,591) at the current date to 576 (95% CI: 484-669) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 9,798 (95% CI: 9,004-10,591) at the current date to 28,694 (95% CI: 24,147-33,240) by 2021-02-15.

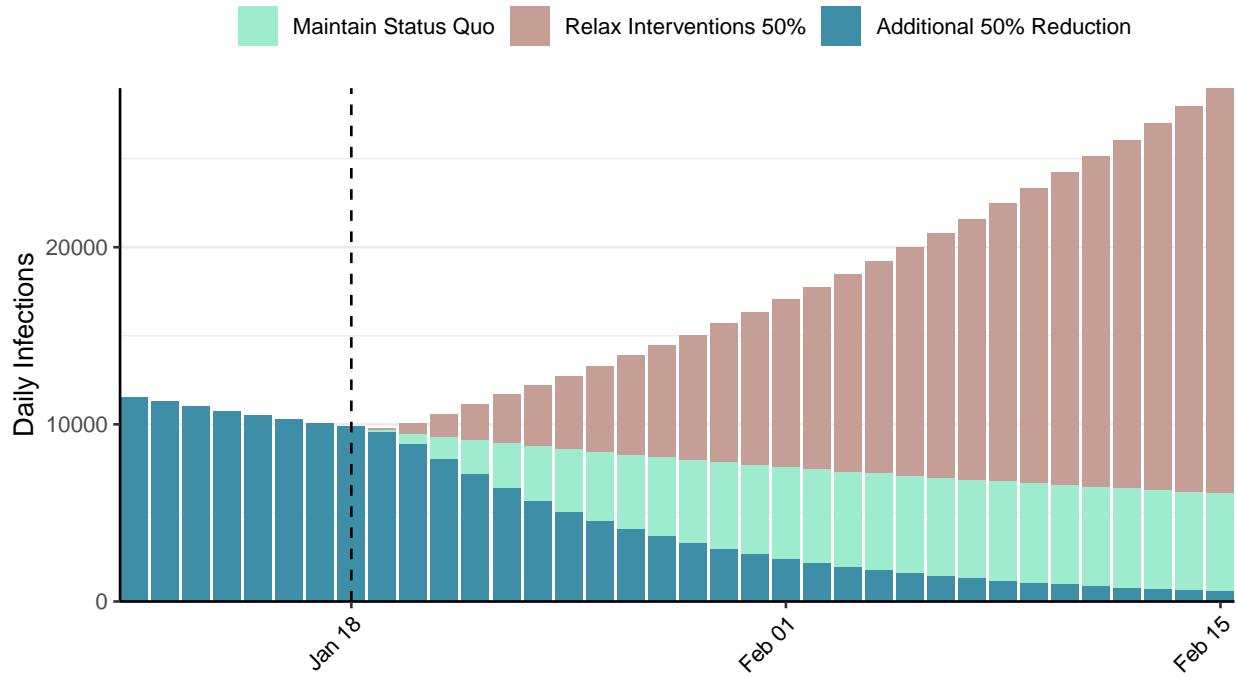


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Bosnia and Herzegovina, 2021-01-18

[Download the report for Bosnia and Herzegovina, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.87 (95% CI: 0.8-0.94)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Bosnia and Herzegovina is not shown in the following plot as only 0 deaths have been reported to date**

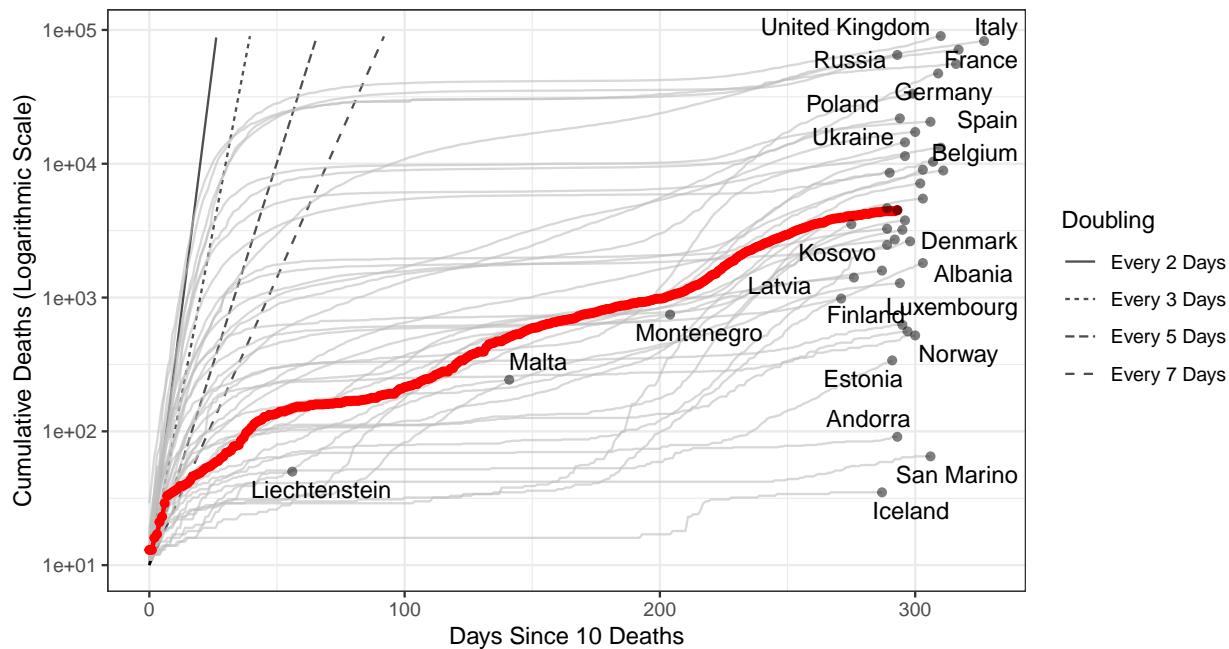


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 196,268 (95% CI: 191,254-201,282) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

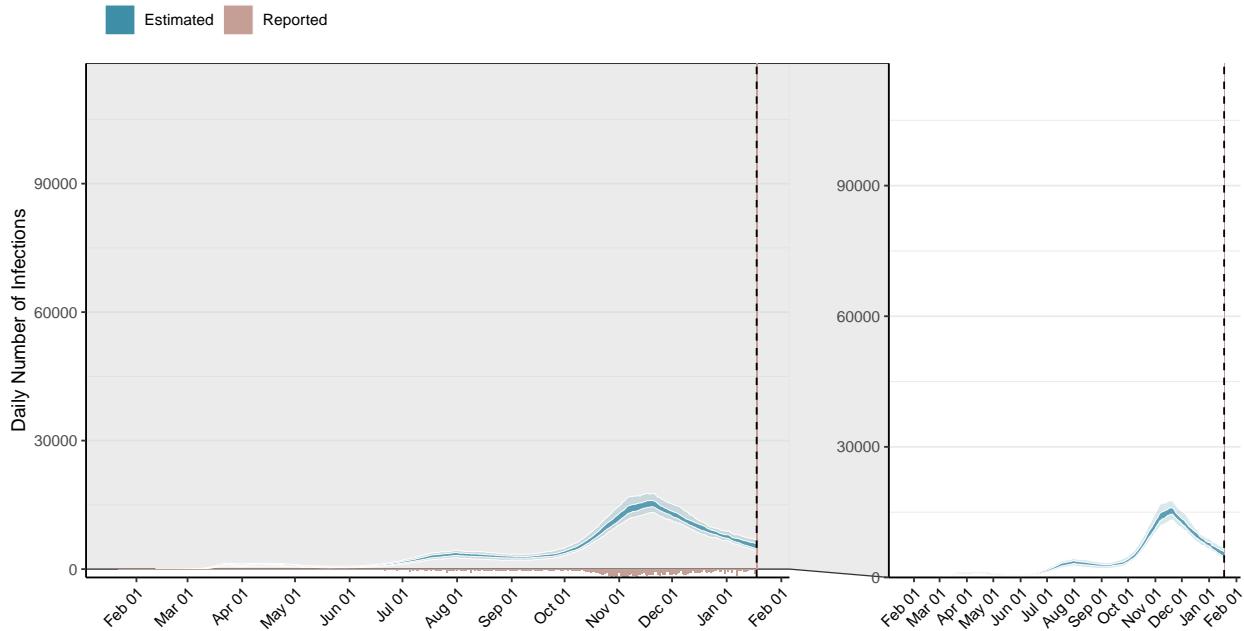


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

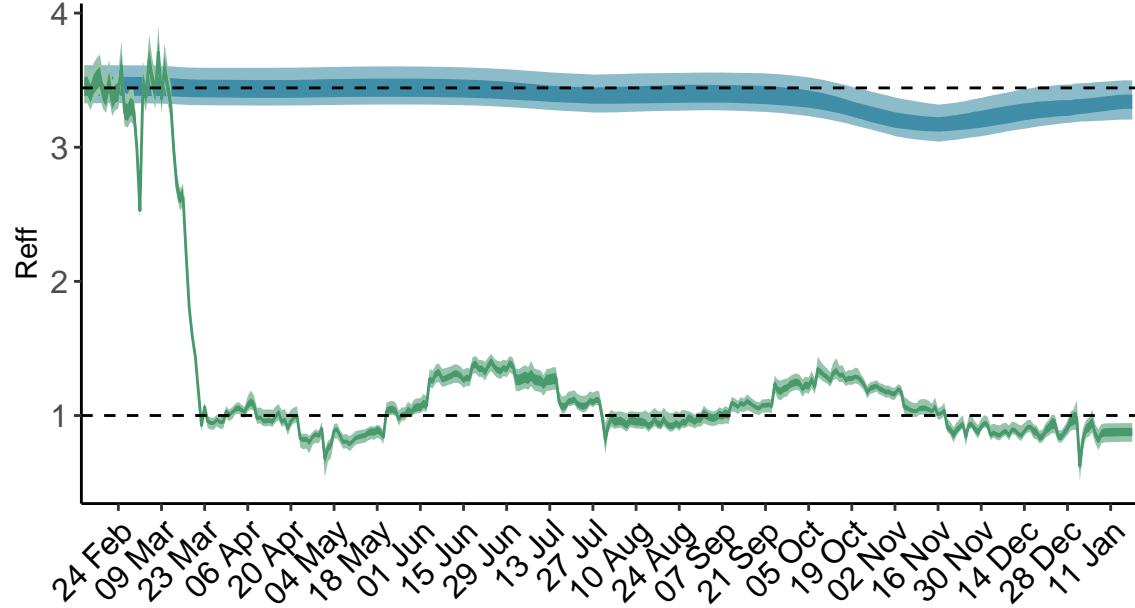


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Bosnia and Herzegovina is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

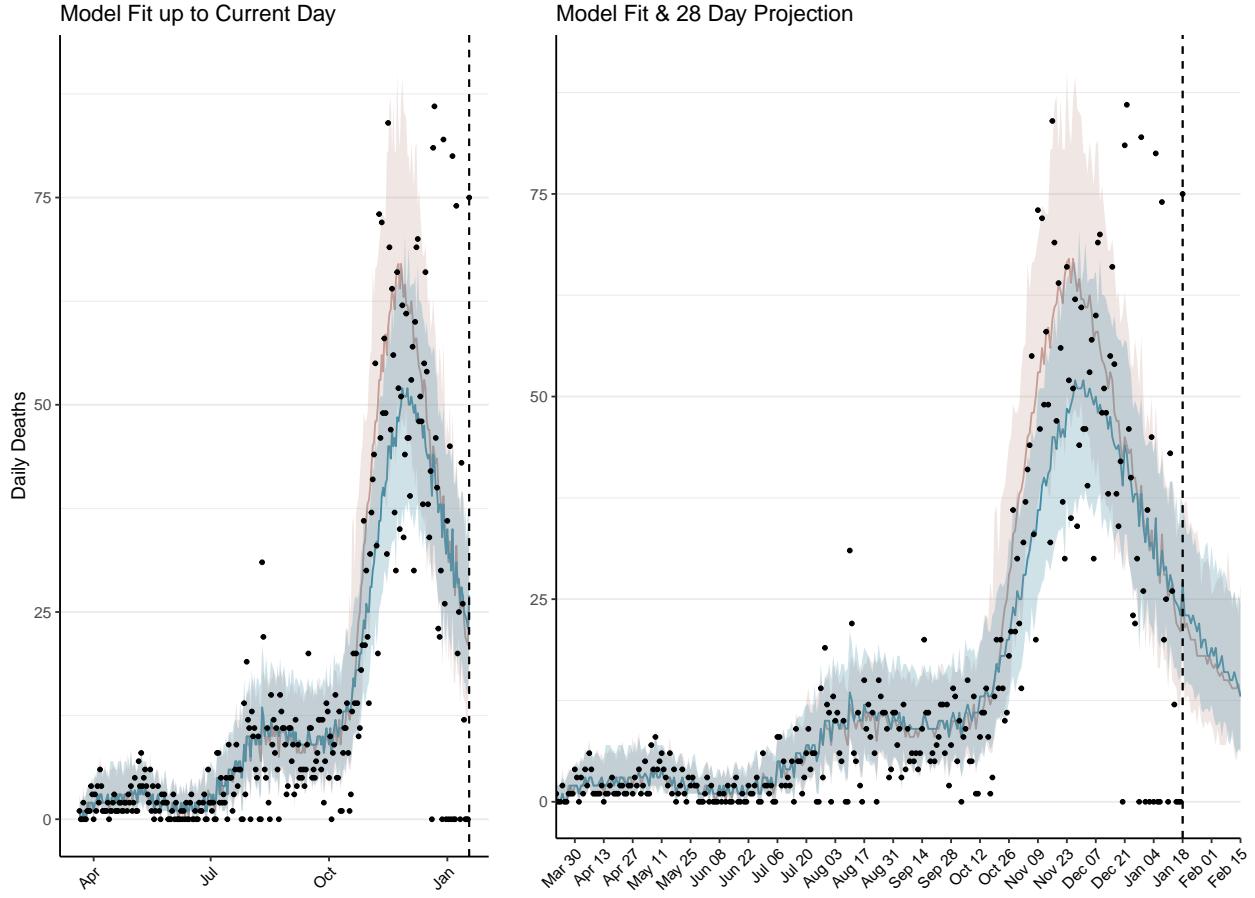


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 815 (95% CI: 792-837) patients requiring treatment with high-pressure oxygen at the current date to 498 (95% CI: 472-523) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 249 (95% CI: 244-255) patients requiring treatment with mechanical ventilation at the current date to 189 (95% CI: 181-197) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

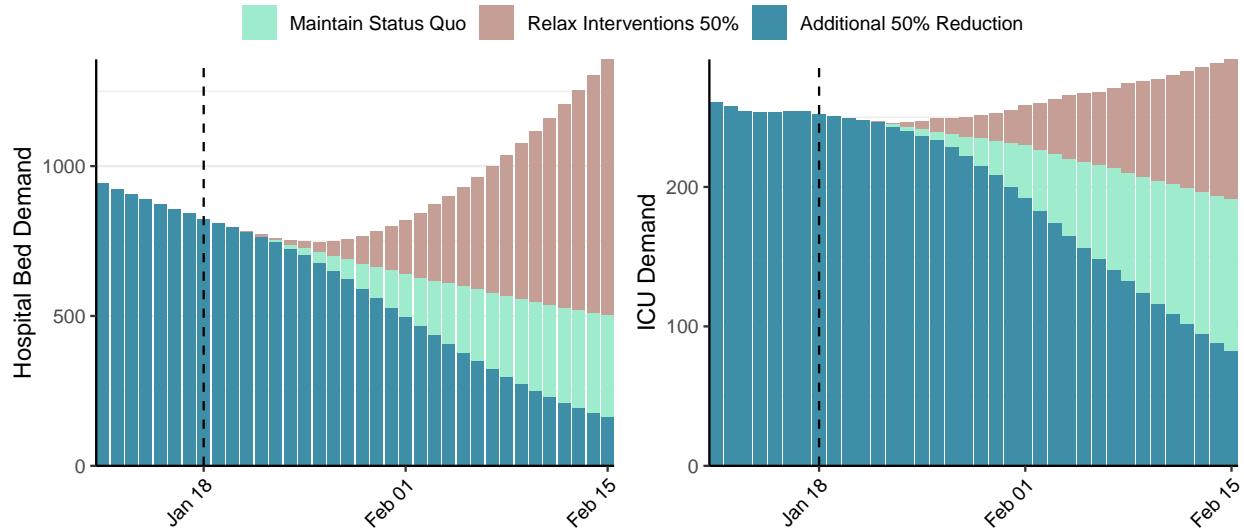


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 5,363 (95% CI: 5,177-5,549) at the current date to 317 (95% CI: 299-335) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 5,363 (95% CI: 5,177-5,549) at the current date to 16,150 (95% CI: 15,161-17,139) by 2021-02-15.

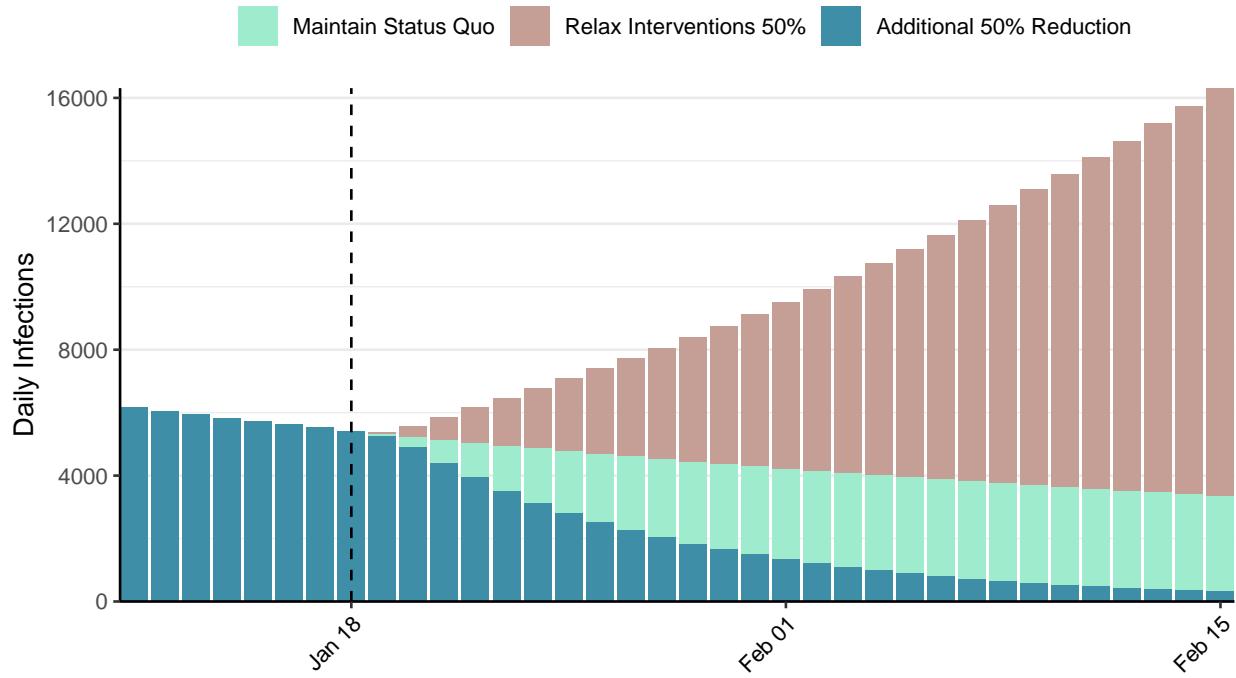


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Belarus, 2021-01-18

[Download the report for Belarus, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.06 (95% CI: 0.87-1.19)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Belarus is not shown in the following plot as only 0 deaths have been reported to date**

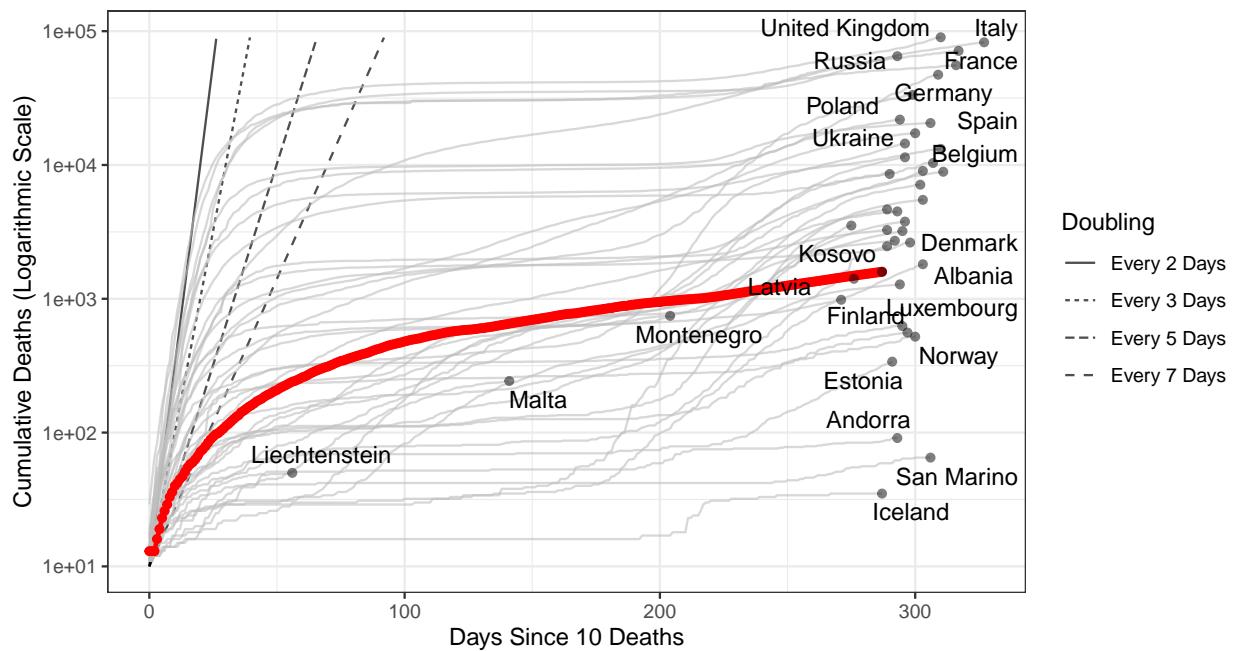


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 124,288 (95% CI: 119,094-129,482) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

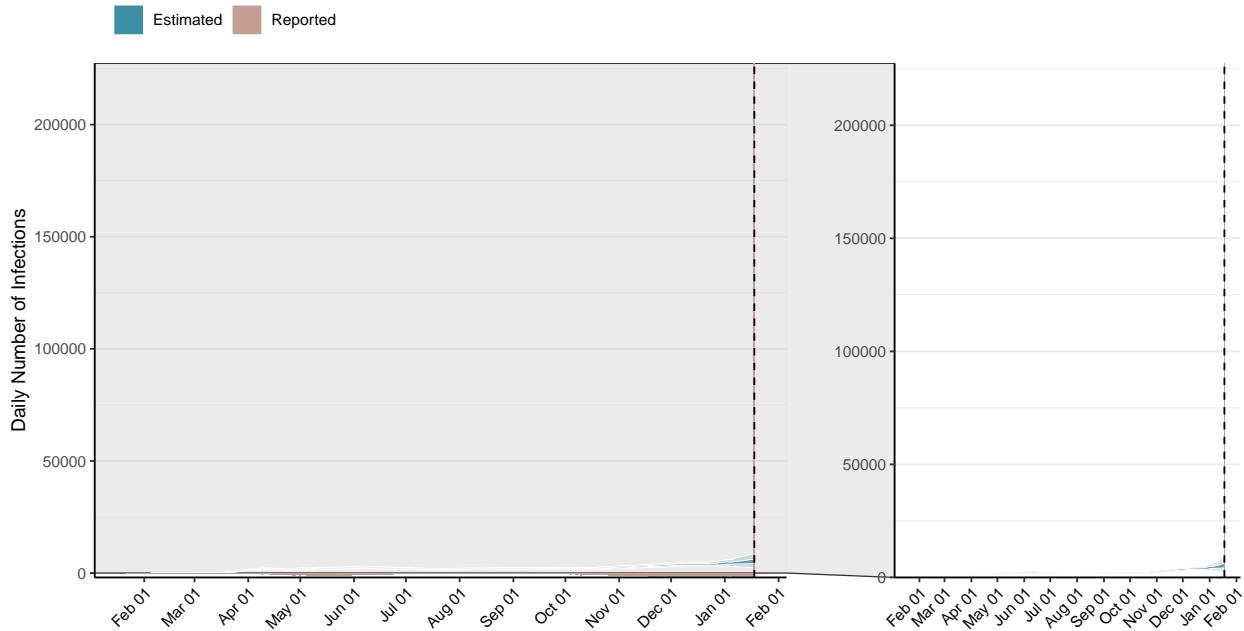


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

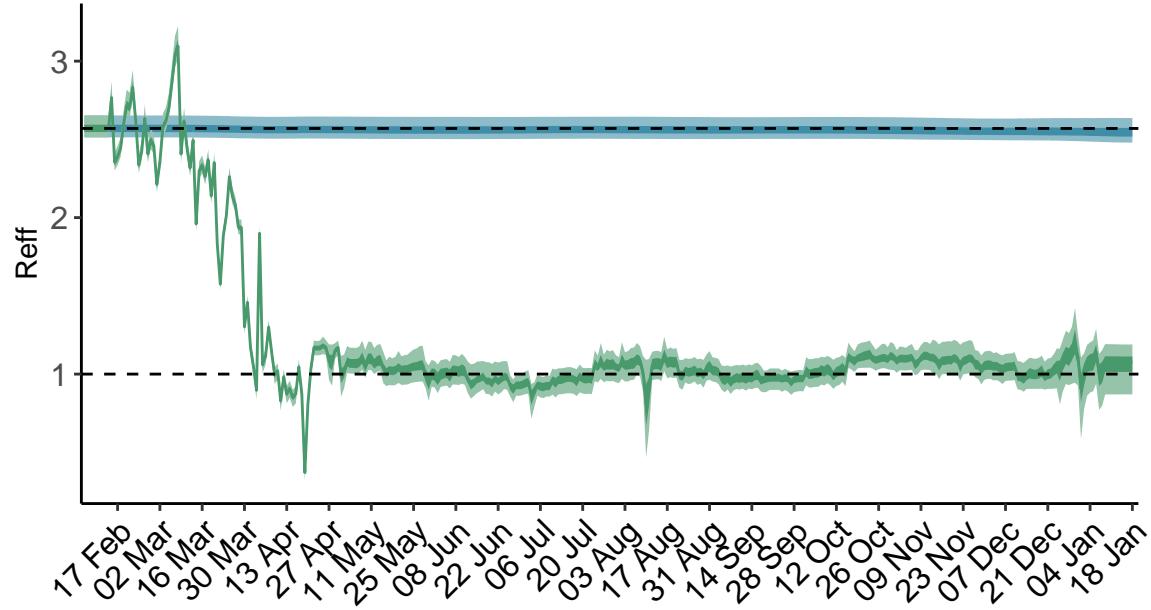


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

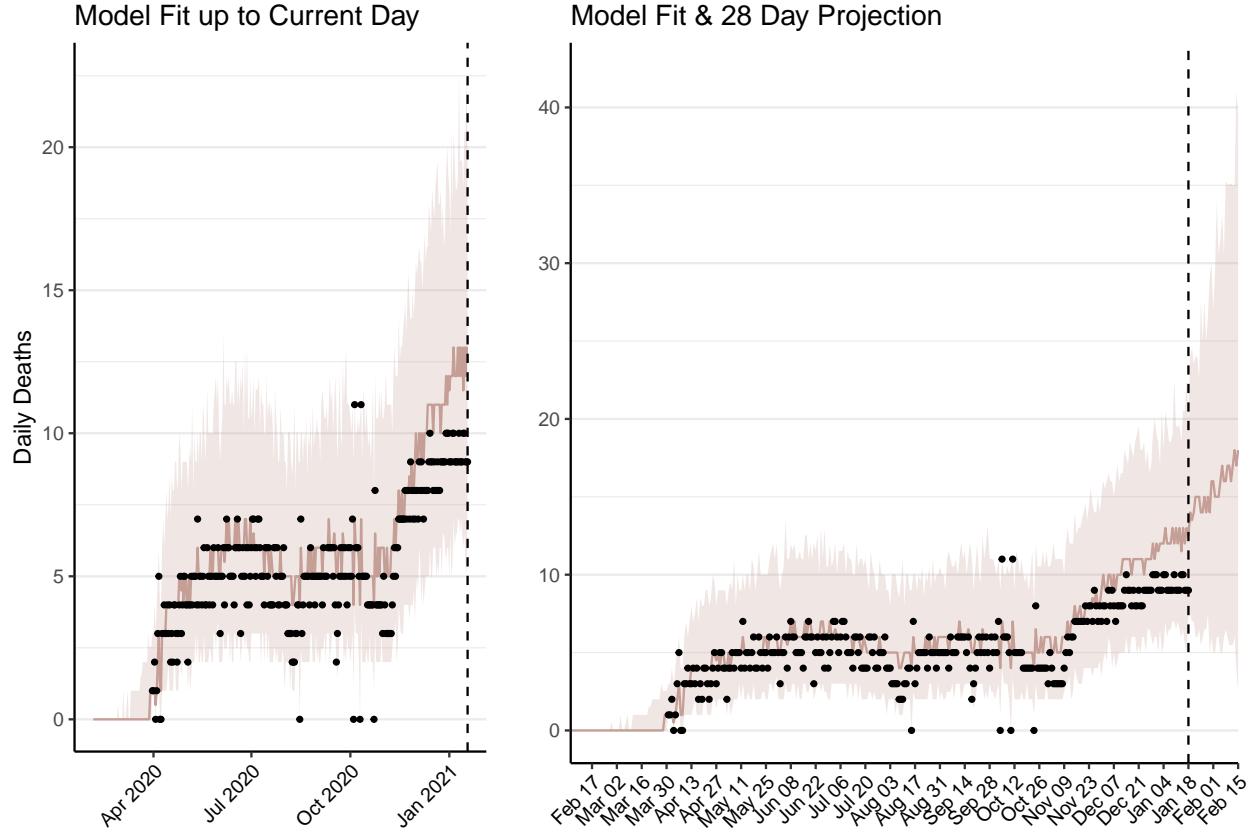


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 528 (95% CI: 504-552) patients requiring treatment with high-pressure oxygen at the current date to 741 (95% CI: 671-811) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 194 (95% CI: 185-202) patients requiring treatment with mechanical ventilation at the current date to 272 (95% CI: 247-297) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

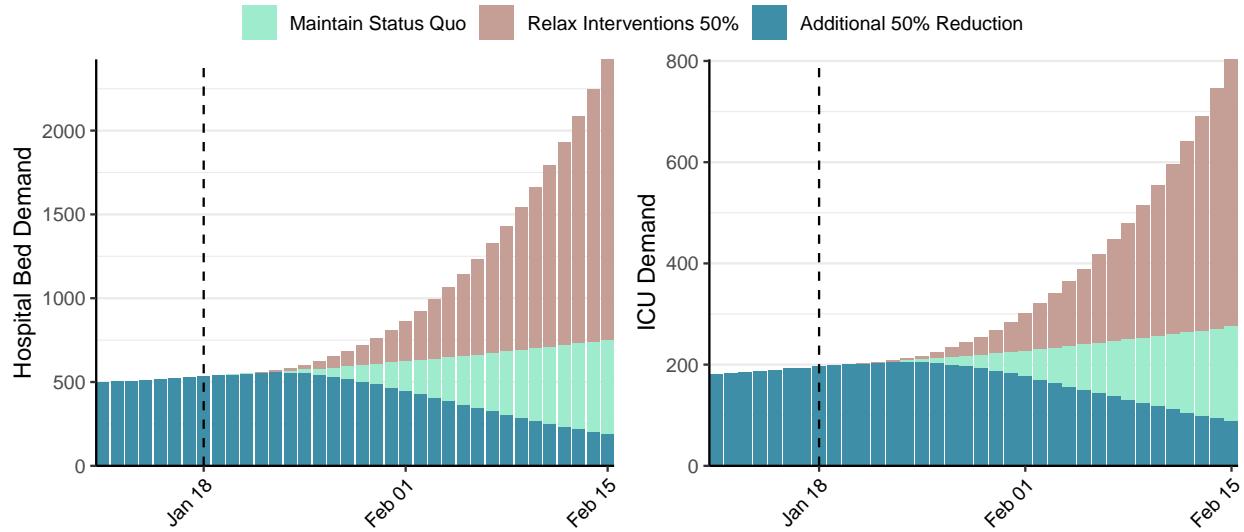


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 5,129 (95% CI: 4,812-5,447) at the current date to 582 (95% CI: 521-643) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 5,129 (95% CI: 4,812-5,447) at the current date to 41,478 (95% CI: 36,907-46,050) by 2021-02-15.

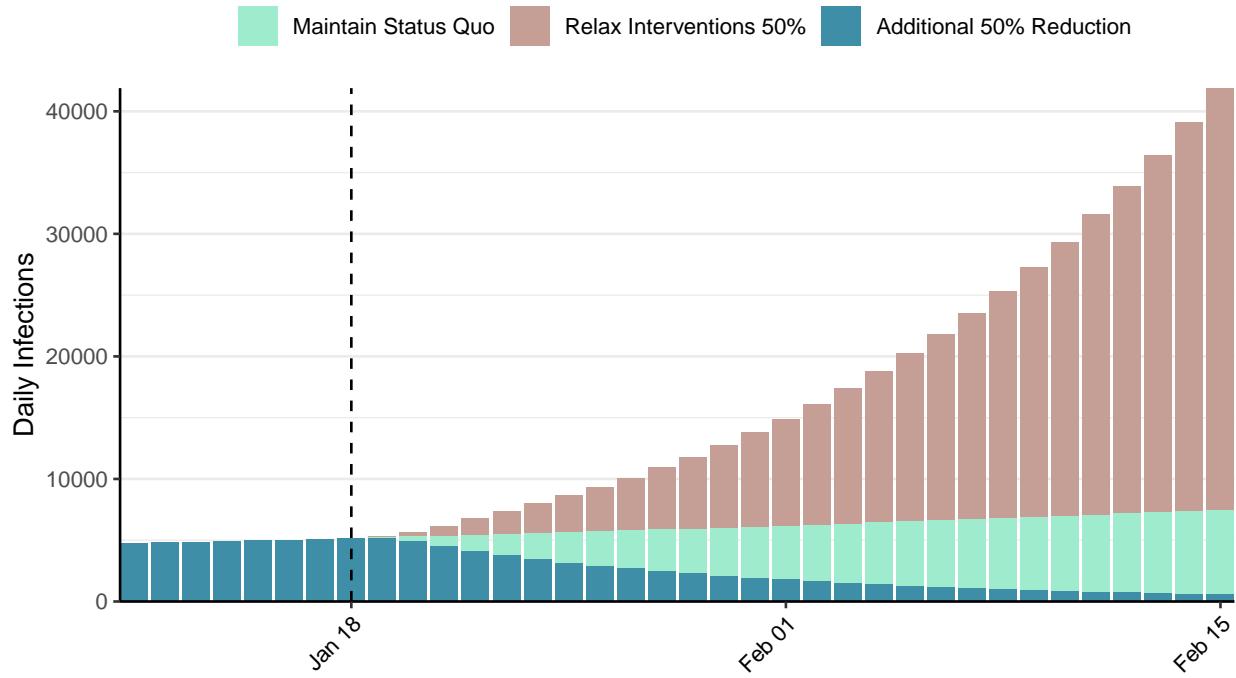


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Belize, 2021-01-18

[Download the report for Belize, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.65 (95% CI: 0.51-0.82)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Belize is not shown in the following plot as only 0 deaths have been reported to date**

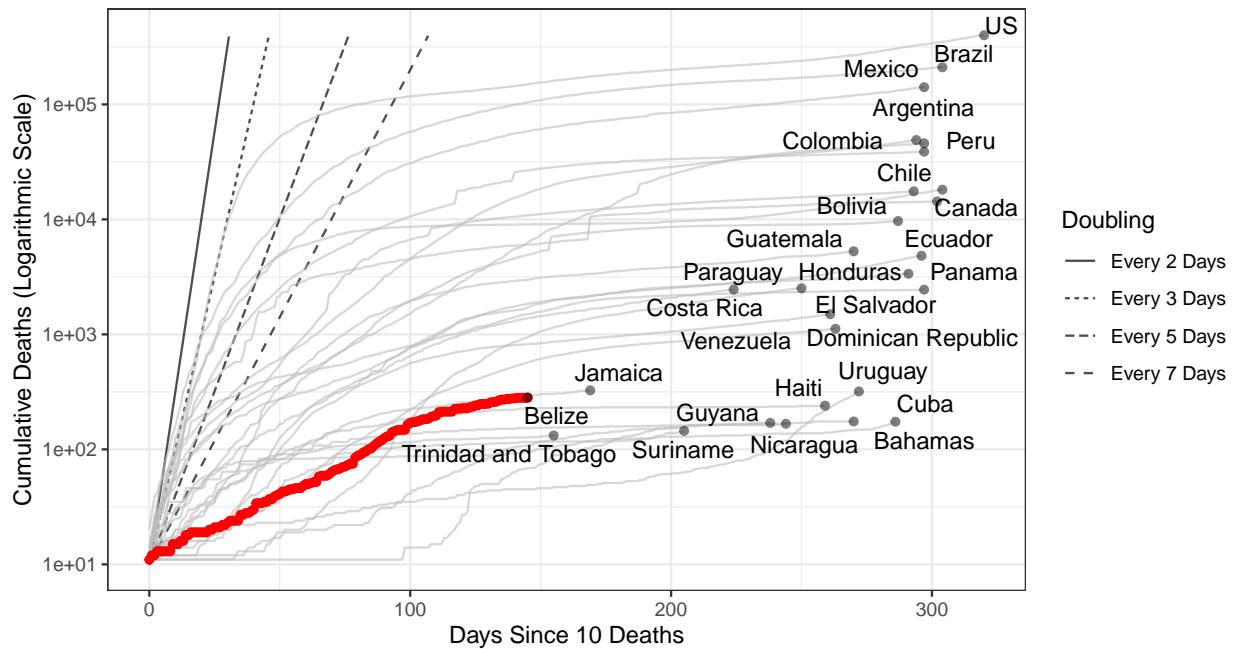


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 17,244 (95% CI: 15,630-18,857) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

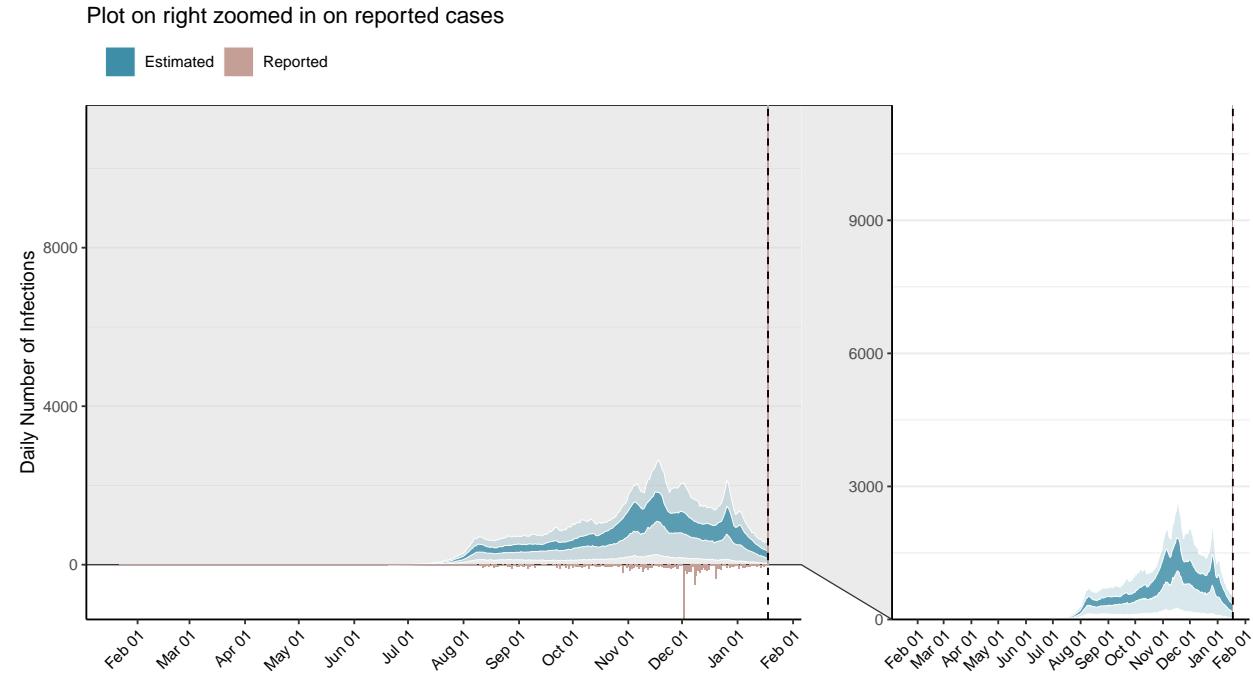


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

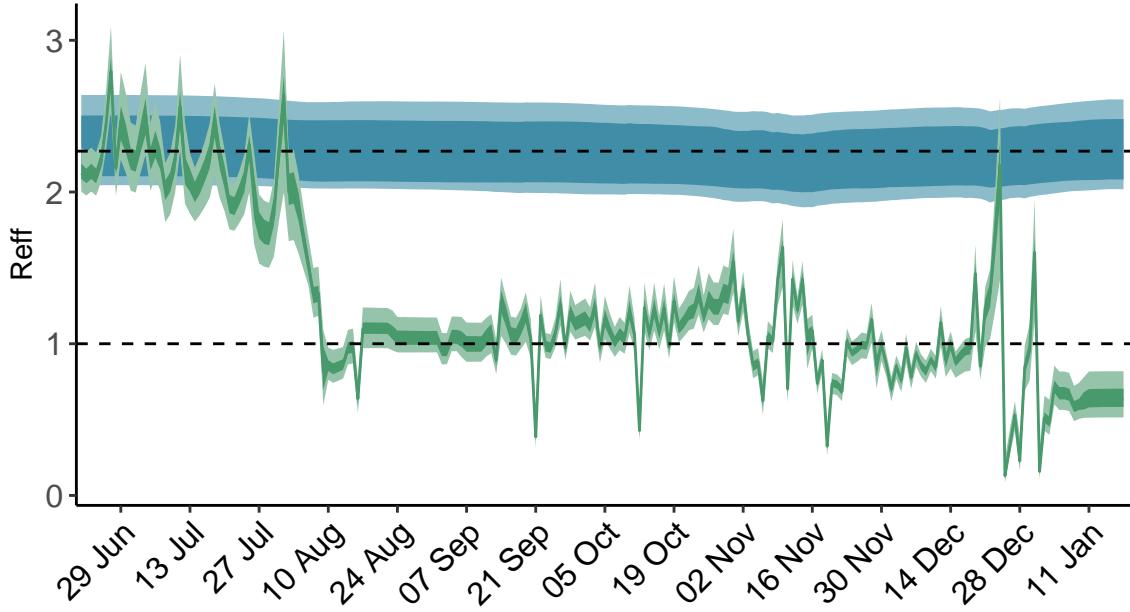


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Belize is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

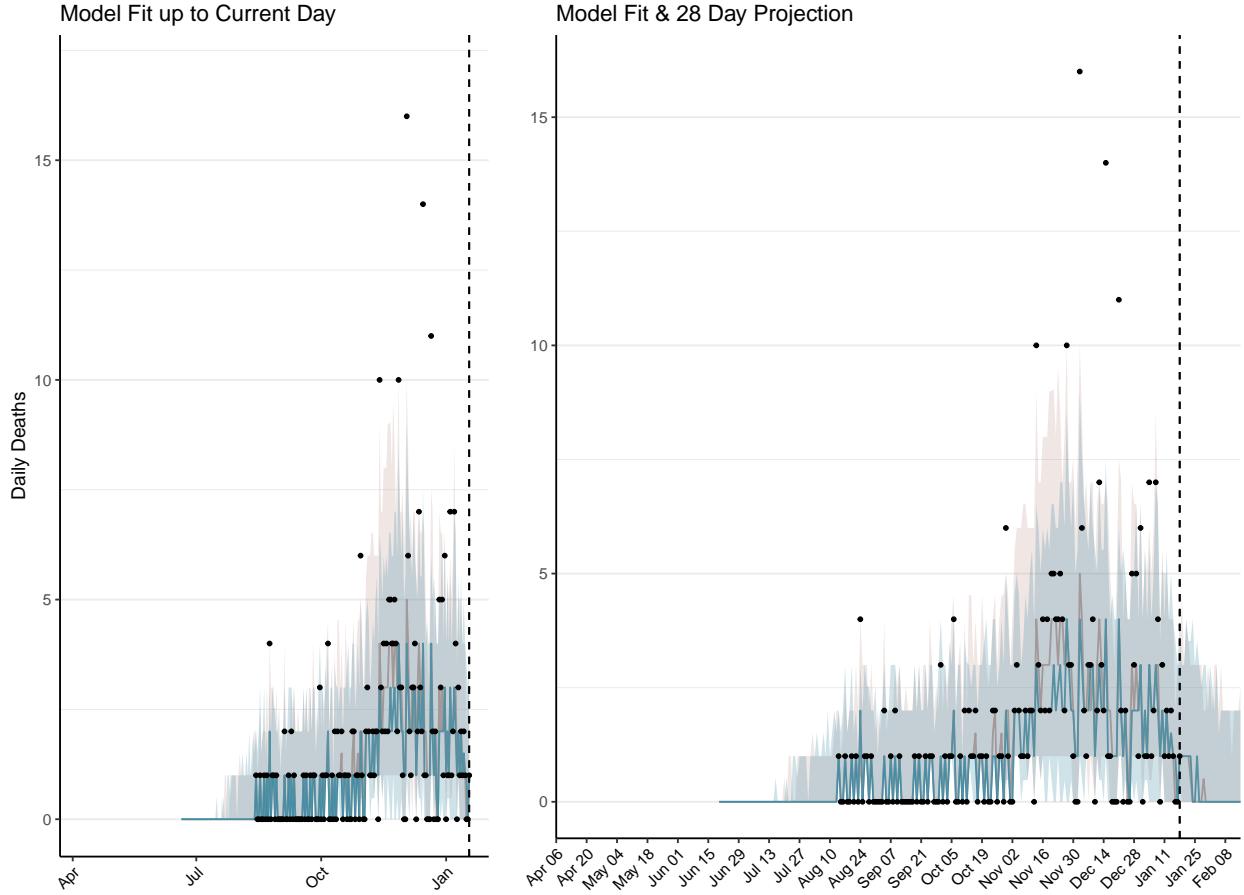


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 38 (95% CI: 35-42) patients requiring treatment with high-pressure oxygen at the current date to 10 (95% CI: 8-12) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 11 (95% CI: 10-12) patients requiring treatment with mechanical ventilation at the current date to 4 (95% CI: 4-5) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

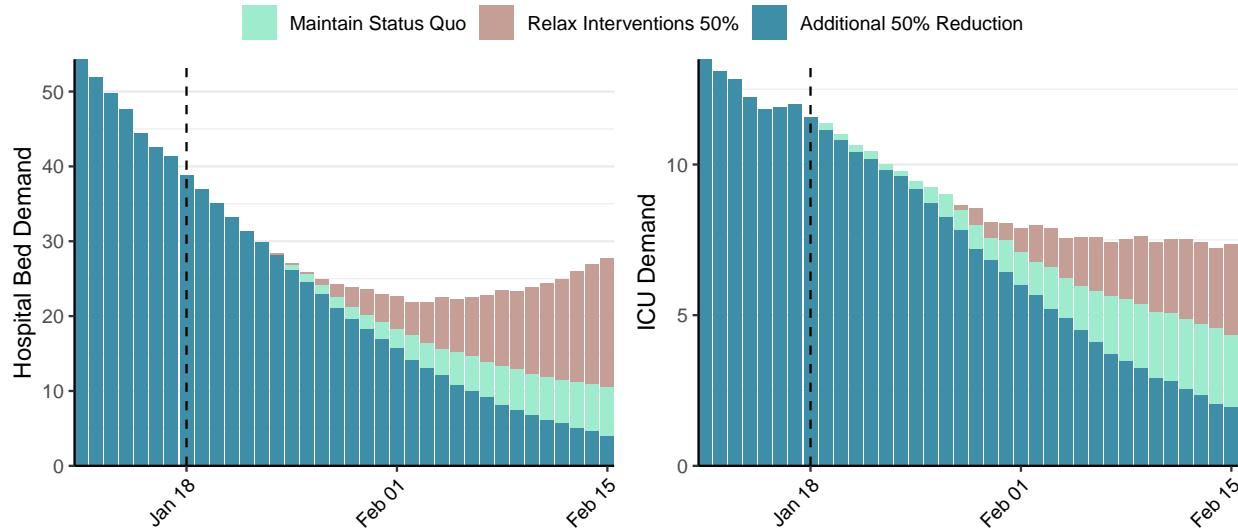


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 256 (95% CI: 230-282) at the current date to 10 (95% CI: 7-13) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 256 (95% CI: 230-282) at the current date to 506 (95% CI: 335-677) by 2021-02-15.

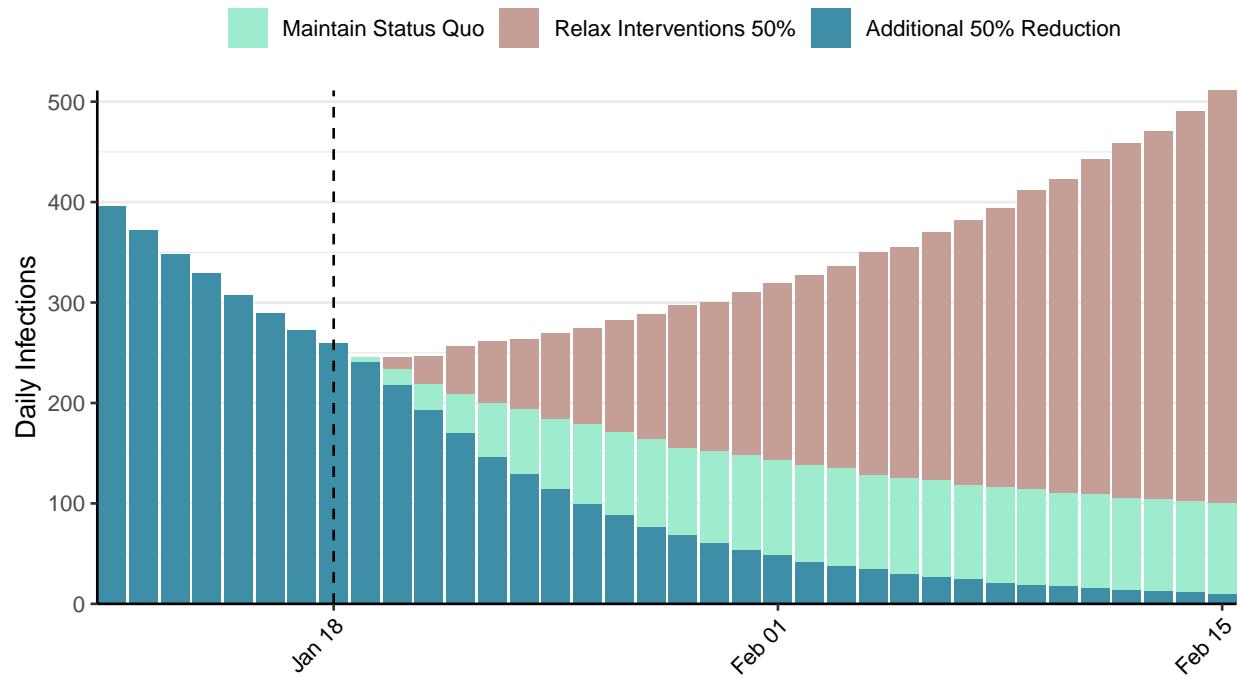


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Bolivia, 2021-01-18

[Download the report for Bolivia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.08 (95% CI: 0.89-1.25)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Bolivia is not shown in the following plot as only 0 deaths have been reported to date**

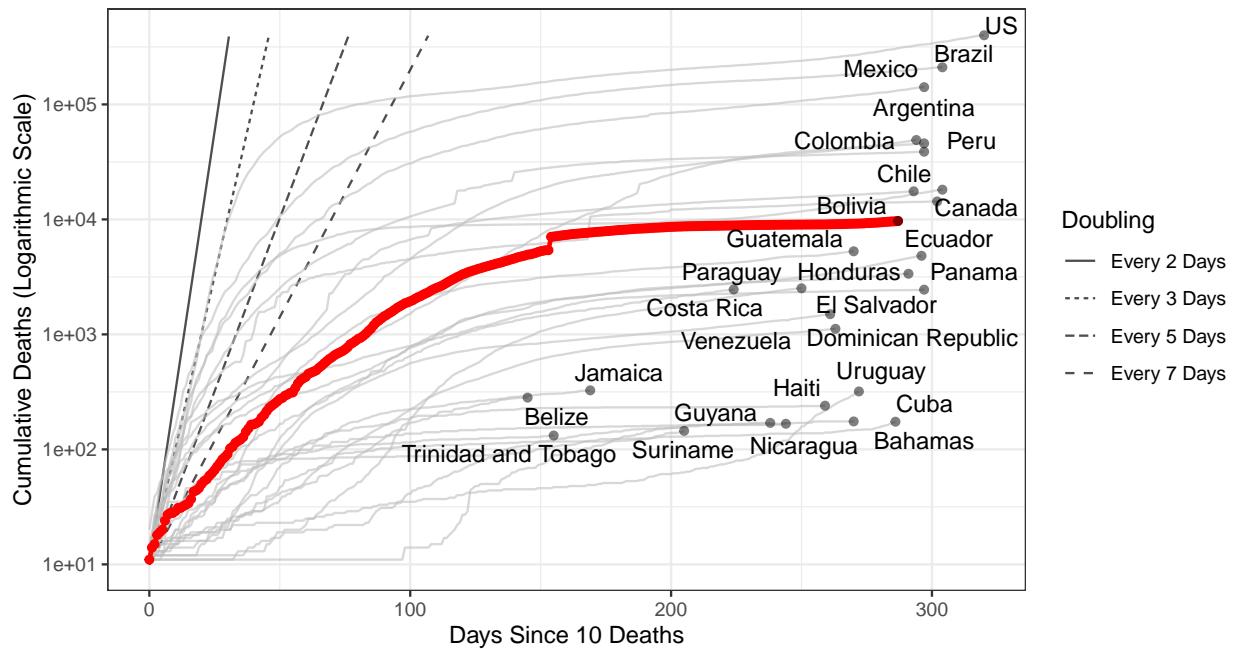


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 309,535 (95% CI: 298,203-320,867) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

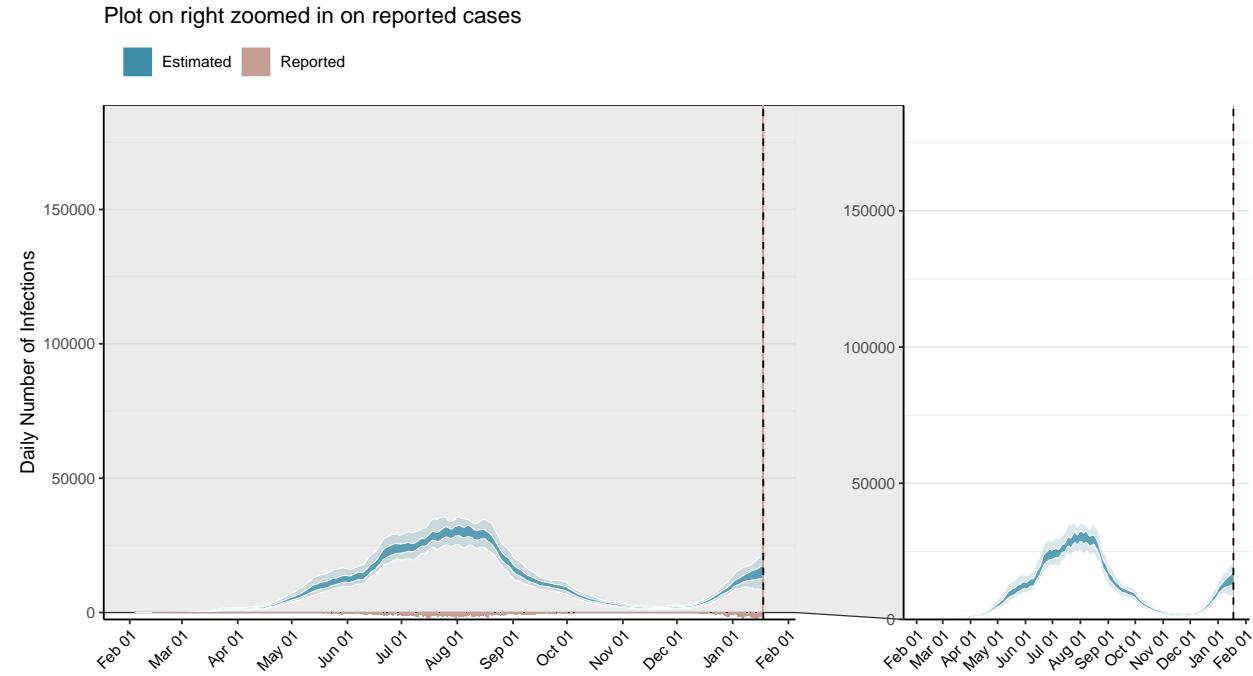


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

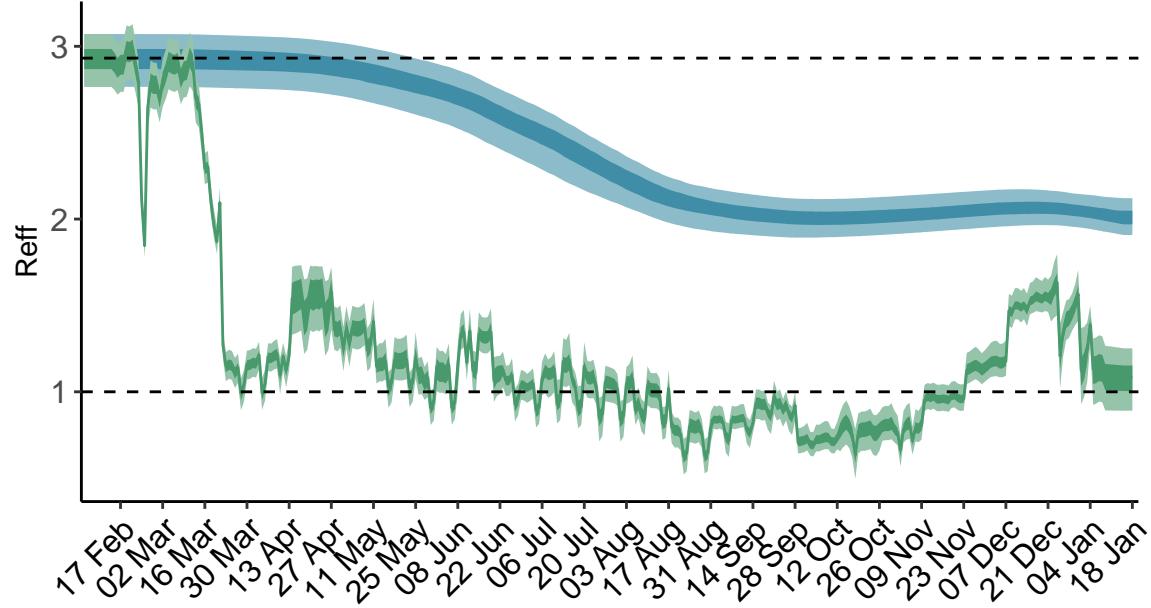


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Bolivia is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

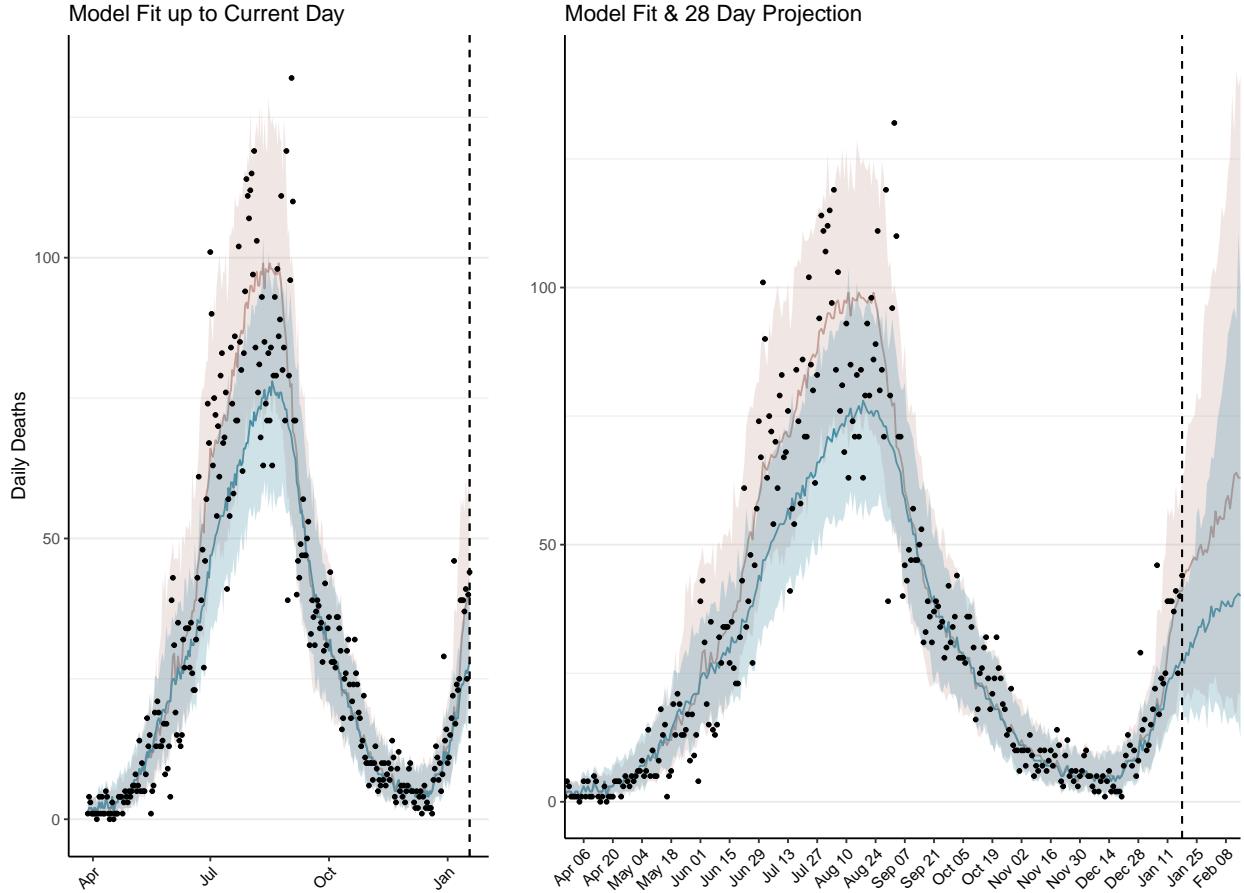


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1,178 (95% CI: 1,133-1,222) patients requiring treatment with high-pressure oxygen at the current date to 1,859 (95% CI: 1,698-2,020) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 301 (95% CI: 294-308) patients requiring treatment with mechanical ventilation at the current date to 331 (95% CI: 320-342) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

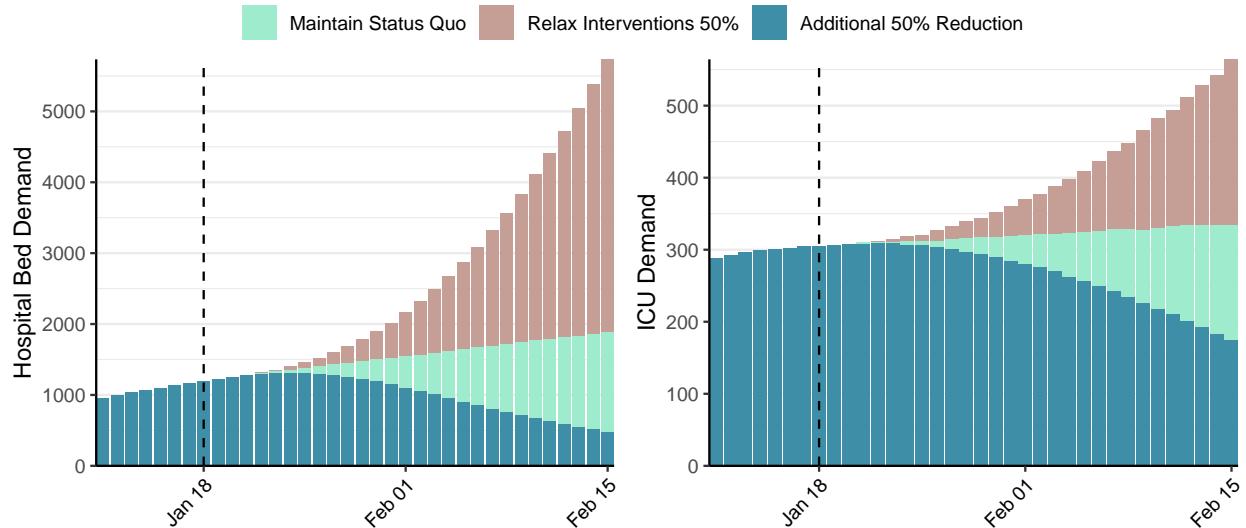


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 15,076 (95% CI: 14,286-15,867) at the current date to 1,811 (95% CI: 1,629-1,992) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 15,076 (95% CI: 14,286-15,867) at the current date to 95,389 (95% CI: 86,941-103,837) by 2021-02-15.

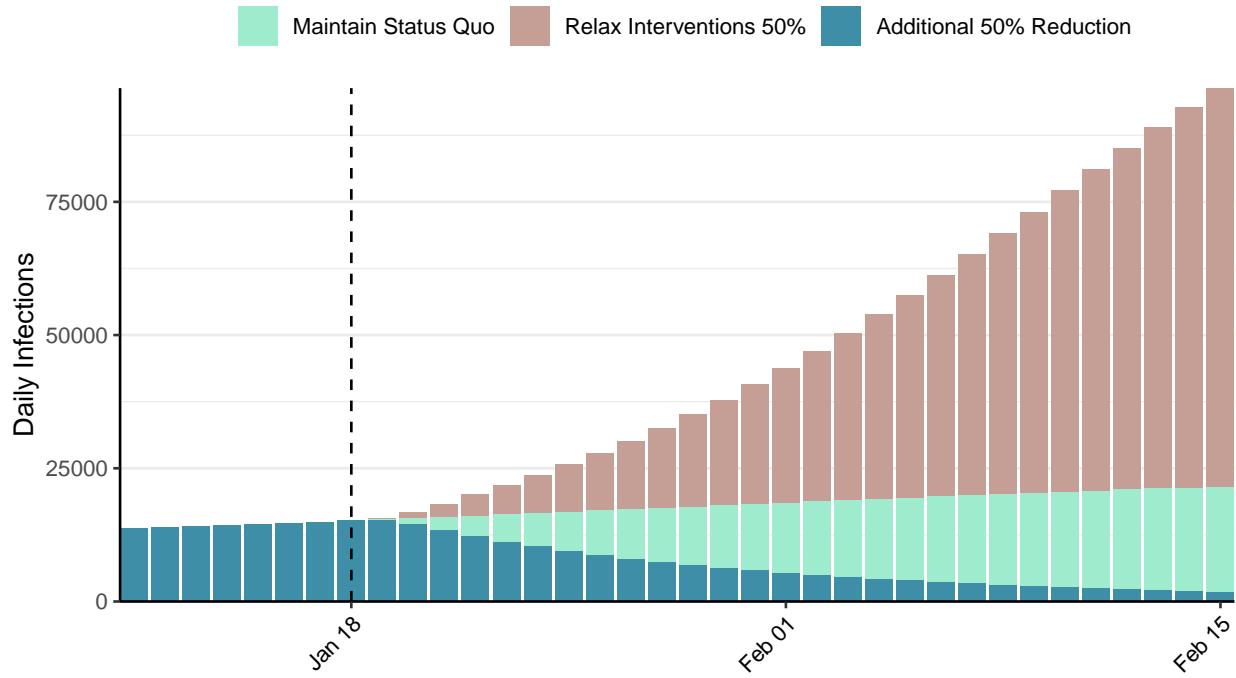


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Brazil, 2021-01-18

[Download the report for Brazil, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.93 (95% CI: 0.76-1.13)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Brazil is not shown in the following plot as only 0 deaths have been reported to date**

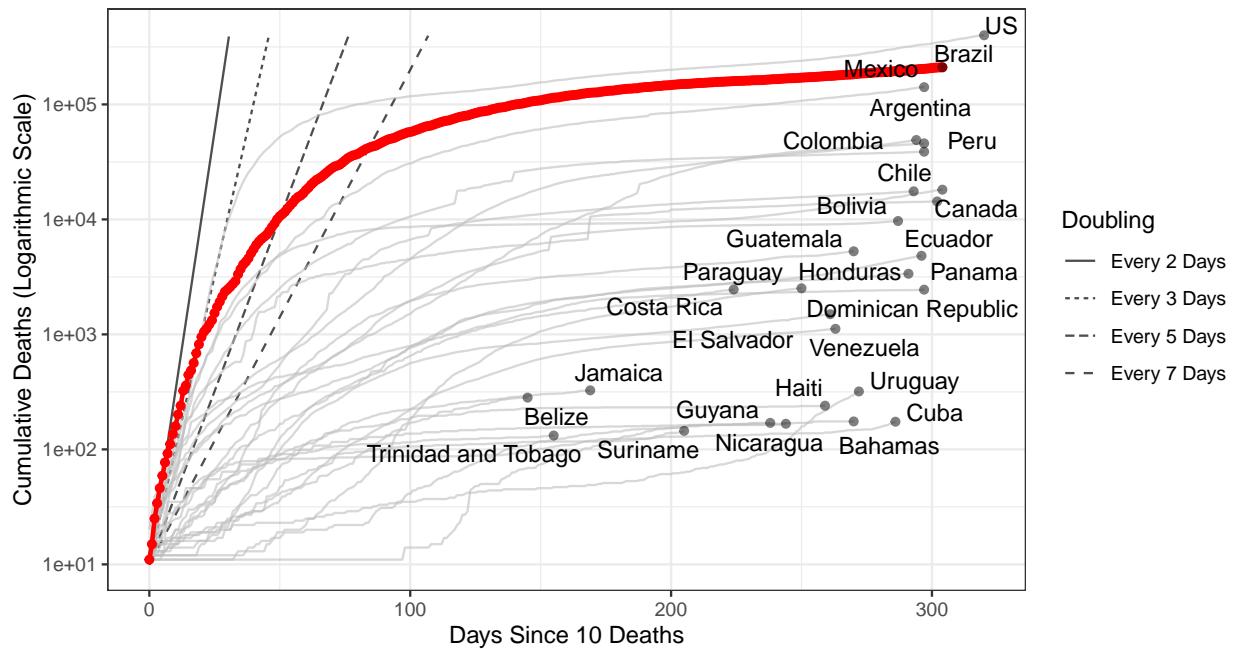


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 6,996,136 (95% CI: 6,698,157-7,294,114) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

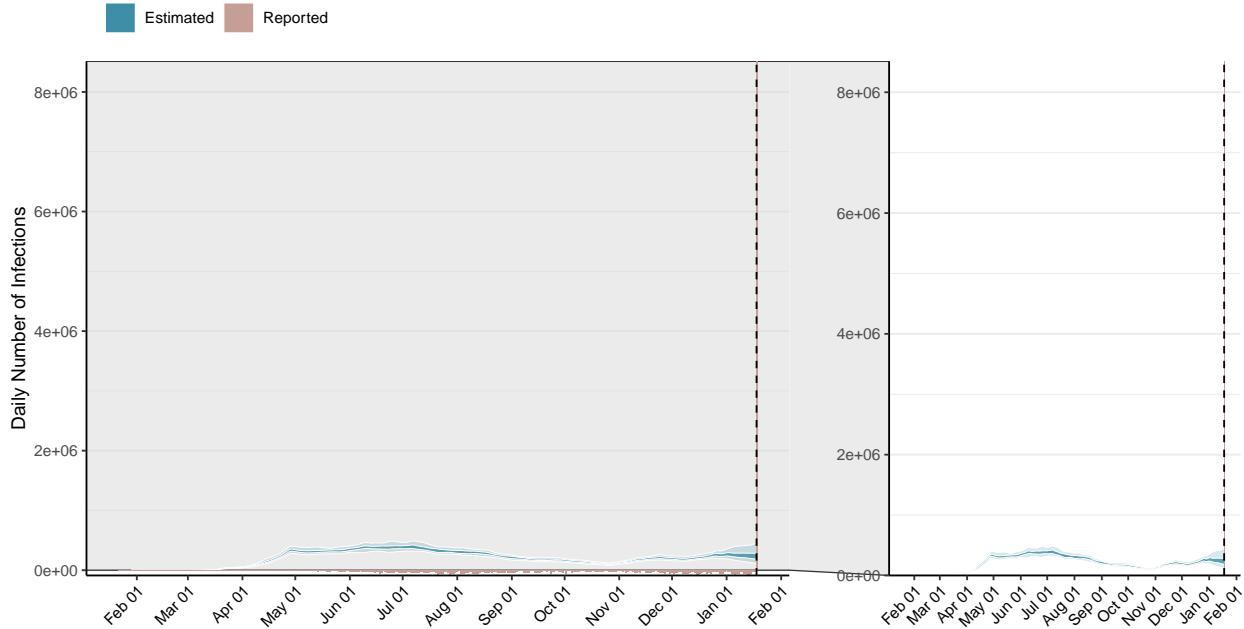


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

For sub-national estimates of R_t , and further analysis of Brazil, please see [Report 21](#)

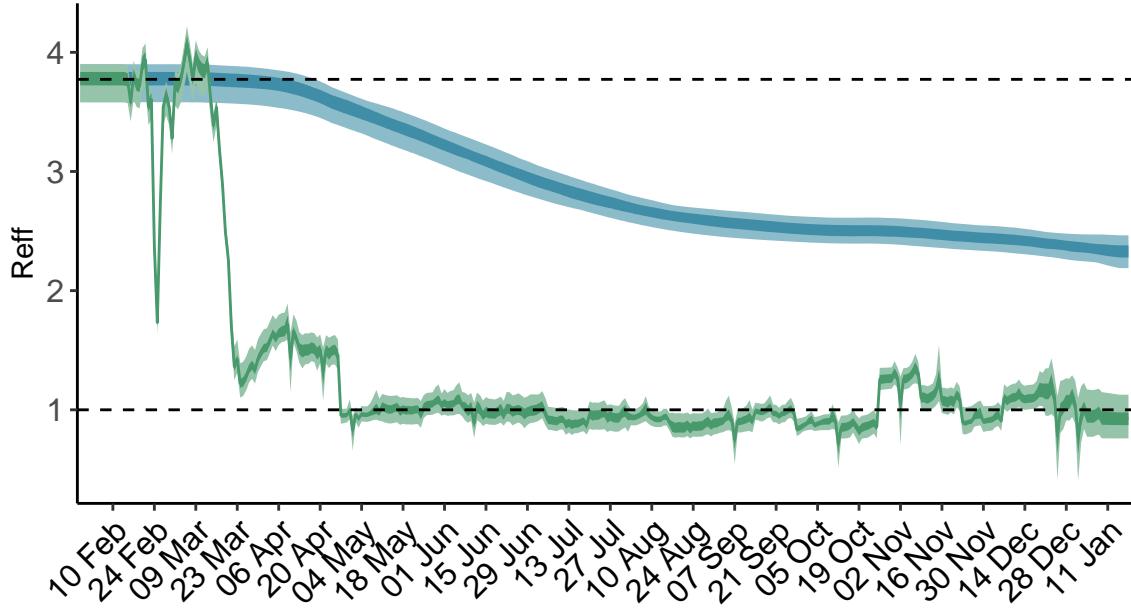


Figure 3: **Time-varying effective reproduction number, R_{eff} .** R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Brazil is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

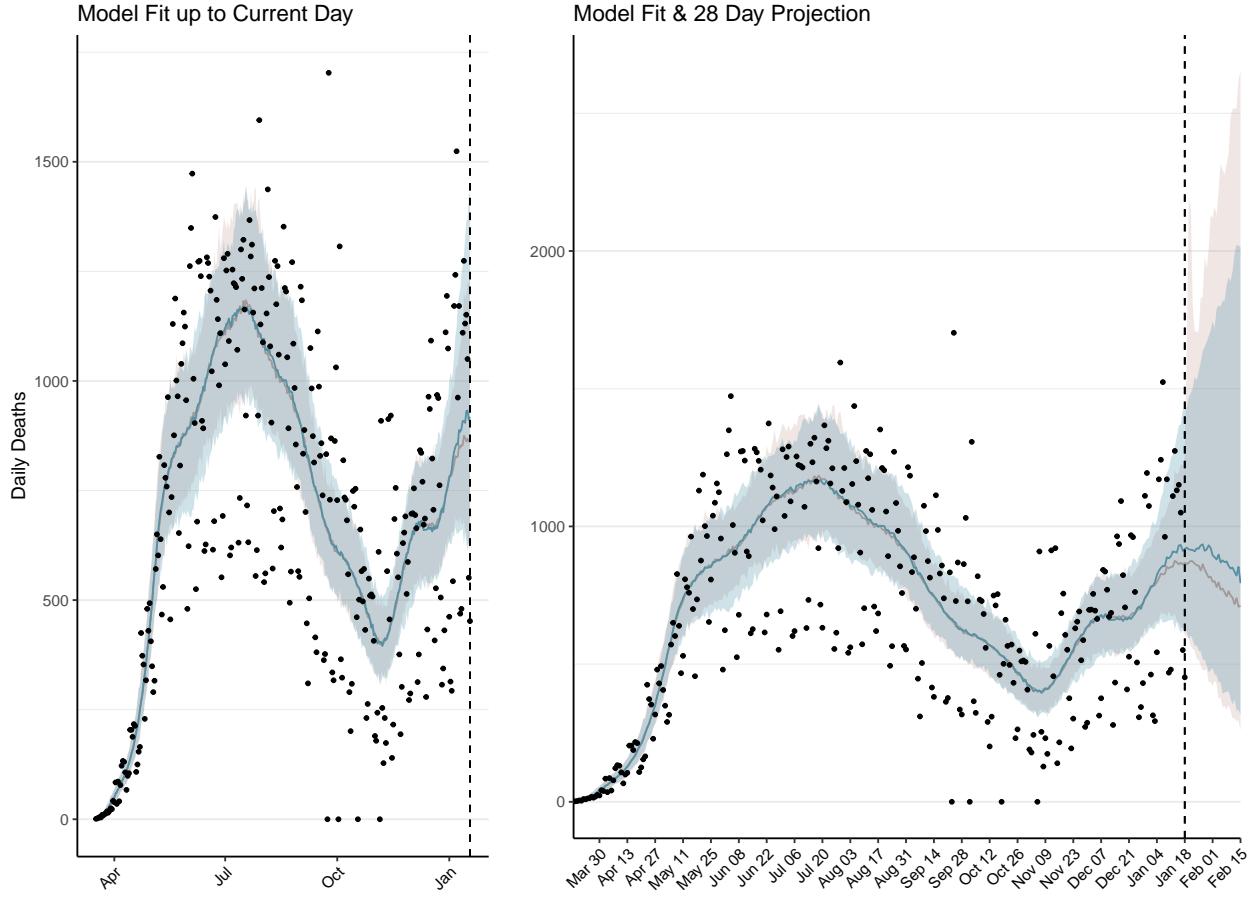


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 31,146 (95% CI: 29,643-32,649) patients requiring treatment with high-pressure oxygen at the current date to 27,111 (95% CI: 23,921-30,302) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 11,421 (95% CI: 10,924-11,919) patients requiring treatment with mechanical ventilation at the current date to 9,478 (95% CI: 8,715-10,241) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B.** These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.

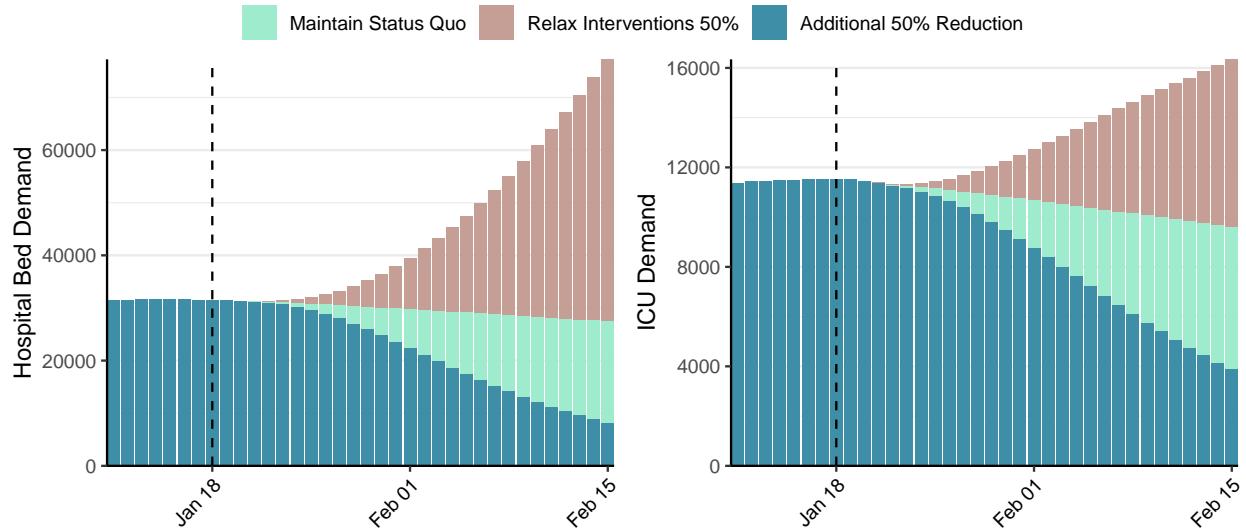


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 238,299 (95% CI: 220,436-256,161) at the current date to 18,270 (95% CI: 15,741-20,799) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 238,299 (95% CI: 220,436-256,161) at the current date to 900,769 (95% CI: 794,698-1,006,839) by 2021-02-15.

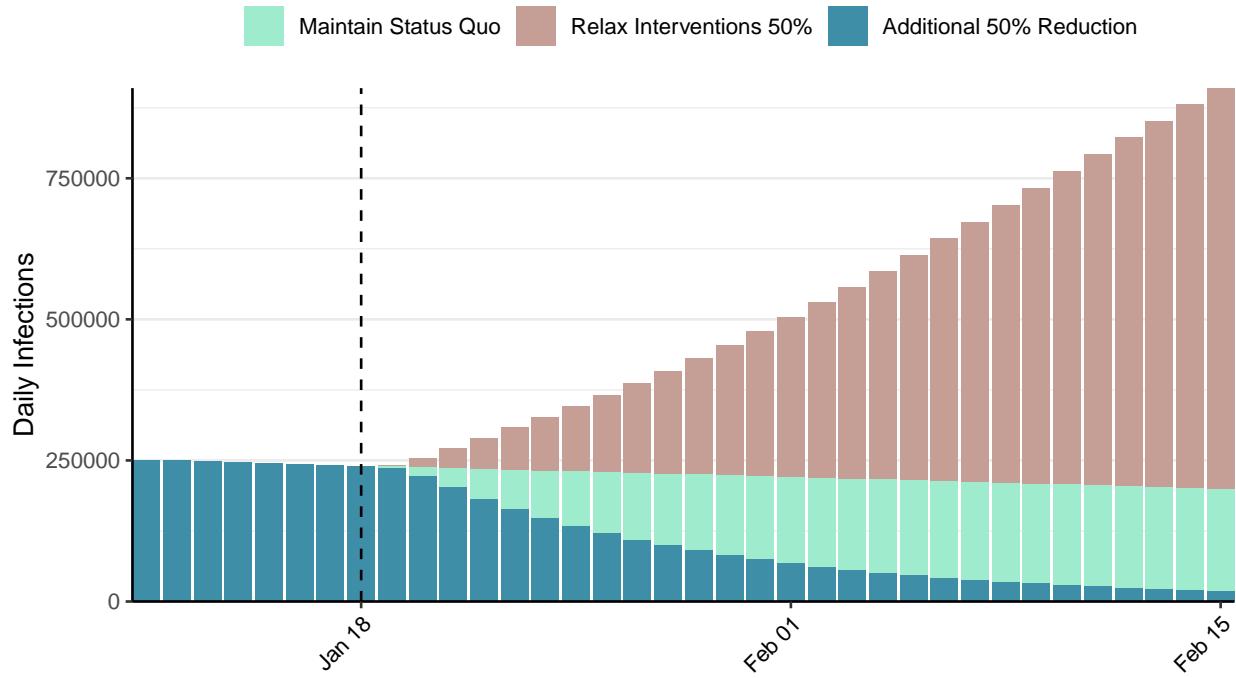


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Bhutan, 2021-01-18

[Download the report for Bhutan, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.88 (95% CI: 1.35-2.57)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Bhutan is not shown in the following plot as only 0 deaths have been reported to date**

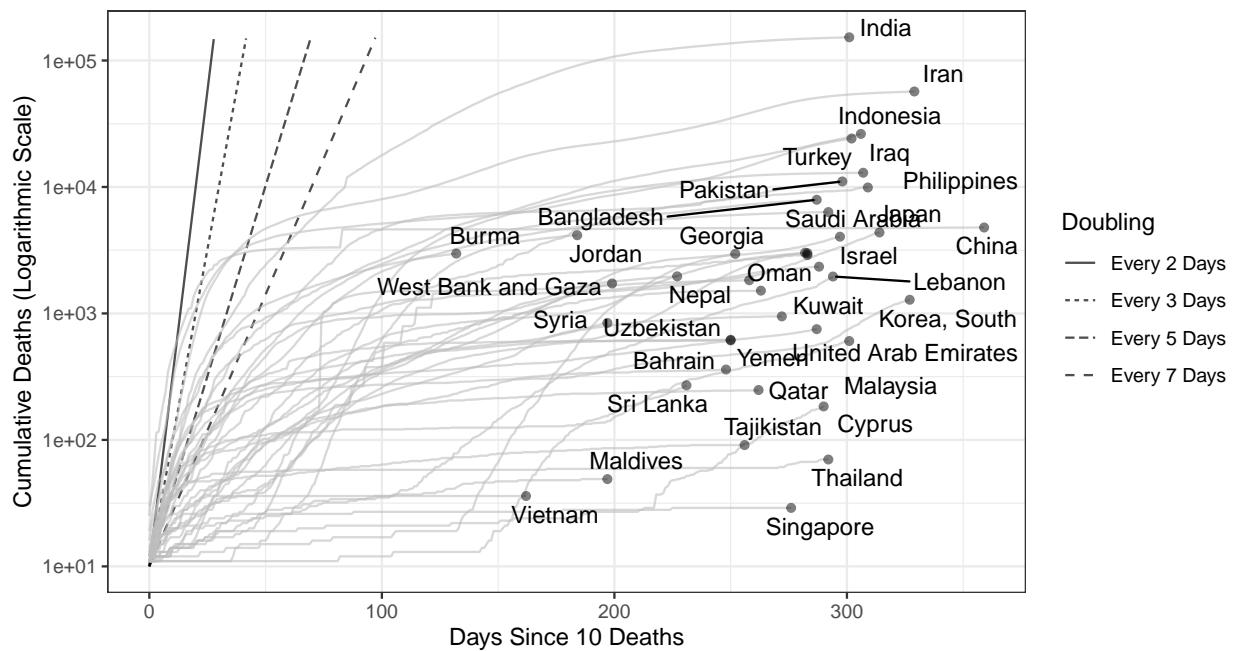


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 2,844 (95% CI: 2,316-3,372) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

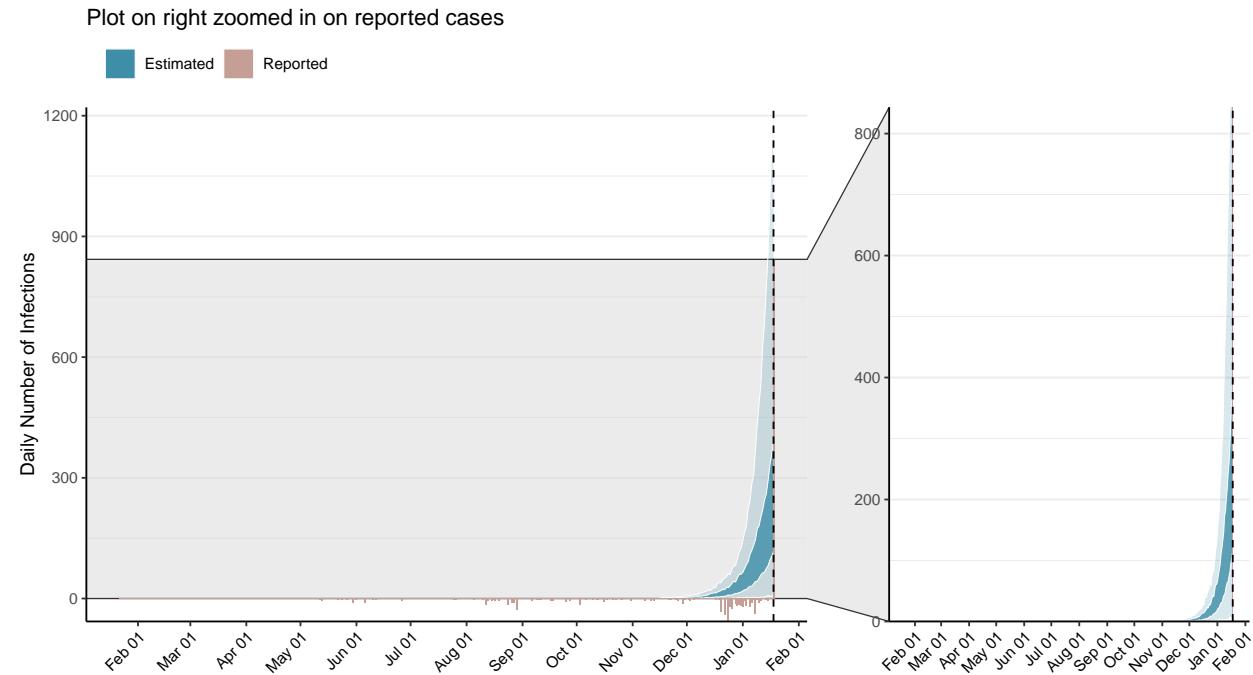


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

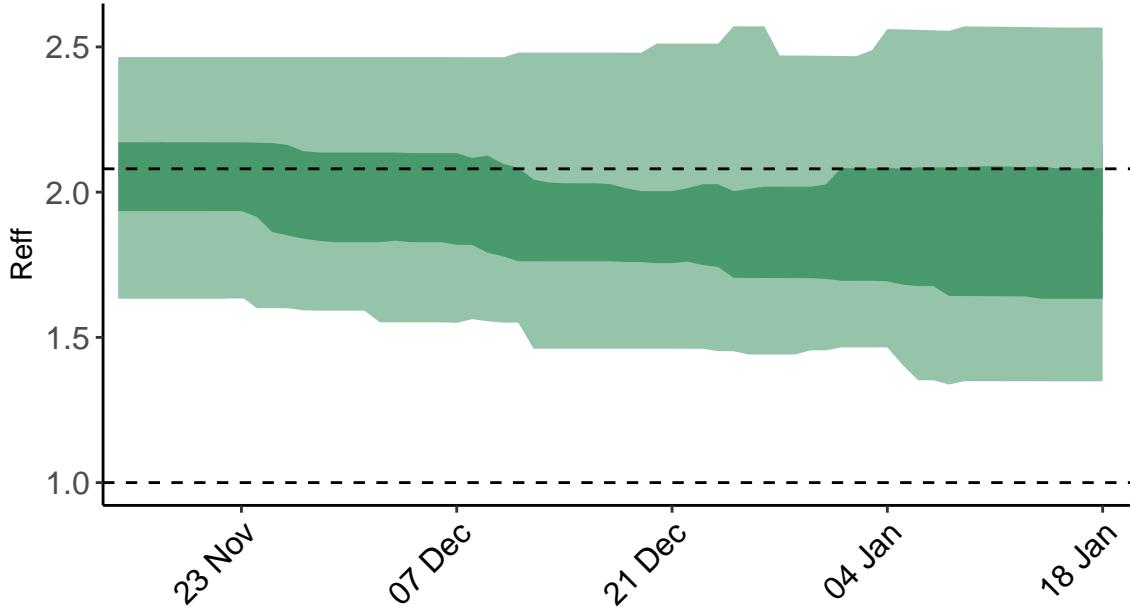


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Bhutan is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

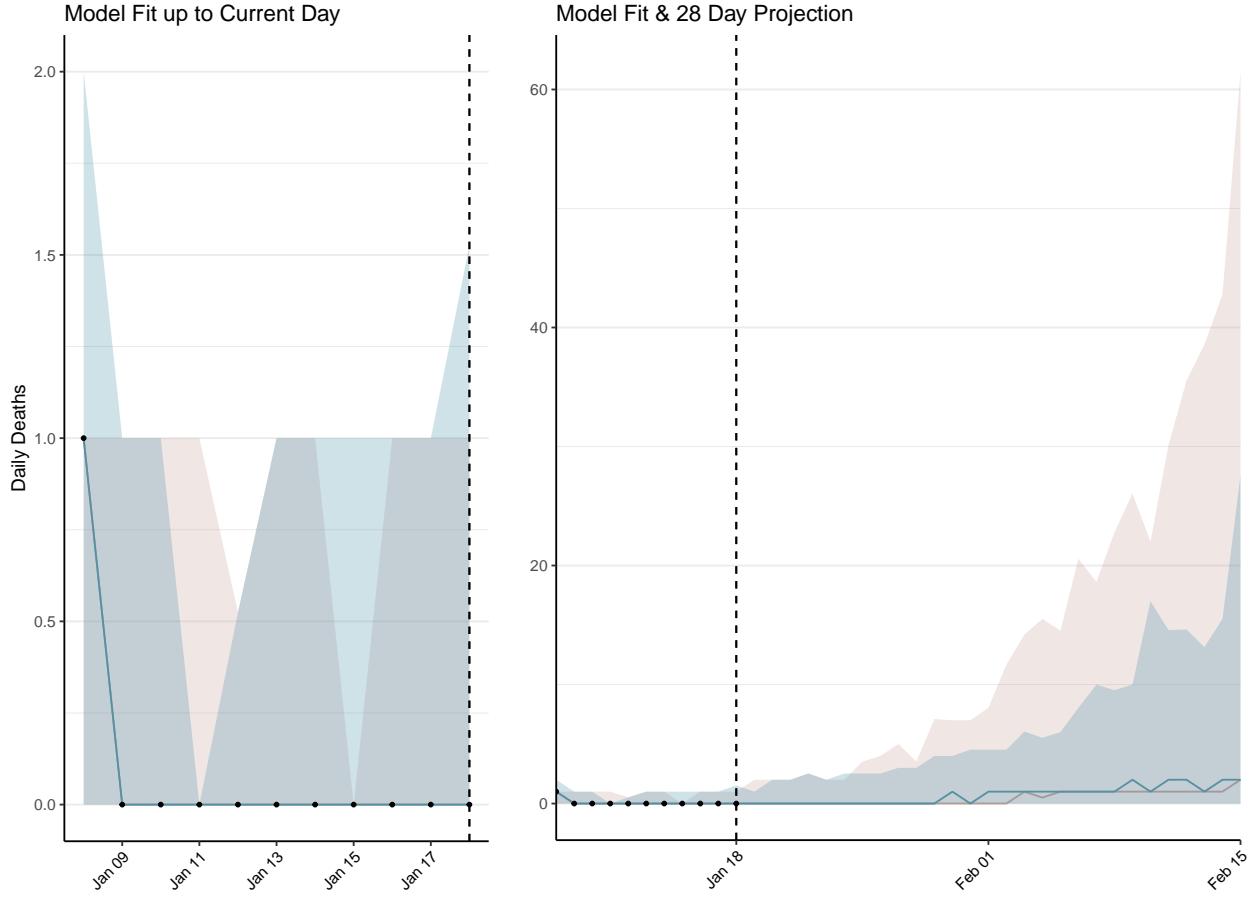


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 13 (95% CI: 10-15) patients requiring treatment with high-pressure oxygen at the current date to 192 (95% CI: 102-282) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 4 (95% CI: 3-5) patients requiring treatment with mechanical ventilation at the current date to 29 (95% CI: 22-37) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

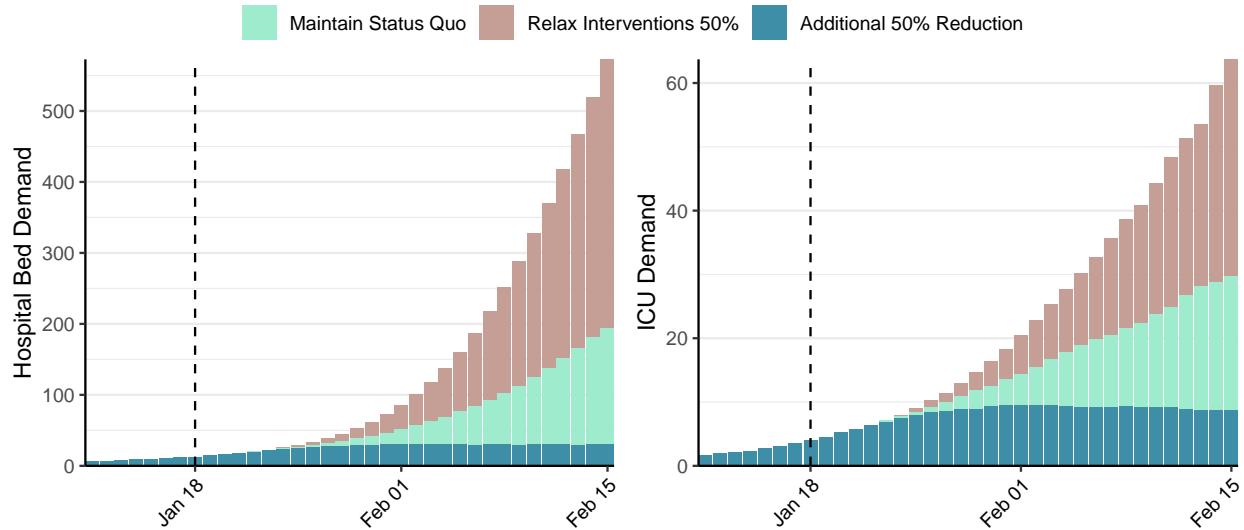


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 313 (95% CI: 246-380) at the current date to 323 (95% CI: 81-566) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 313 (95% CI: 246-380) at the current date to 12,489 (95% CI: 9,219-15,759) by 2021-02-15.

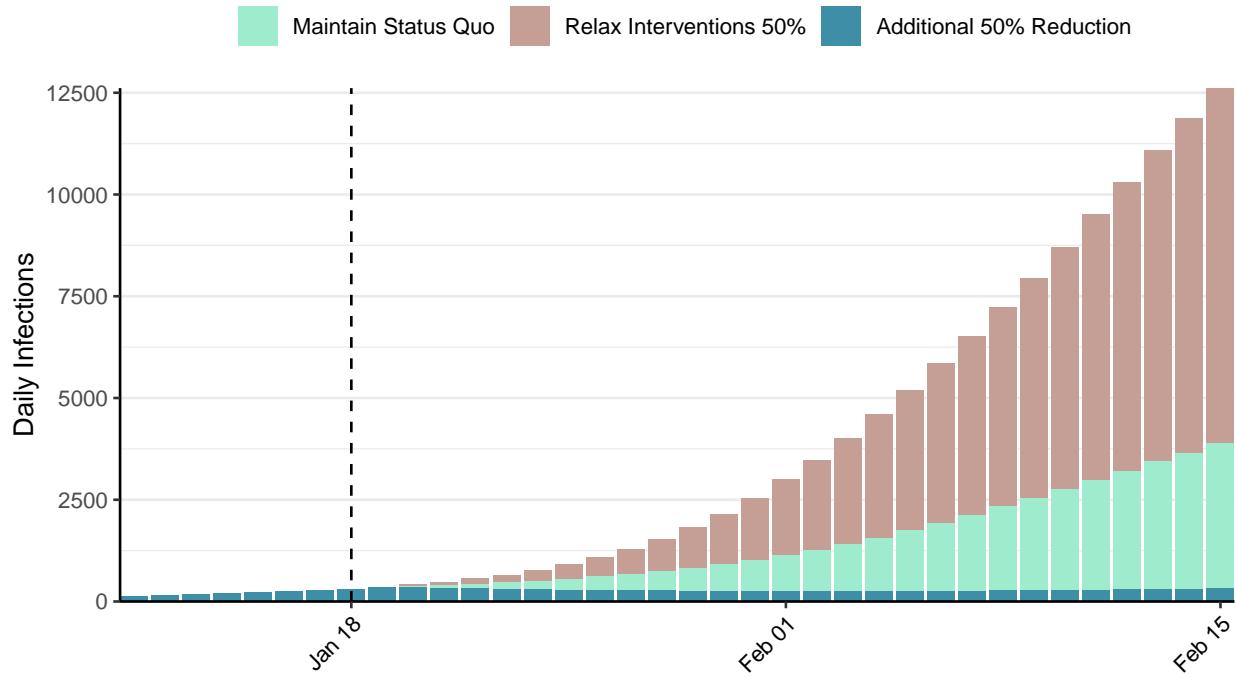


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Botswana, 2021-01-18

[Download the report for Botswana, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.66 (95% CI: 1.36-2.03)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Botswana is not shown in the following plot as only 0 deaths have been reported to date**

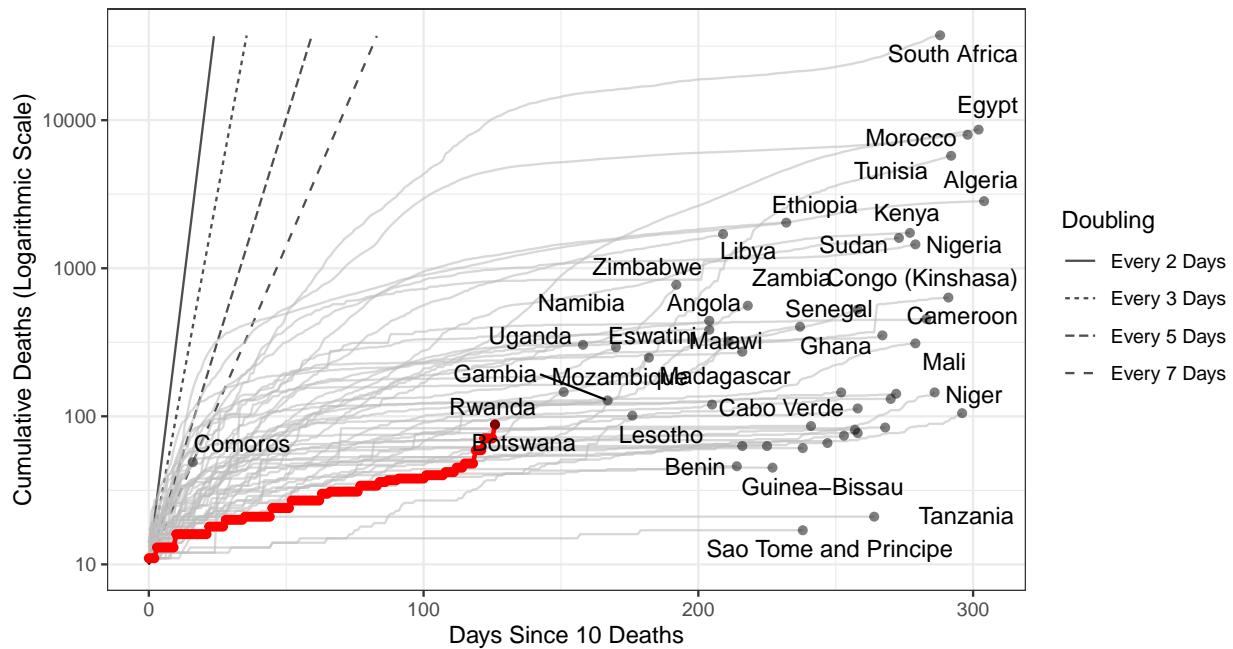


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 73,457 (95% CI: 63,764–83,150) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

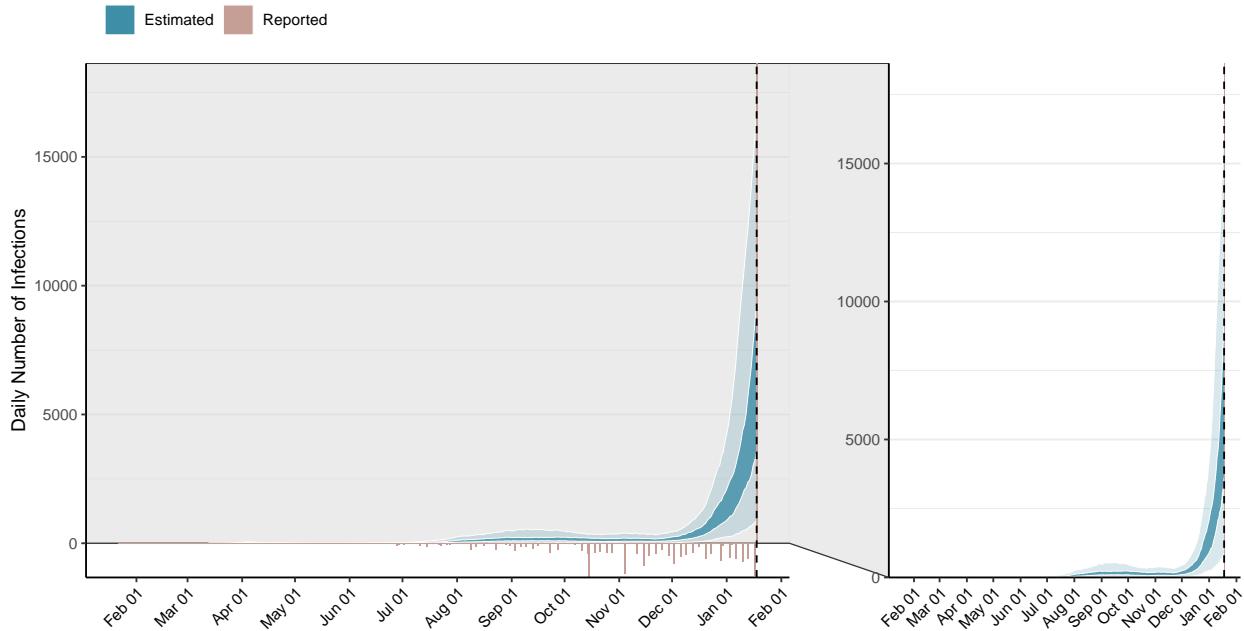


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

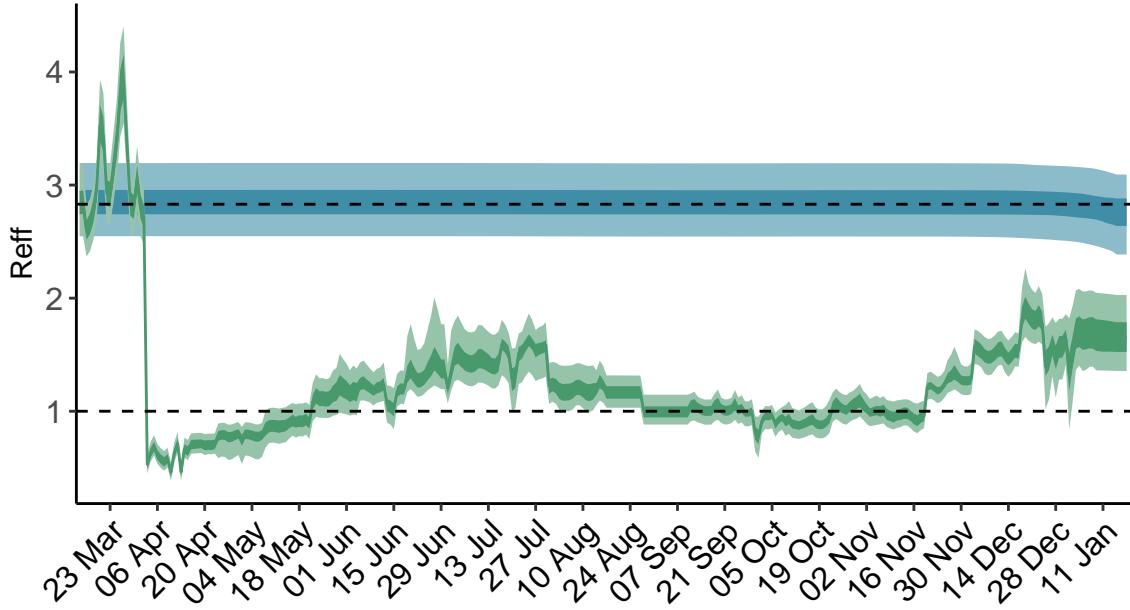


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Botswana is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

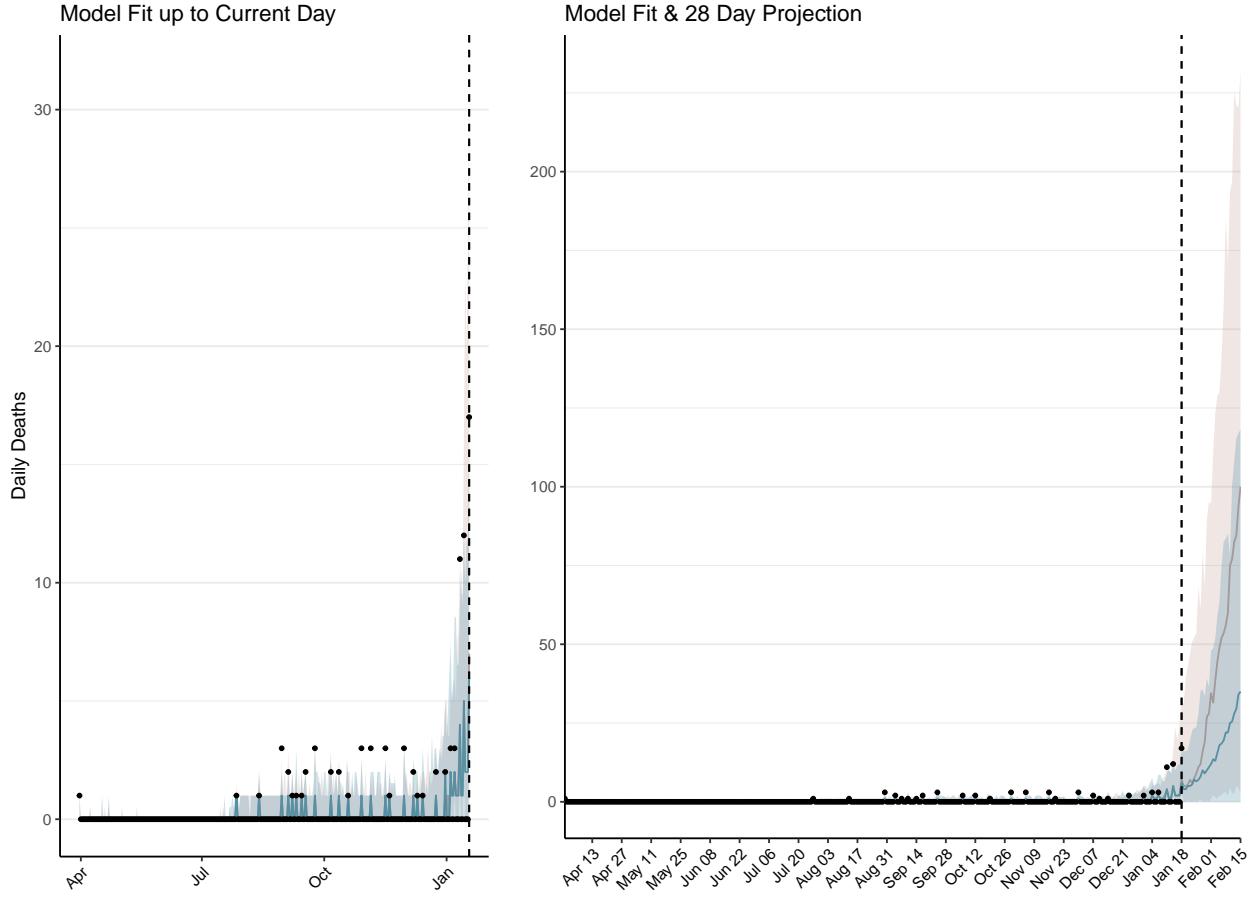


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 260 (95% CI: 226-295) patients requiring treatment with high-pressure oxygen at the current date to 2,244 (95% CI: 1,962-2,526) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 86 (95% CI: 76-96) patients requiring treatment with mechanical ventilation at the current date to 273 (95% CI: 254-293) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

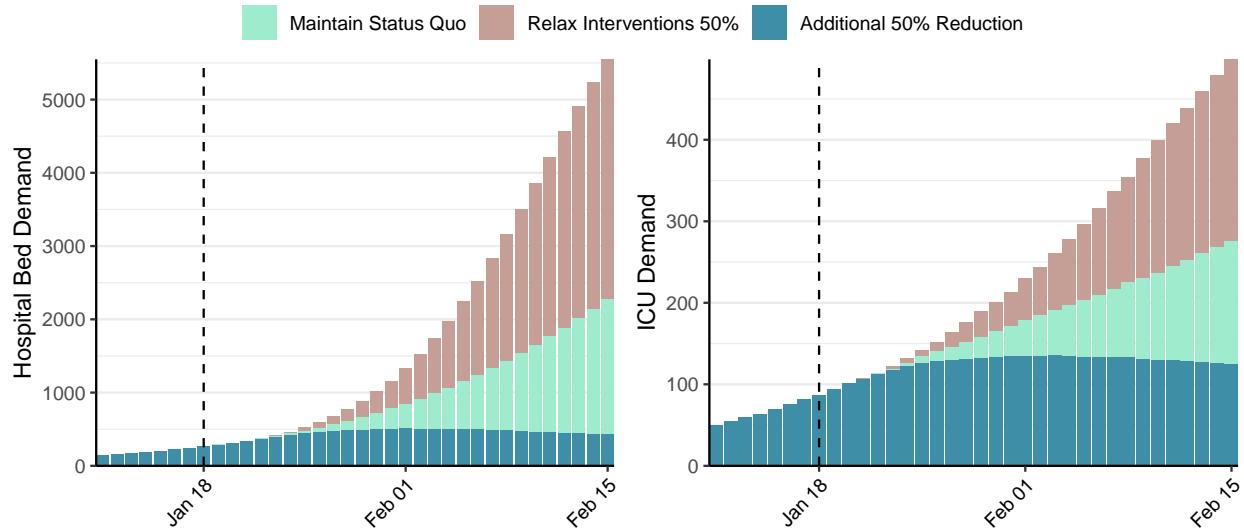


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 6,505 (95% CI: 5,617-7,394) at the current date to 3,857 (95% CI: 3,214-4,500) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 6,505 (95% CI: 5,617-7,394) at the current date to 110,611 (95% CI: 103,528-117,694) by 2021-02-15.

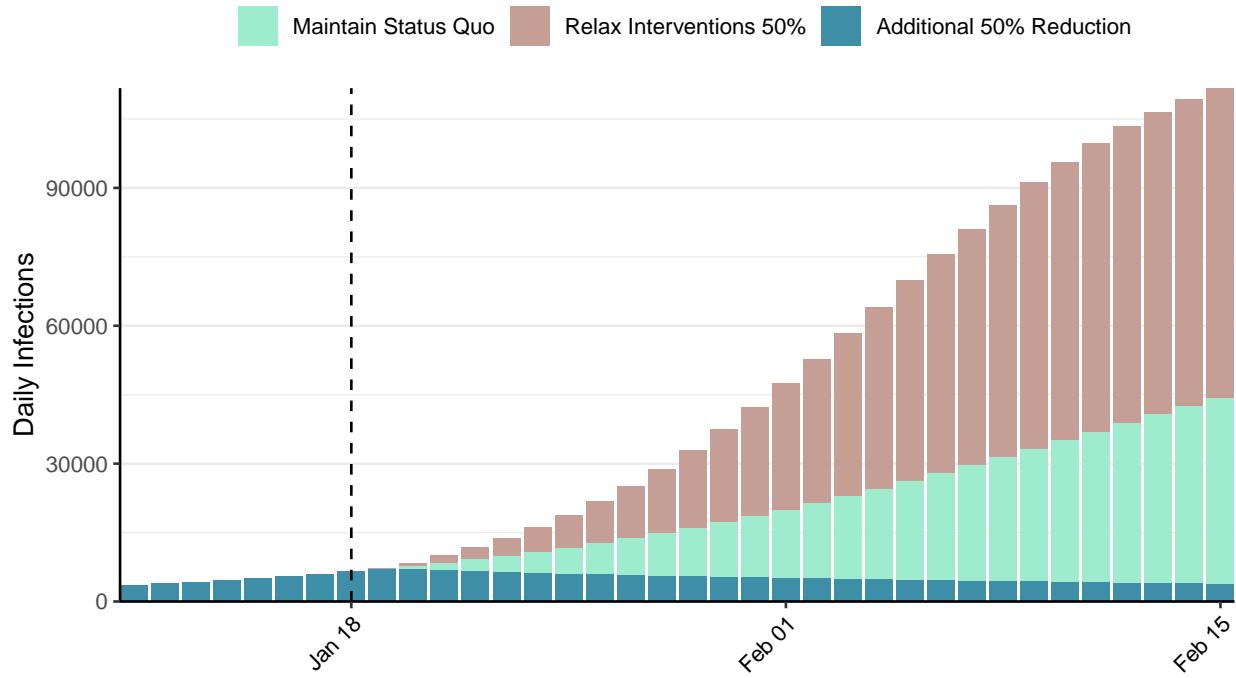


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Central African Republic, 2021-01-18

[Download the report for Central African Republic, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.48 (95% CI: 0.27-0.81)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Central African Republic is not shown in the following plot as only 0 deaths have been reported to date**

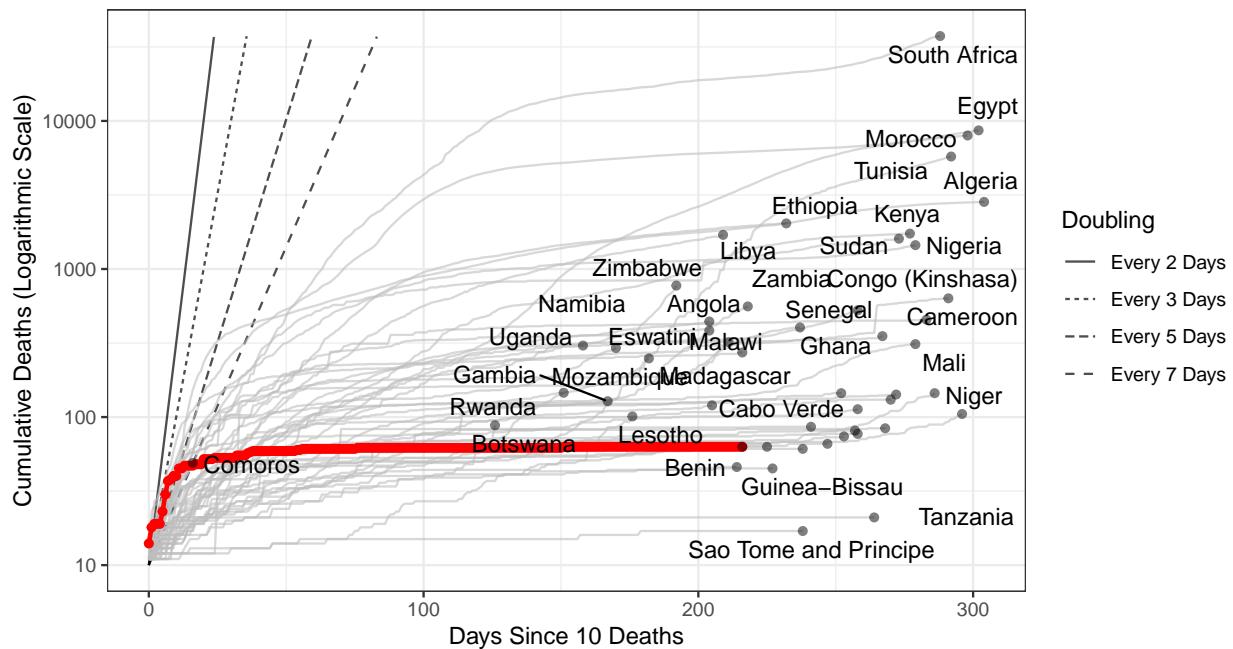


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 3 (95% CI: -3-10) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

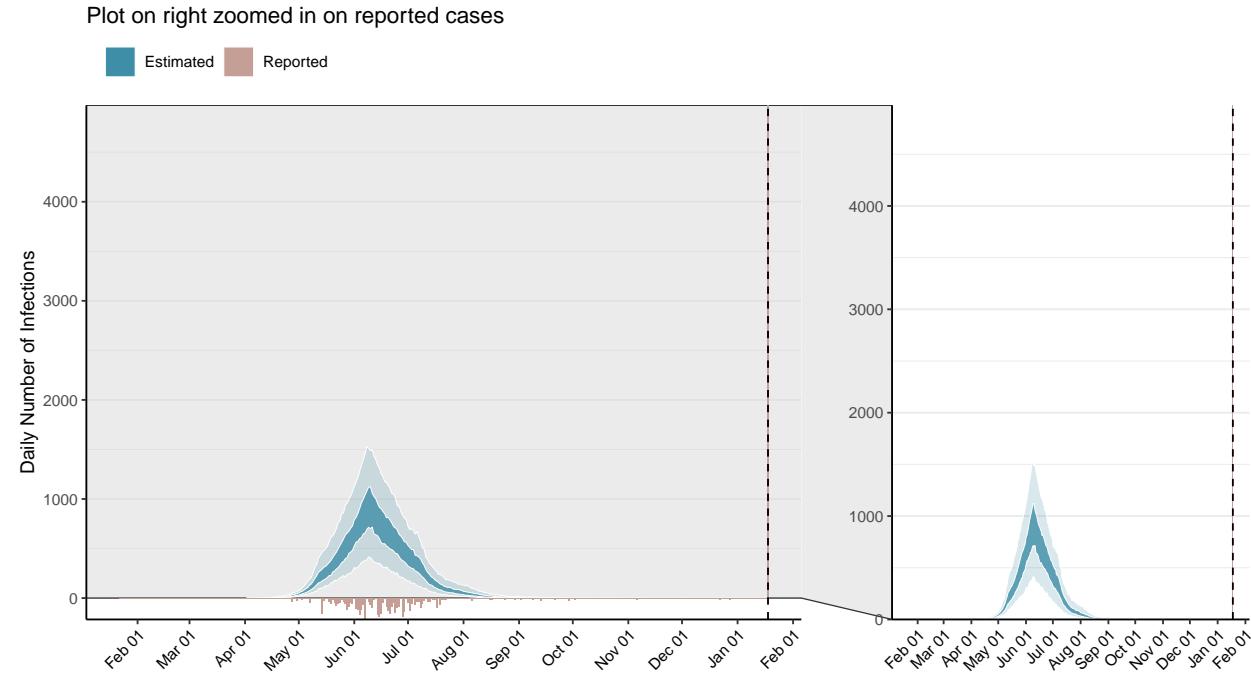


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

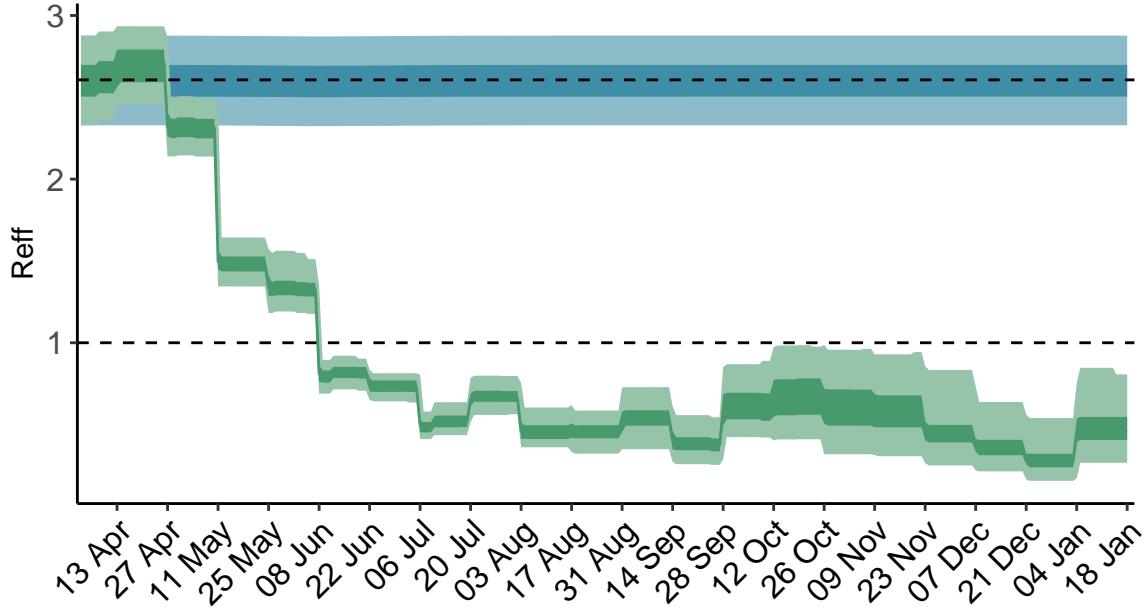


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

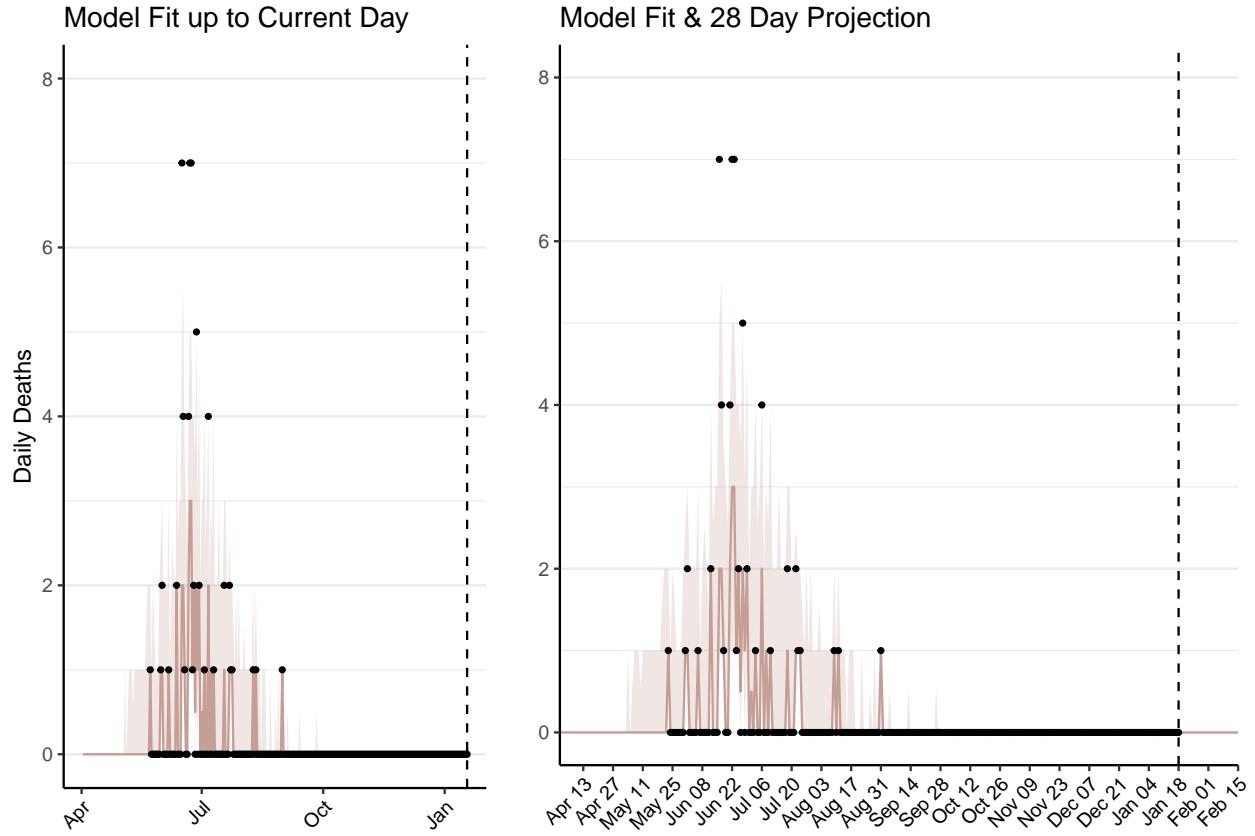


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 0 (95% CI: NaN-NaN) patients requiring treatment with high-pressure oxygen at the current date to 0 (95% CI: 0-0) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 0 (95% CI: 0-0) patients requiring treatment with mechanical ventilation at the current date to 0 (95% CI: 0-0) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

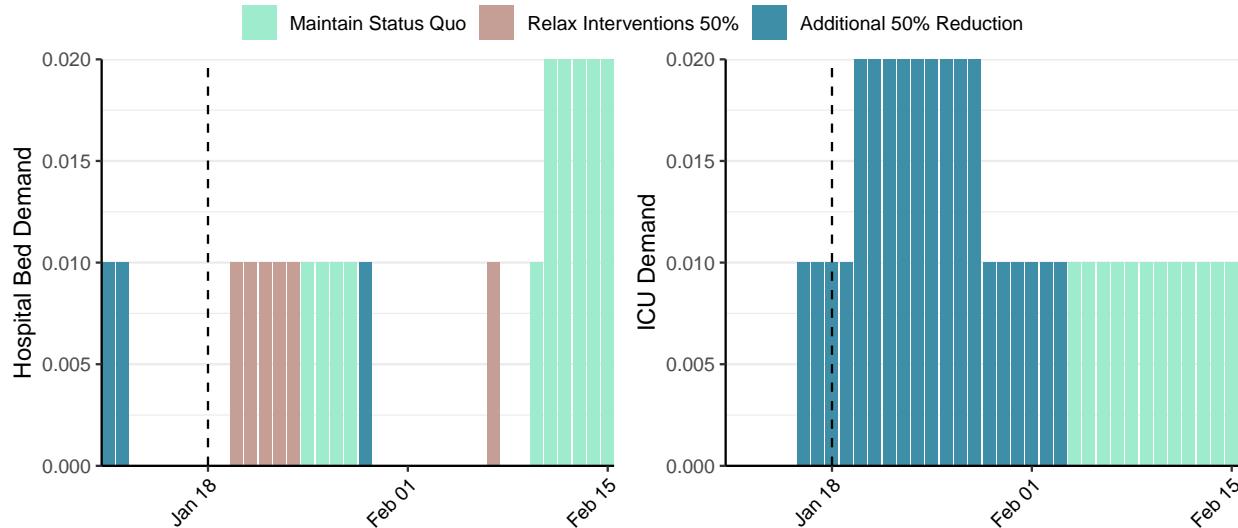


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 0 (95% CI: 0-1) at the current date to 0 (95% CI: 0-0) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 0 (95% CI: 0-1) at the current date to 0 (95% CI: 0-0) by 2021-02-15.

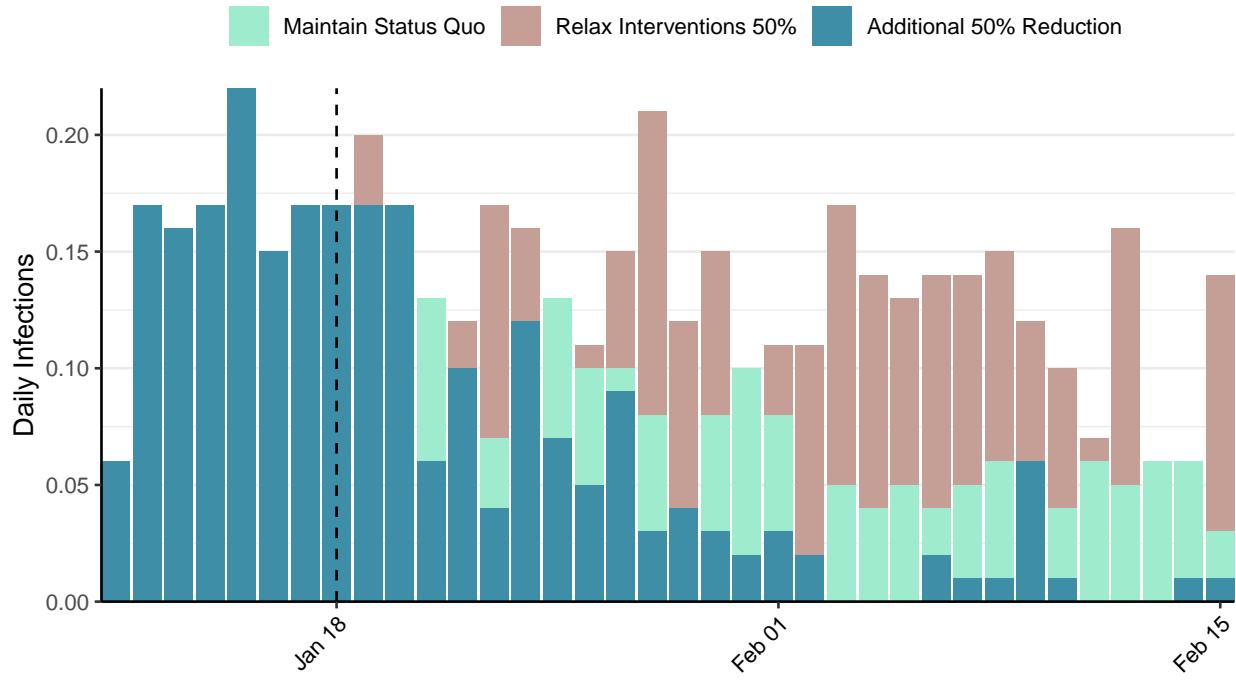


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Chile, 2021-01-18

[Download the report for Chile, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.95 (95% CI: 0.75-1.35)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Chile is not shown in the following plot as only 0 deaths have been reported to date**

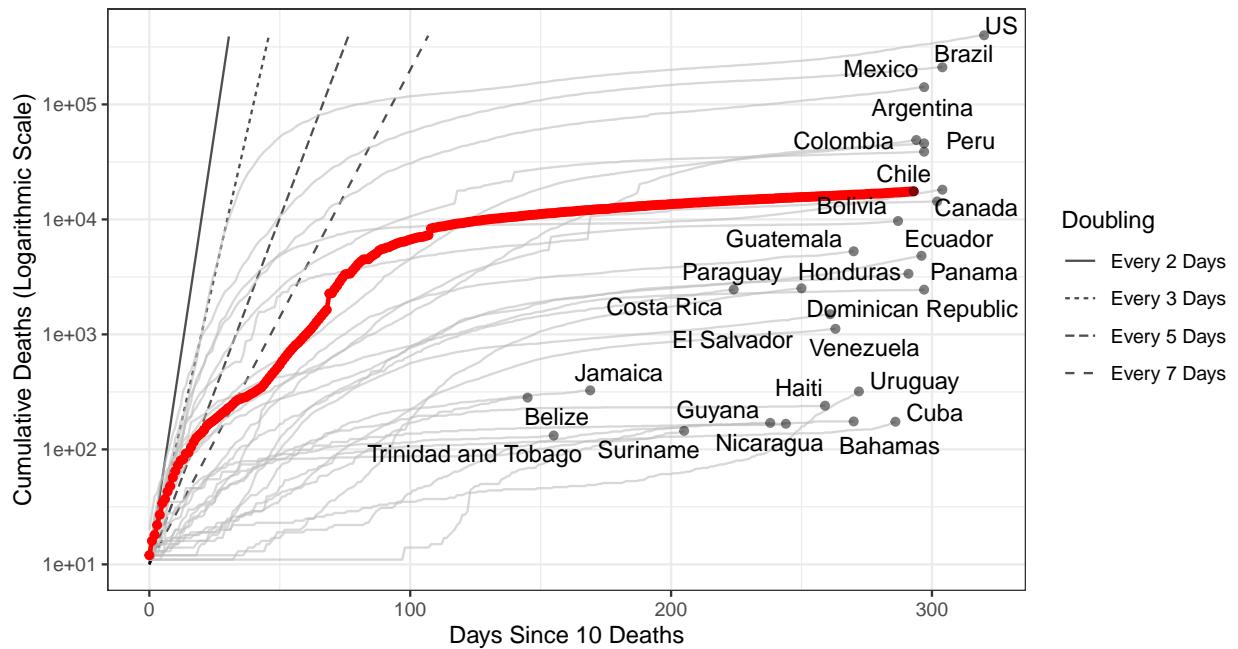


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 349,796 (95% CI: 329,328-370,265) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

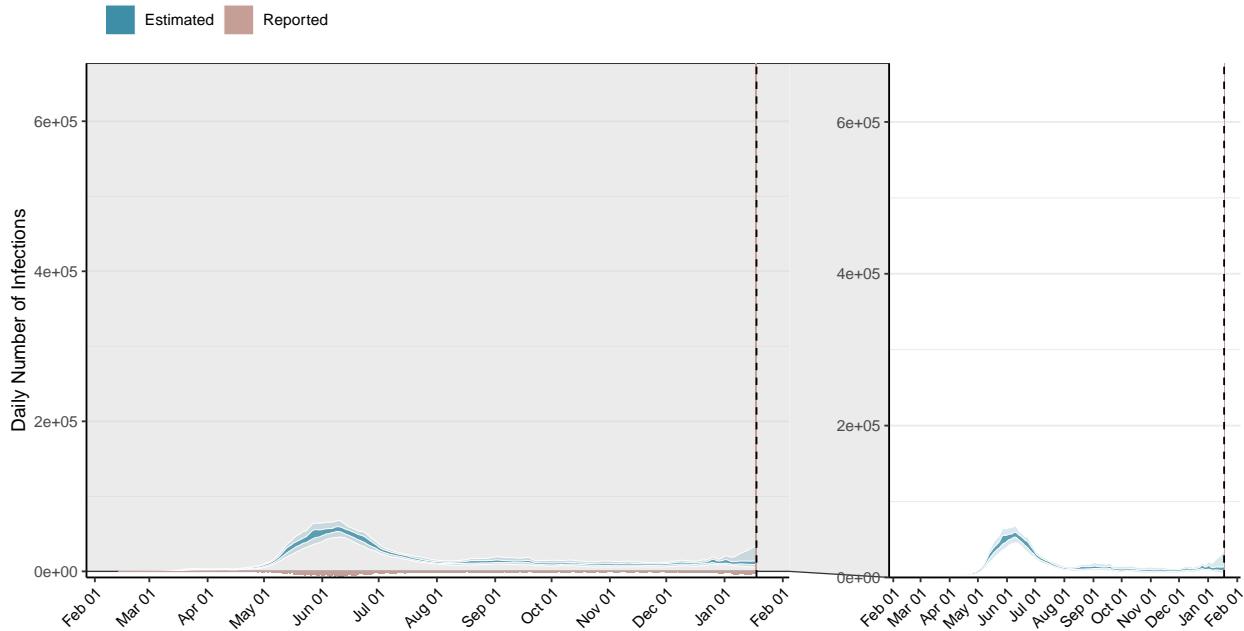


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

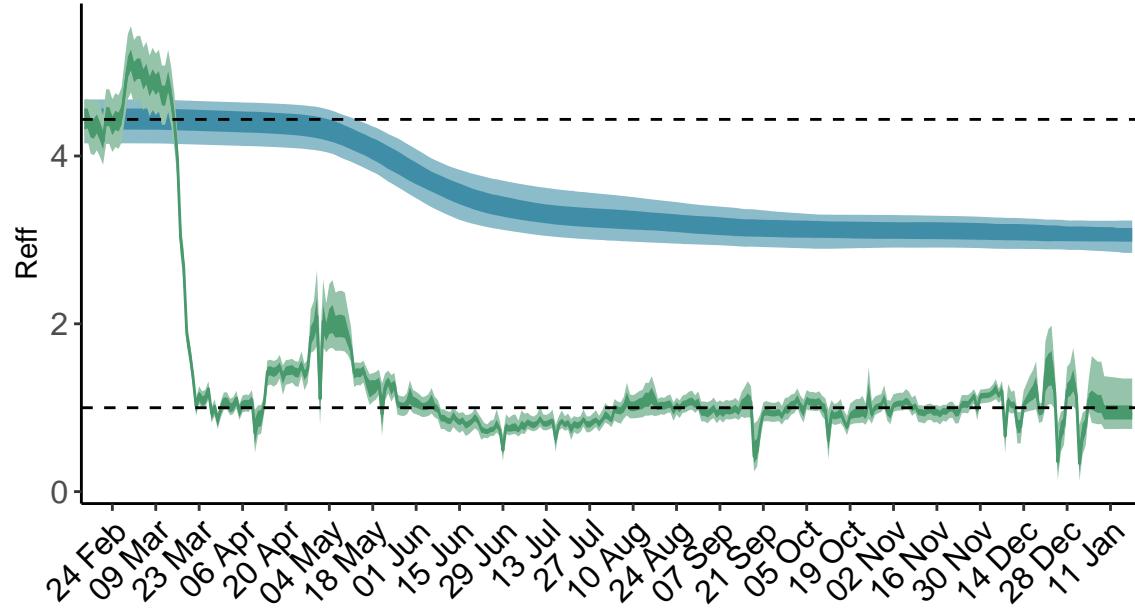


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

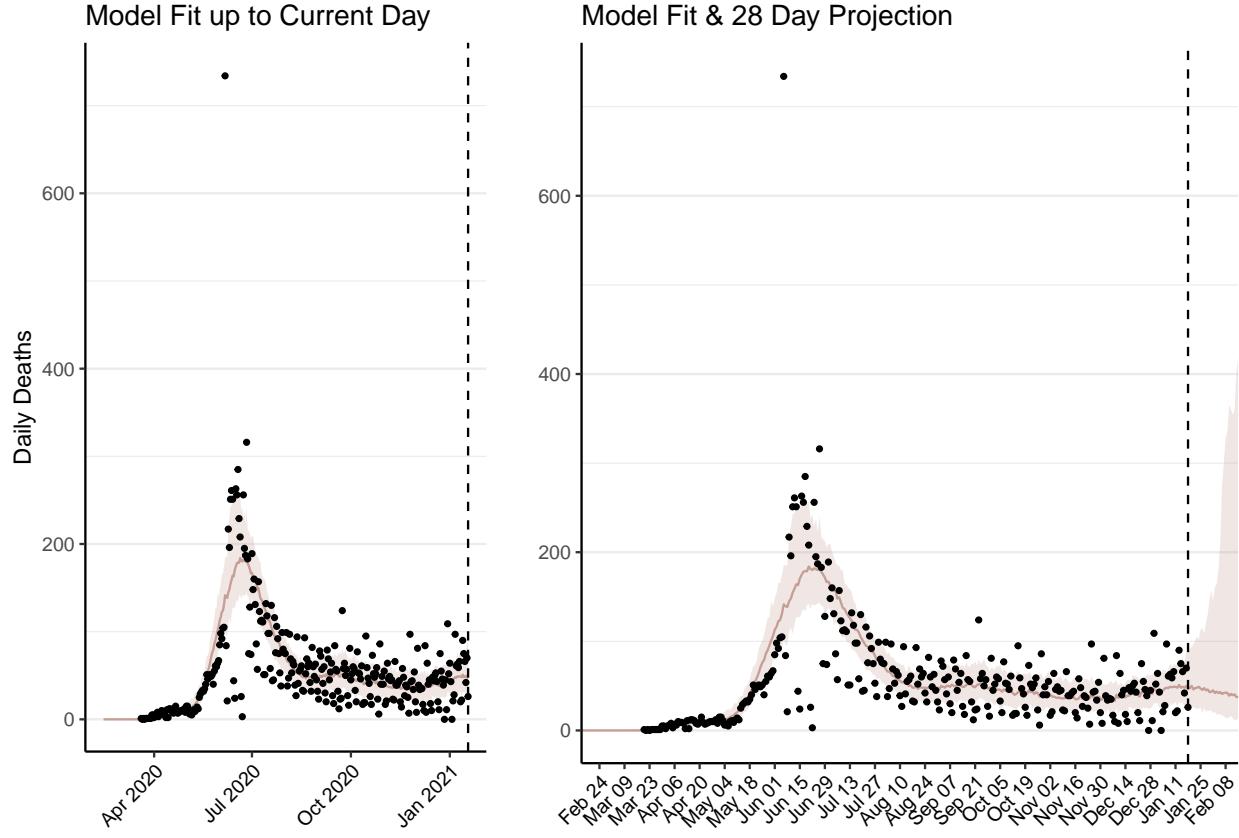


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1,676 (95% CI: 1,566-1,786) patients requiring treatment with high-pressure oxygen at the current date to 1,984 (95% CI: 1,479-2,488) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 602 (95% CI: 566-638) patients requiring treatment with mechanical ventilation at the current date to 634 (95% CI: 523-745) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

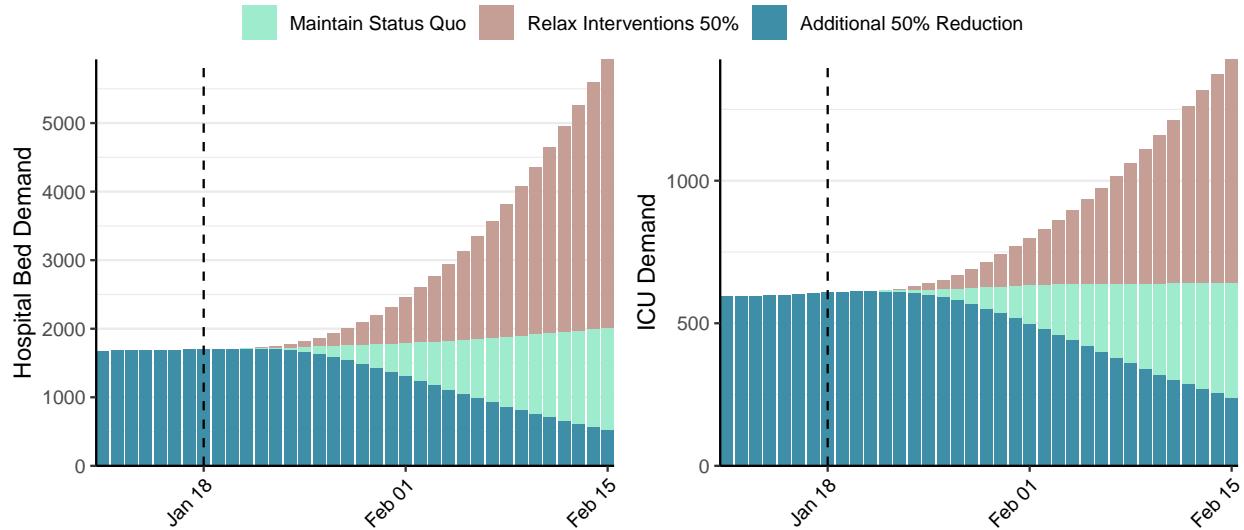


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 12,705 (95% CI: 11,189-14,221) at the current date to 1,339 (95% CI: 922-1,755) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 12,705 (95% CI: 11,189-14,221) at the current date to 67,287 (95% CI: 52,371-82,202) by 2021-02-15.

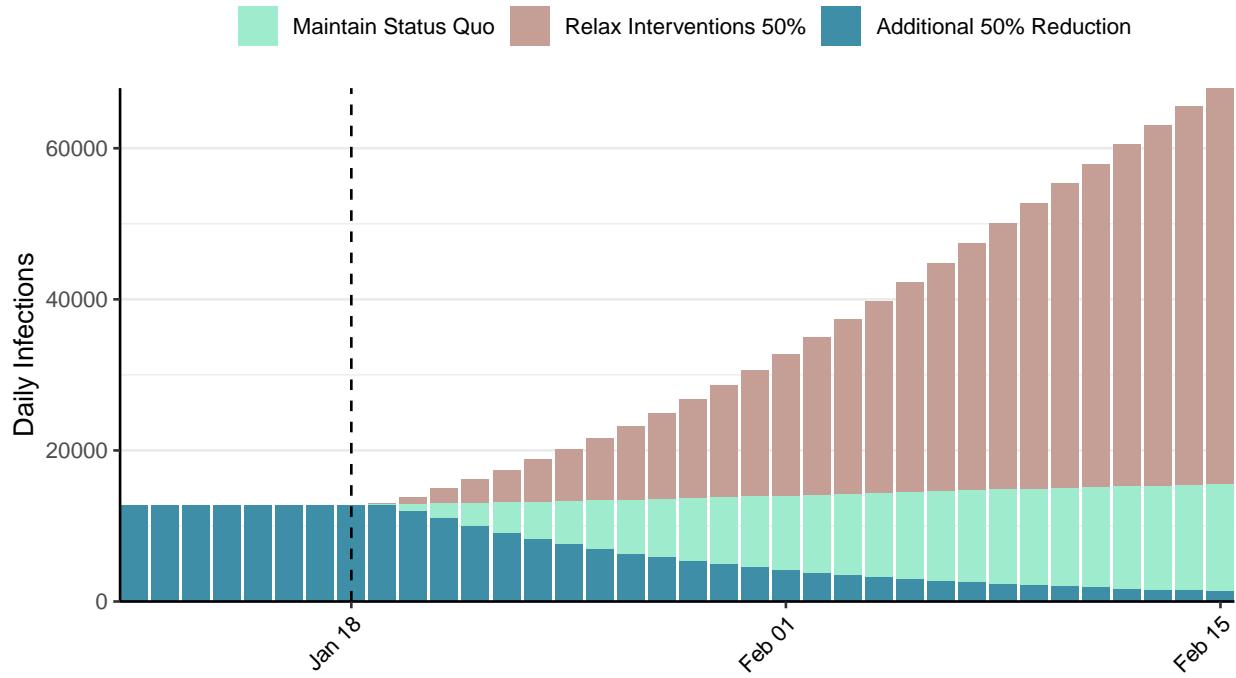


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: China, 2021-01-18

[Download the report for China, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.16 (95% CI: 0.97-1.38)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. China is not shown in the following plot as only 0 deaths have been reported to date**

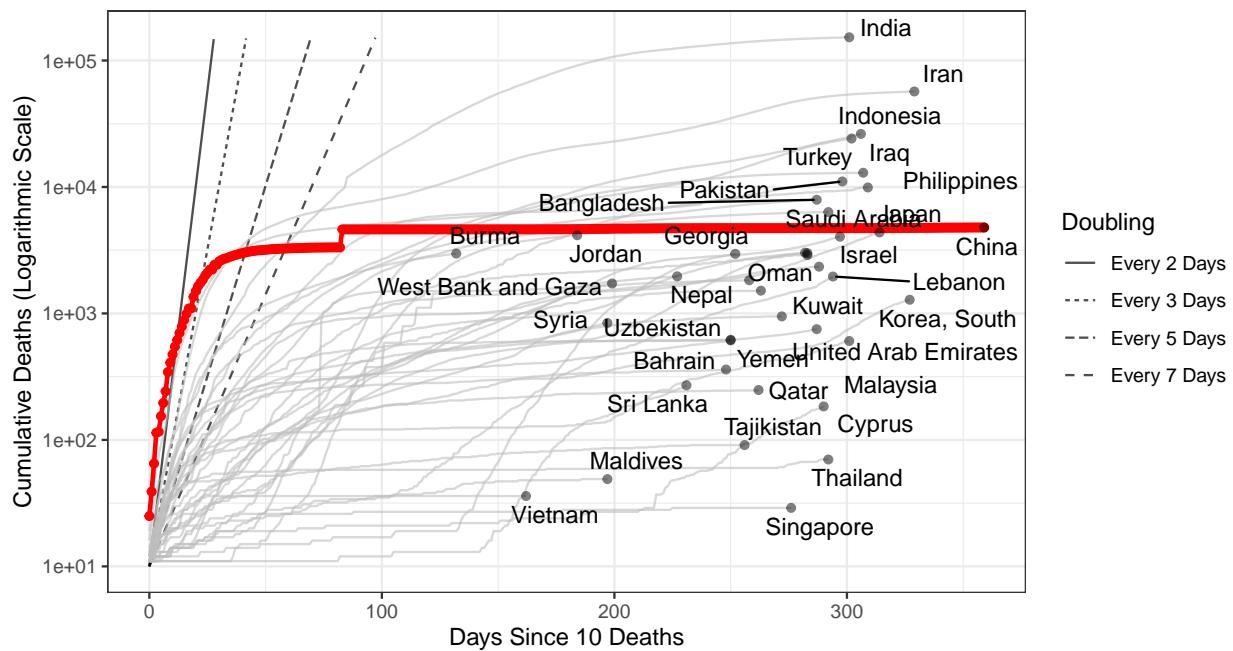


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 13,683 (95% CI: 12,744-14,621) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. China has revised their historic reported cases and thus have reported negative cases.**

Plot on right zoomed in on reported cases

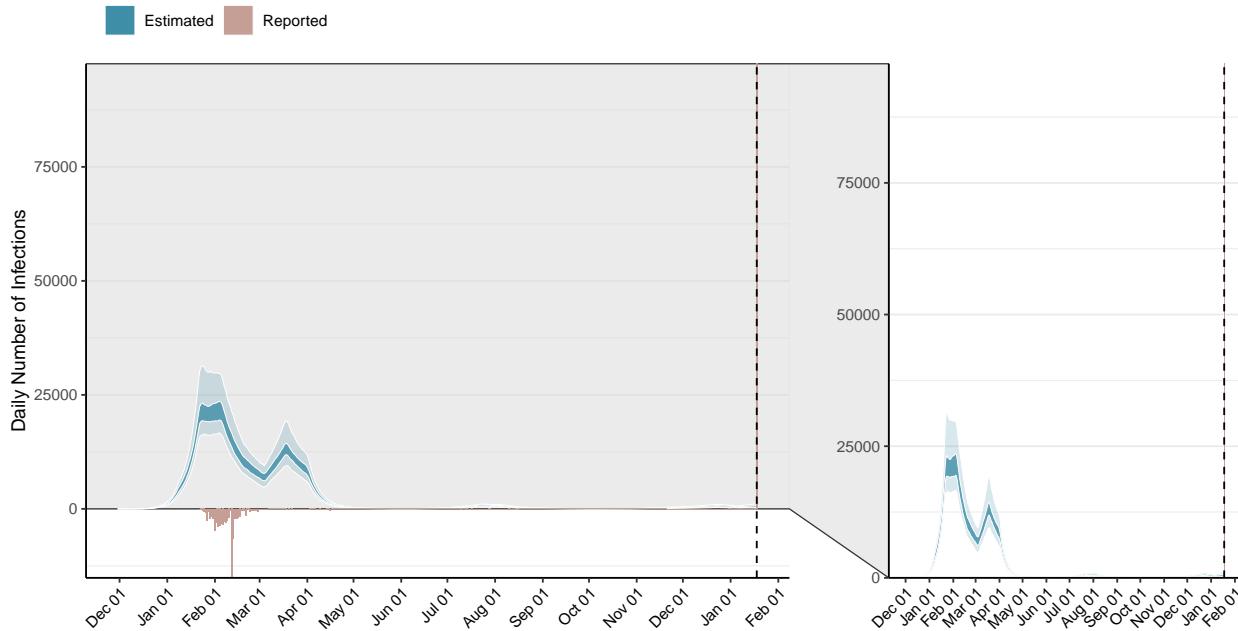


Figure 2: Daily number of infections estimated by fitting to the current total of deaths. Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

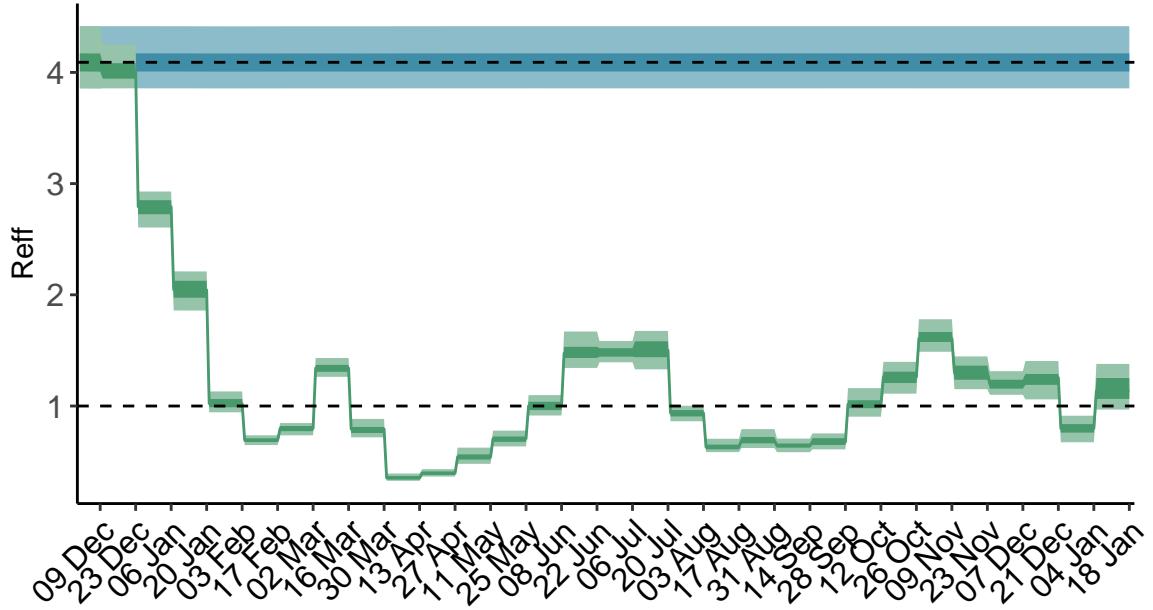


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

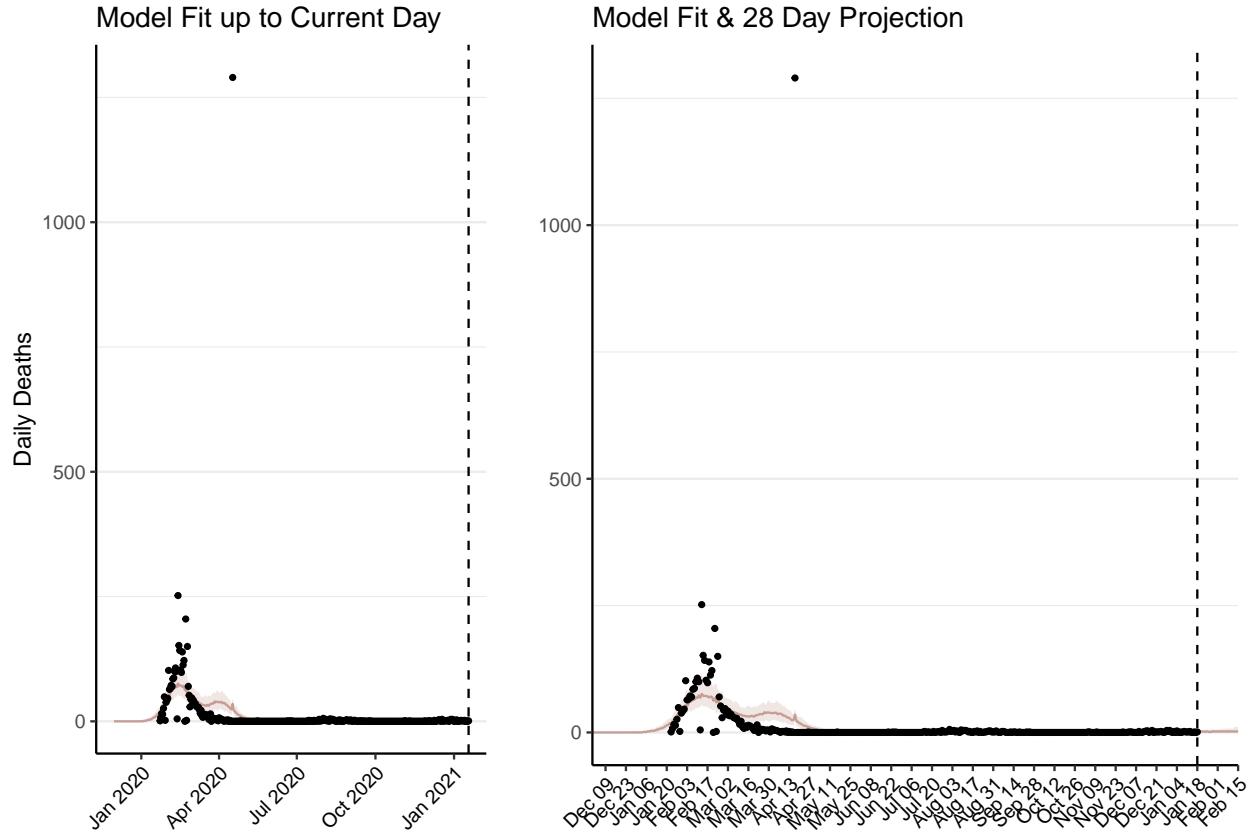


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 63 (95% CI: 58-68) patients requiring treatment with high-pressure oxygen at the current date to 132 (95% CI: 110-154) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 26 (95% CI: 24-28) patients requiring treatment with mechanical ventilation at the current date to 49 (95% CI: 41-58) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

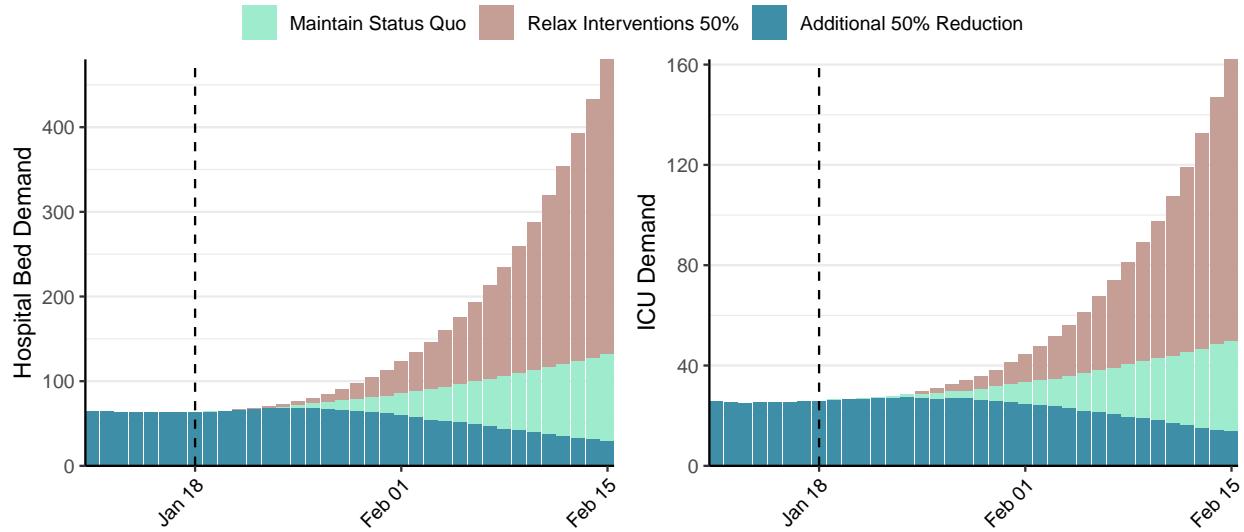


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 548 (95% CI: 495-601) at the current date to 90 (95% CI: 74-107) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 548 (95% CI: 495-601) at the current date to 8,806 (95% CI: 6,855-10,756) by 2021-02-15.

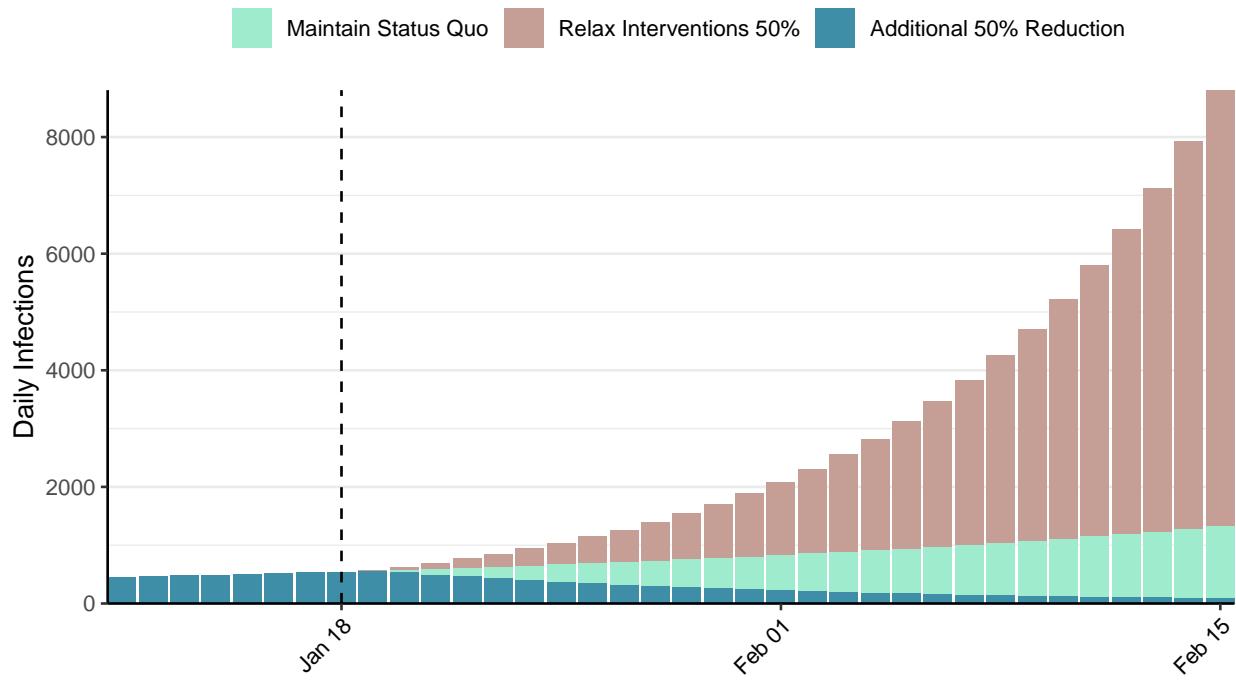


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Cote d'Ivoire, 2021-01-18

[Download the report for Cote d'Ivoire, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.53 (95% CI: 1.29-1.83)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Cote d'Ivoire is not shown in the following plot as only 0 deaths have been reported to date**

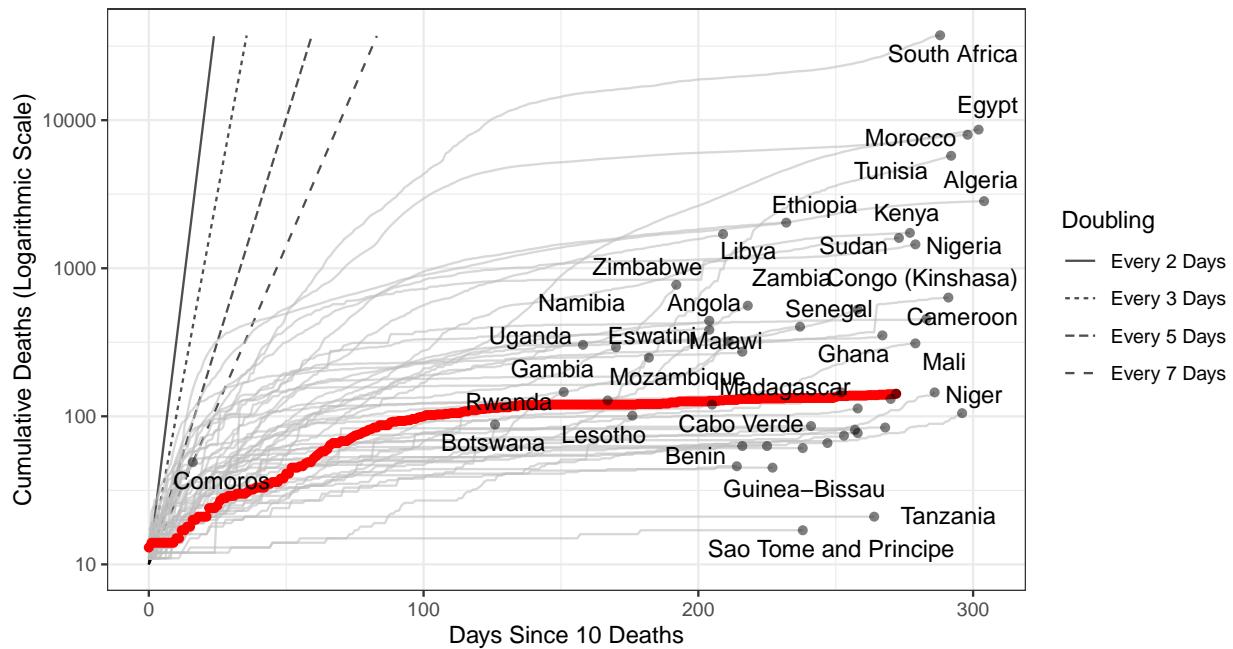


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 19,063 (95% CI: 17,092-21,034) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. Cote d'Ivoire has revised their historic reported cases and thus have reported negative cases.**

Plot on right zoomed in on reported cases

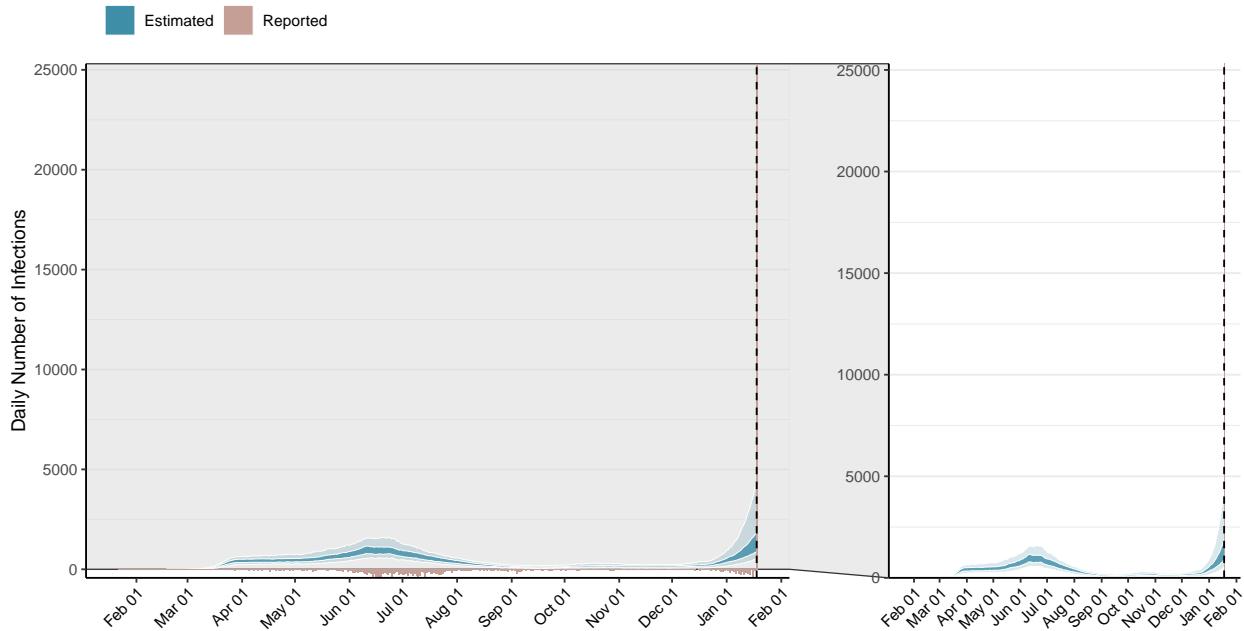


Figure 2: Daily number of infections estimated by fitting to the current total of deaths. Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

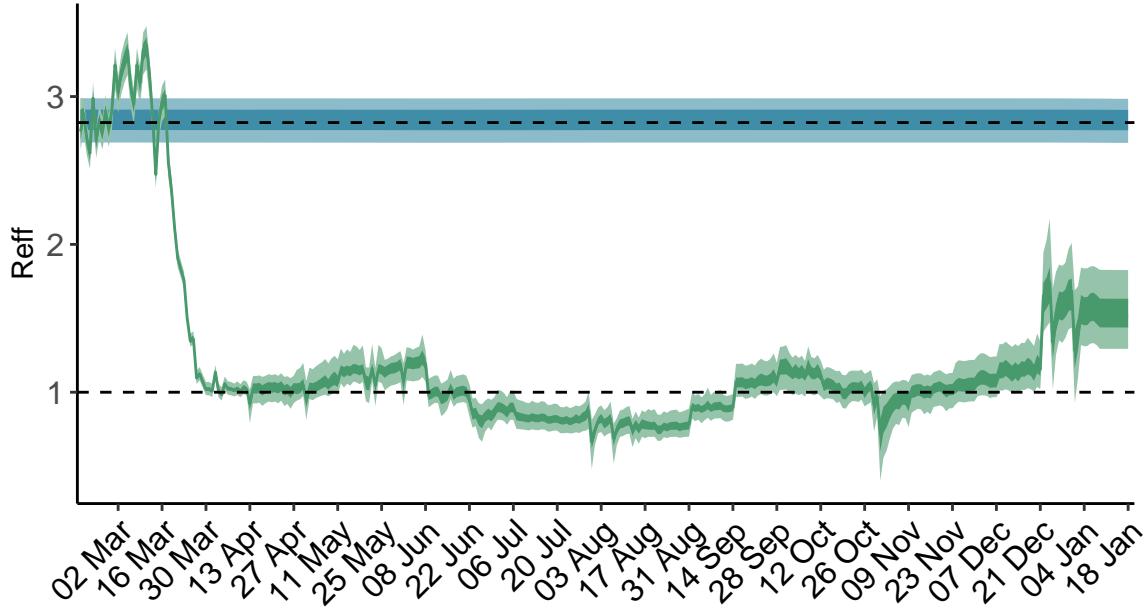


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Cote d'Ivoire is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

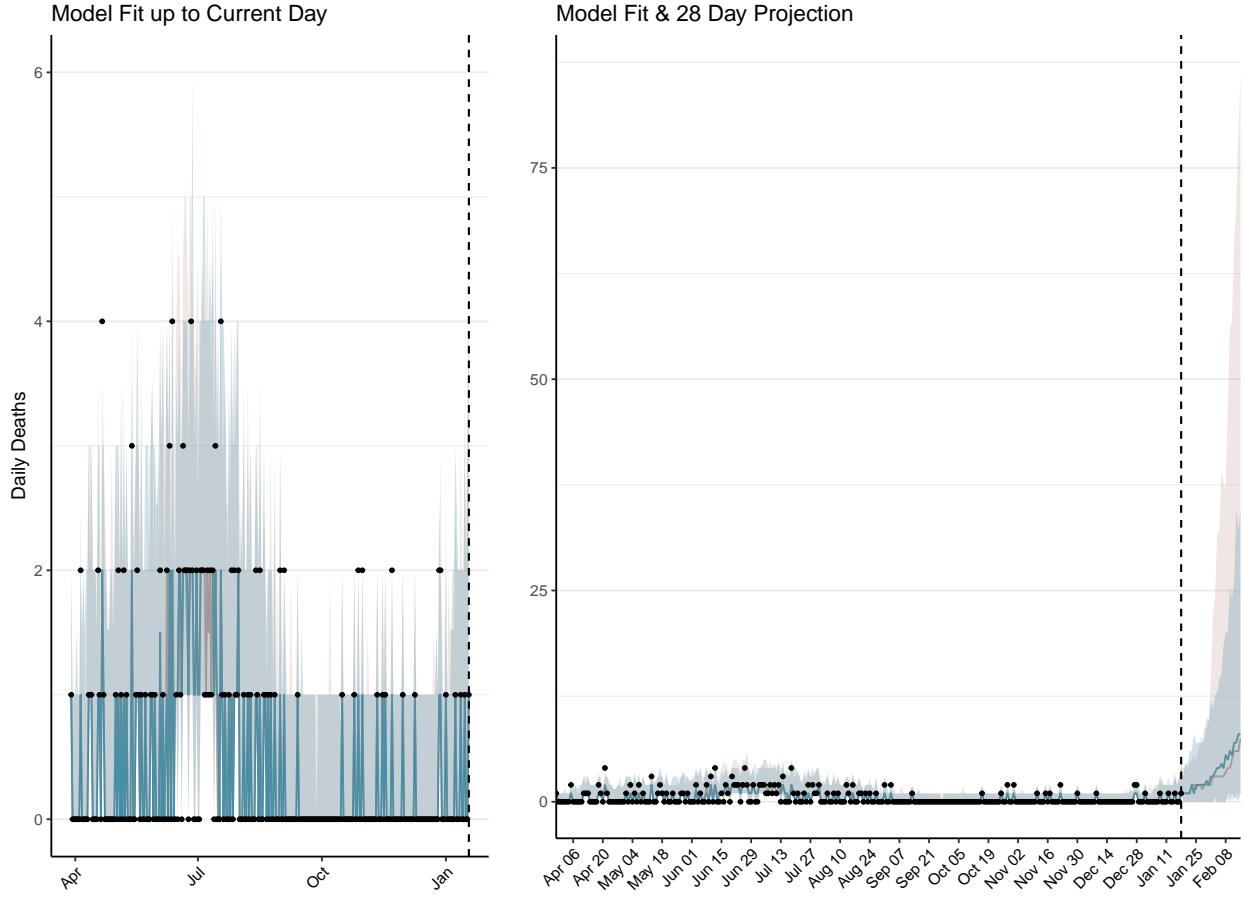


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 59 (95% CI: 52-65) patients requiring treatment with high-pressure oxygen at the current date to 490 (95% CI: 401-579) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 21 (95% CI: 19-23) patients requiring treatment with mechanical ventilation at the current date to 123 (95% CI: 110-136) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

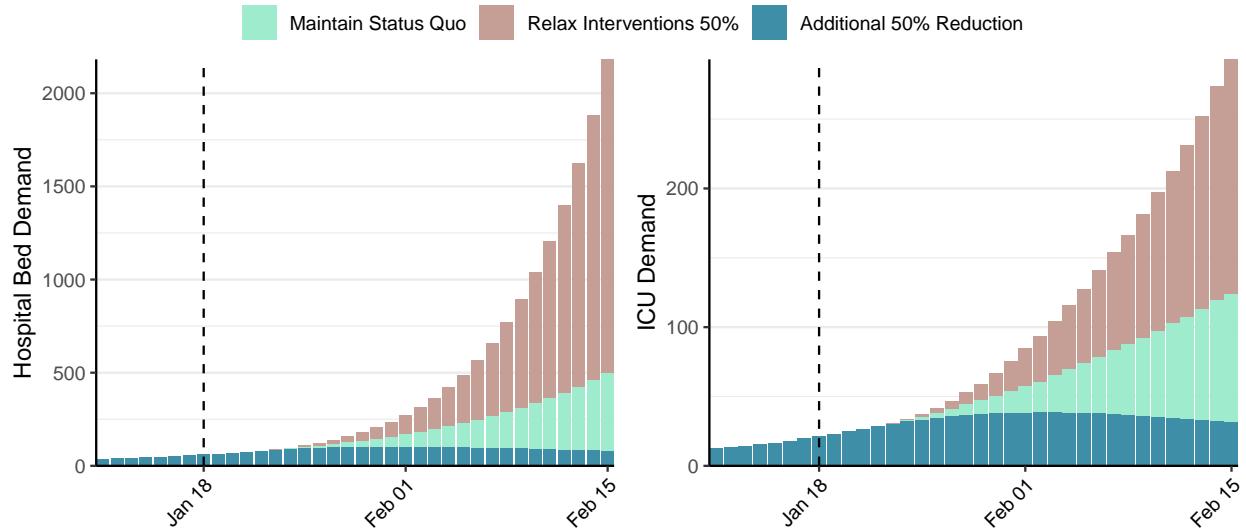


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 1,552 (95% CI: 1,357-1,746) at the current date to 732 (95% CI: 590-874) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,552 (95% CI: 1,357-1,746) at the current date to 100,756 (95% CI: 79,469-122,042) by 2021-02-15.

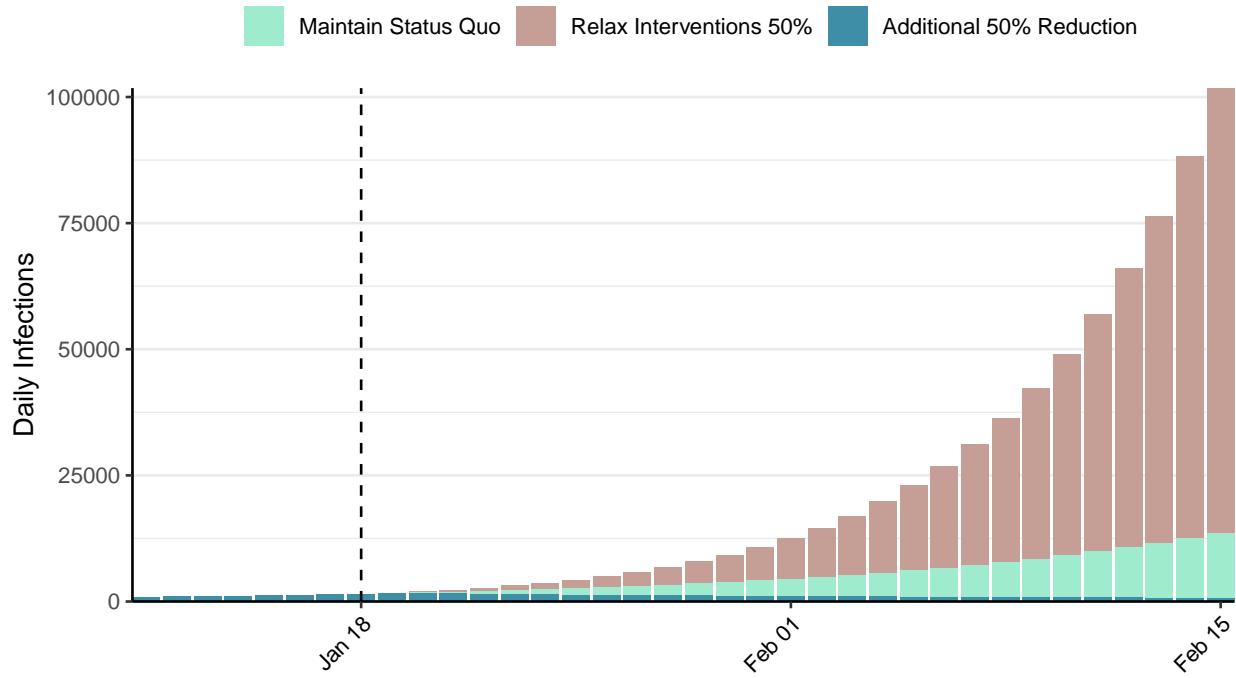


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Cameroon, 2021-01-18

[Download the report for Cameroon, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.5 (95% CI: 1.22-1.81)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Cameroon is not shown in the following plot as only 0 deaths have been reported to date**

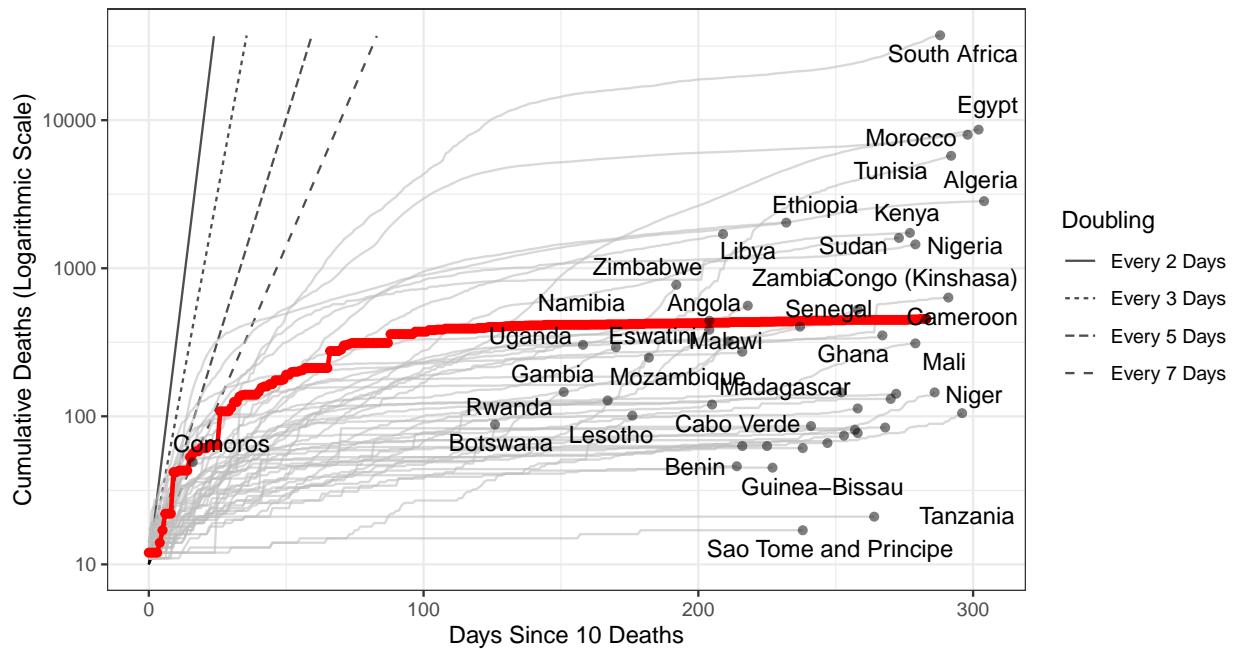


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 9,734 (95% CI: 8,624-10,843) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

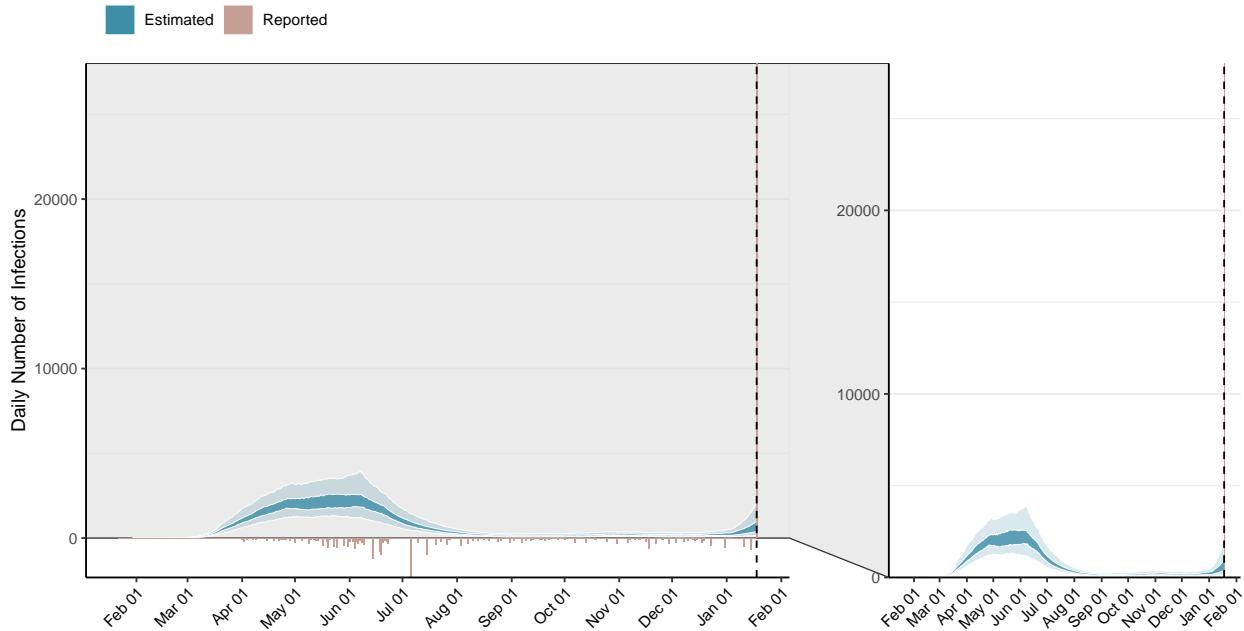


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

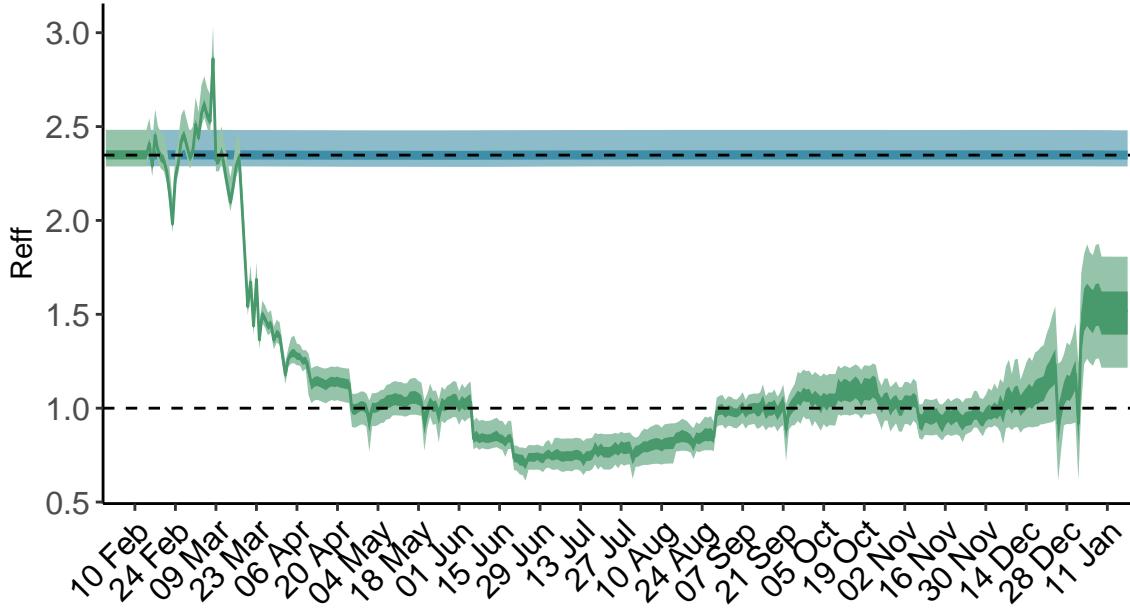


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Cameroon is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

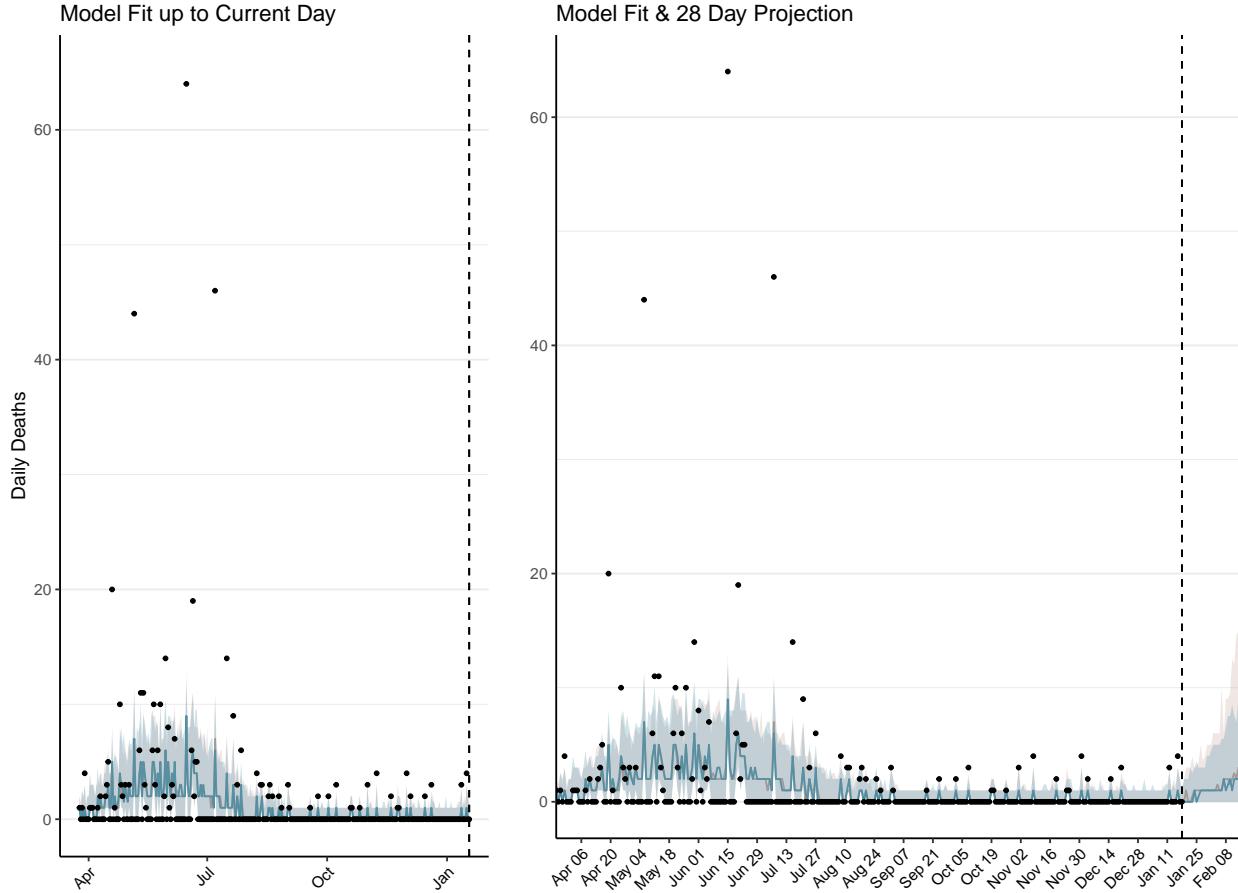


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 28 (95% CI: 25-32) patients requiring treatment with high-pressure oxygen at the current date to 232 (95% CI: 181-283) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 11 (95% CI: 9-12) patients requiring treatment with mechanical ventilation at the current date to 80 (95% CI: 63-98) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

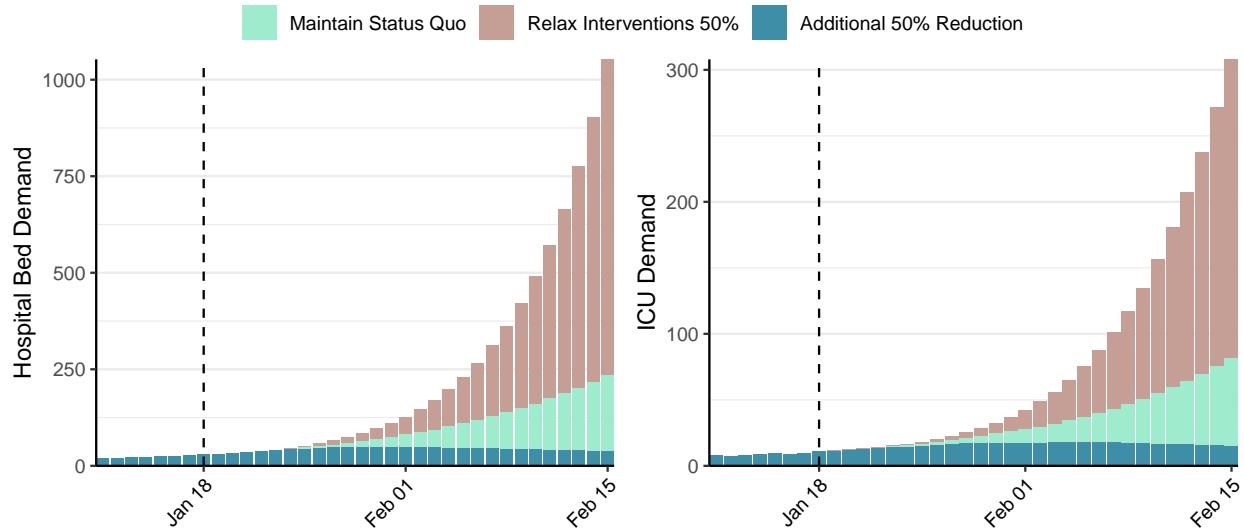


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 737 (95% CI: 630-845) at the current date to 344 (95% CI: 263-424) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 737 (95% CI: 630-845) at the current date to 49,699 (95% CI: 36,880-62,518) by 2021-02-15.

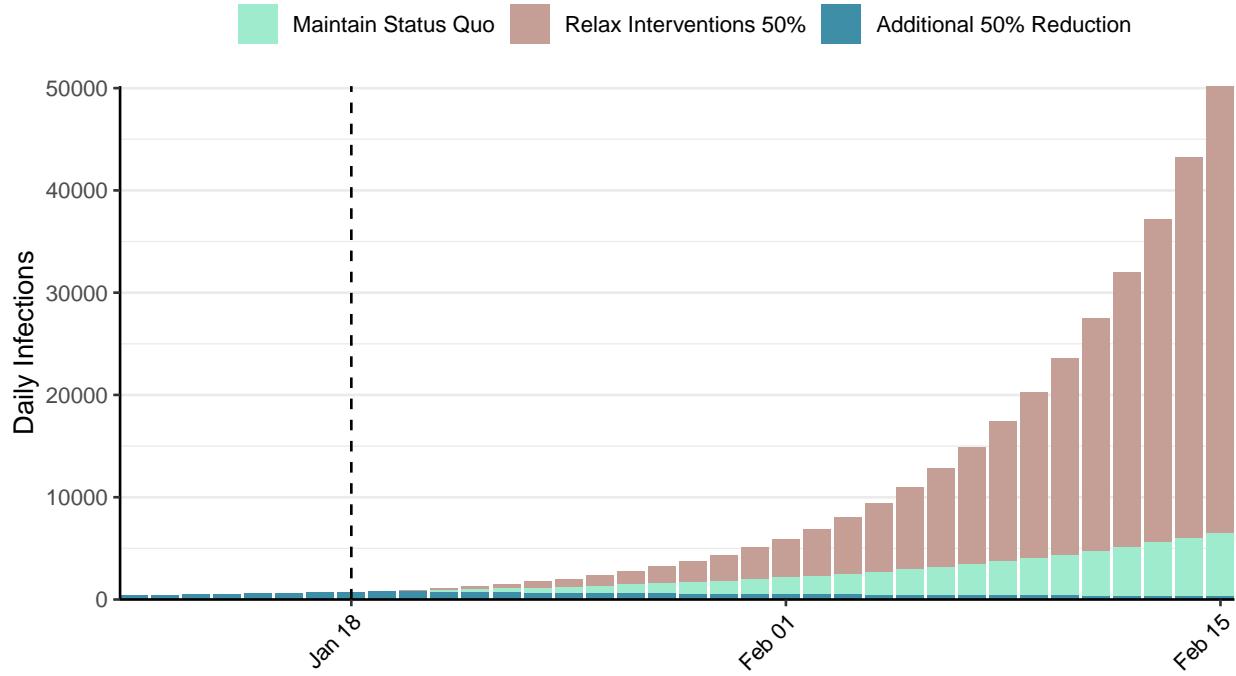


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Democratic Republic of Congo, 2021-01-18

[Download the report for Democratic Republic of Congo, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.06 (95% CI: 0.9-1.25)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B.** Democratic Republic of Congo is not shown in the following plot as only 0 deaths have been reported to date

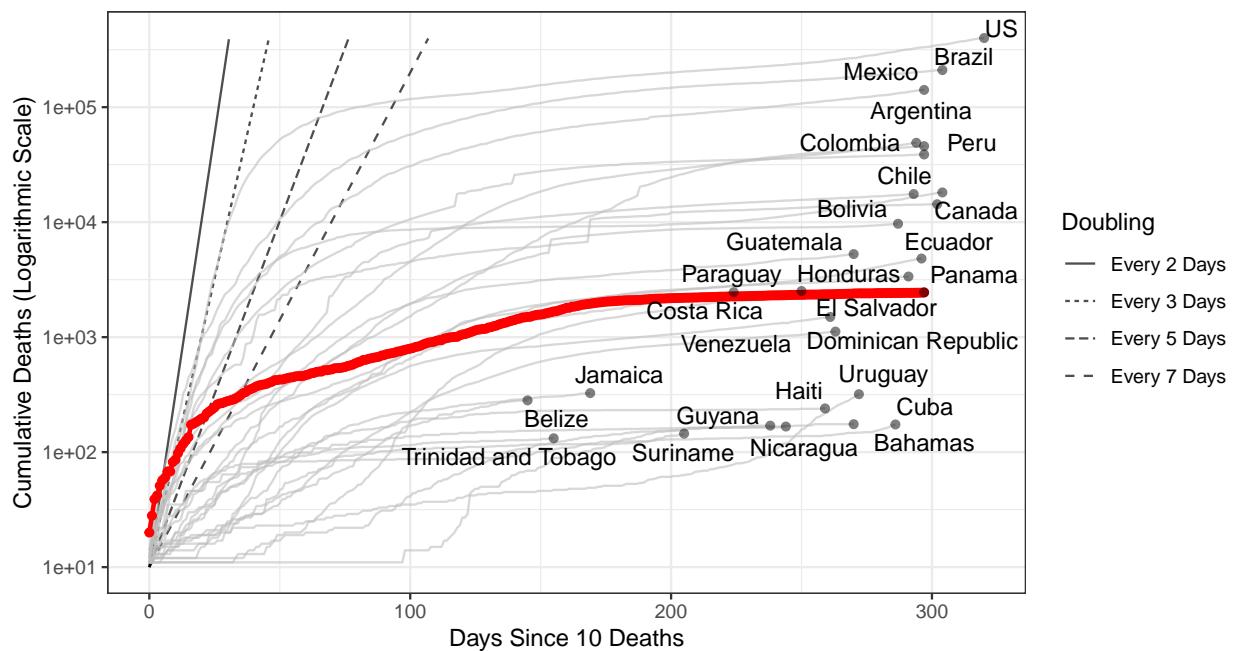


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 177,495 (95% CI: 156,555–198,434) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

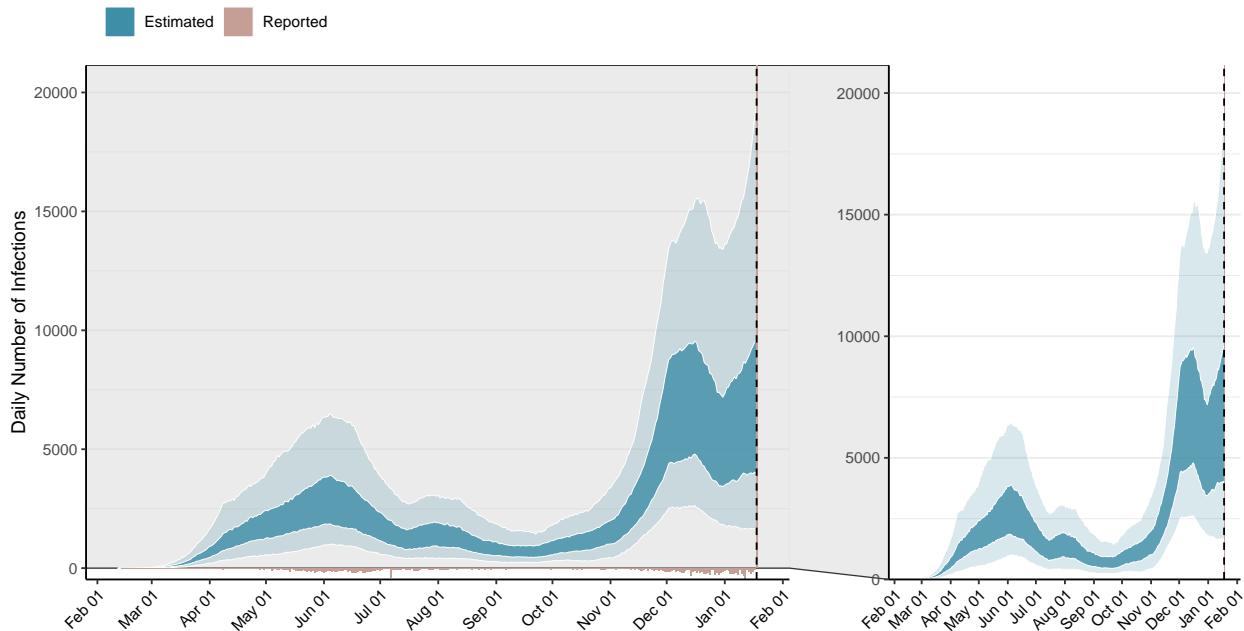


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

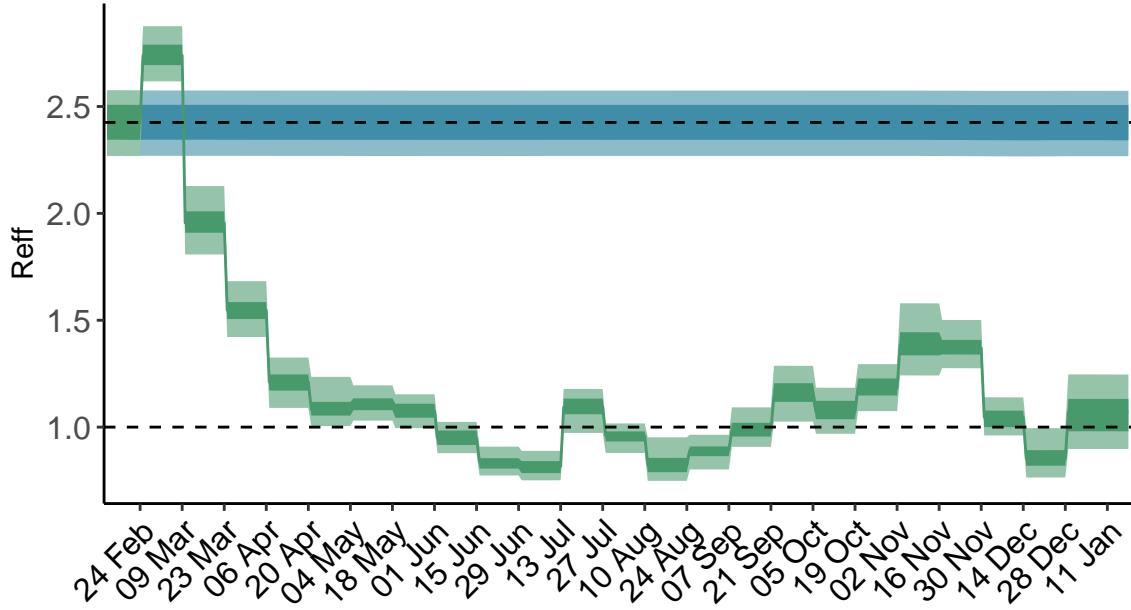


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Democratic Republic of Congo is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

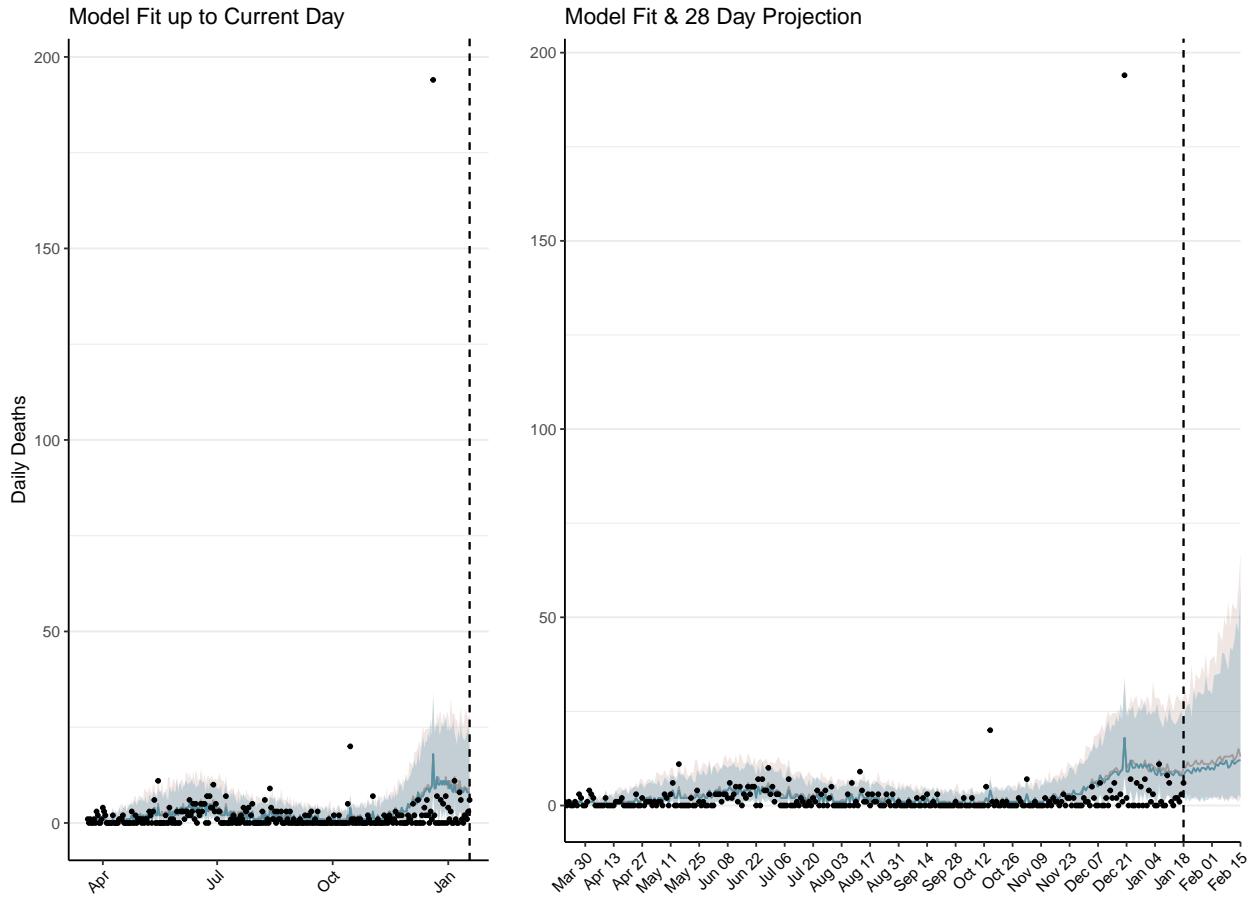


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 505 (95% CI: 445-565) patients requiring treatment with high-pressure oxygen at the current date to 764 (95% CI: 627-901) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 198 (95% CI: 174-221) patients requiring treatment with mechanical ventilation at the current date to 281 (95% CI: 235-326) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

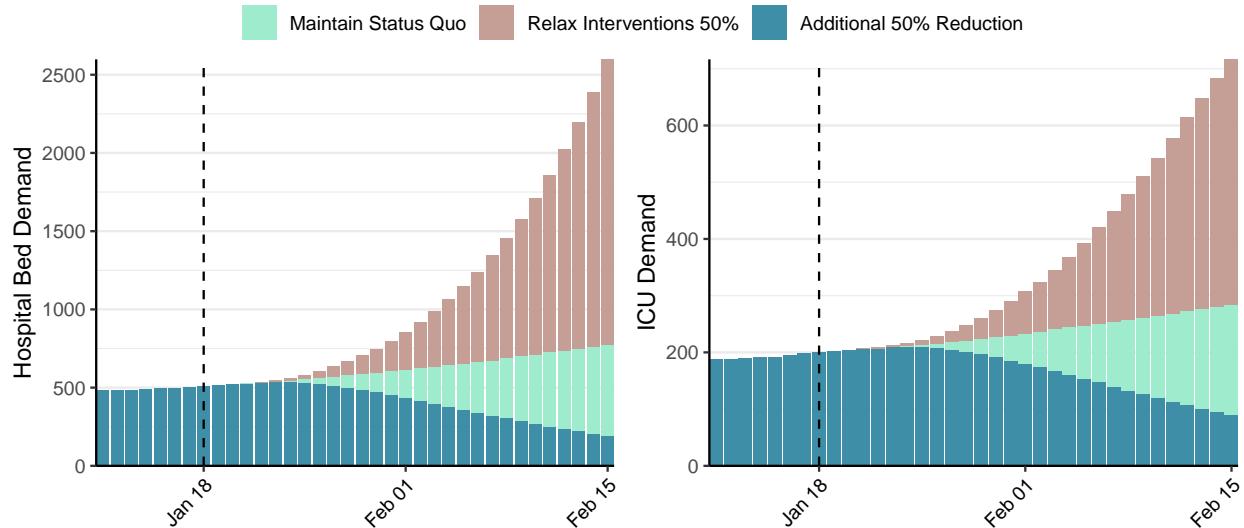


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 7,321 (95% CI: 6,297-8,344) at the current date to 897 (95% CI: 723-1,070) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 7,321 (95% CI: 6,297-8,344) at the current date to 73,982 (95% CI: 58,280-89,683) by 2021-02-15.

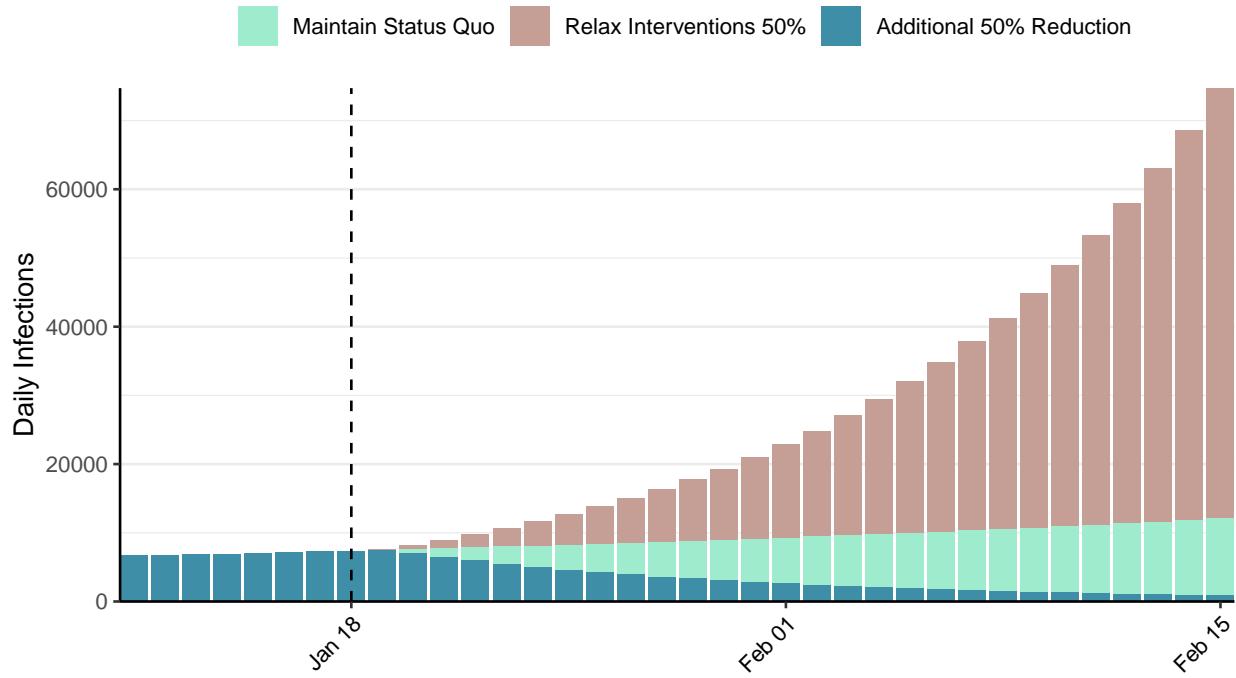


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Republic of the Congo, 2021-01-18

[Download the report for Republic of the Congo, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.28 (95% CI: 1.03-1.59)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B.** Republic of the Congo is not shown in the following plot as only 0 deaths have been reported to date

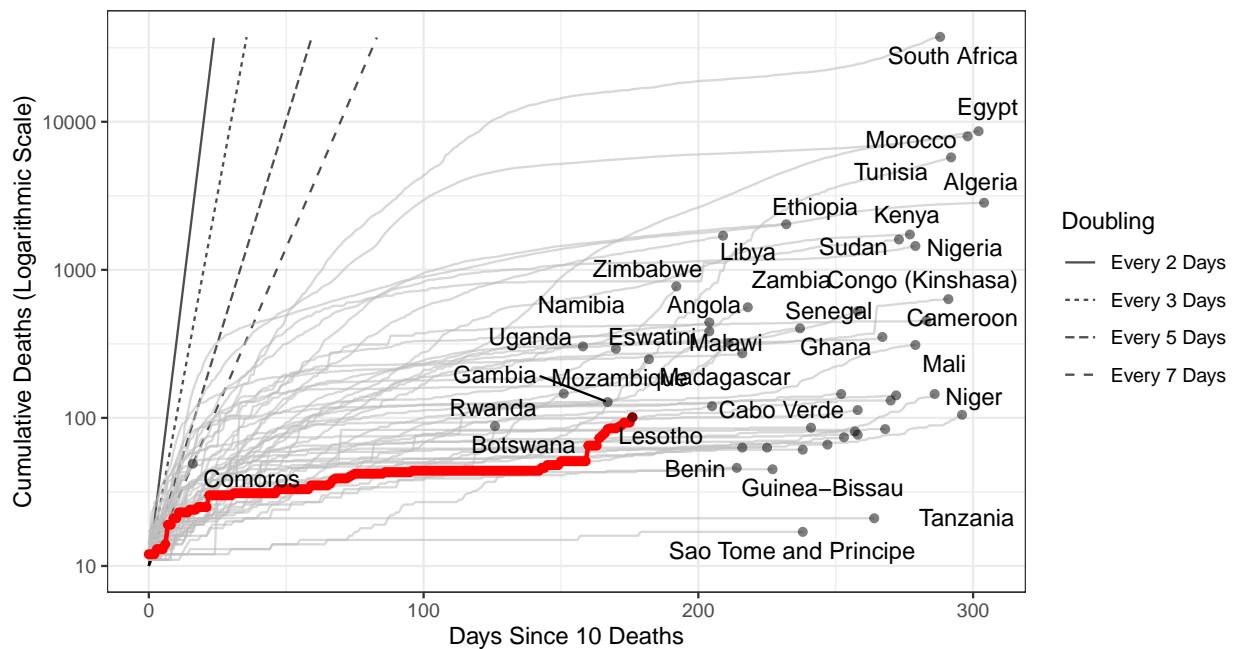


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 11,125 (95% CI: 9,762-12,487) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

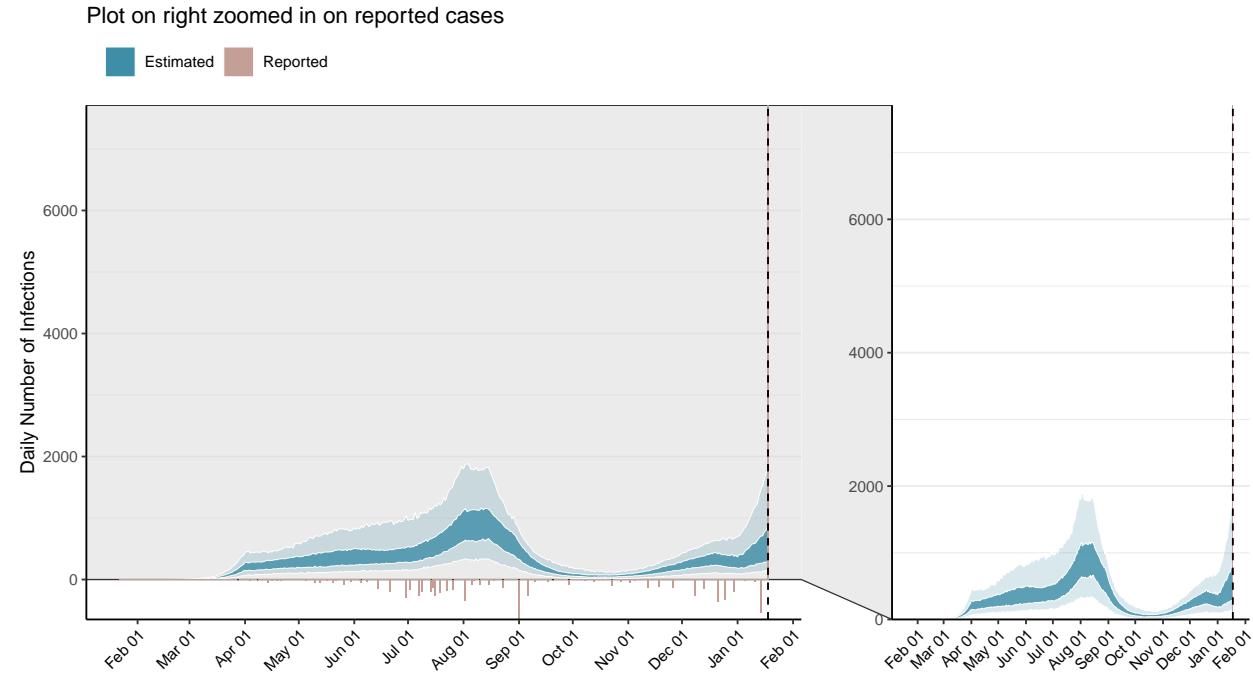


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

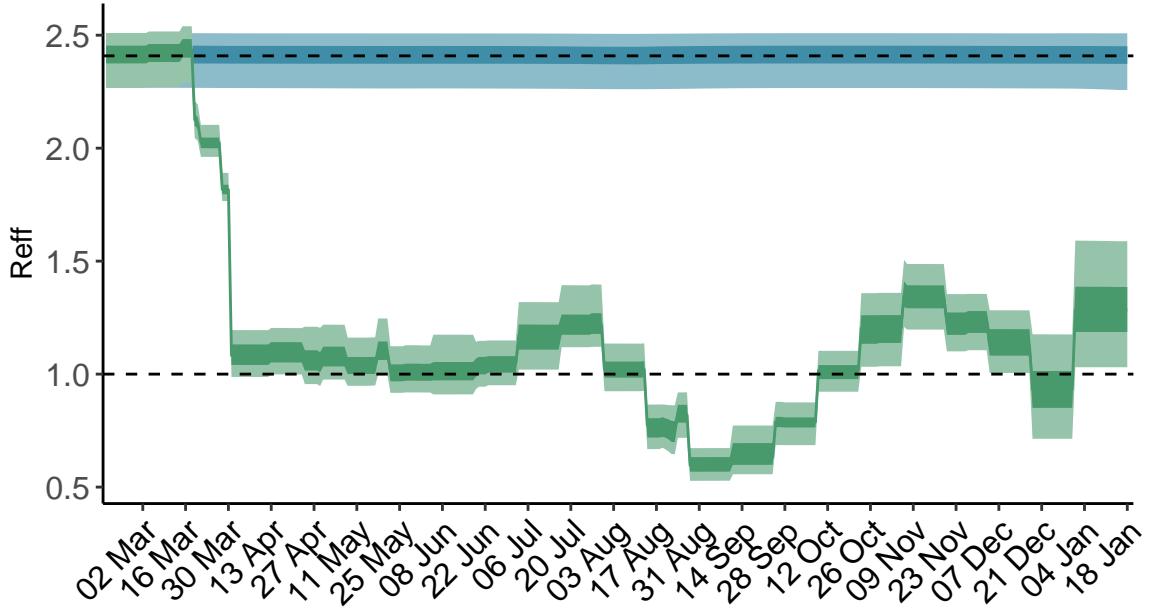


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Republic of the Congo is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

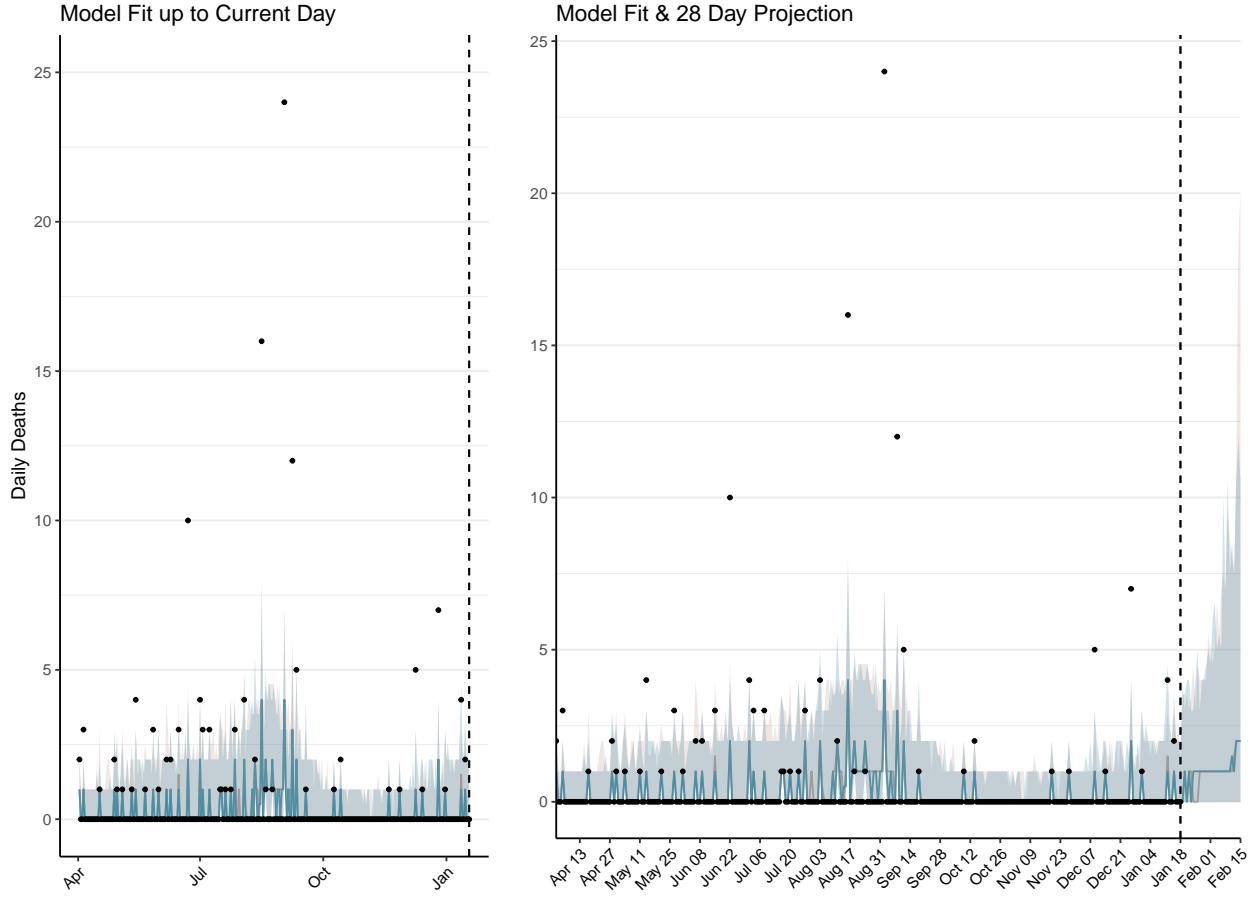


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 32 (95% CI: 29-36) patients requiring treatment with high-pressure oxygen at the current date to 127 (95% CI: 98-156) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 12 (95% CI: 10-14) patients requiring treatment with mechanical ventilation at the current date to 42 (95% CI: 34-50) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

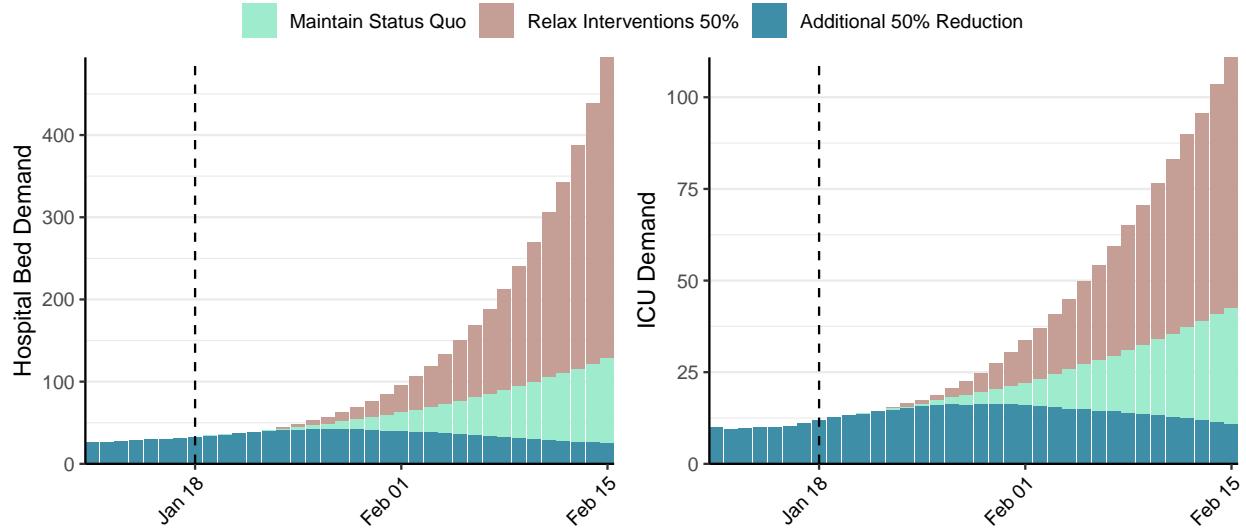


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 644 (95% CI: 543-745) at the current date to 171 (95% CI: 130-212) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 644 (95% CI: 543-745) at the current date to 17,999 (95% CI: 13,560-22,438) by 2021-02-15.

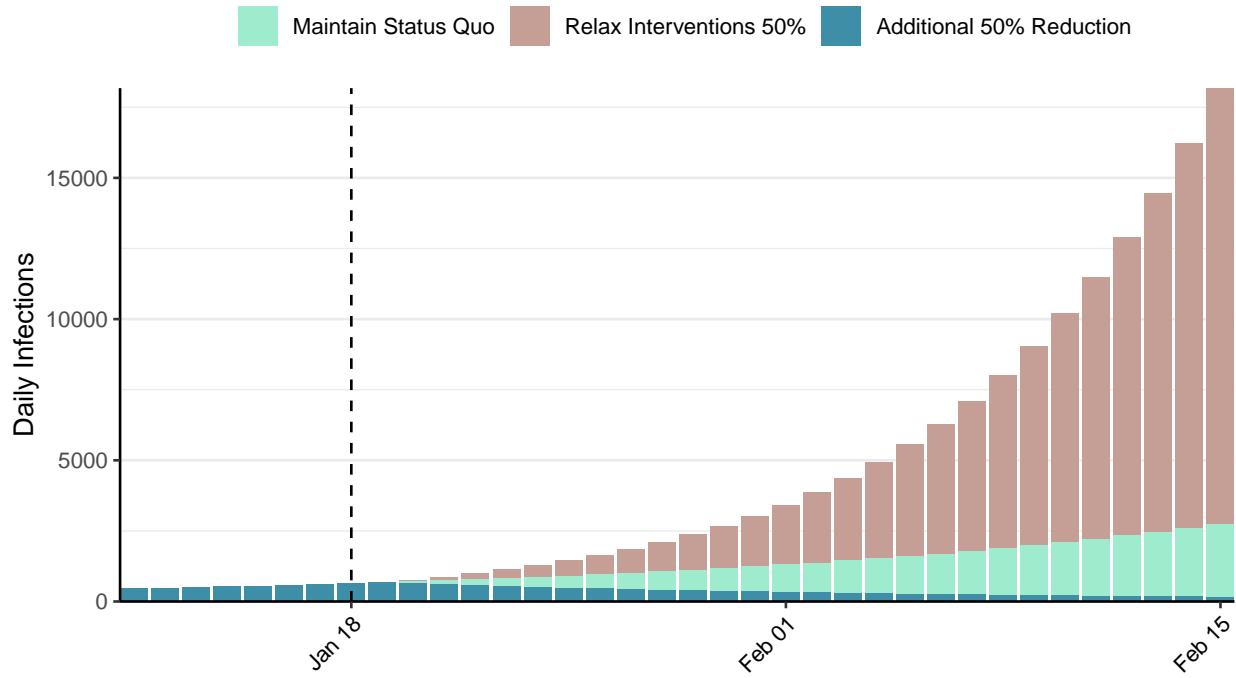


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Colombia, 2021-01-18

[Download the report for Colombia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.97 (95% CI: 0.8-1.24)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Colombia is not shown in the following plot as only 0 deaths have been reported to date**

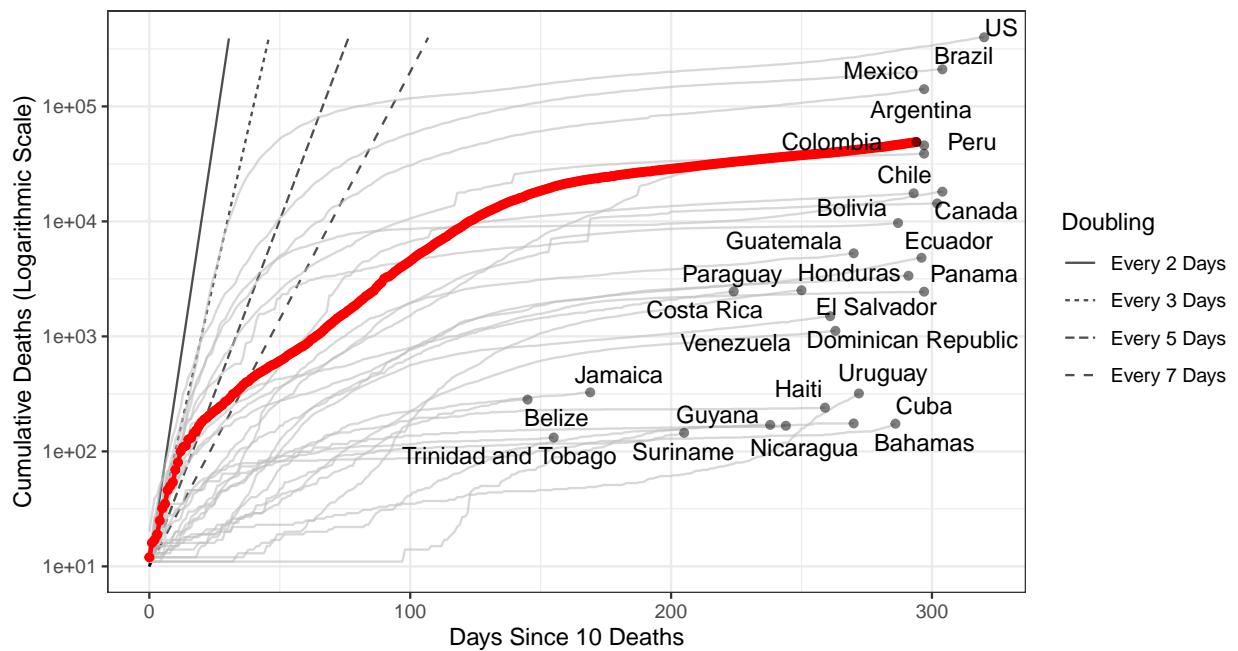


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 2,435,225 (95% CI: 2,360,182-2,510,268) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

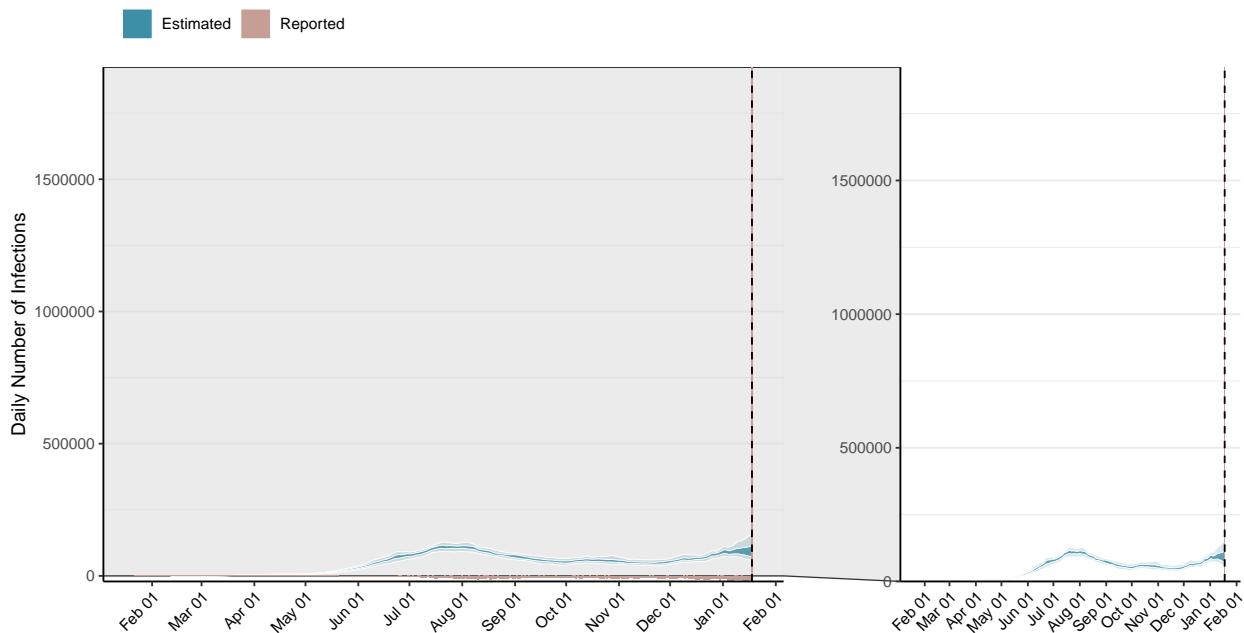


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

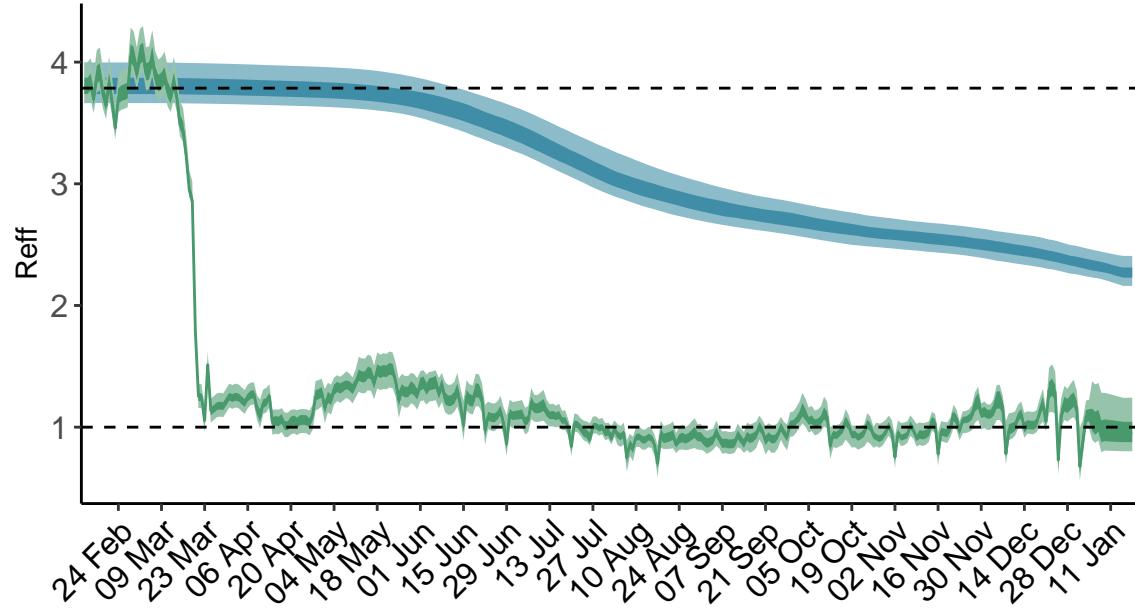


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Colombia is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

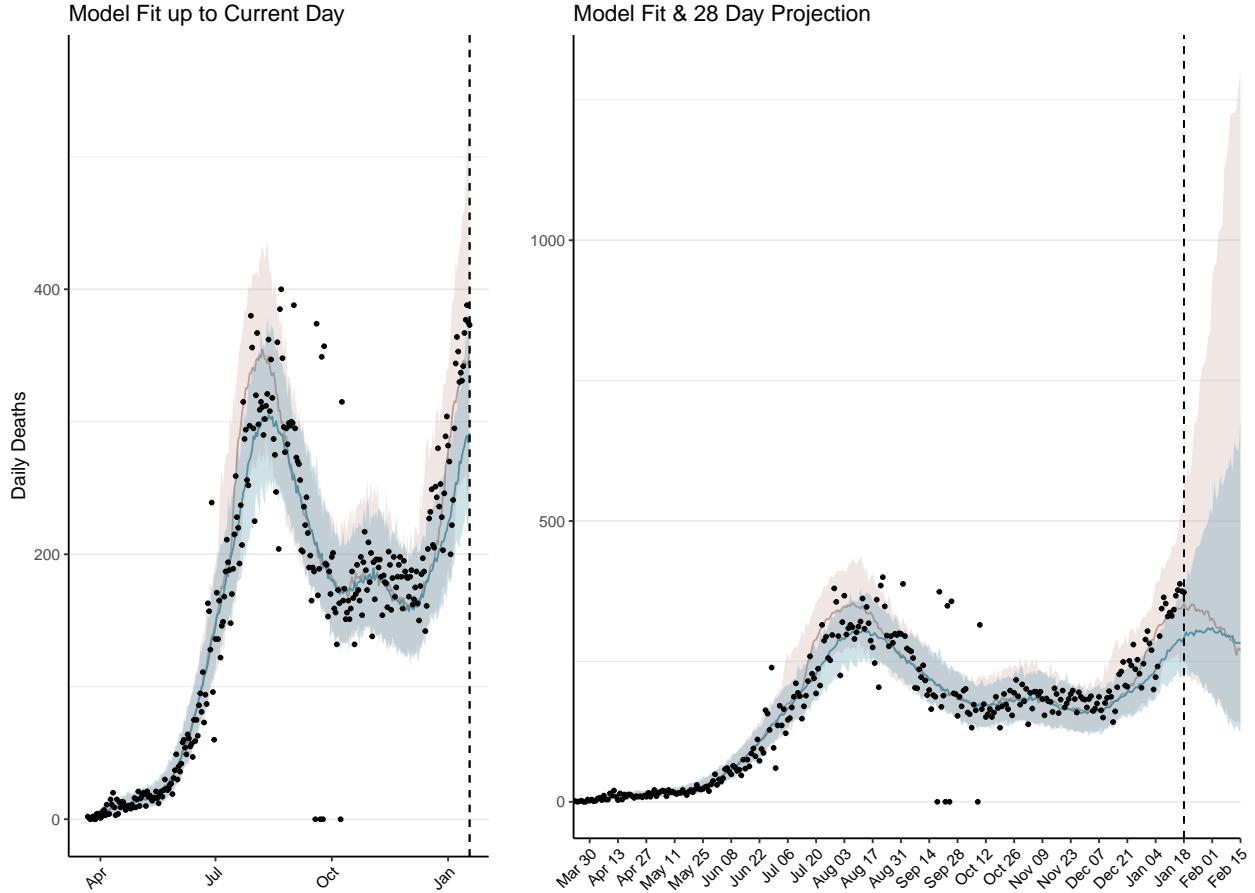


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 10,678 (95% CI: 10,320-11,036) patients requiring treatment with high-pressure oxygen at the current date to 11,346 (95% CI: 9,926-12,766) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 2,823 (95% CI: 2,764-2,882) patients requiring treatment with mechanical ventilation at the current date to 2,703 (95% CI: 2,583-2,823) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B.** These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.

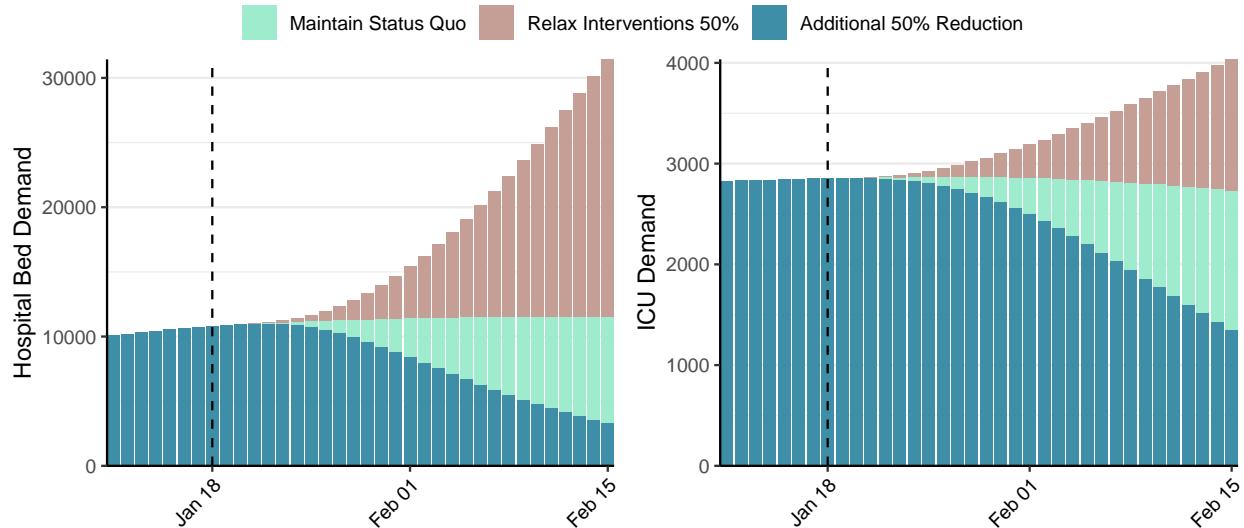


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 93,657 (95% CI: 87,728-99,587) at the current date to 8,467 (95% CI: 7,150-9,784) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 93,657 (95% CI: 87,728-99,587) at the current date to 340,650 (95% CI: 303,104-378,195) by 2021-02-15.

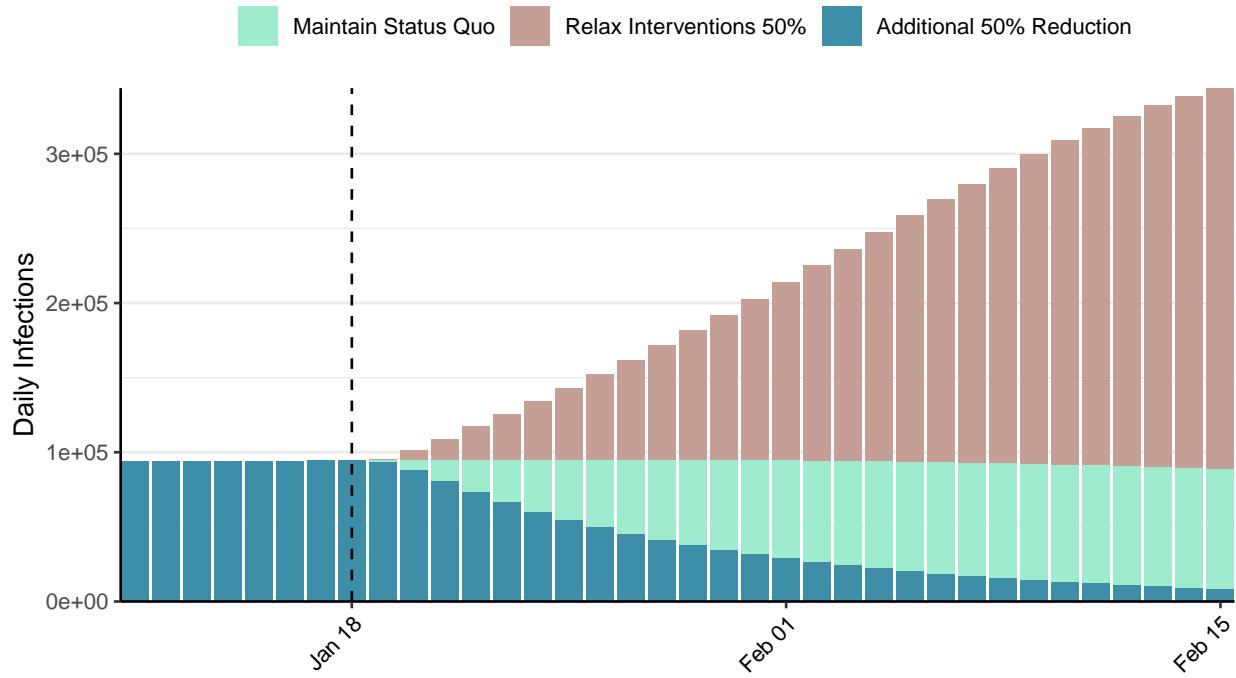


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Comoros, 2021-01-18

[Download the report for Comoros, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.42 (95% CI: 1.24-1.61)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Comoros is not shown in the following plot as only 0 deaths have been reported to date**

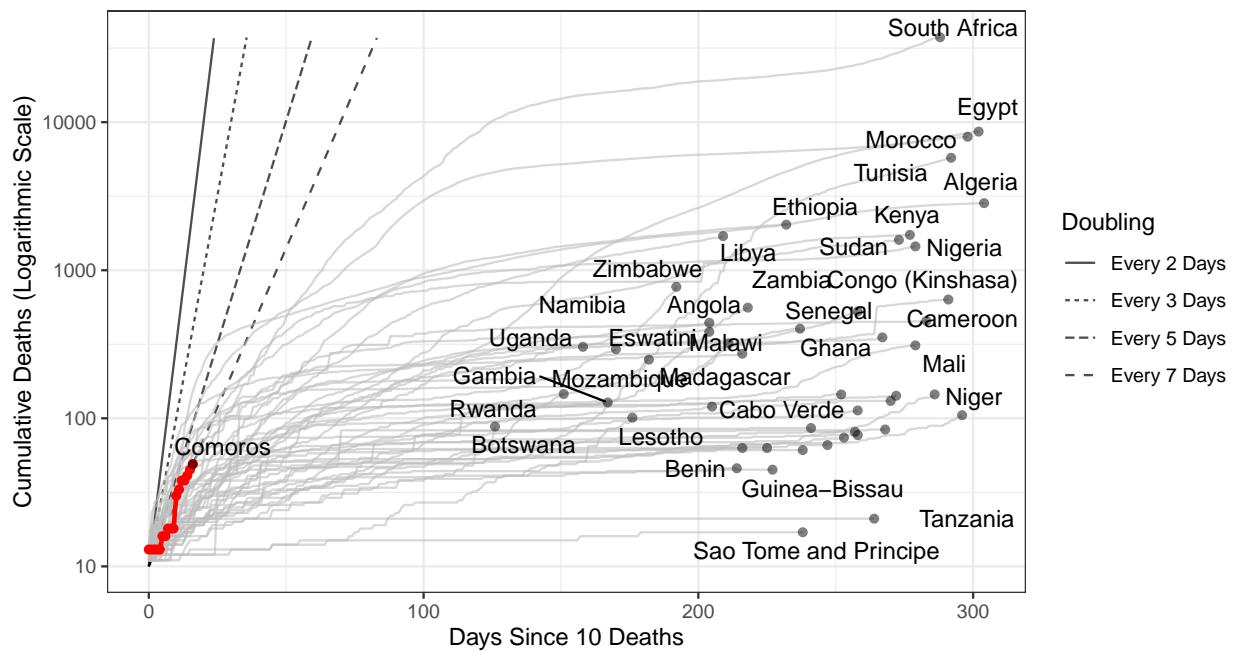


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 21,934 (95% CI: 18,886-24,982) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

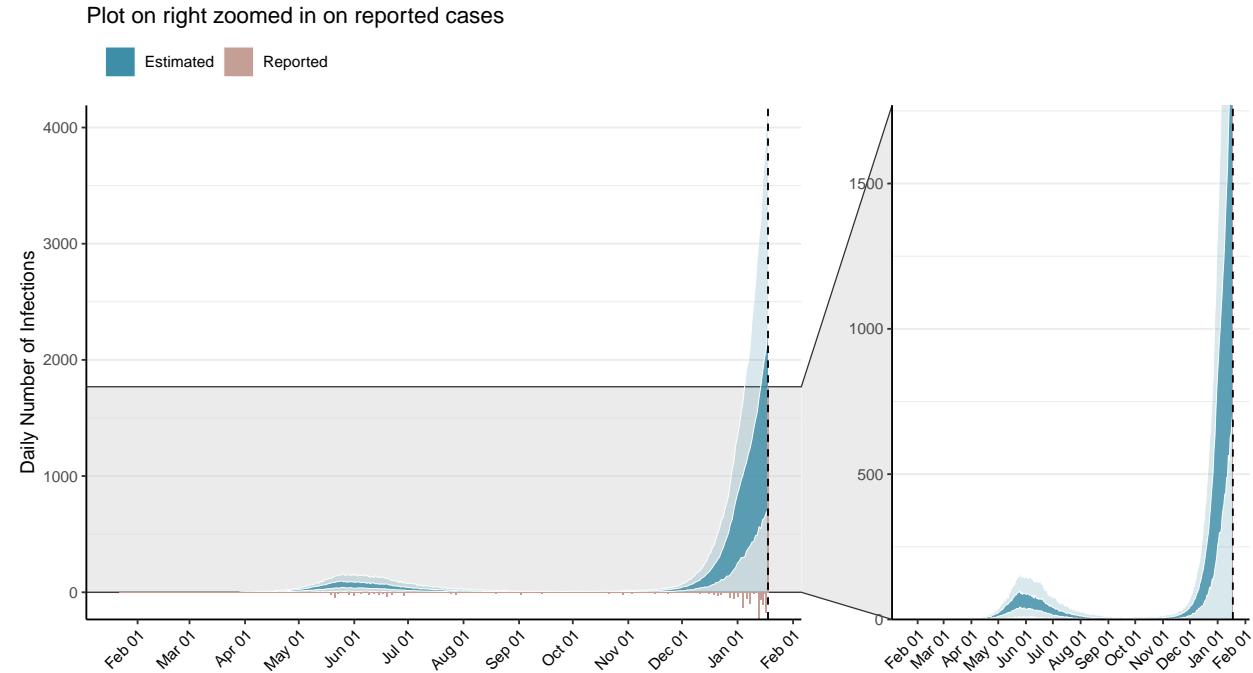


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

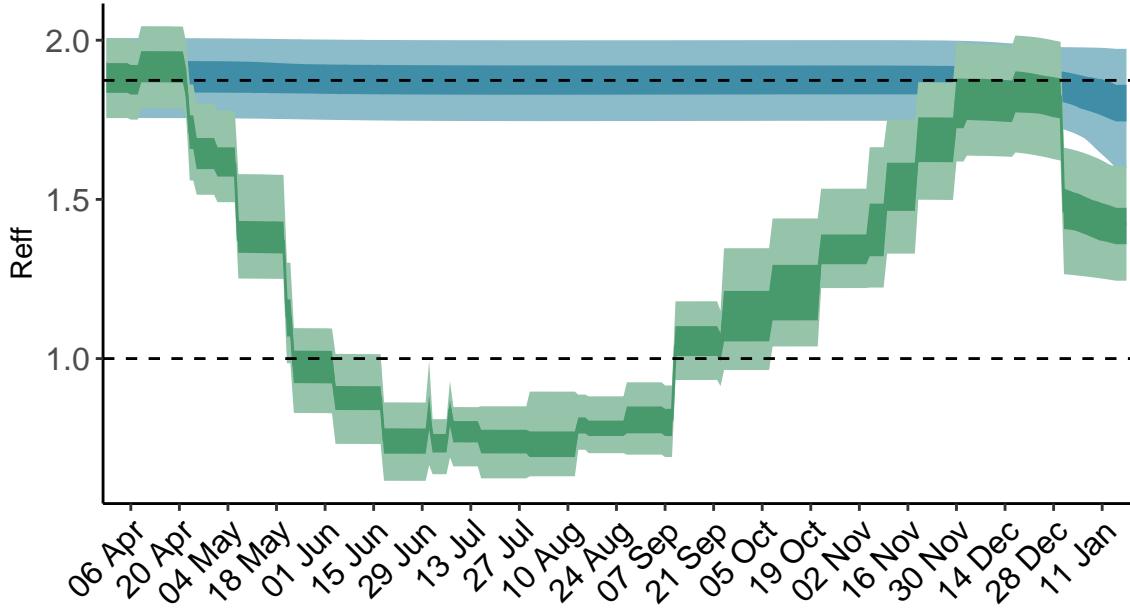


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Comoros is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

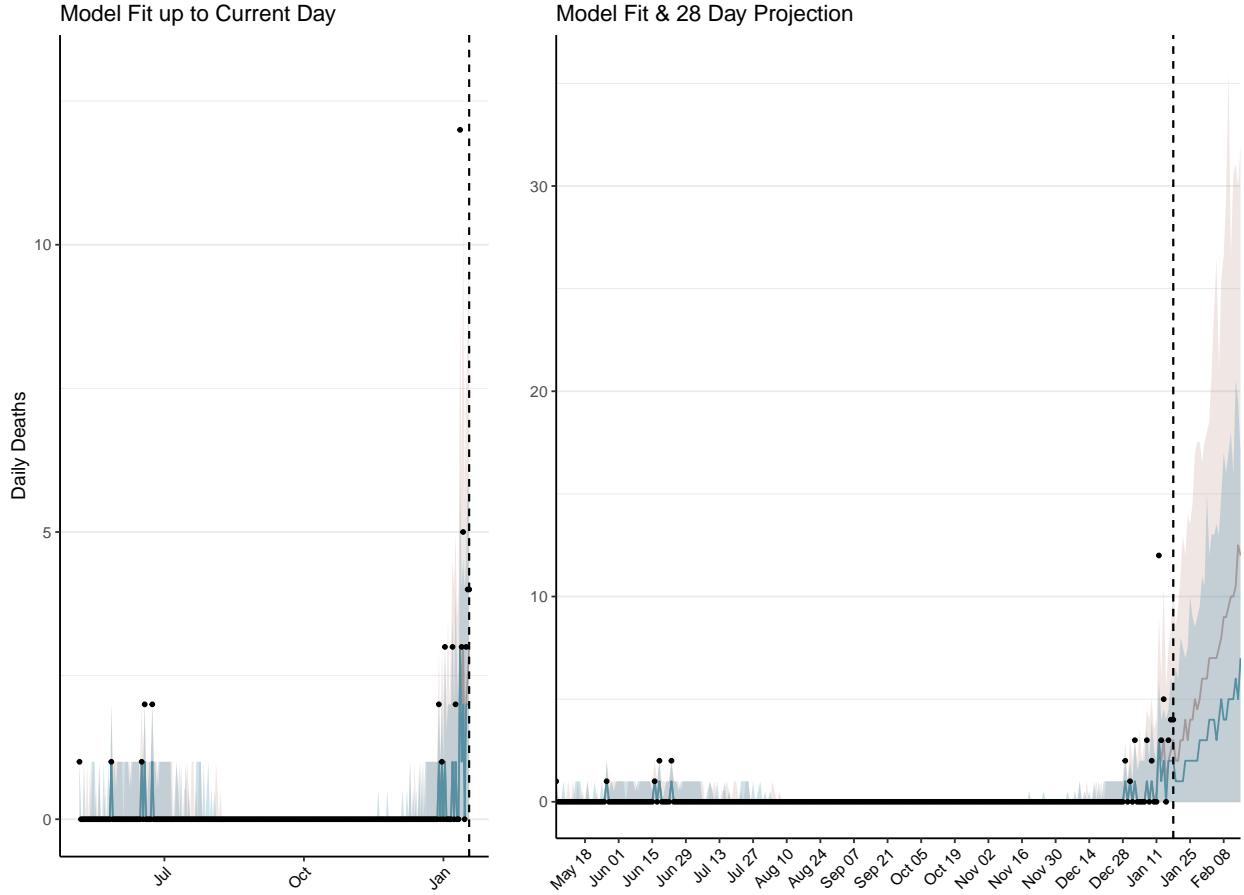


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 71 (95% CI: 60-81) patients requiring treatment with high-pressure oxygen at the current date to 287 (95% CI: 248-326) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 14 (95% CI: 12-15) patients requiring treatment with mechanical ventilation at the current date to 28 (95% CI: 25-31) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

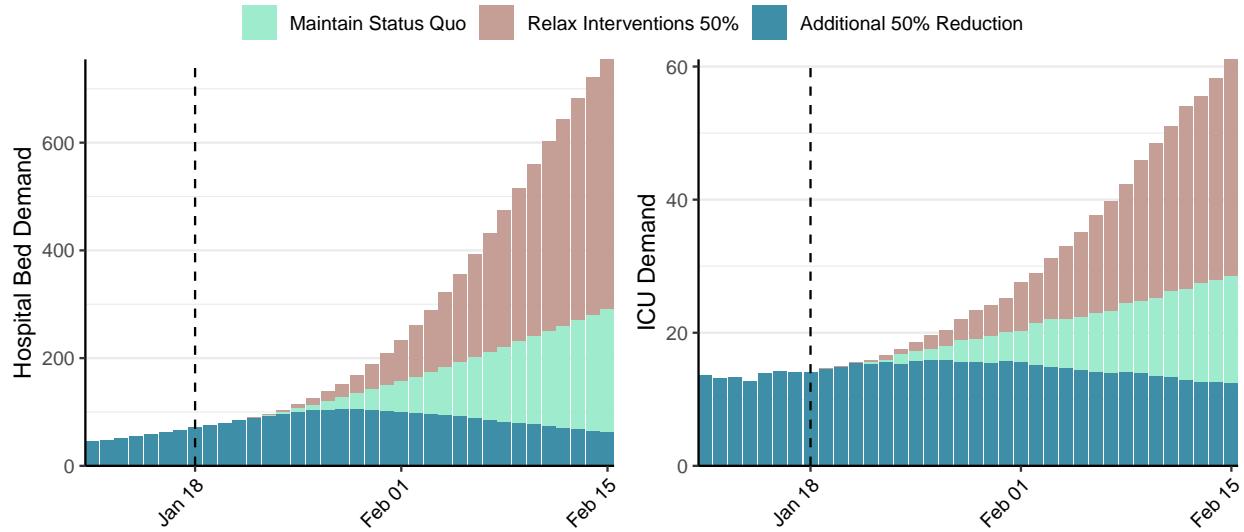


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 1,608 (95% CI: 1,377-1,838) at the current date to 432 (95% CI: 368-496) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,608 (95% CI: 1,377-1,838) at the current date to 17,131 (95% CI: 15,505-18,757) by 2021-02-15.

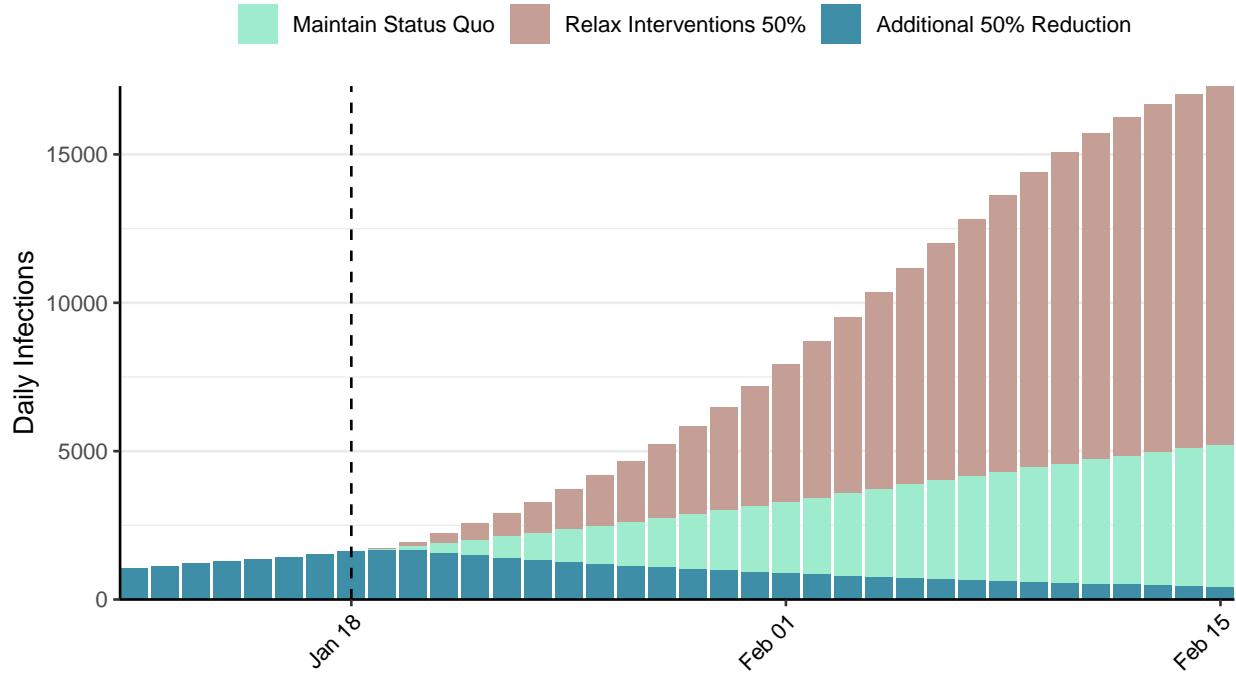


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Cabo Verde, 2021-01-18

[Download the report for Cabo Verde, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.21 (95% CI: 1.04-1.43)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Cabo Verde is not shown in the following plot as only 0 deaths have been reported to date**

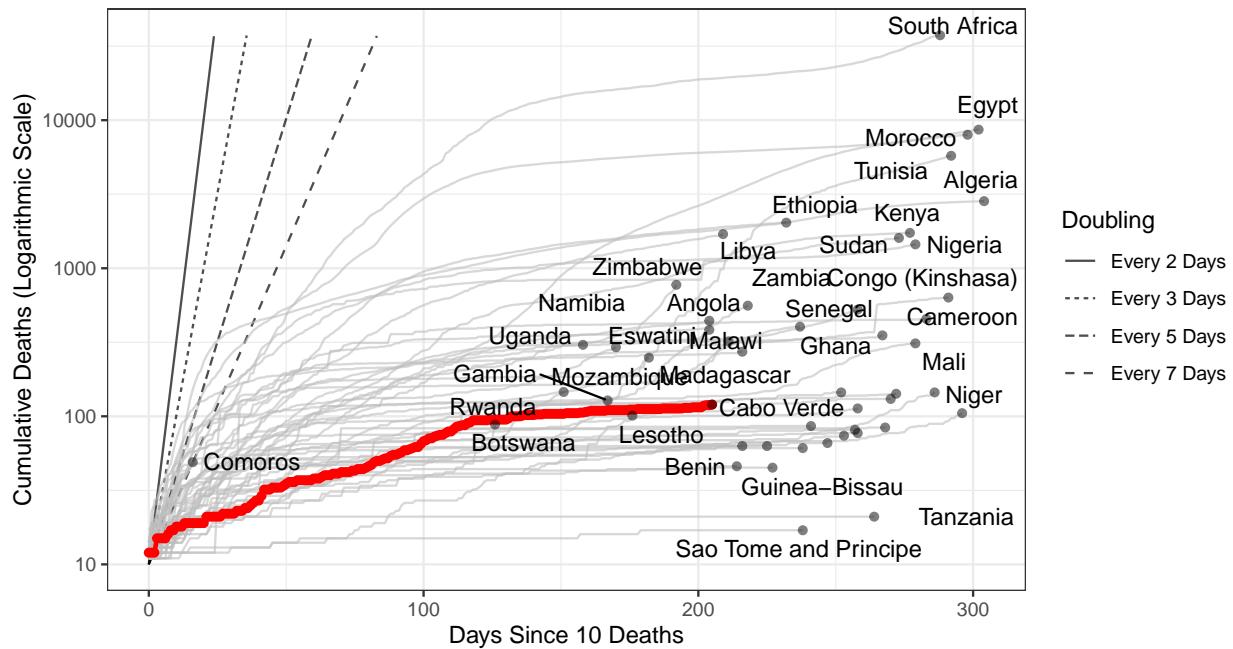


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 6,449 (95% CI: 5,655-7,242) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

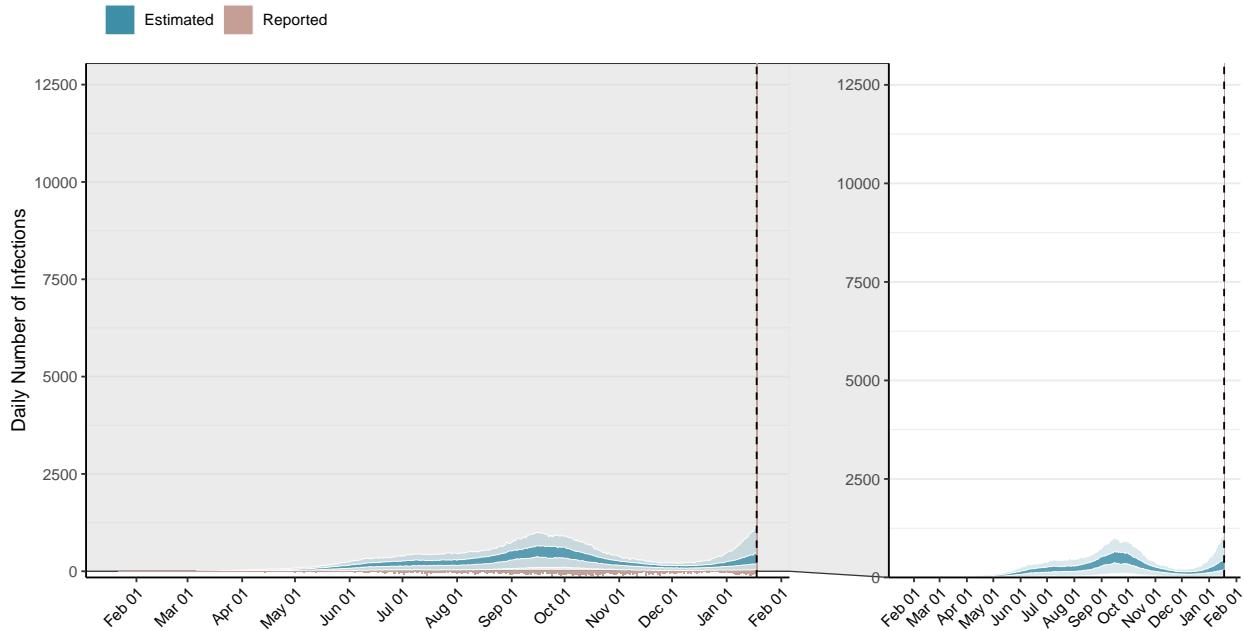


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

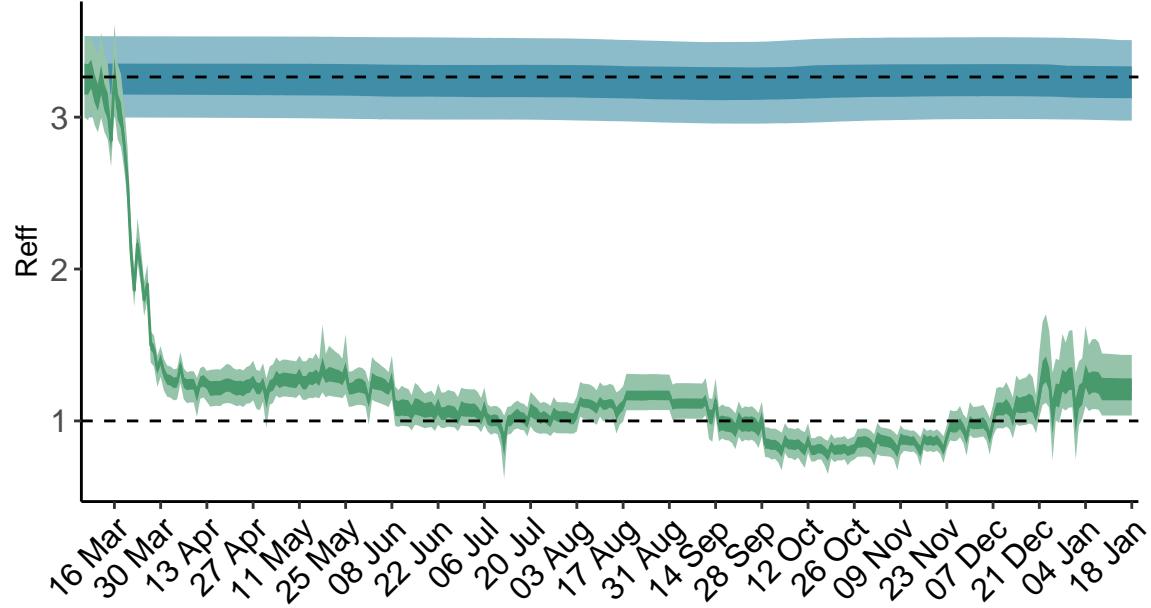


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Cabo Verde is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

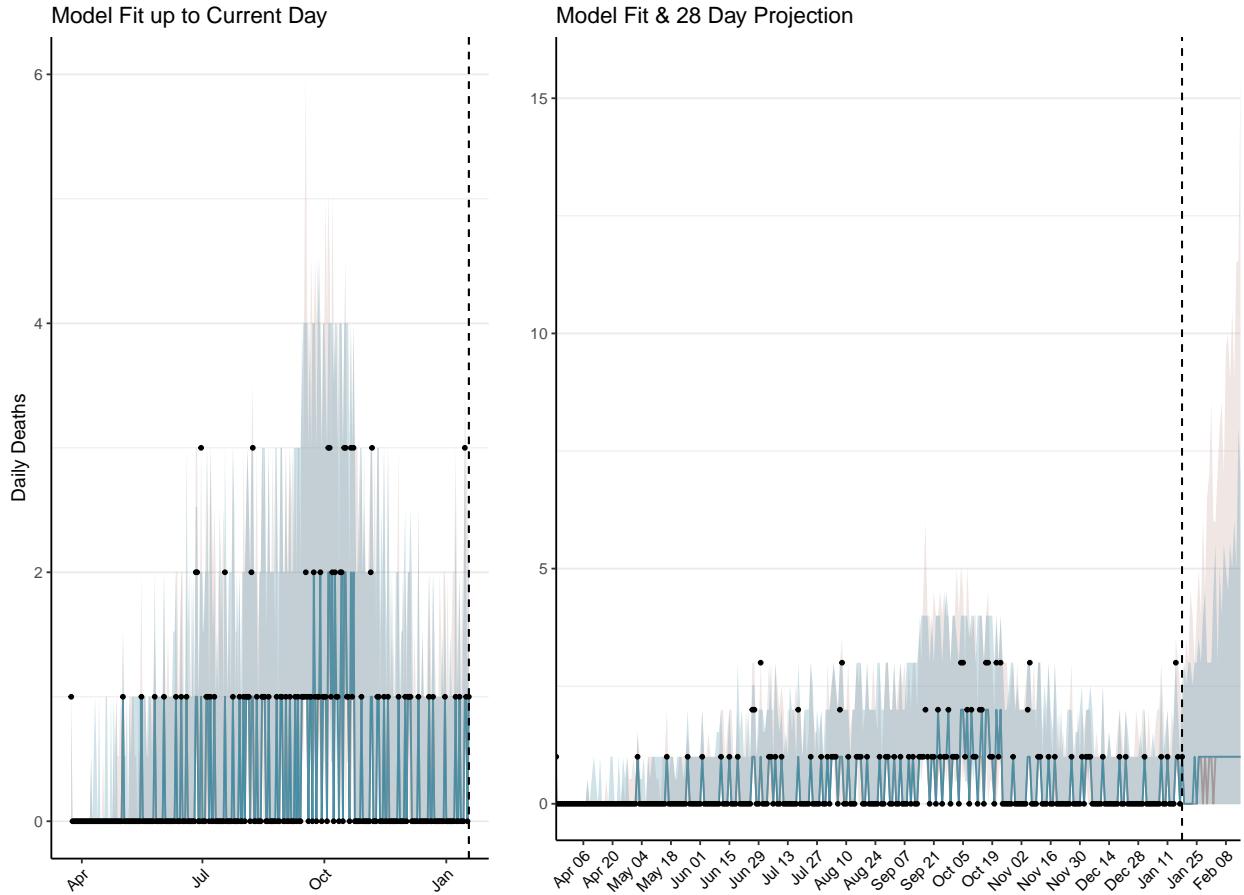


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 25 (95% CI: 22-29) patients requiring treatment with high-pressure oxygen at the current date to 69 (95% CI: 56-83) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 8 (95% CI: 7-9) patients requiring treatment with mechanical ventilation at the current date to 17 (95% CI: 15-20) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

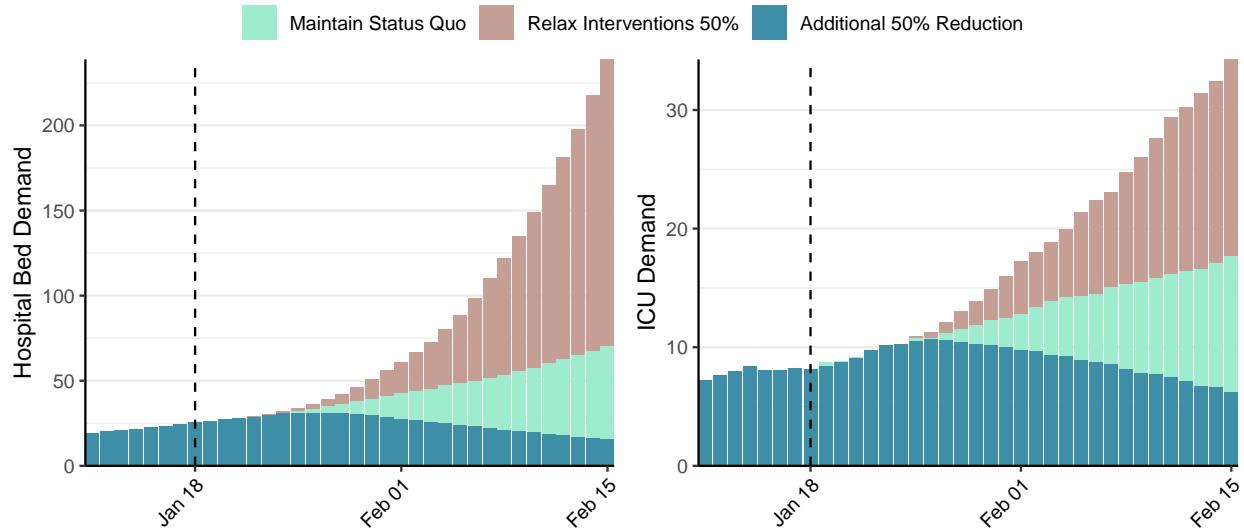


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 365 (95% CI: 310-420) at the current date to 74 (95% CI: 58-91) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 365 (95% CI: 310-420) at the current date to 5,343 (95% CI: 4,370-6,317) by 2021-02-15.

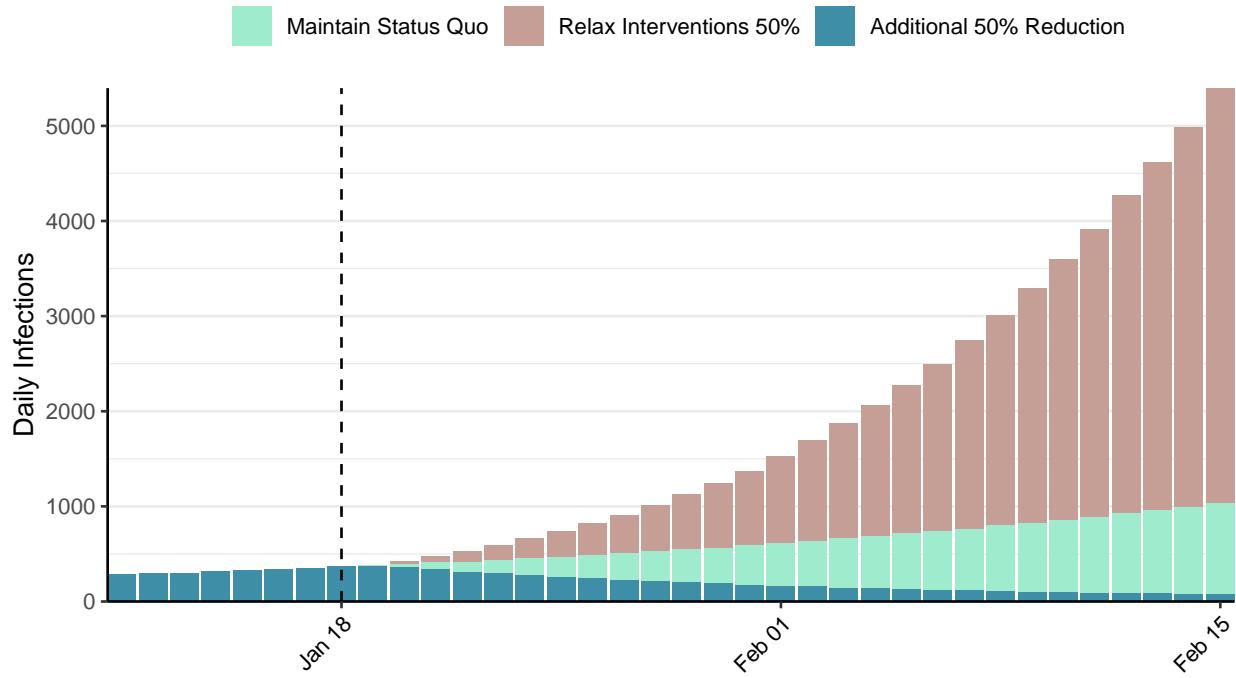


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Costa Rica, 2021-01-18

[Download the report for Costa Rica, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.96 (95% CI: 0.83-1.09)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Costa Rica is not shown in the following plot as only 0 deaths have been reported to date**

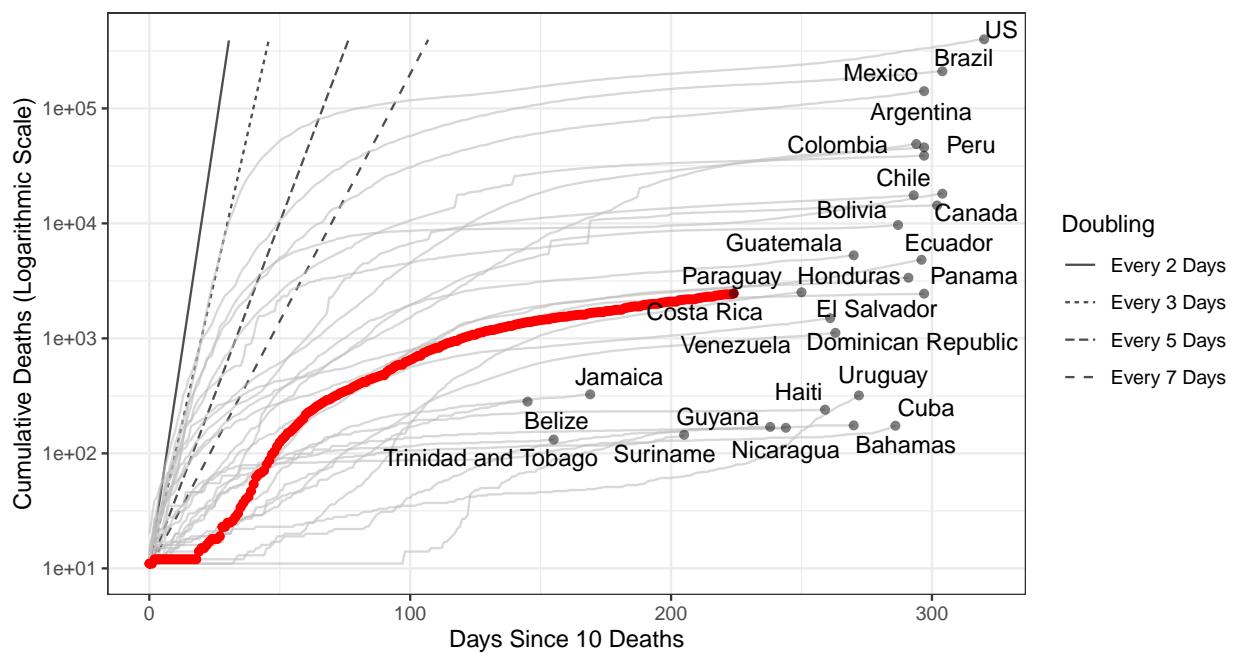


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 111,020 (95% CI: 100,993-121,046) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

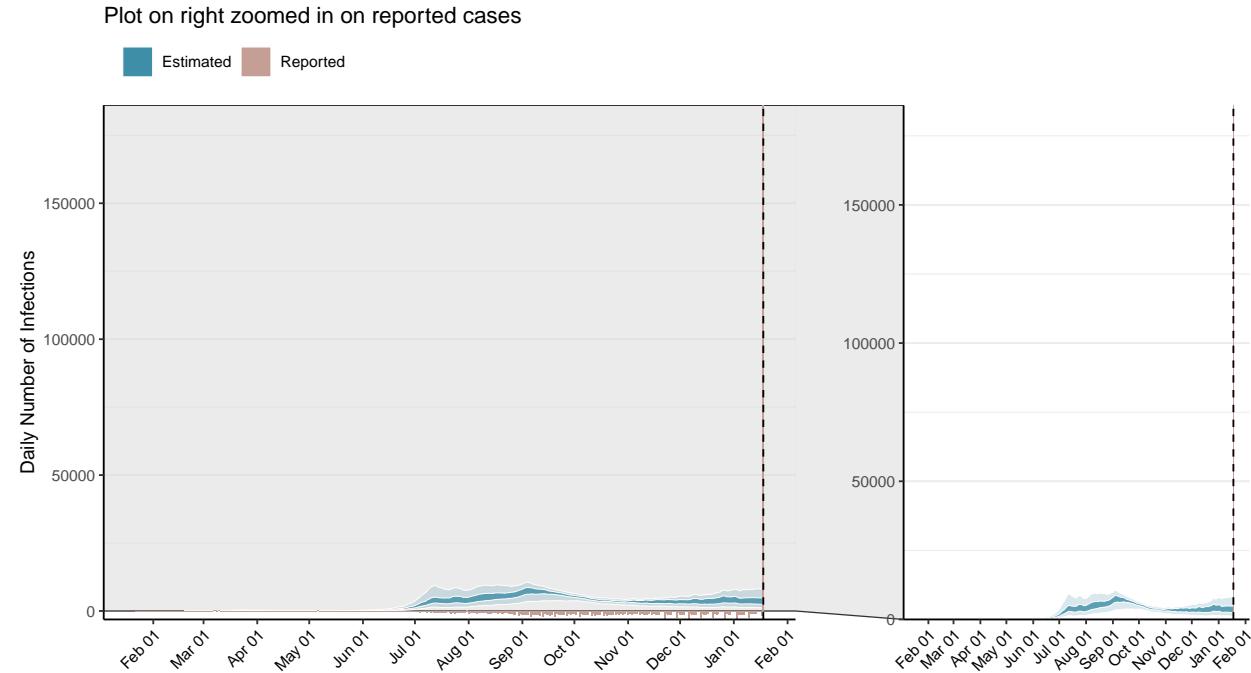


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

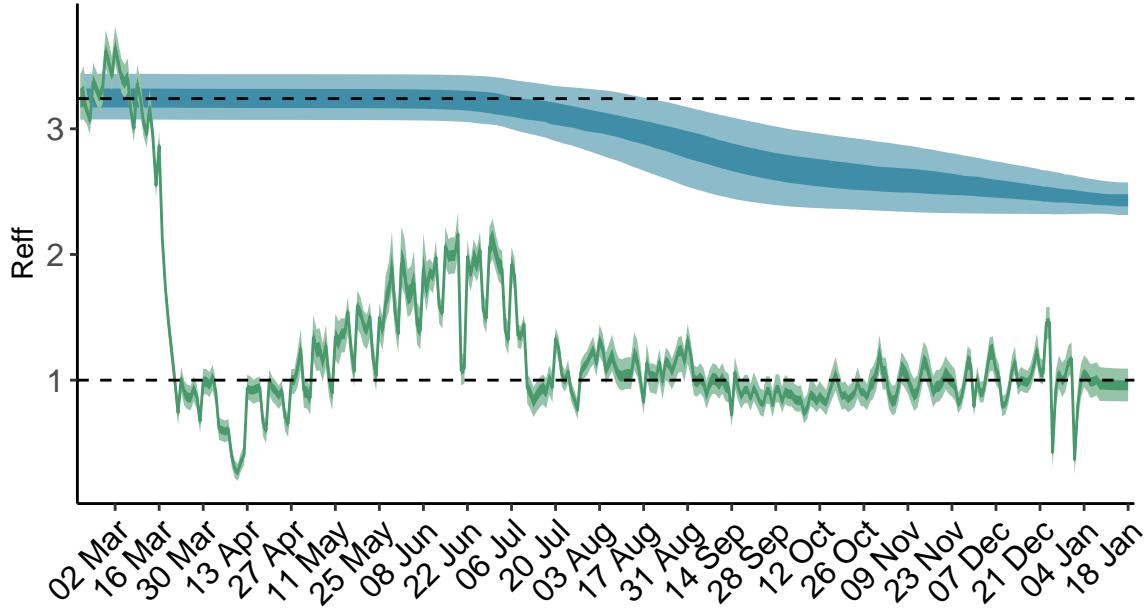


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

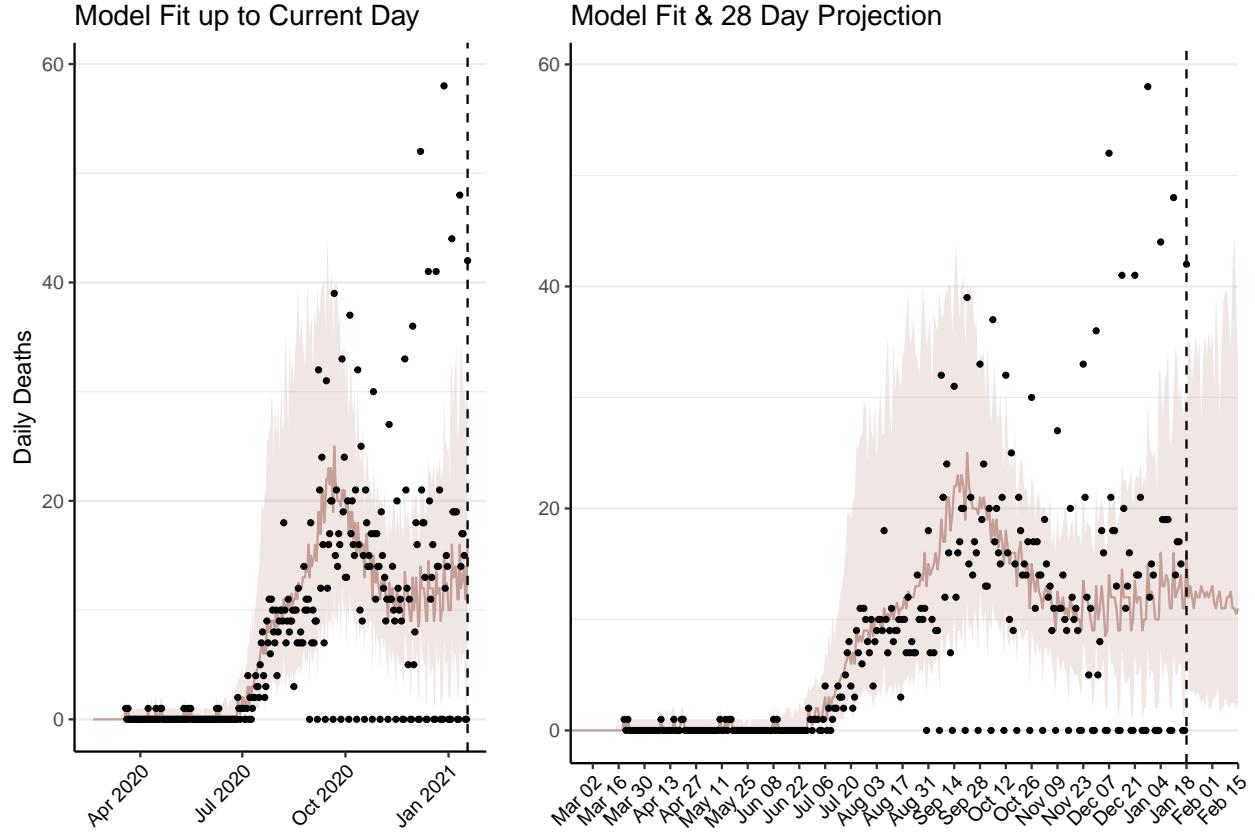


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 462 (95% CI: 420-504) patients requiring treatment with high-pressure oxygen at the current date to 430 (95% CI: 373-487) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 159 (95% CI: 148-171) patients requiring treatment with mechanical ventilation at the current date to 143 (95% CI: 131-156) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

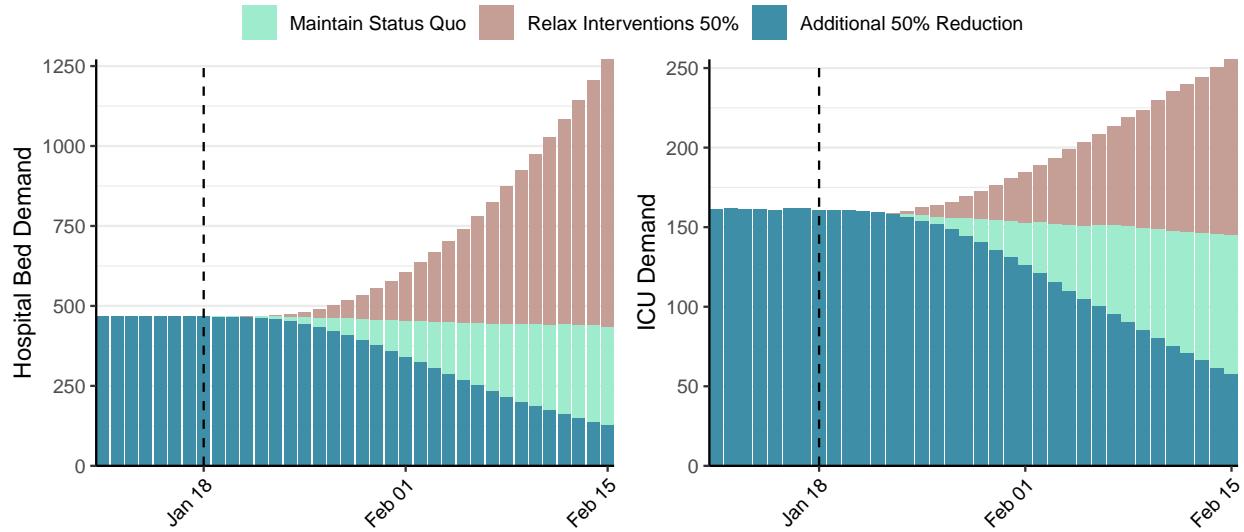


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 3,845 (95% CI: 3,426-4,264) at the current date to 302 (95% CI: 258-346) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,845 (95% CI: 3,426-4,264) at the current date to 16,873 (95% CI: 14,824-18,921) by 2021-02-15.

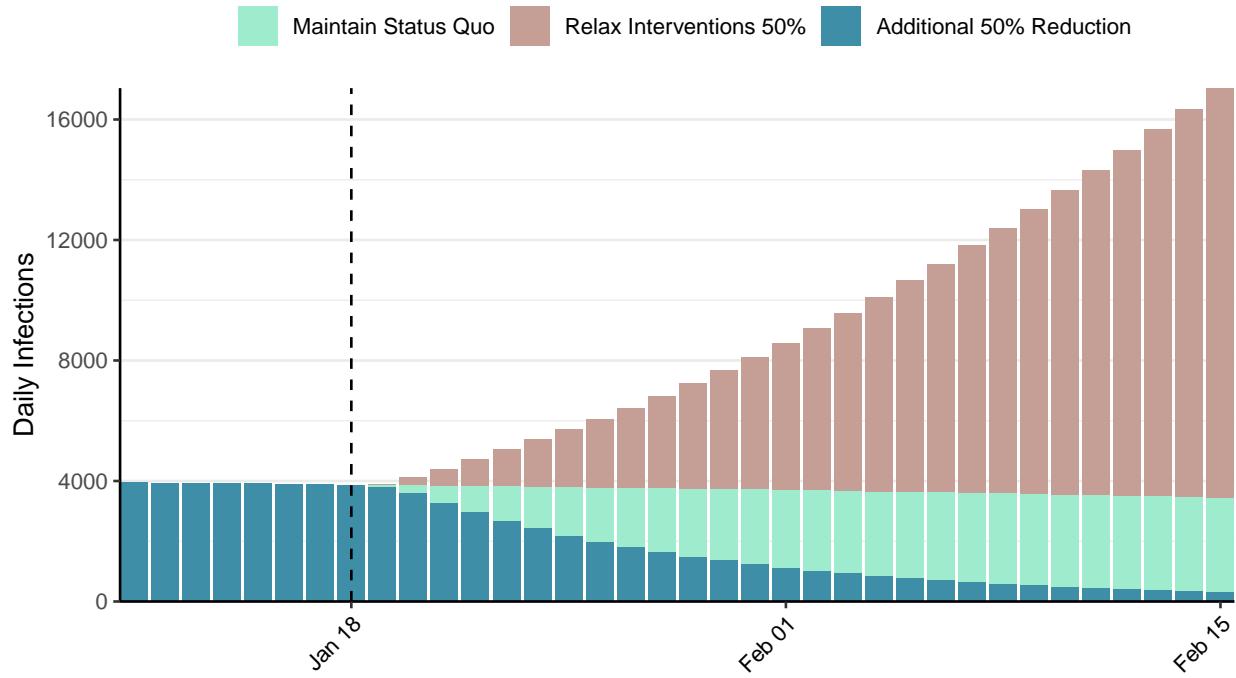


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Cuba, 2021-01-18

[Download the report for Cuba, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.55 (95% CI: 1.39-1.75)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Cuba is not shown in the following plot as only 0 deaths have been reported to date**

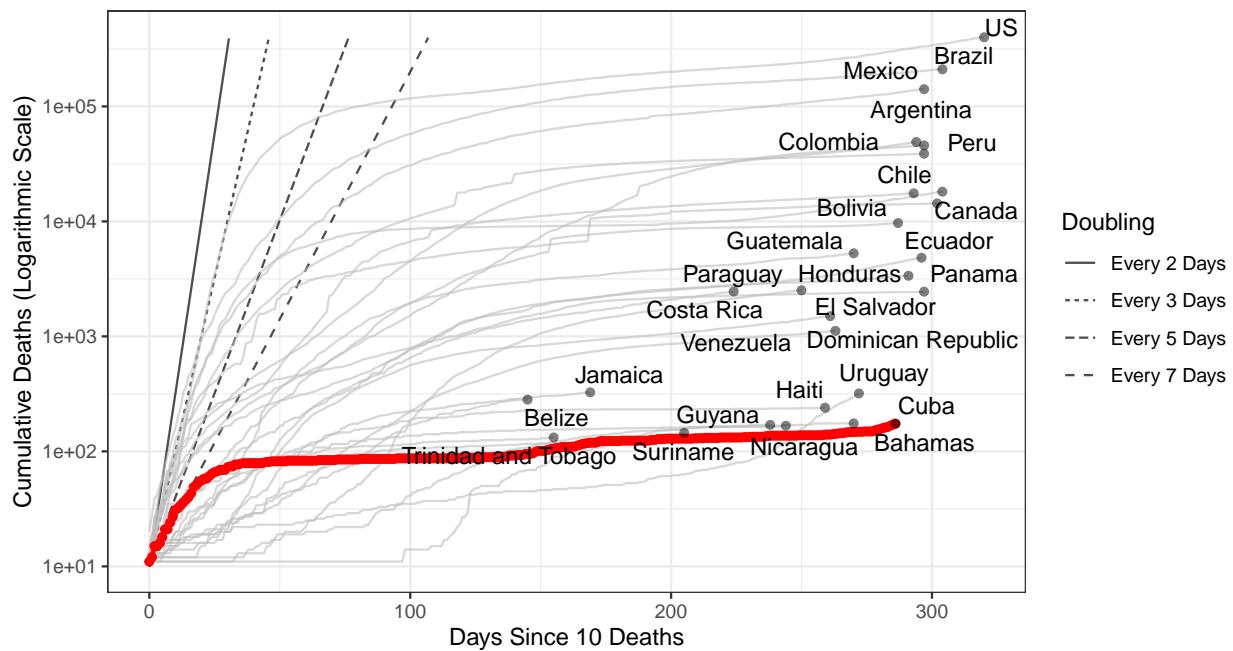


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 20,697 (95% CI: 19,011-22,384) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

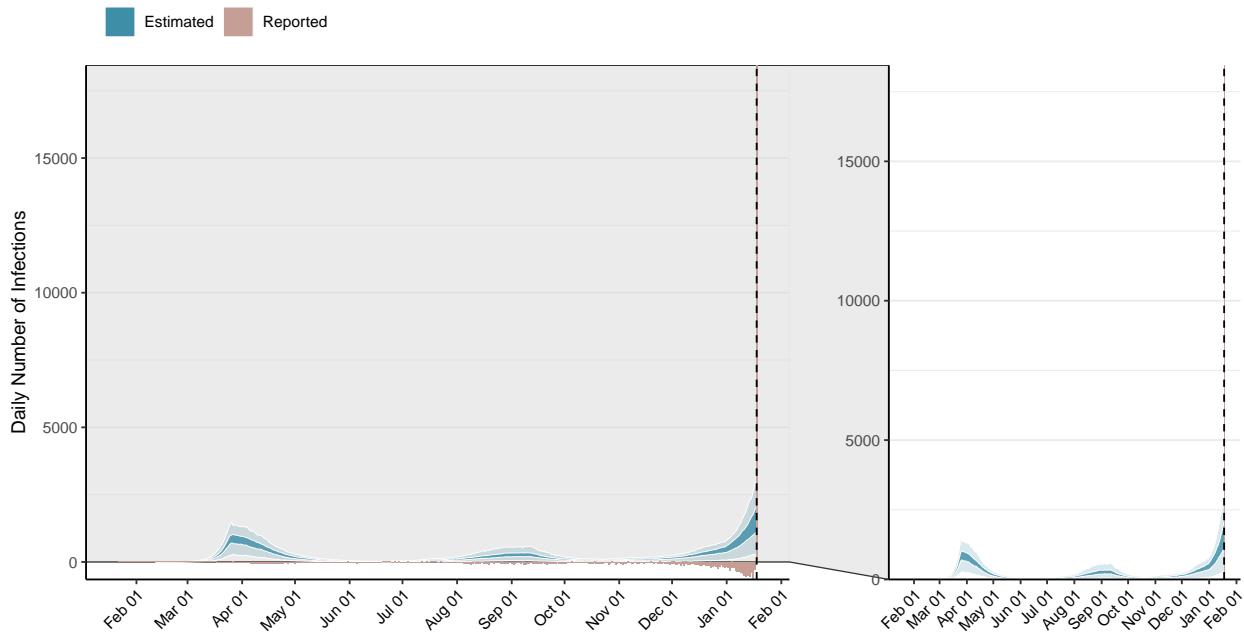


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

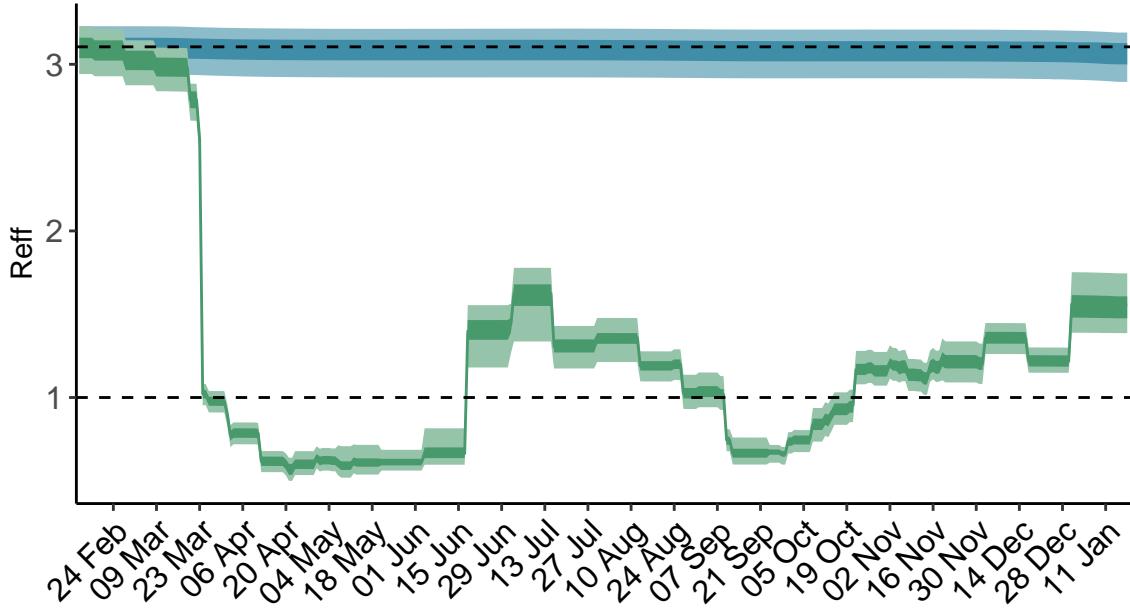


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Cuba is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

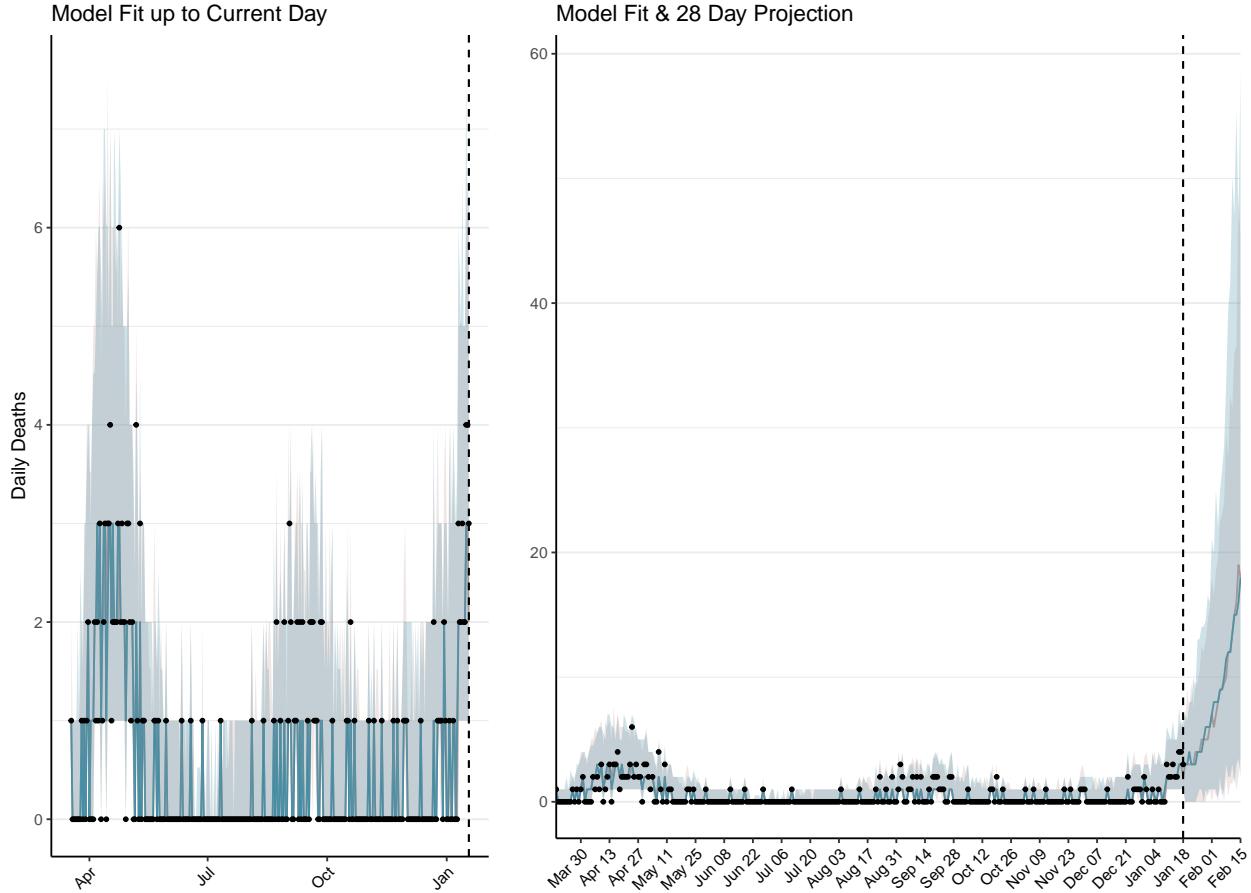


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 109 (95% CI: 100-118) patients requiring treatment with high-pressure oxygen at the current date to 817 (95% CI: 725-909) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 33 (95% CI: 30-36) patients requiring treatment with mechanical ventilation at the current date to 249 (95% CI: 222-277) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

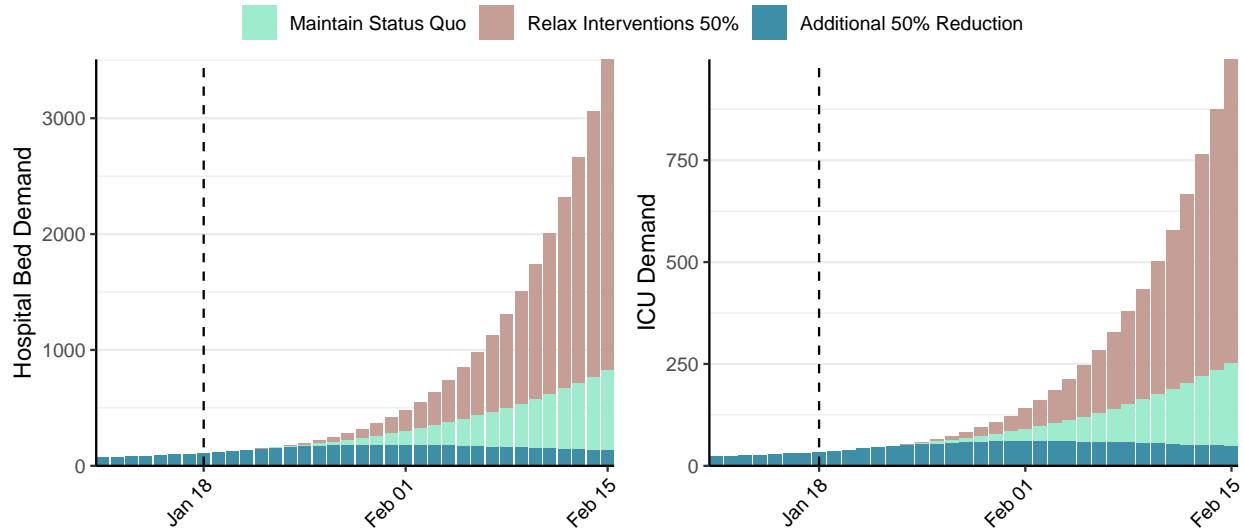


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 1,607 (95% CI: 1,464-1,750) at the current date to 679 (95% CI: 599-759) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,607 (95% CI: 1,464-1,750) at the current date to 76,920 (95% CI: 68,444-85,396) by 2021-02-15.

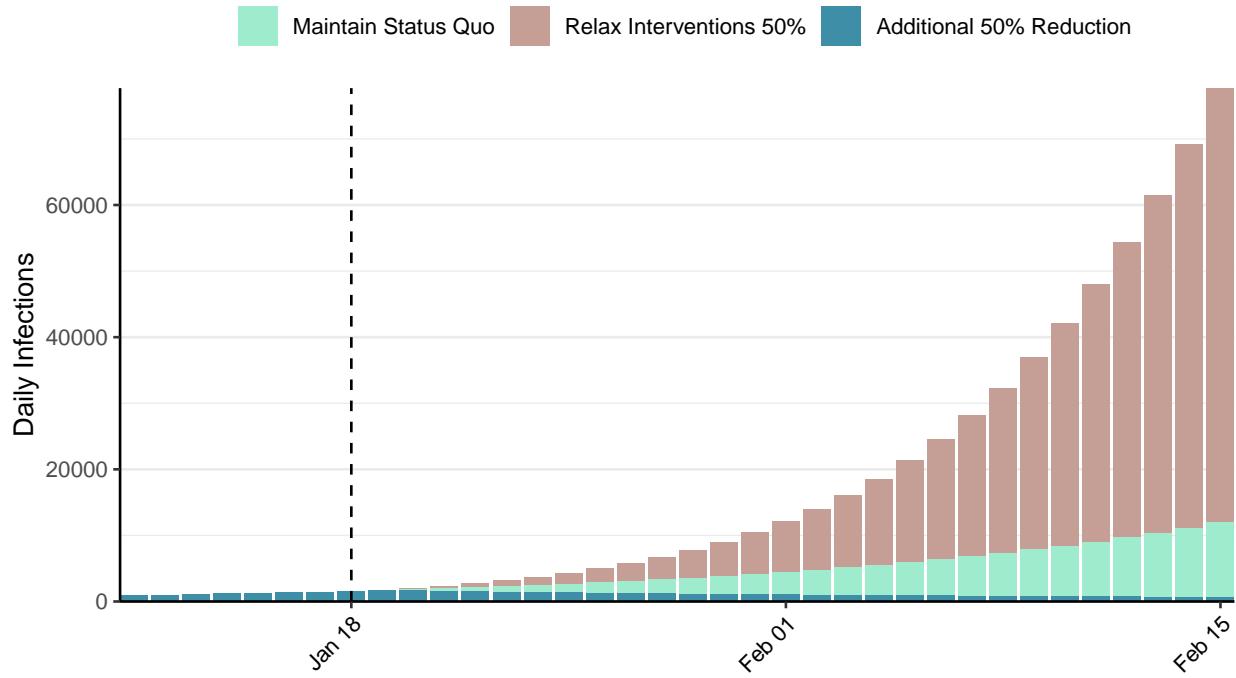


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Djibouti, 2021-01-18

[Download the report for Djibouti, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.86 (95% CI: 0.4-1.43)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Djibouti is not shown in the following plot as only 0 deaths have been reported to date**

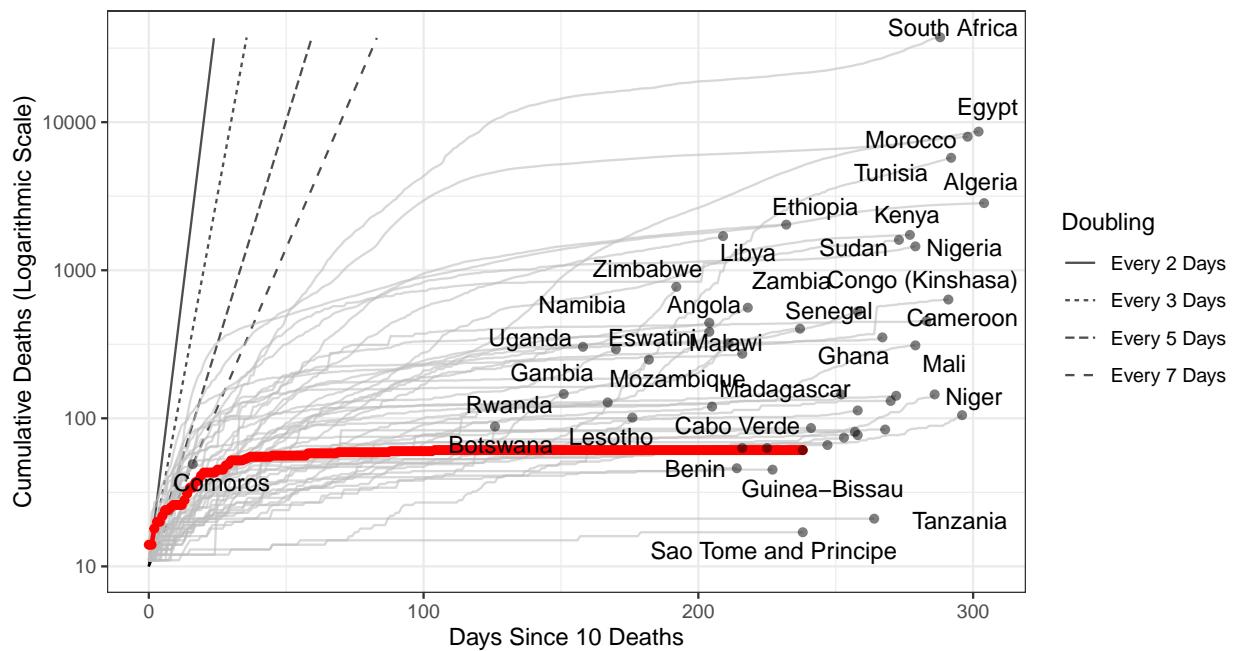


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 6 (95% CI: 0-11) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

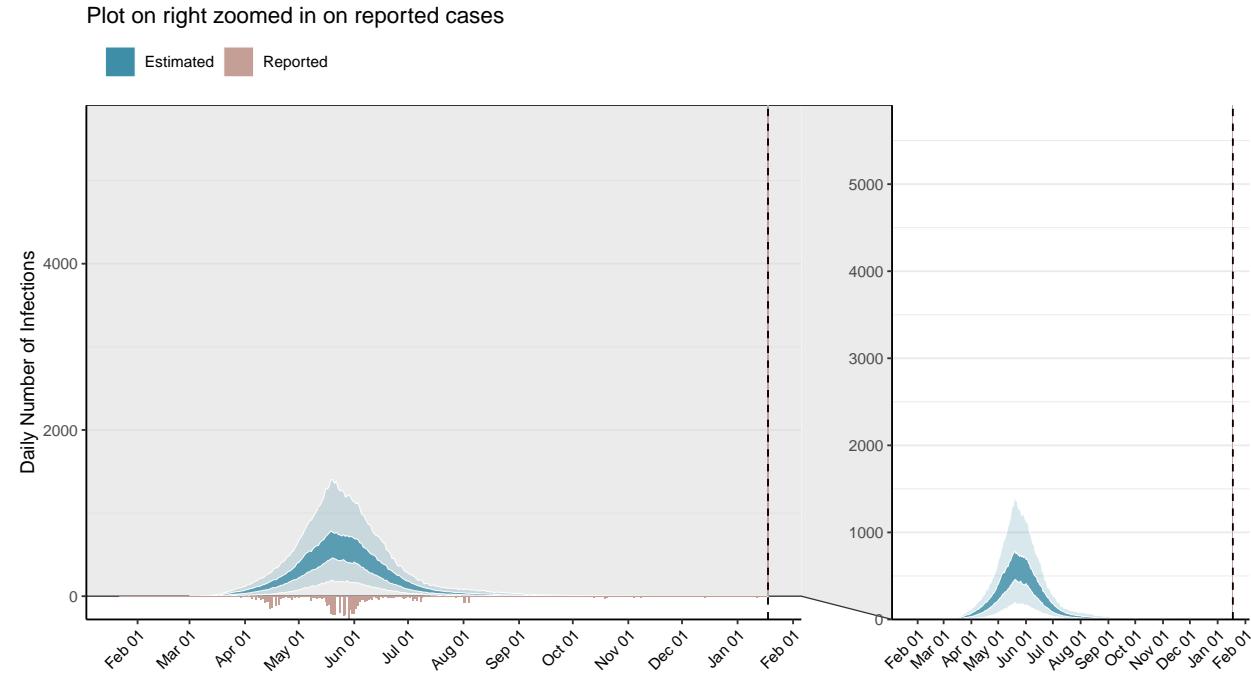


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

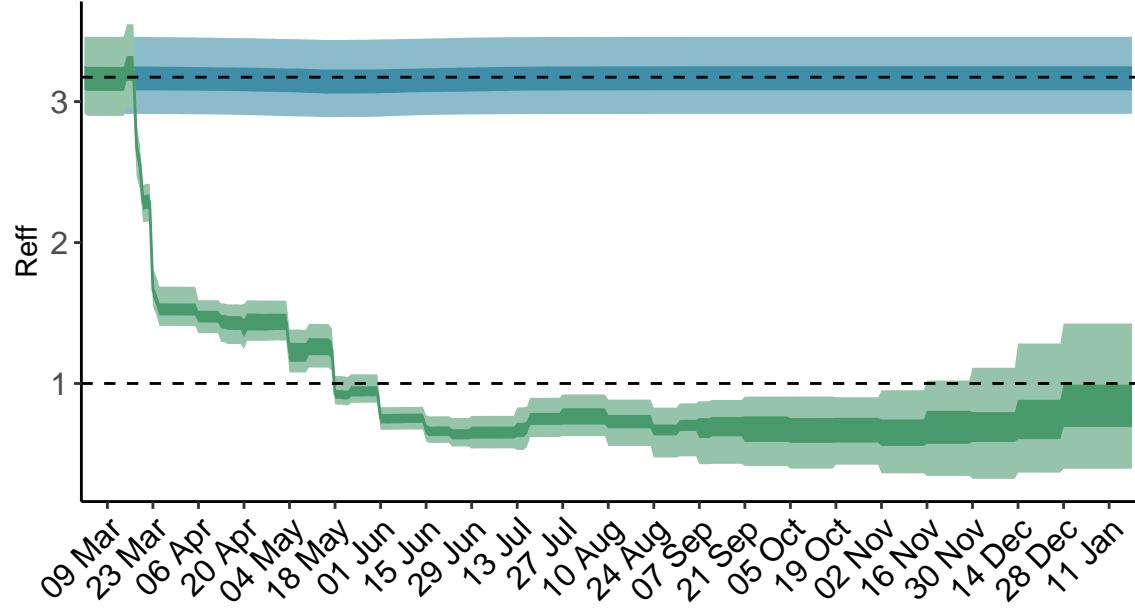


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

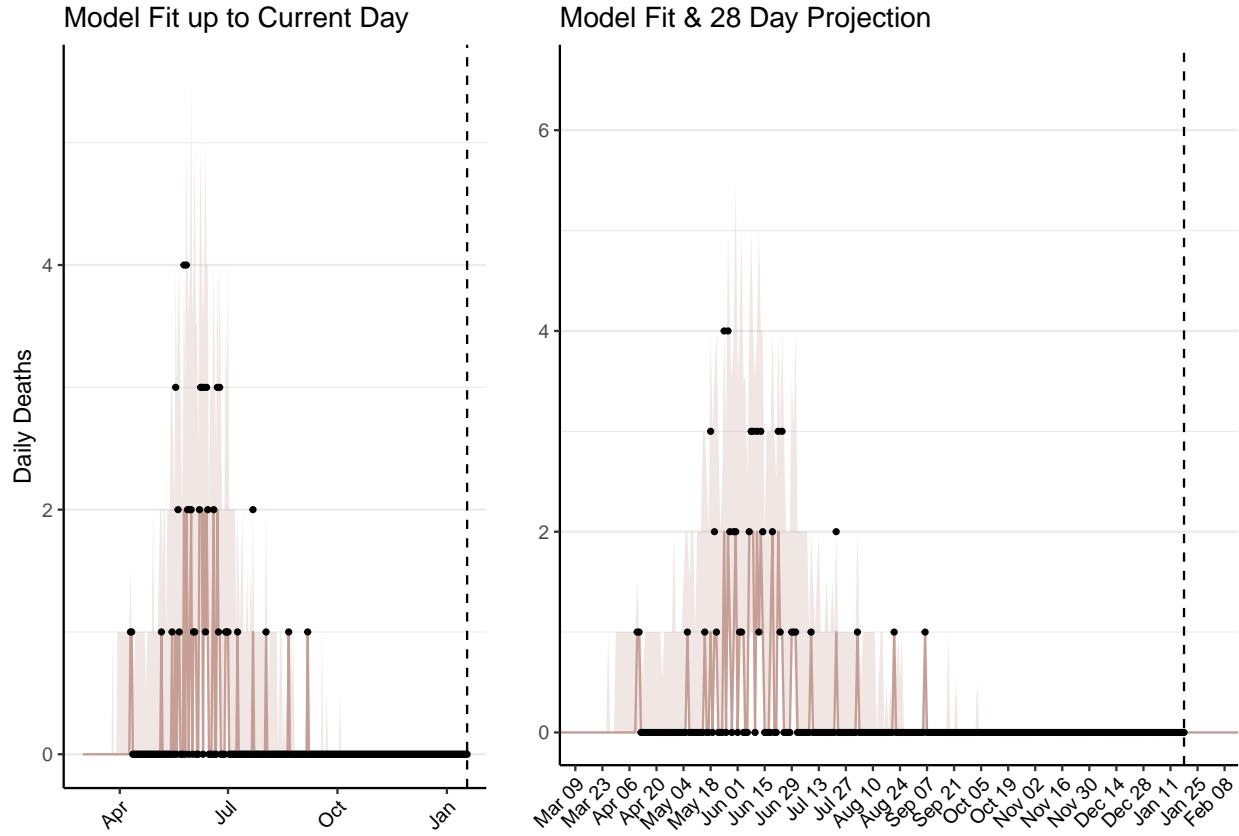


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 0 (95% CI: 0-0) patients requiring treatment with high-pressure oxygen at the current date to 0 (95% CI: 0-0) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 0 (95% CI: NaN-NaN) patients requiring treatment with mechanical ventilation at the current date to 0 (95% CI: 0-0) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

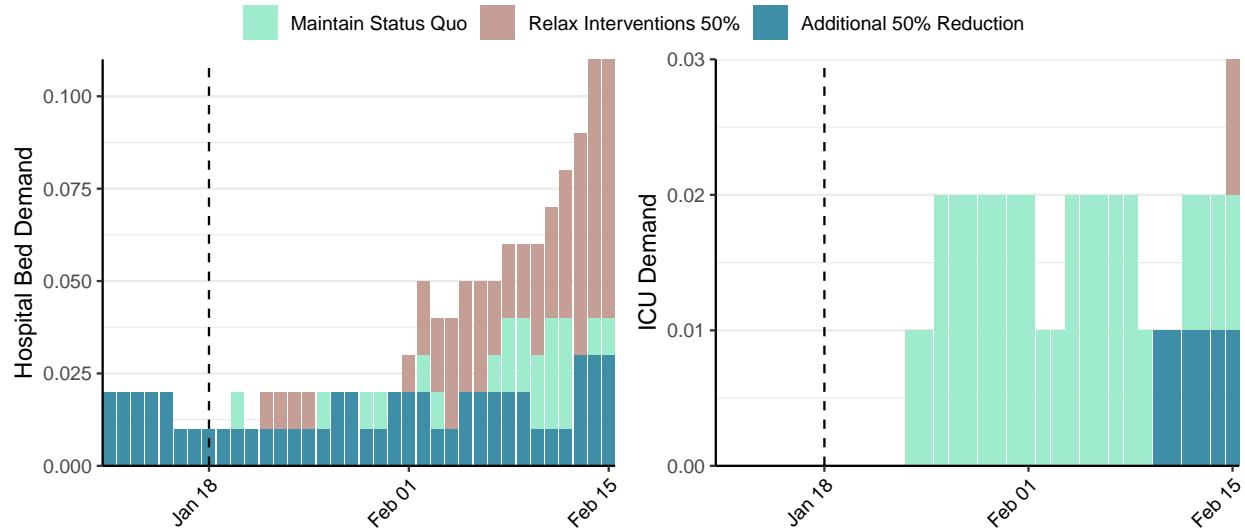


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 0 (95% CI: 0-0) at the current date to 0 (95% CI: 0-0) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 0 (95% CI: 0-0) at the current date to 3 (95% CI: 0-6) by 2021-02-15.

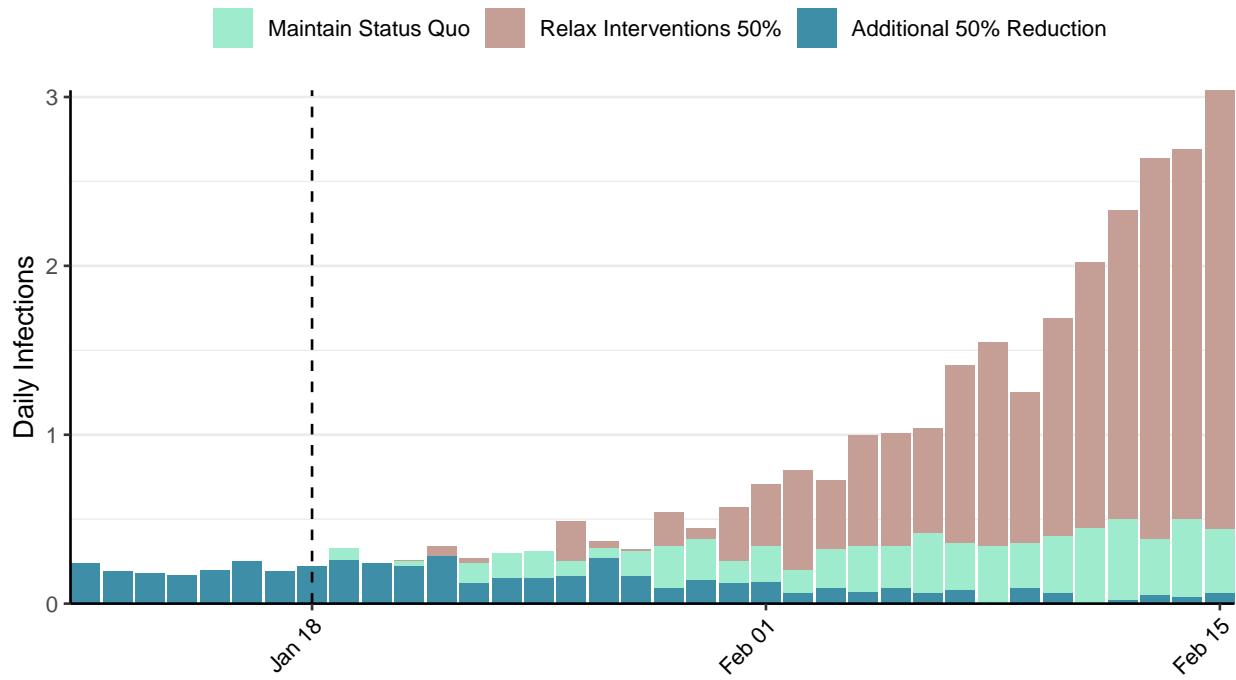


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Dominican Republic, 2021-01-18

[Download the report for Dominican Republic, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.41 (95% CI: 1.07-1.73)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Dominican Republic is not shown in the following plot as only 0 deaths have been reported to date**

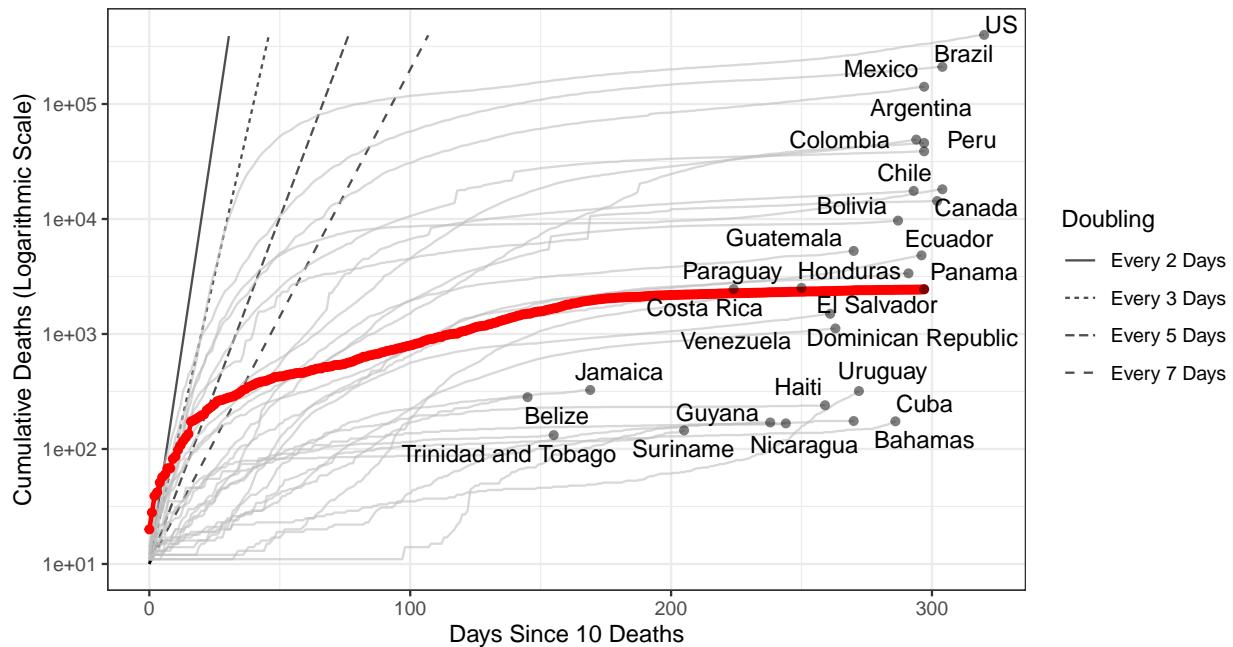


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 74,823 (95% CI: 69,665-79,980) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

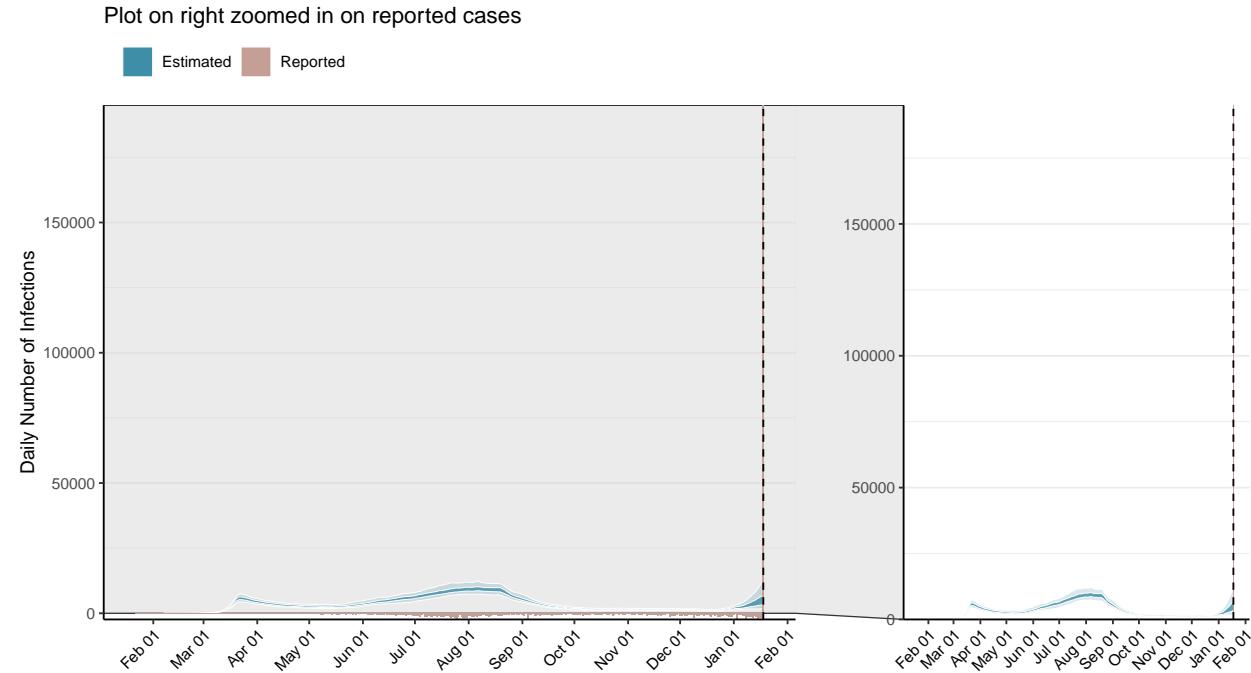


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

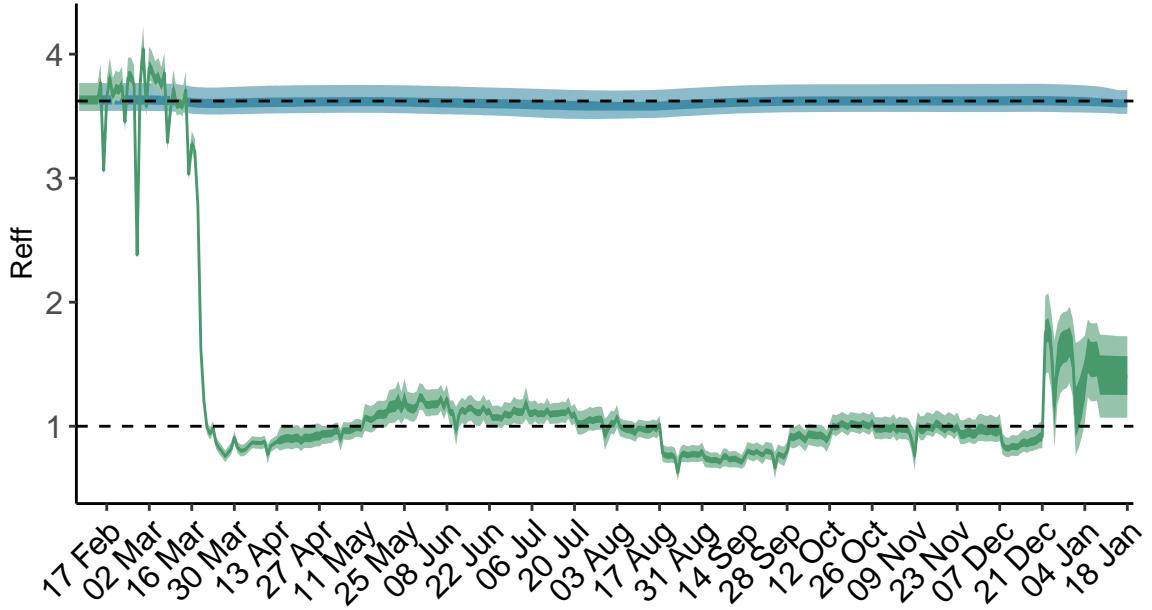


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Dominican Republic is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

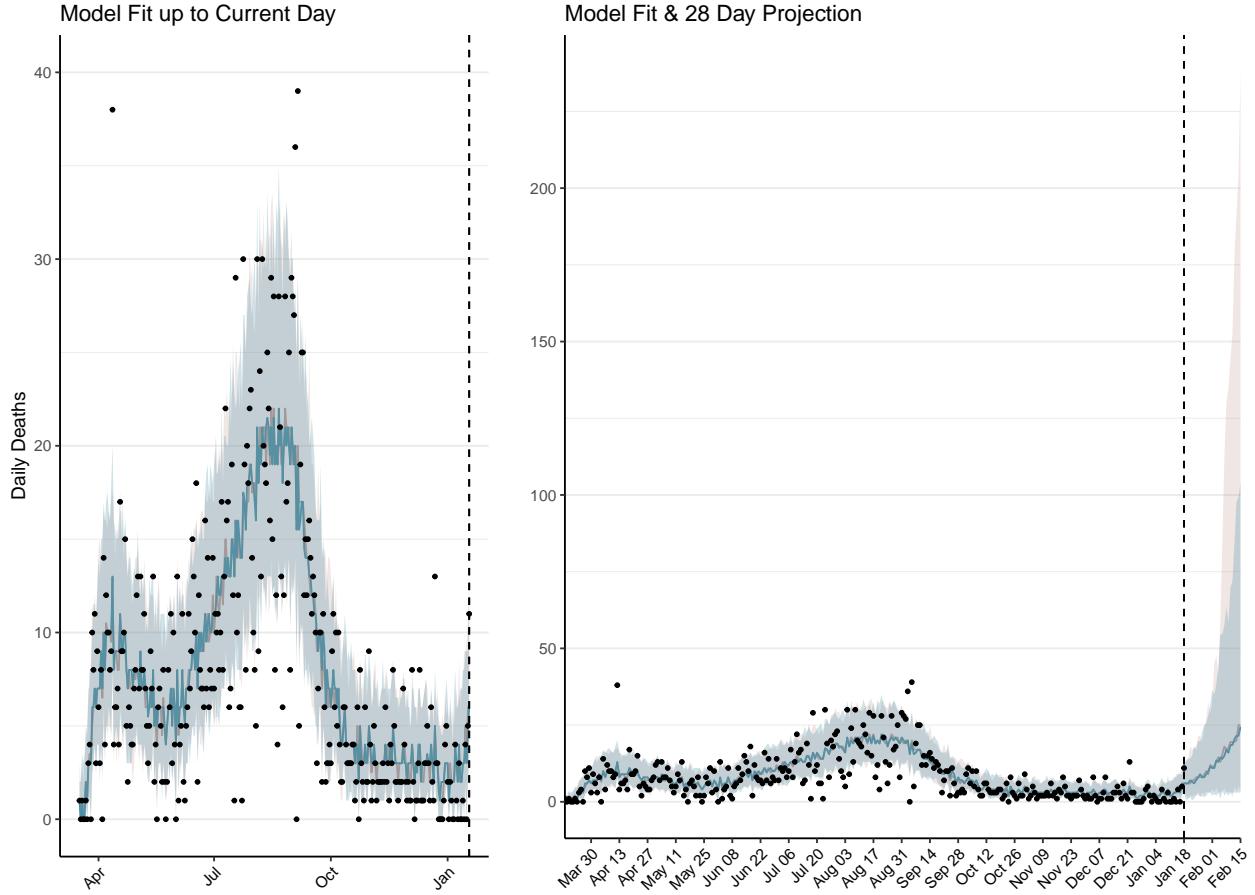


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 252 (95% CI: 233-271) patients requiring treatment with high-pressure oxygen at the current date to 1,606 (95% CI: 1,315-1,898) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 83 (95% CI: 77-89) patients requiring treatment with mechanical ventilation at the current date to 416 (95% CI: 362-470) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

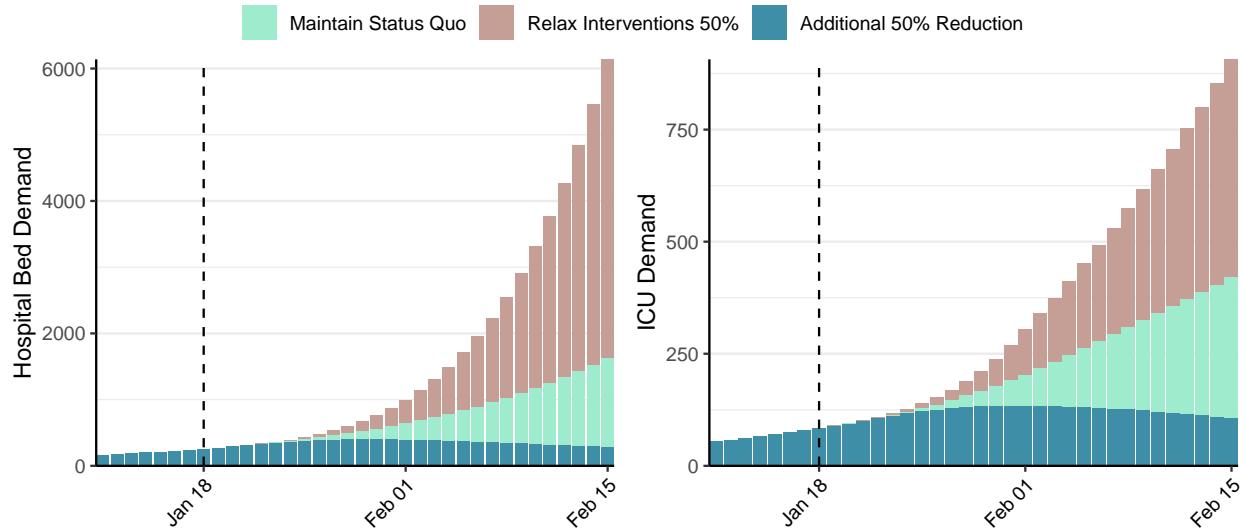


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 5,550 (95% CI: 4,955-6,145) at the current date to 2,209 (95% CI: 1,769-2,648) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 5,550 (95% CI: 4,955-6,145) at the current date to 170,744 (95% CI: 143,301-198,187) by 2021-02-15.

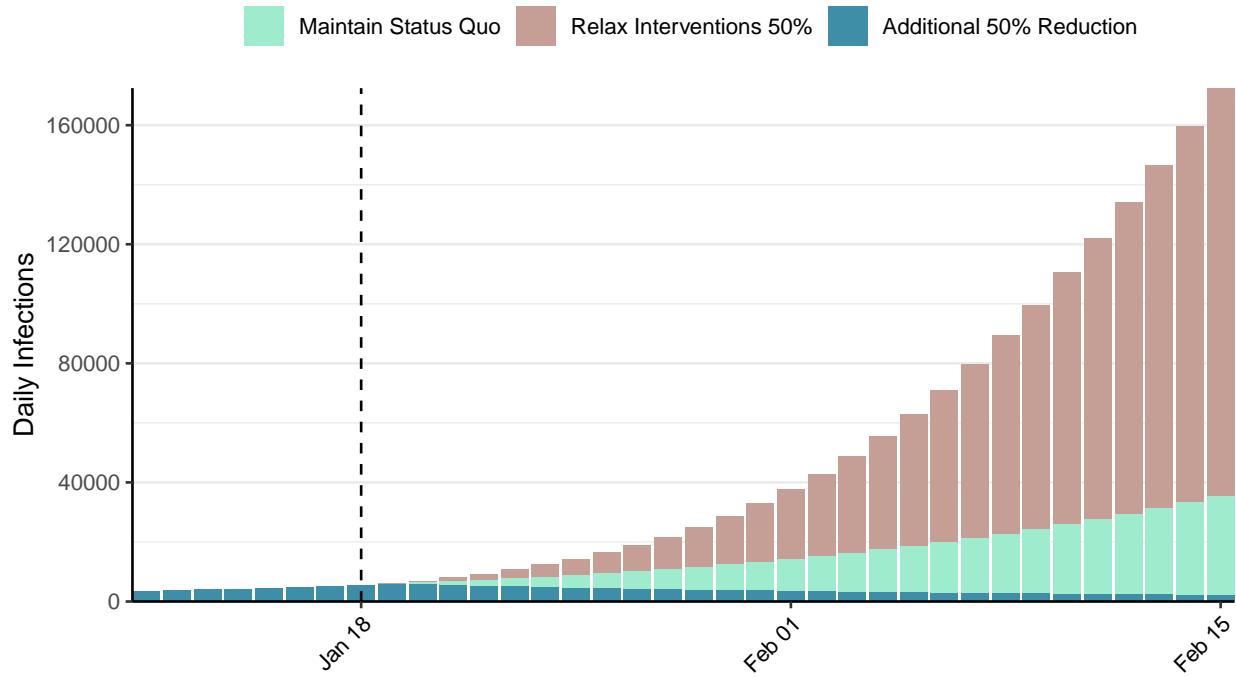


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Algeria, 2021-01-18

[Download the report for Algeria, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.89 (95% CI: 0.7-1.07)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Algeria is not shown in the following plot as only 0 deaths have been reported to date**

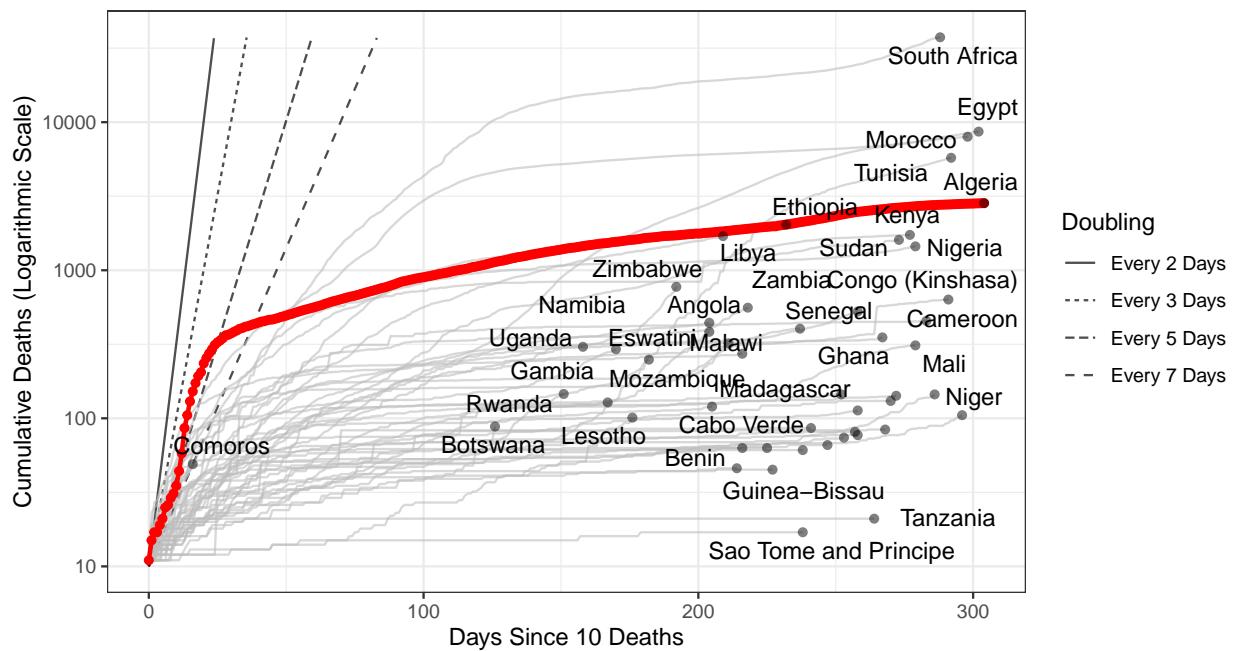


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 42,133 (95% CI: 39,840-44,425) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

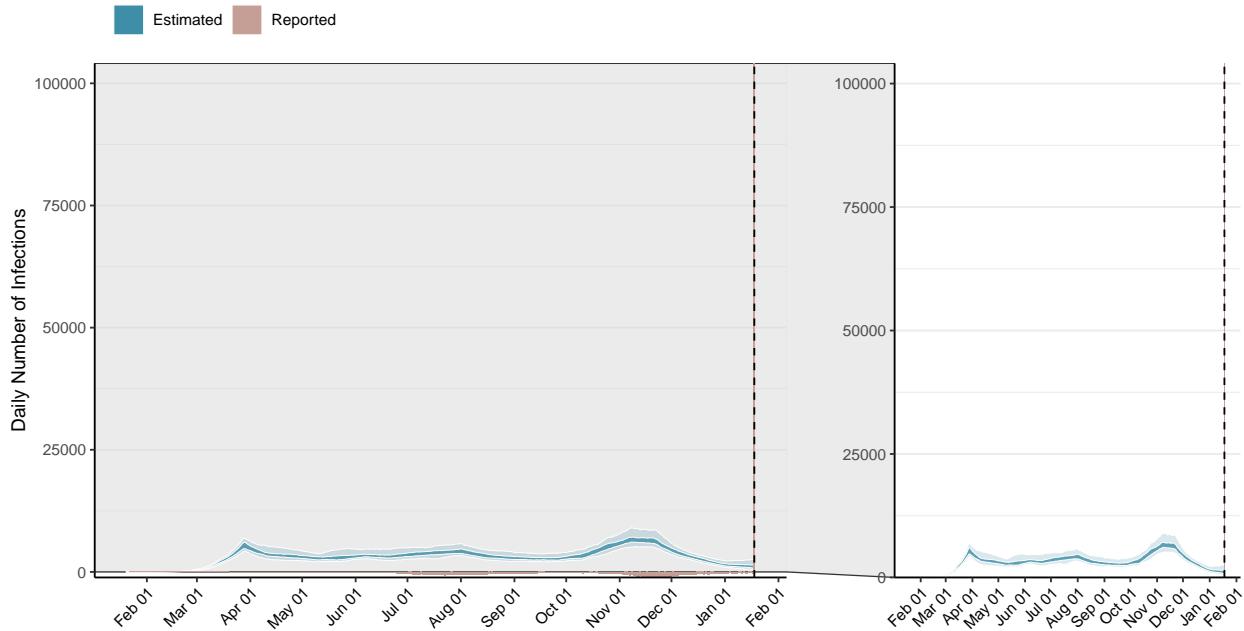


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

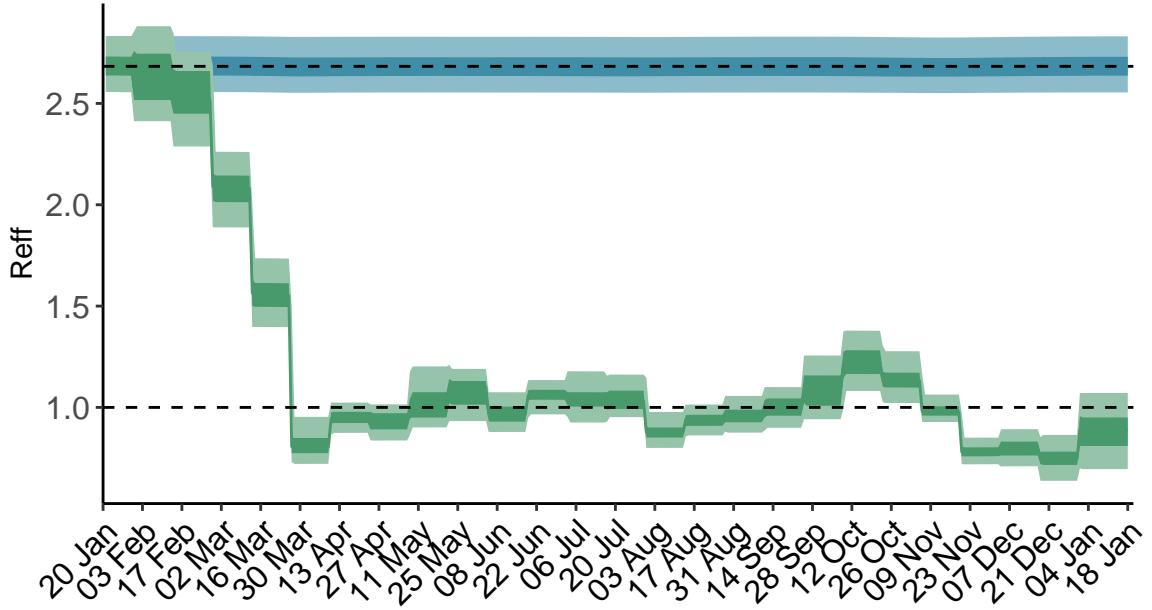


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

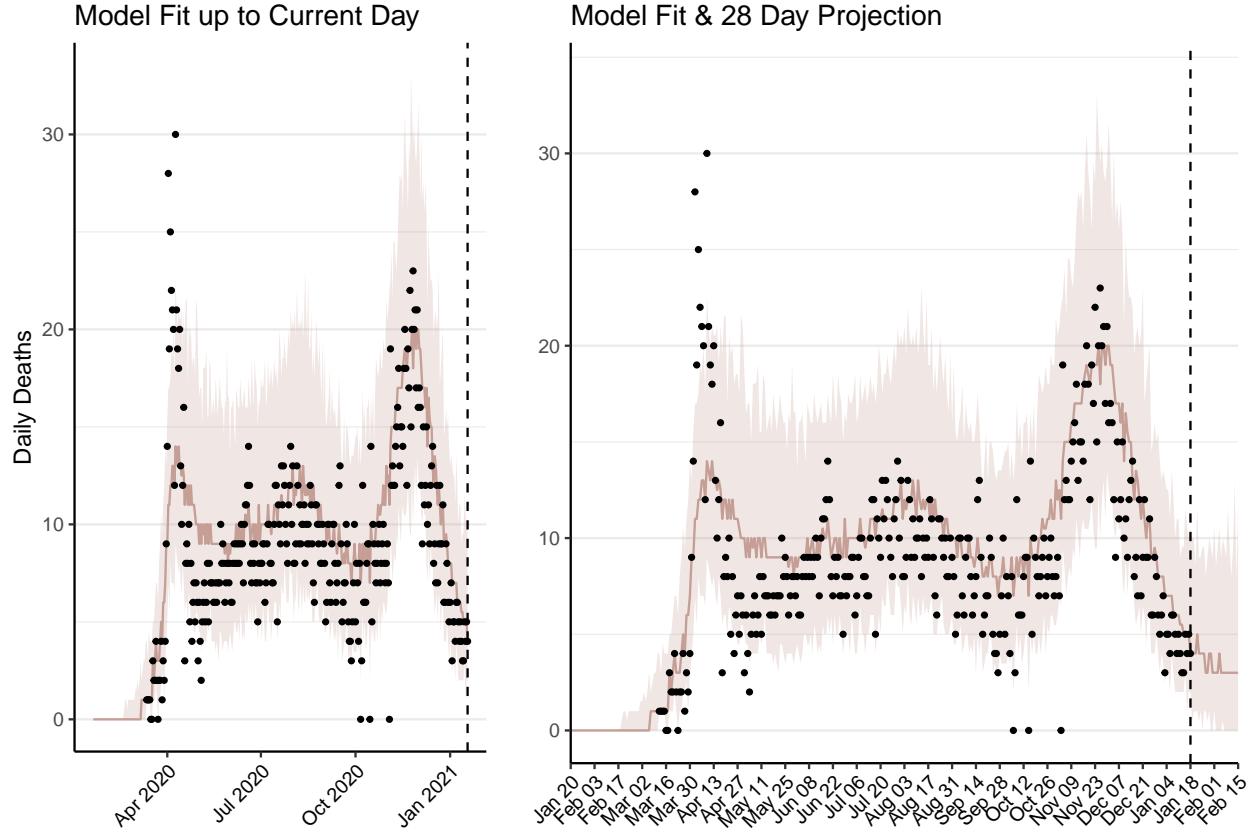


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 172 (95% CI: 161-182) patients requiring treatment with high-pressure oxygen at the current date to 122 (95% CI: 102-141) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 72 (95% CI: 68-75) patients requiring treatment with mechanical ventilation at the current date to 48 (95% CI: 41-54) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

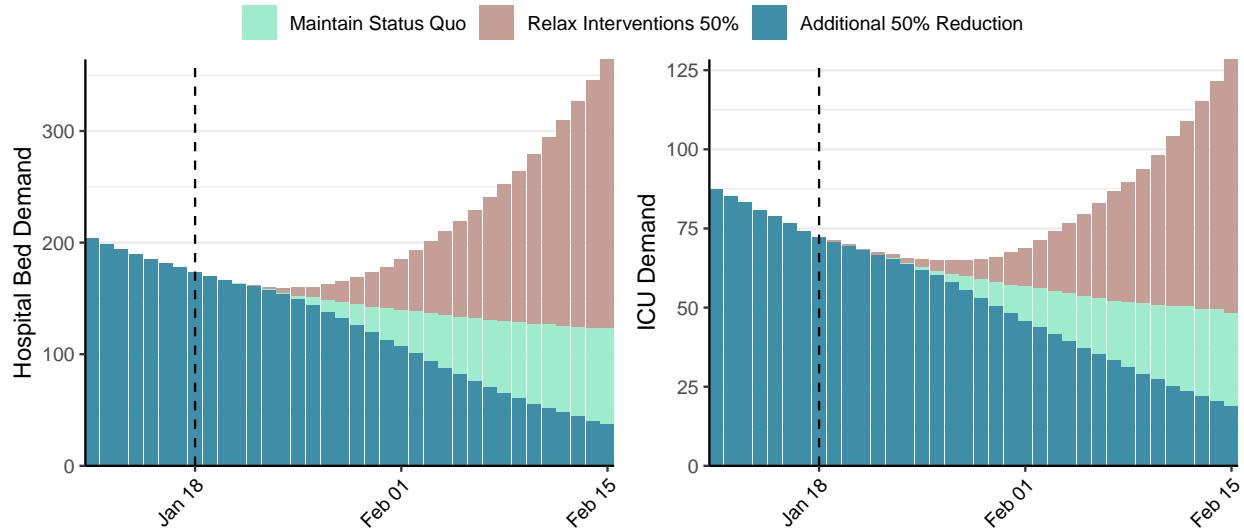


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 1,161 (95% CI: 1,053-1,270) at the current date to 81 (95% CI: 66-96) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,161 (95% CI: 1,053-1,270) at the current date to 5,404 (95% CI: 4,106-6,703) by 2021-02-15.

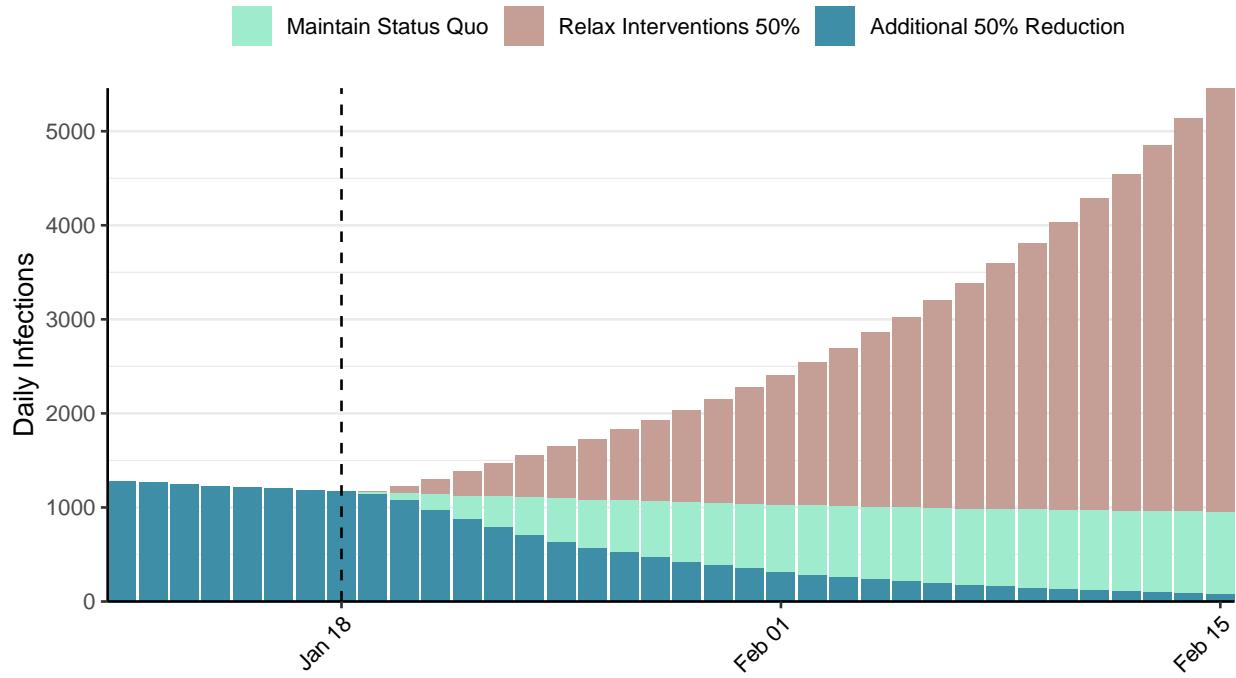


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Ecuador, 2021-01-18

[Download the report for Ecuador, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.05 (95% CI: 0.84-1.24)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Ecuador is not shown in the following plot as only 0 deaths have been reported to date**

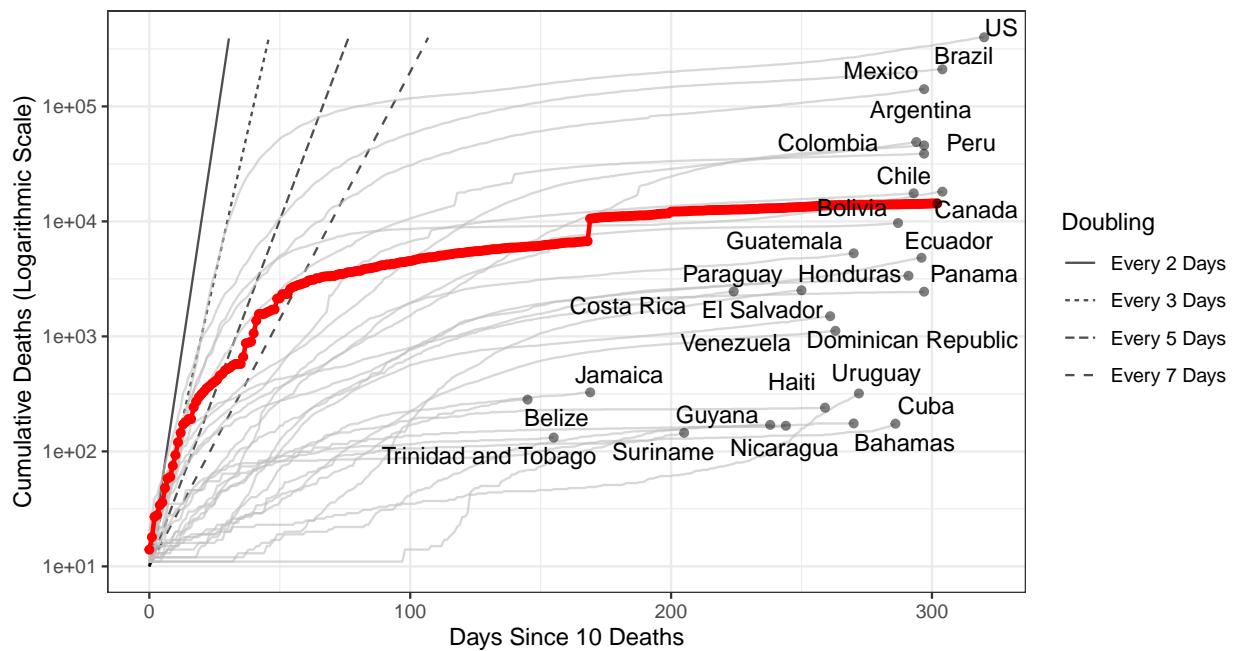


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 218,121 (95% CI: 208,939–227,304) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

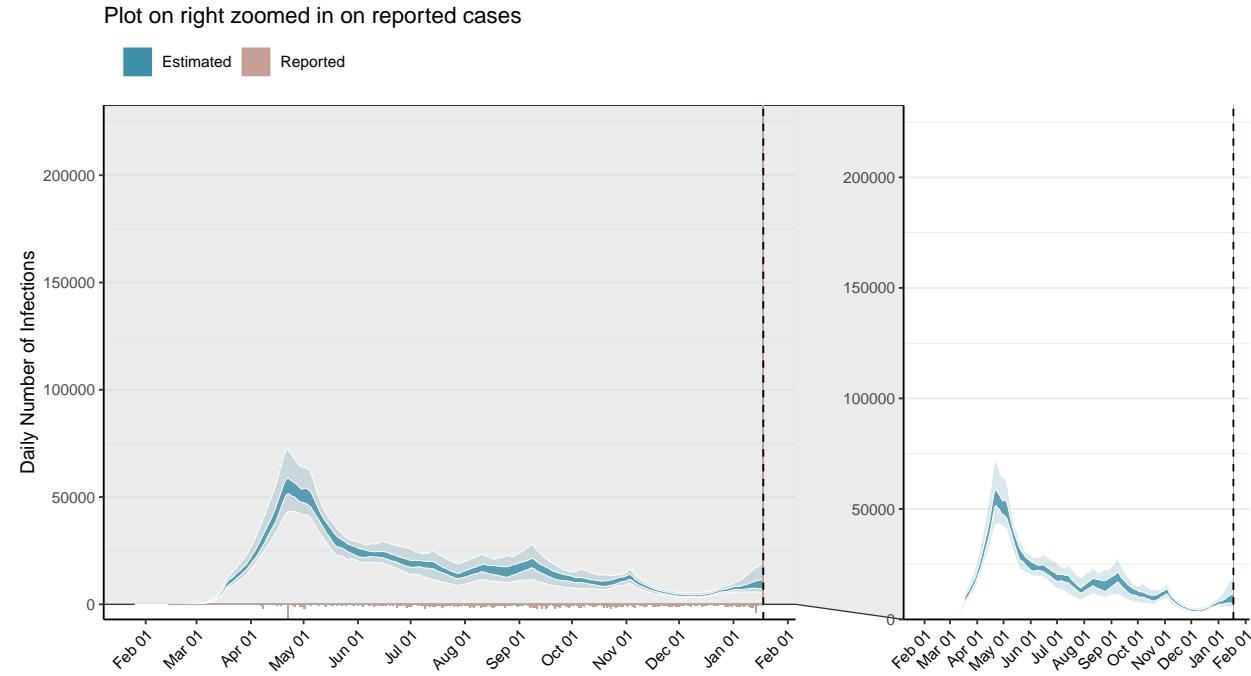


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

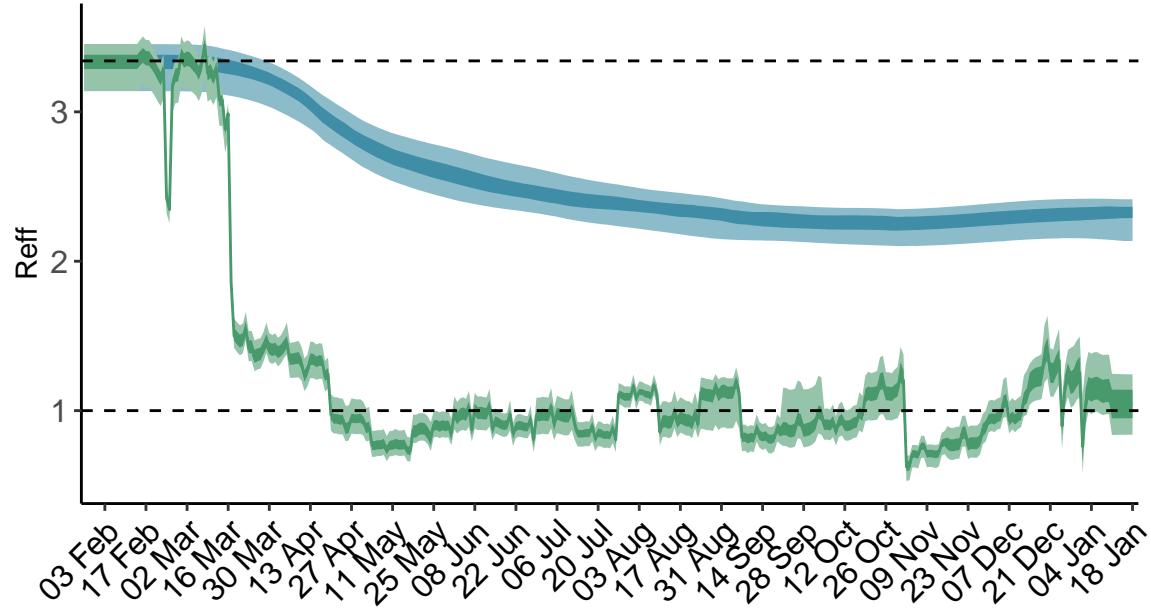


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Ecuador is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

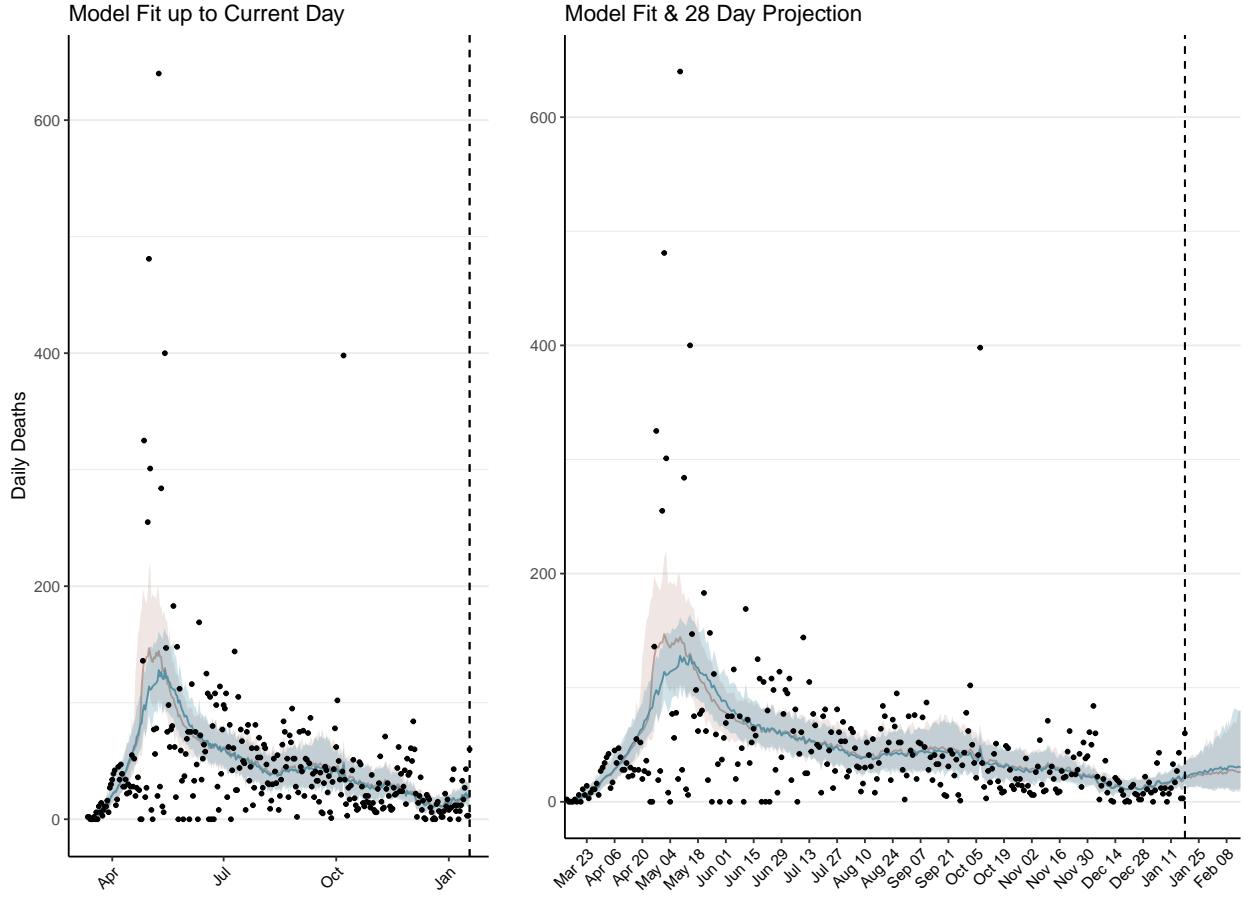


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 829 (95% CI: 791-867) patients requiring treatment with high-pressure oxygen at the current date to 1,234 (95% CI: 1,088-1,381) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 289 (95% CI: 276-302) patients requiring treatment with mechanical ventilation at the current date to 429 (95% CI: 381-478) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

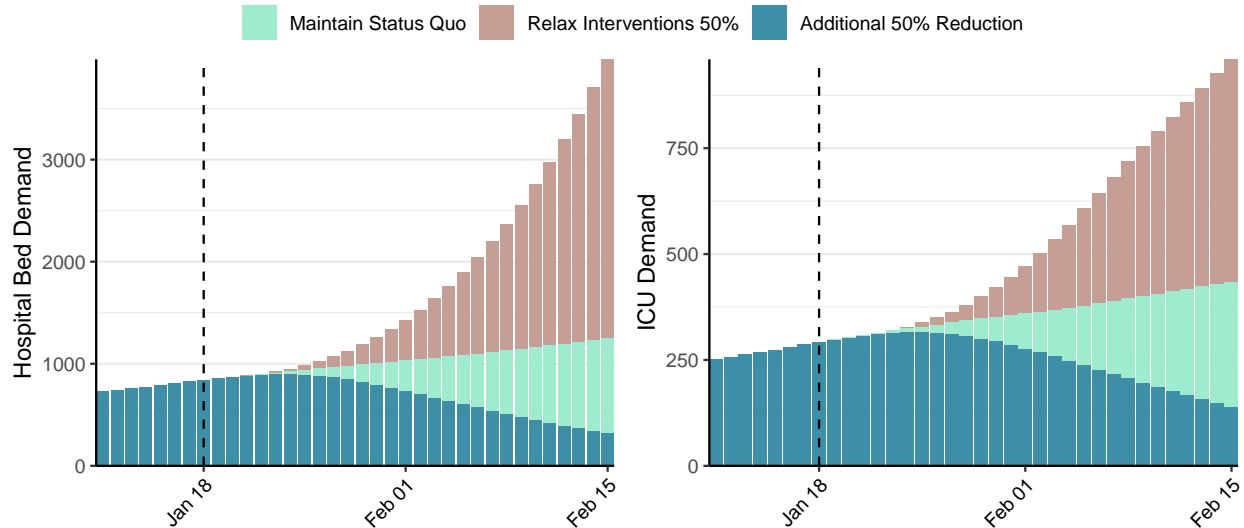


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 9,670 (95% CI: 8,984-10,355) at the current date to 1,125 (95% CI: 976-1,274) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 9,670 (95% CI: 8,984-10,355) at the current date to 74,362 (95% CI: 64,354-84,371) by 2021-02-15.

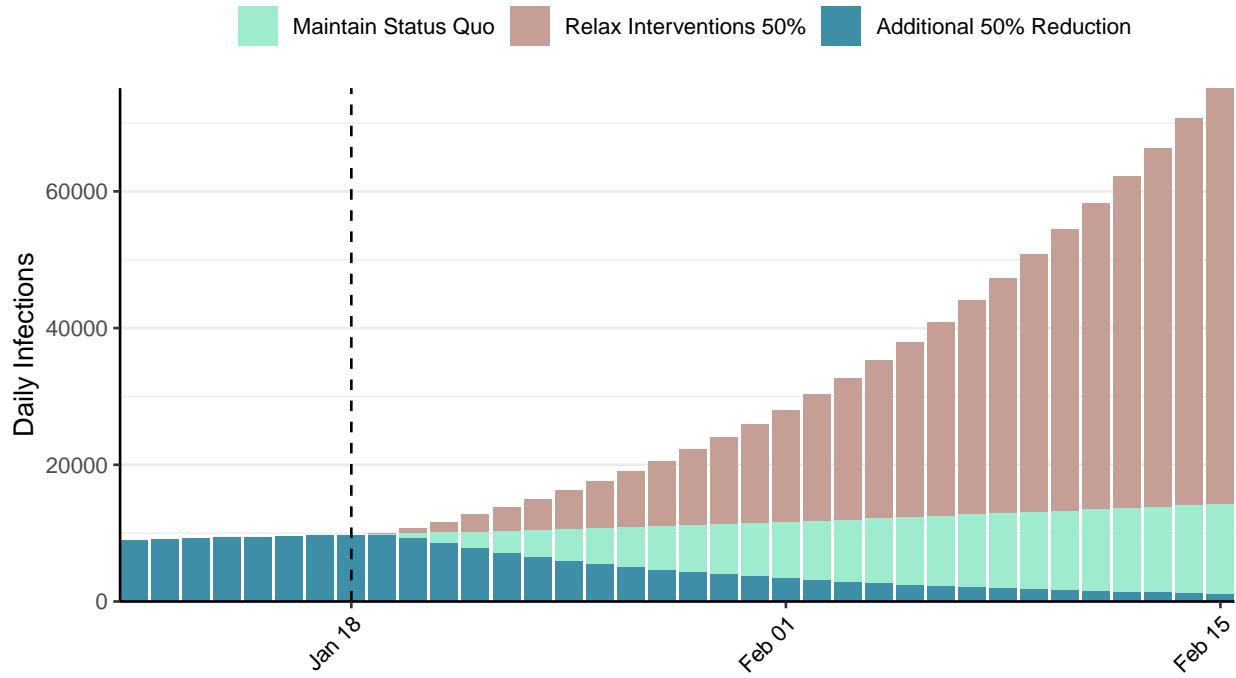


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Egypt, 2021-01-18

[Download the report for Egypt, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.87 (95% CI: 0.7-1.02)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Egypt is not shown in the following plot as only 0 deaths have been reported to date**

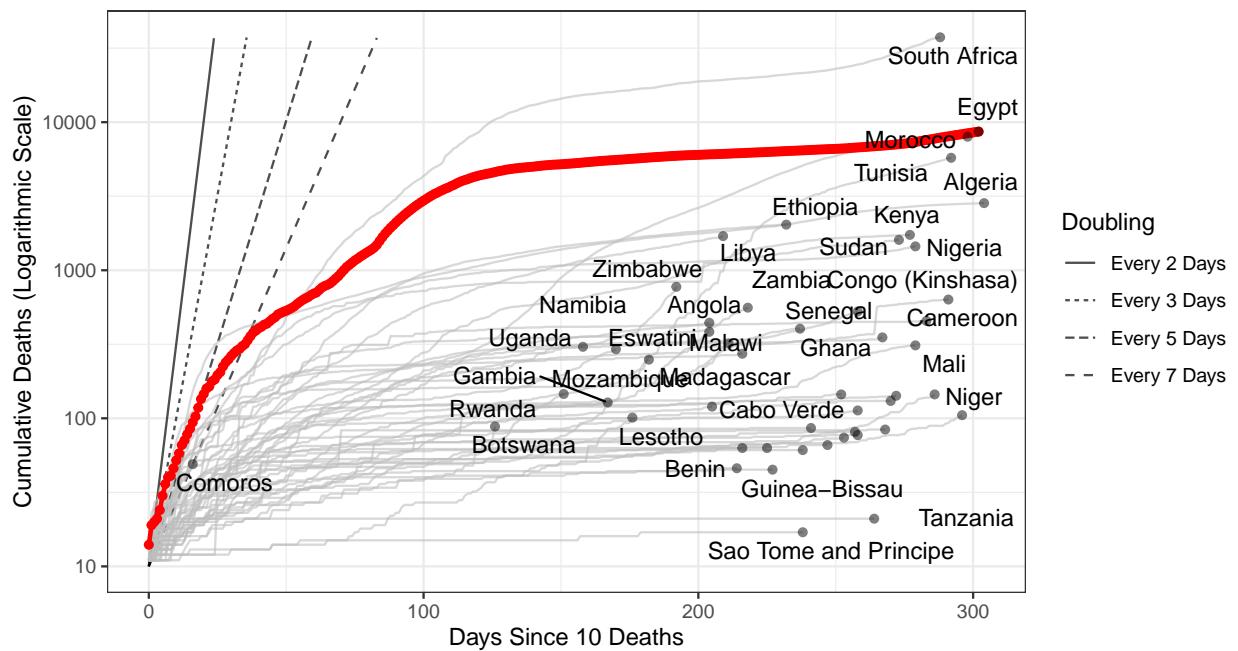


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 737,640 (95% CI: 694,608–780,673) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

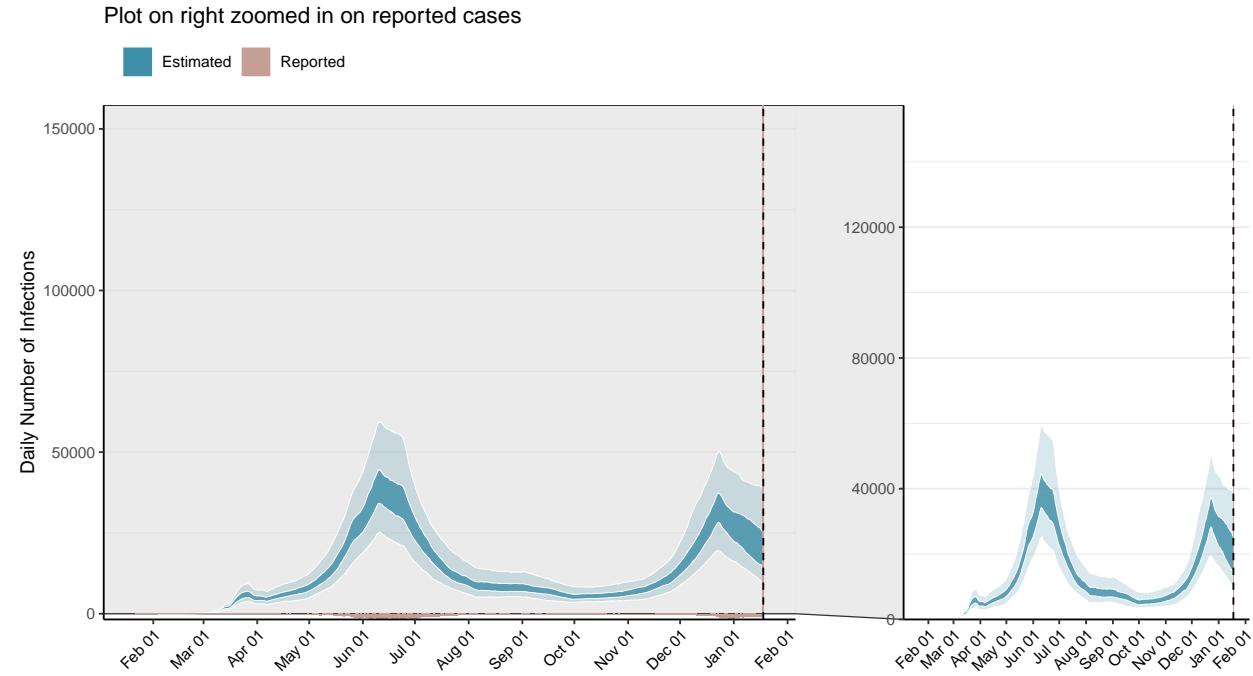


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

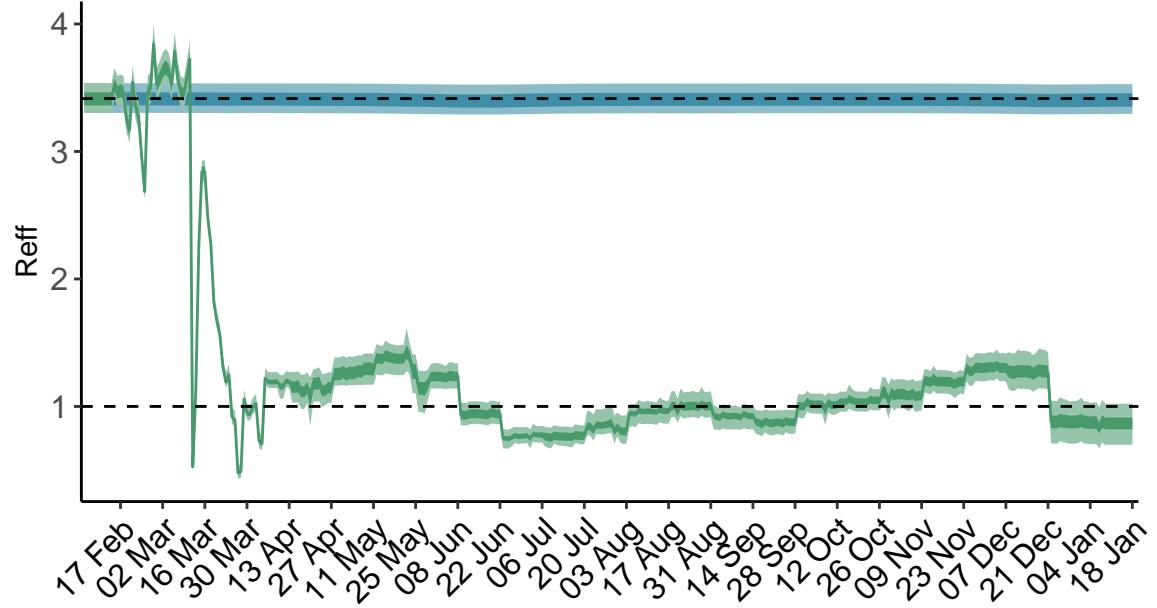


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

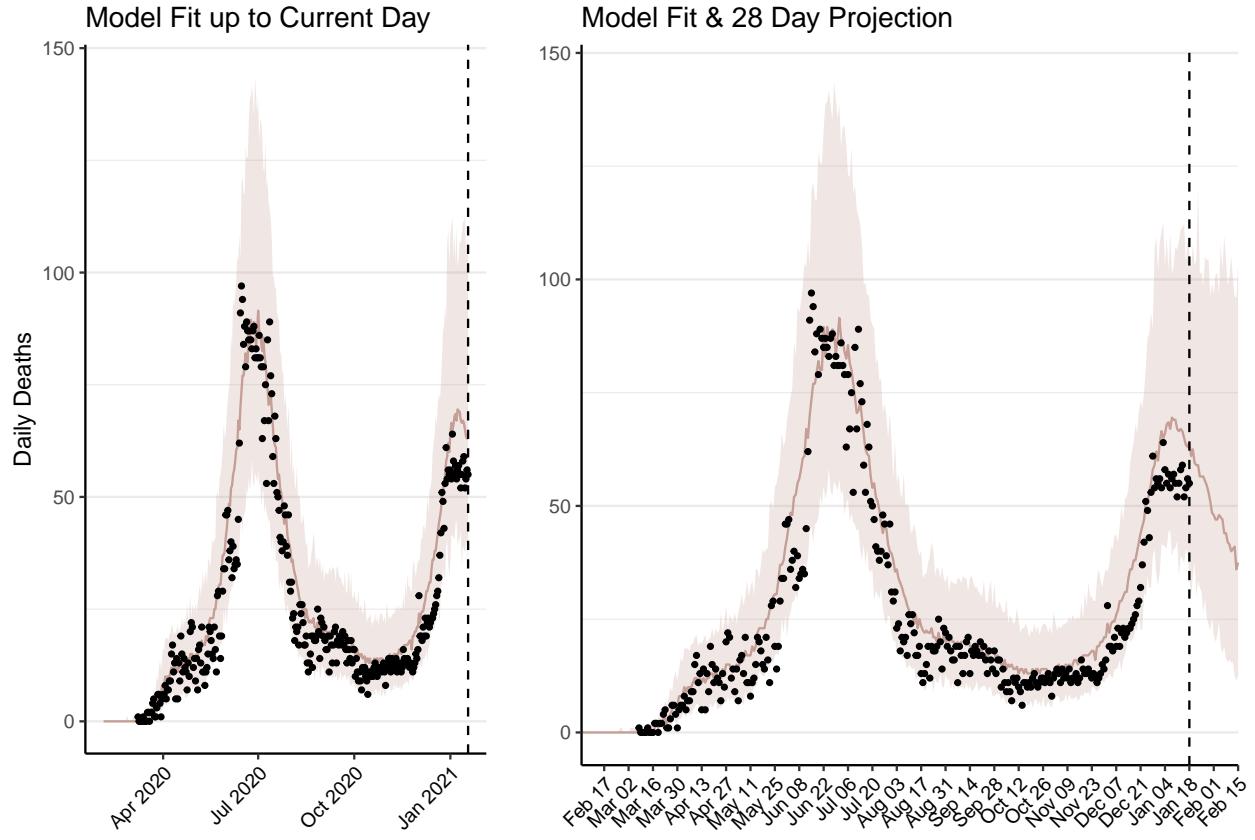


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 2,407 (95% CI: 2,255-2,558) patients requiring treatment with high-pressure oxygen at the current date to 1,555 (95% CI: 1,369-1,741) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 959 (95% CI: 902-1,016) patients requiring treatment with mechanical ventilation at the current date to 636 (95% CI: 565-707) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

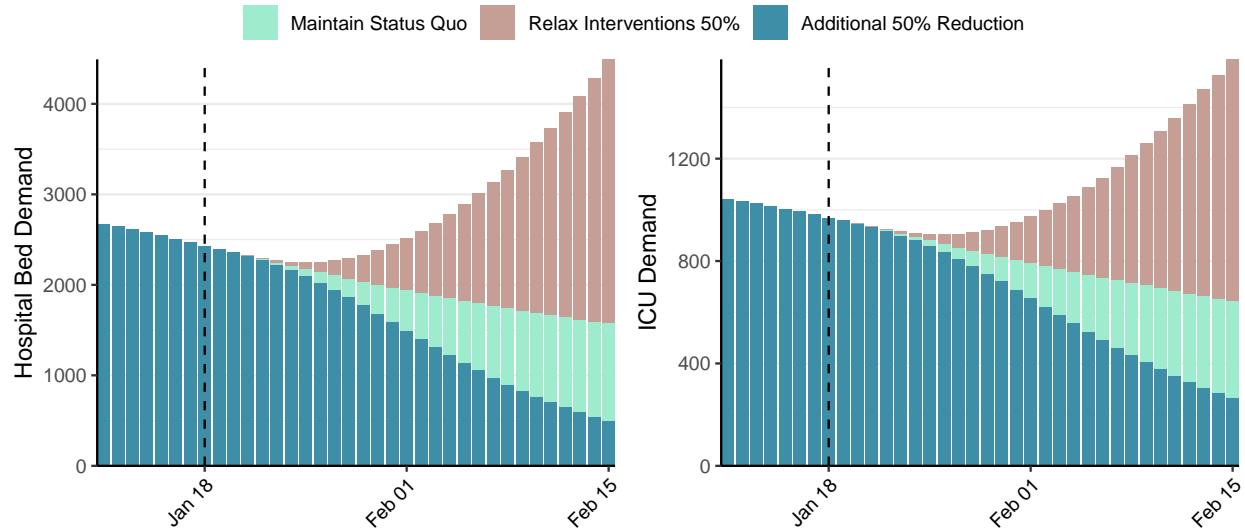


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 20,560 (95% CI: 18,850-22,270) at the current date to 1,223 (95% CI: 1,055-1,392) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 20,560 (95% CI: 18,850-22,270) at the current date to 74,311 (95% CI: 62,455-86,167) by 2021-02-15.

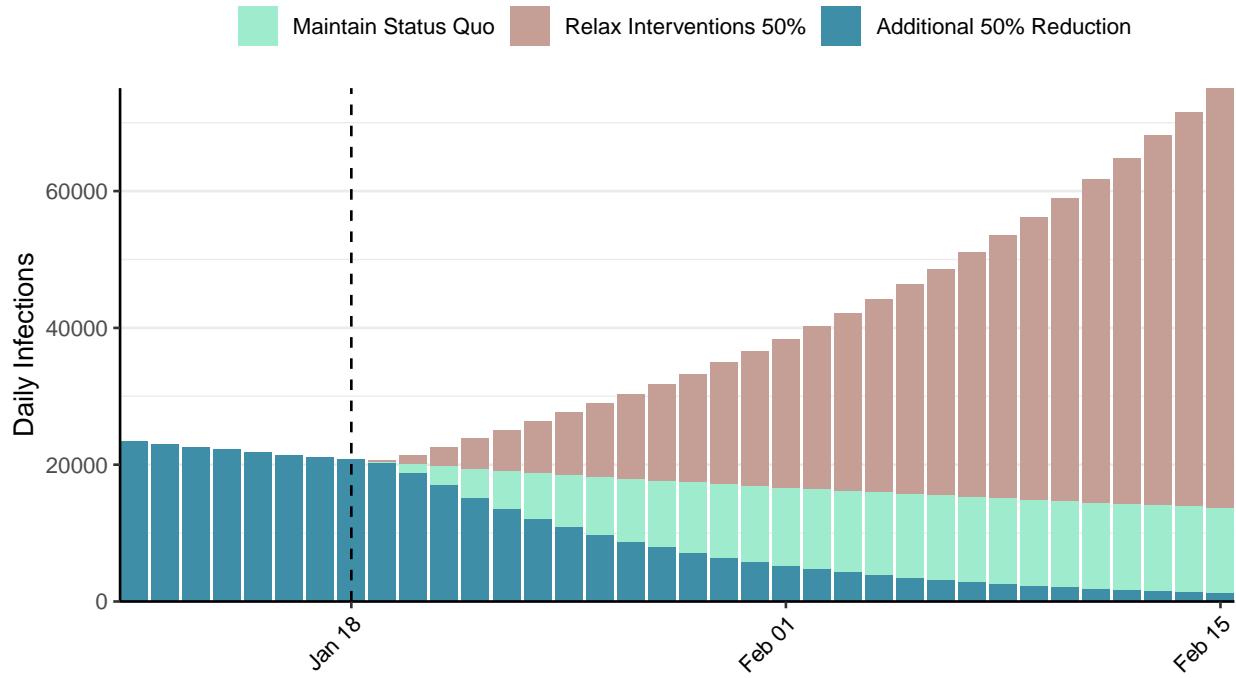


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Eritrea, 2021-01-18

[Download the report for Eritrea, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.87 (95% CI: 1.52-2.29)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Eritrea is not shown in the following plot as only 0 deaths have been reported to date**

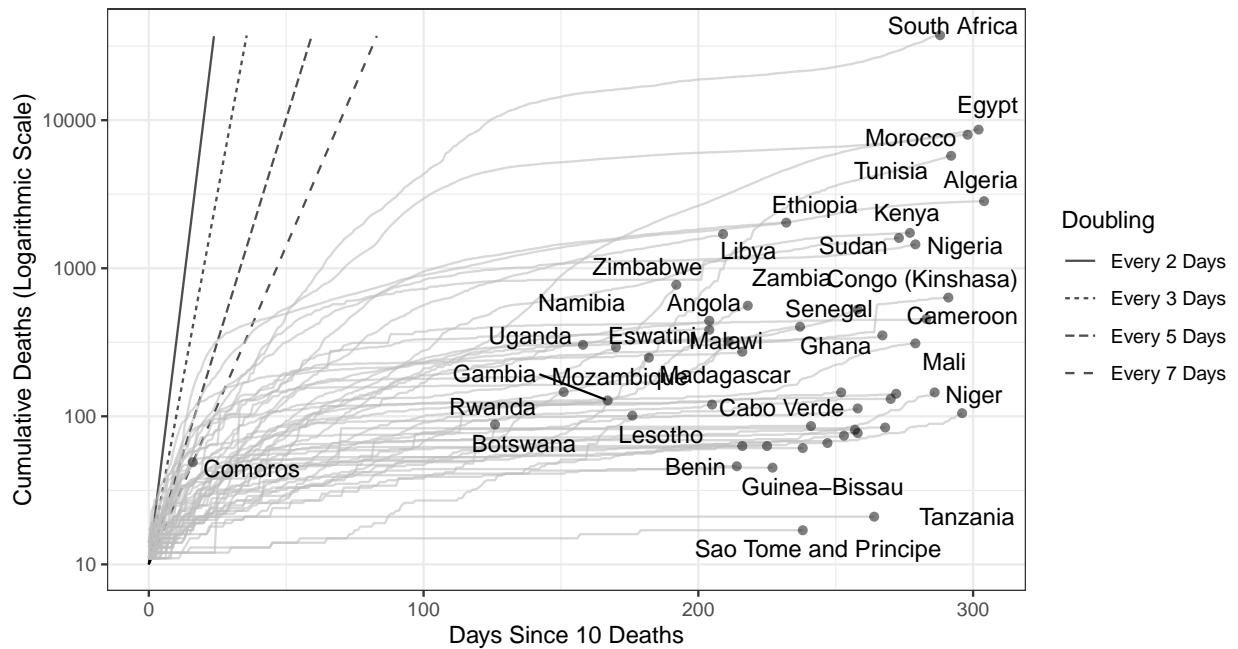


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 13,070 (95% CI: 11,123-15,018) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

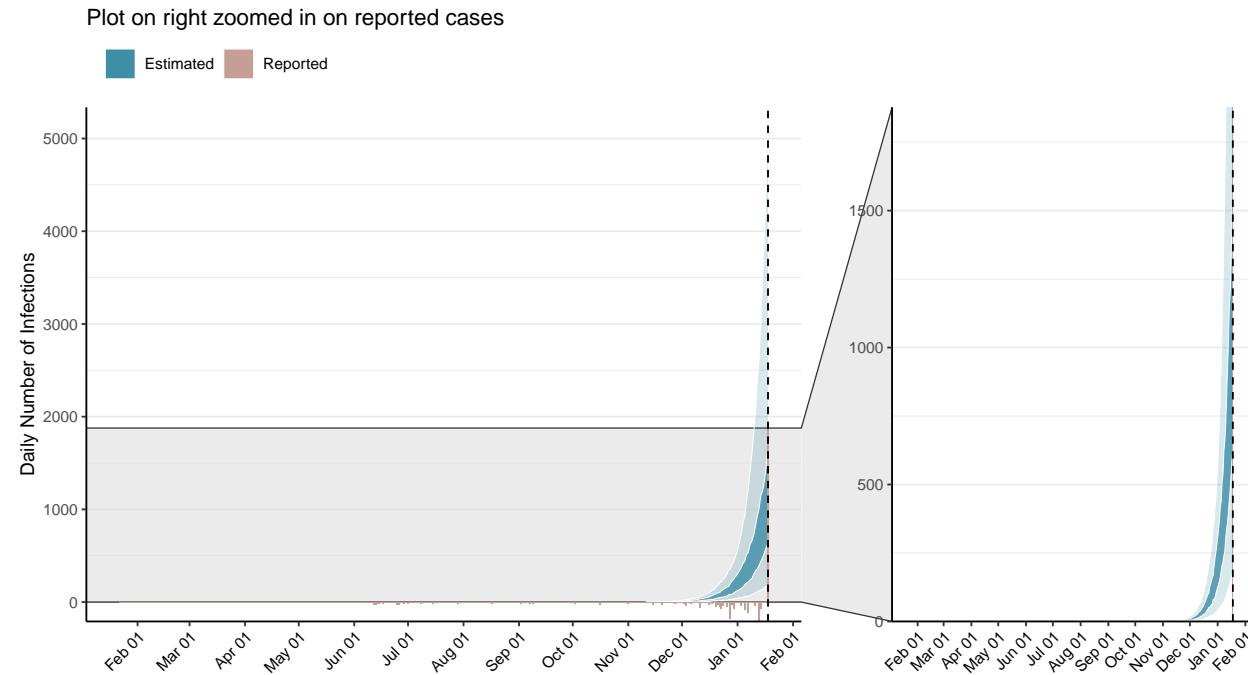


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

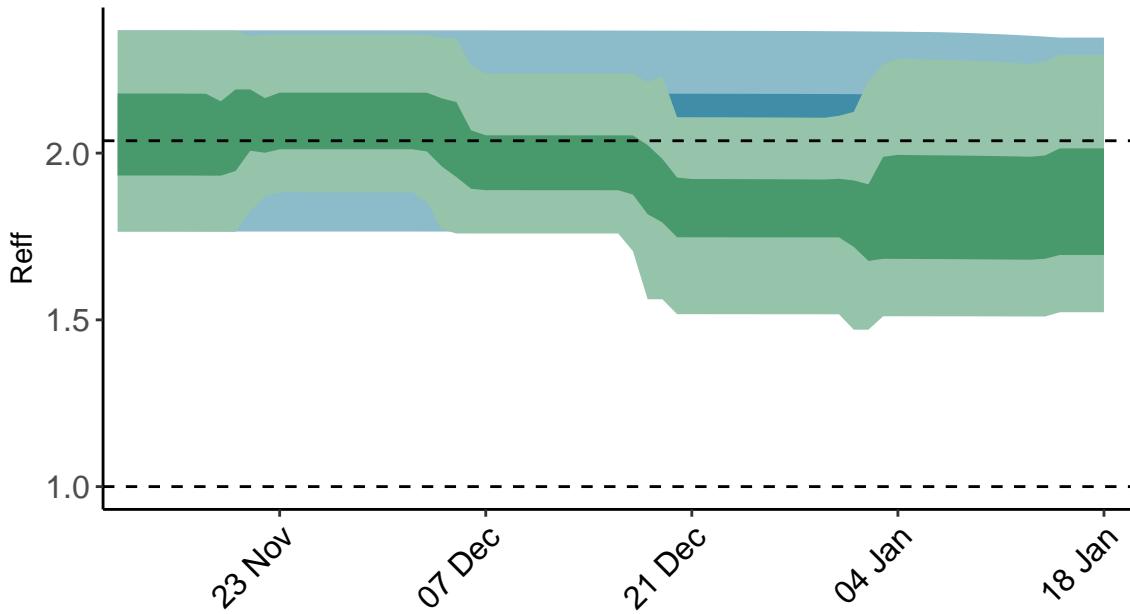


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Eritrea is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

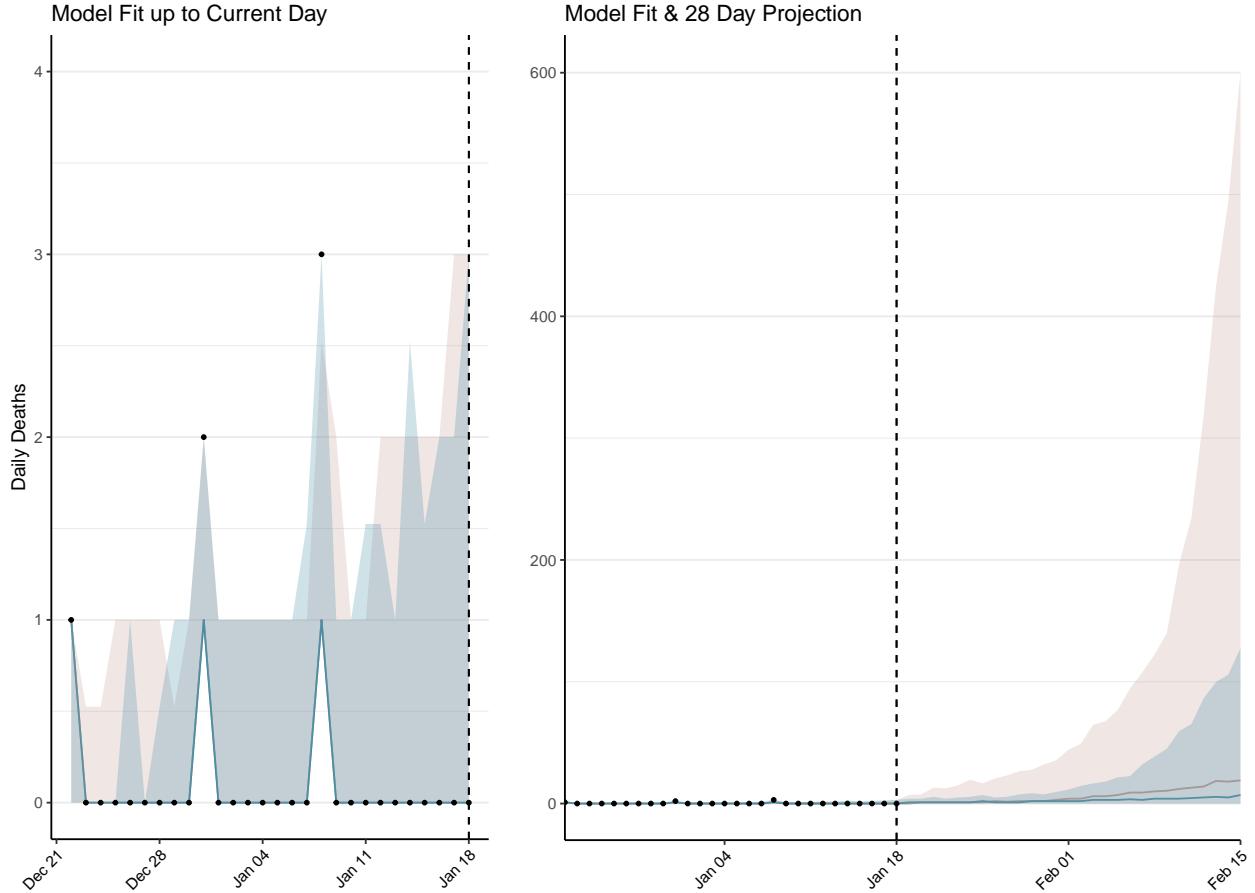


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 44 (95% CI: 37-51) patients requiring treatment with high-pressure oxygen at the current date to 1,062 (95% CI: 758-1,367) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 15 (95% CI: 13-17) patients requiring treatment with mechanical ventilation at the current date to 104 (95% CI: 80-129) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

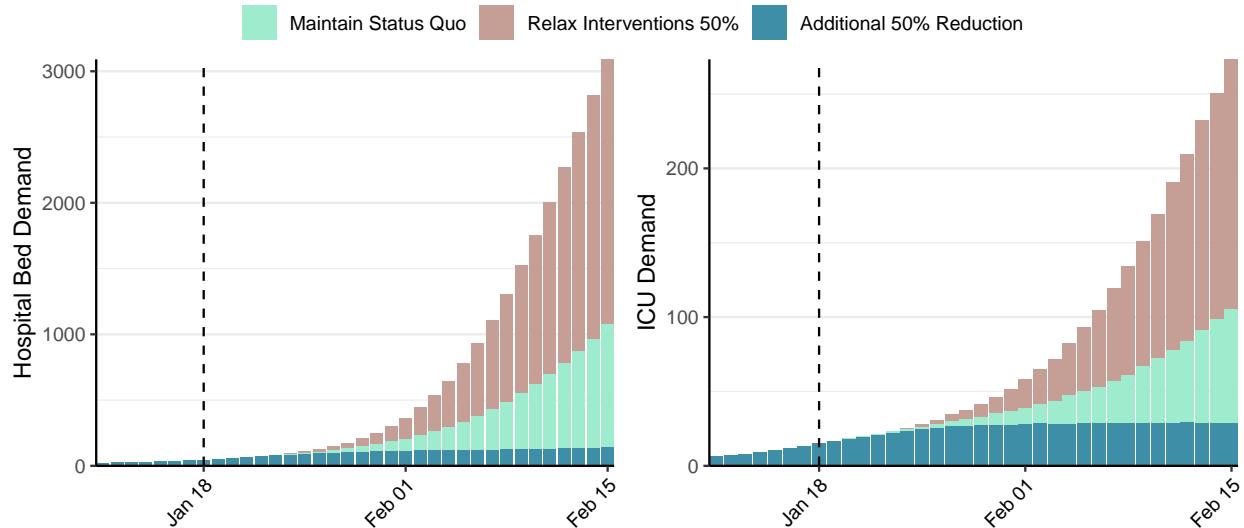


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 1,409 (95% CI: 1,165-1,653) at the current date to 2,157 (95% CI: 1,249-3,066) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,409 (95% CI: 1,165-1,653) at the current date to 101,031 (95% CI: 82,002-120,061) by 2021-02-15.

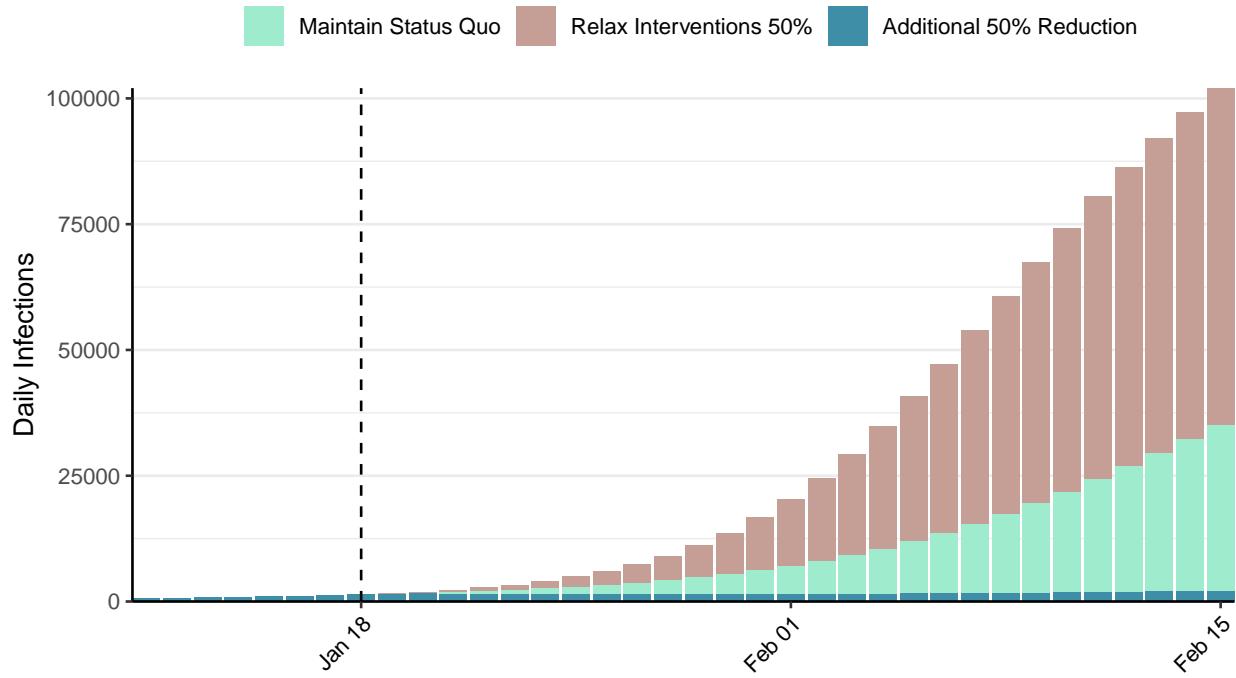


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Ethiopia, 2021-01-18

[Download the report for Ethiopia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.04 (95% CI: 0.9-1.16)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Ethiopia is not shown in the following plot as only 0 deaths have been reported to date**

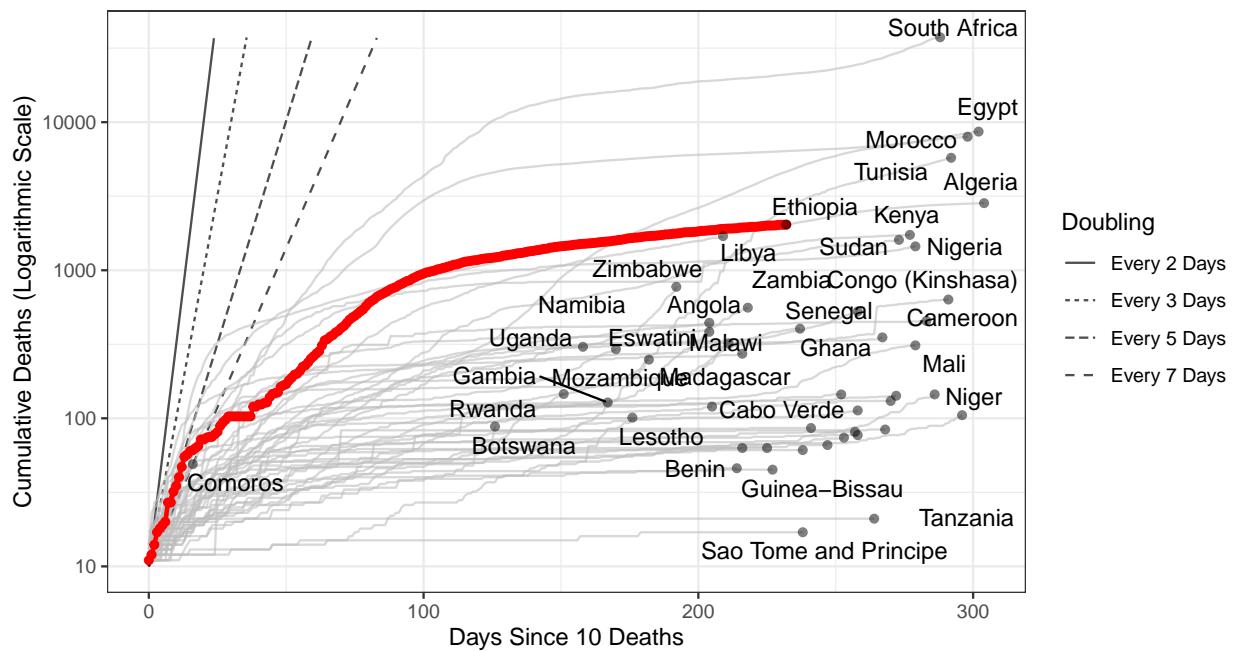


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 148,729 (95% CI: 134,394-163,064) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

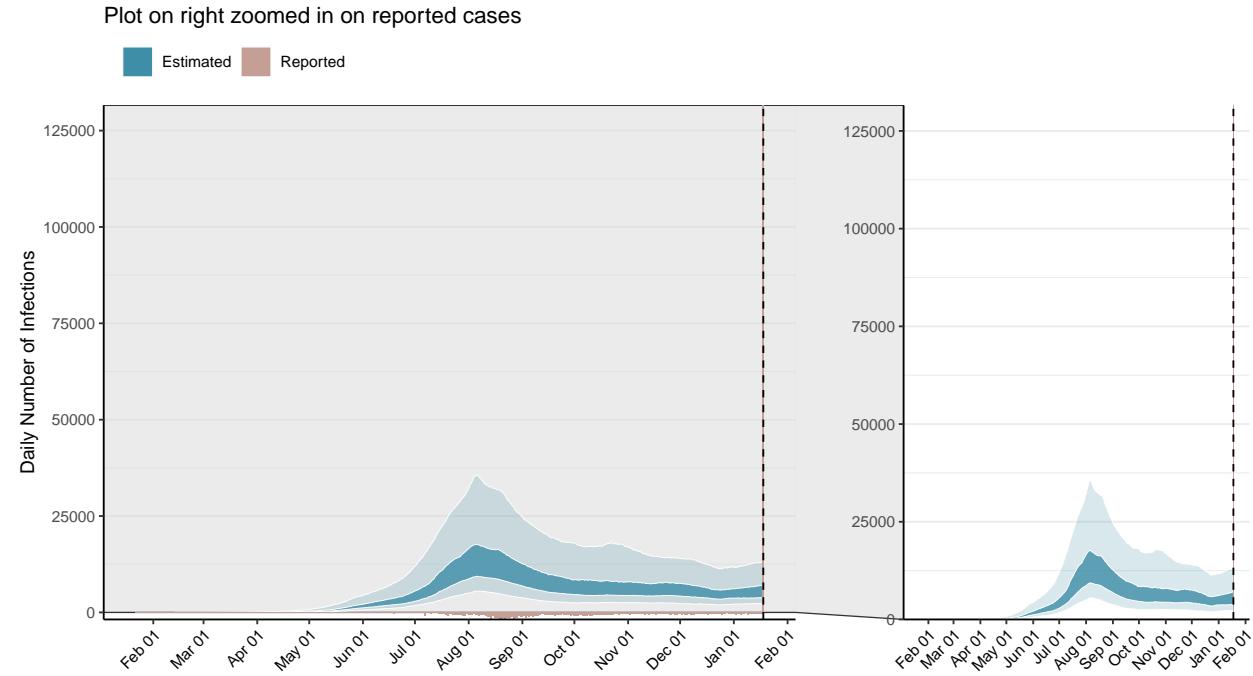


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

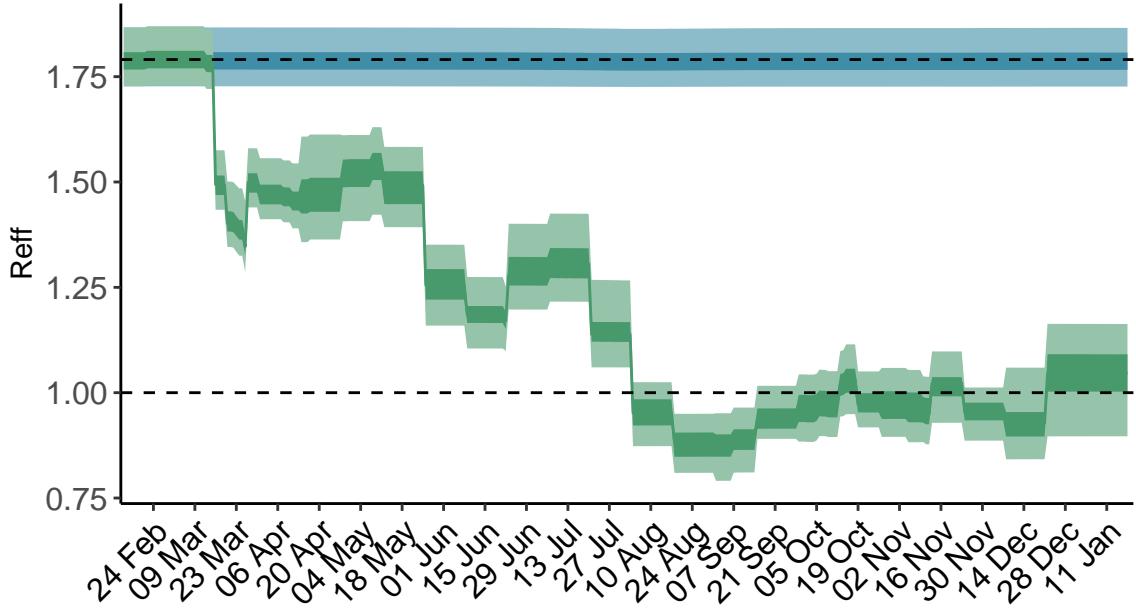


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

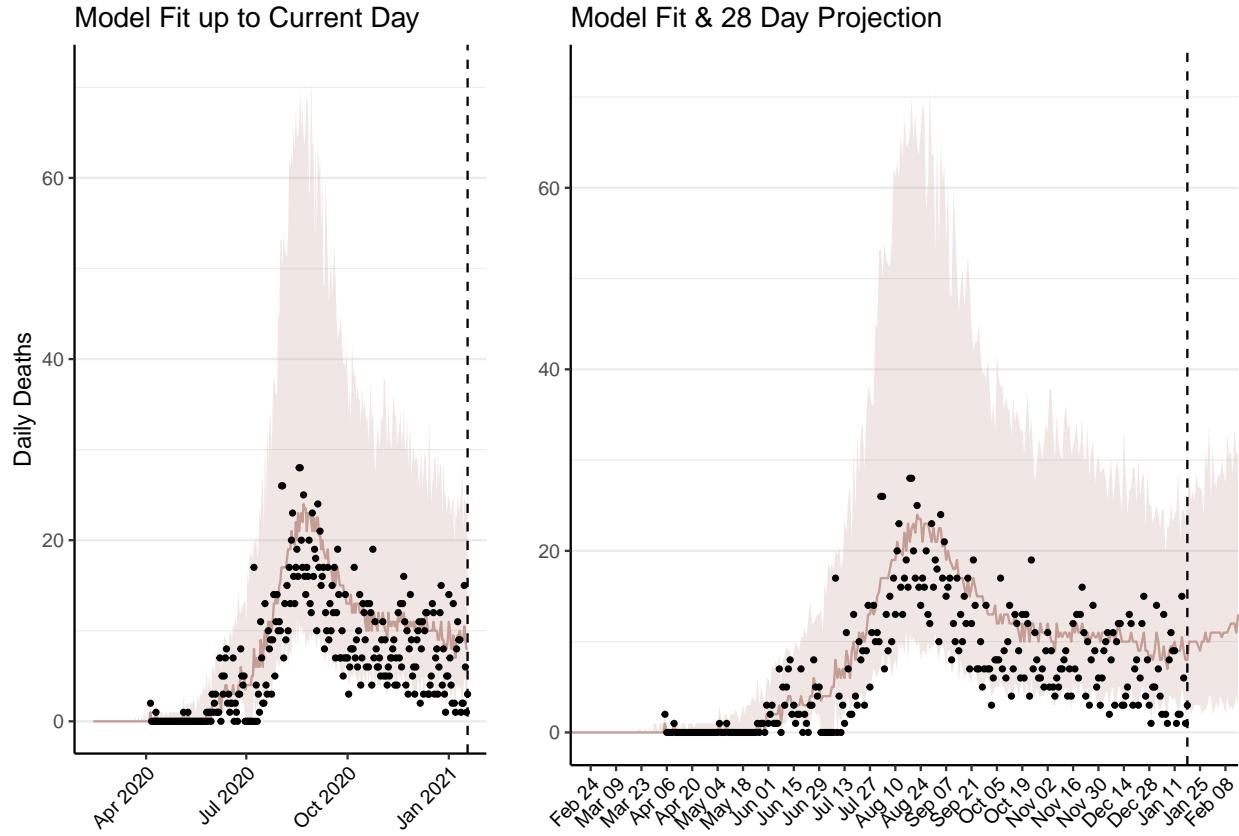


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 446 (95% CI: 404-489) patients requiring treatment with high-pressure oxygen at the current date to 570 (95% CI: 501-638) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 170 (95% CI: 153-186) patients requiring treatment with mechanical ventilation at the current date to 214 (95% CI: 189-239) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

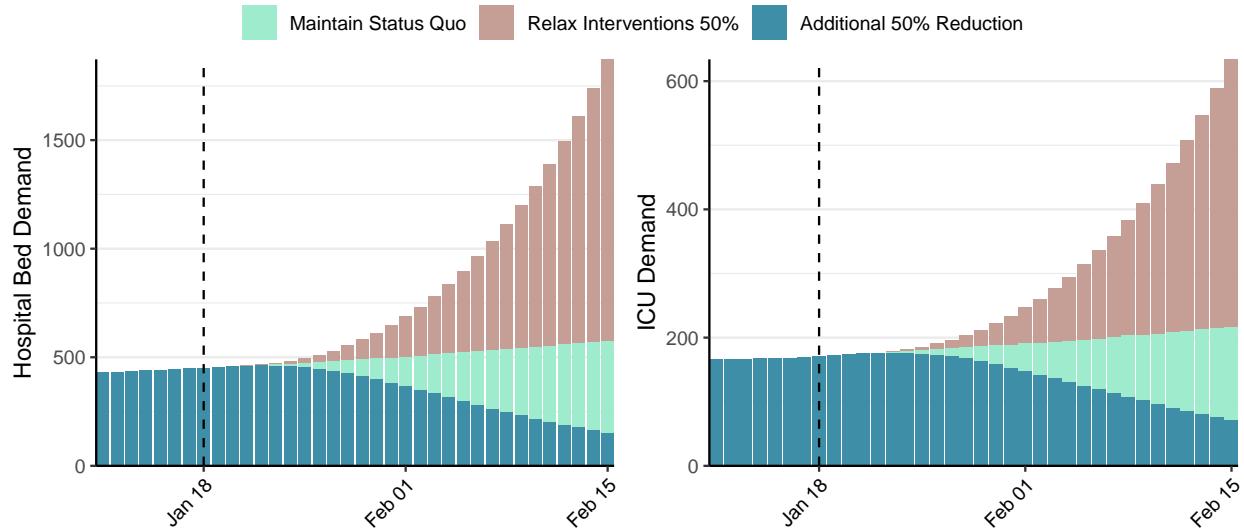


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 5,876 (95% CI: 5,267-6,485) at the current date to 601 (95% CI: 526-675) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 5,876 (95% CI: 5,267-6,485) at the current date to 46,647 (95% CI: 40,473-52,822) by 2021-02-15.

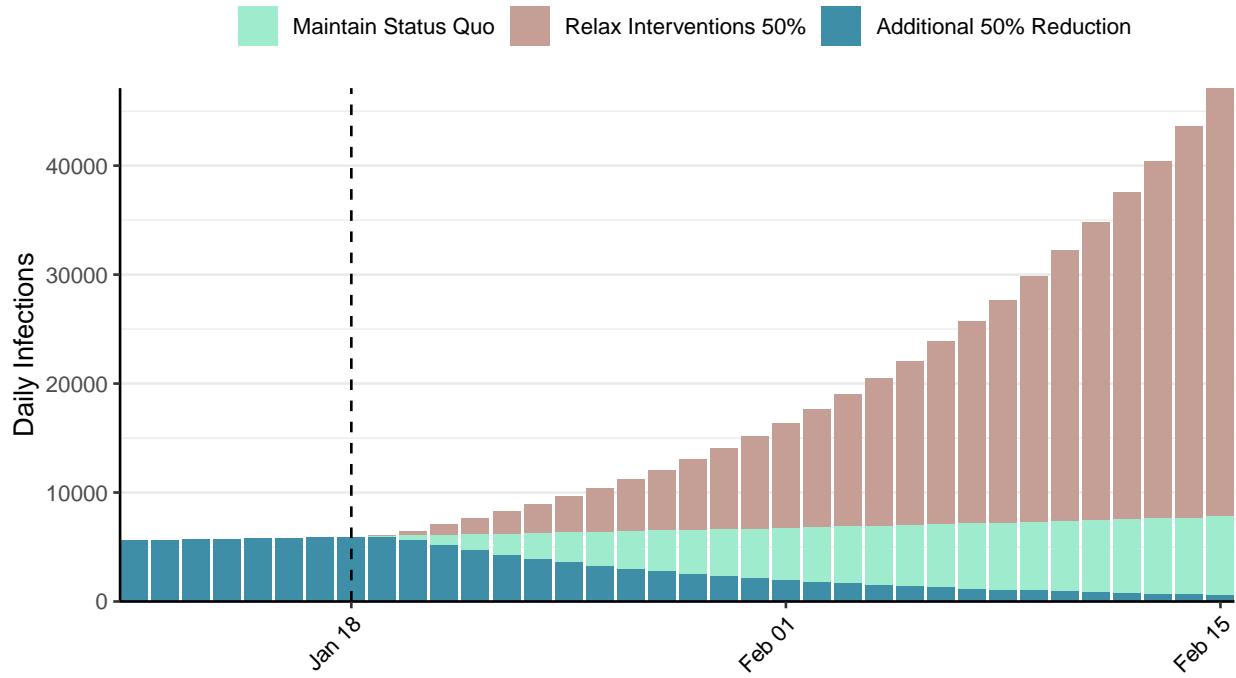


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Fiji, 2021-01-18

[Download the report for Fiji, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.82 (95% CI: 0.48-1.27)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Fiji is not shown in the following plot as only 0 deaths have been reported to date**

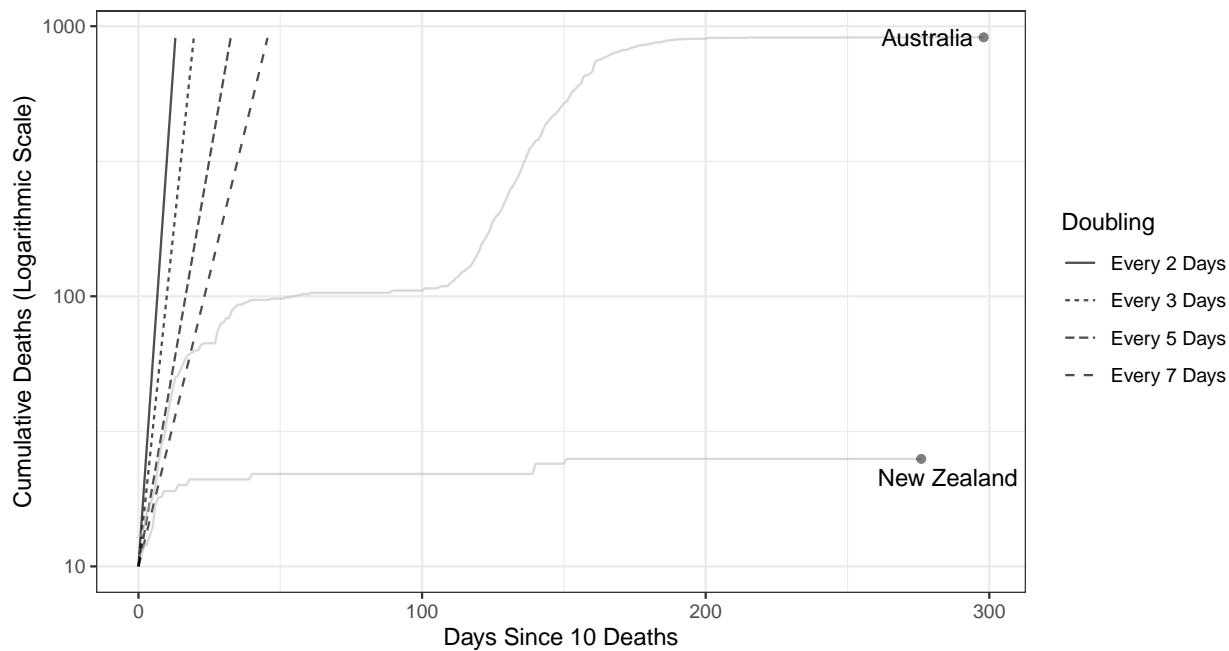


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 14 (95% CI: 5-23) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

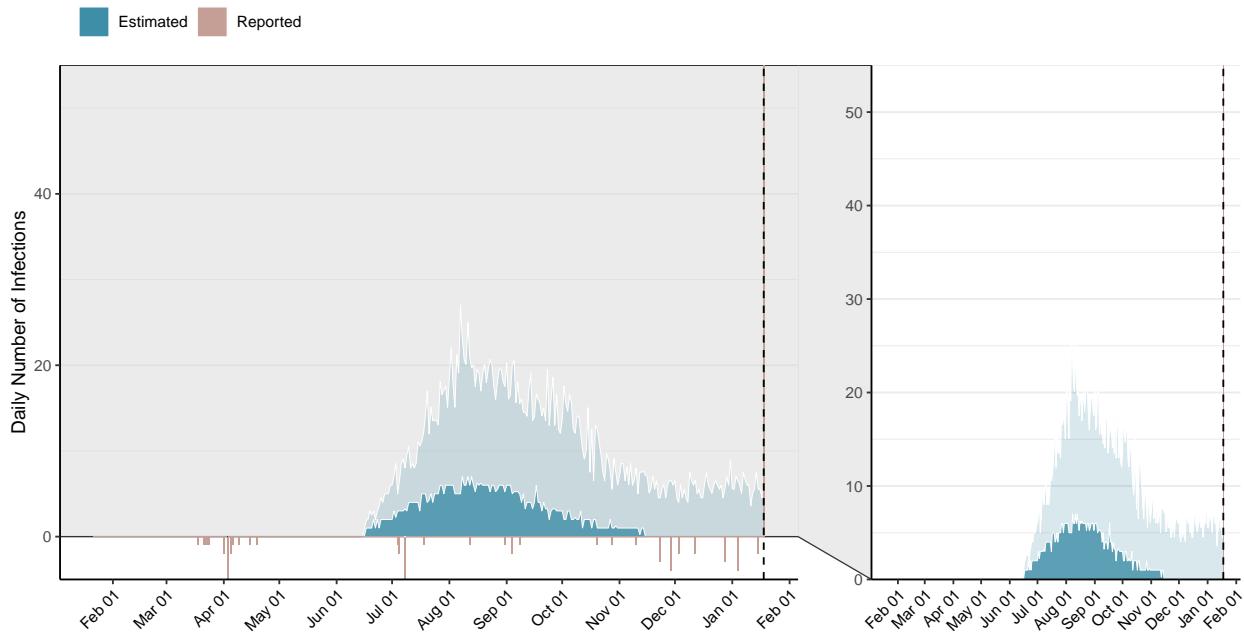


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

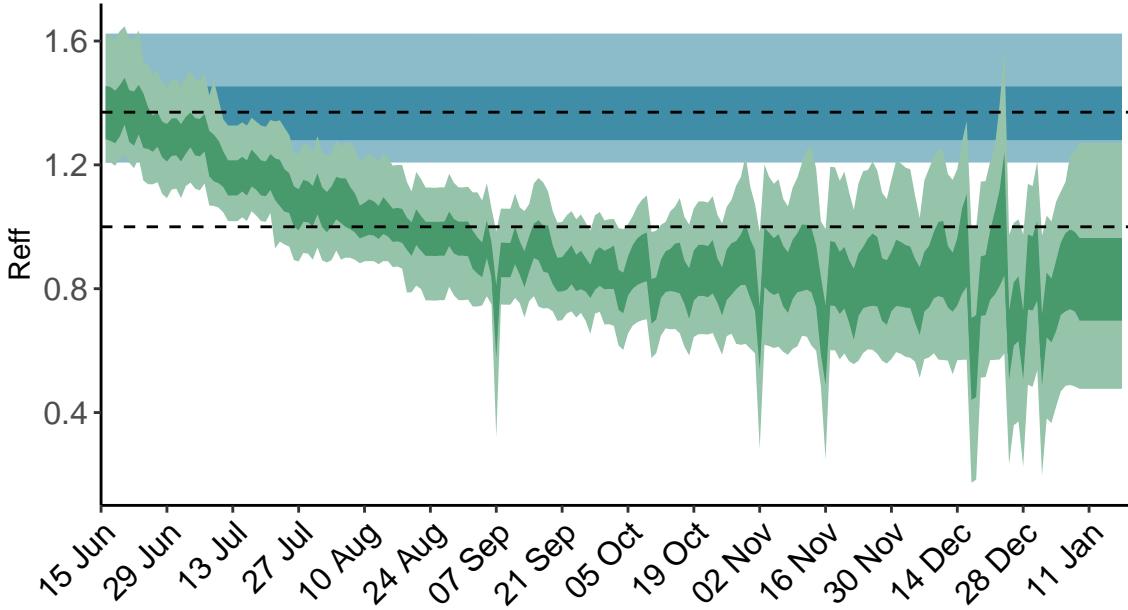


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

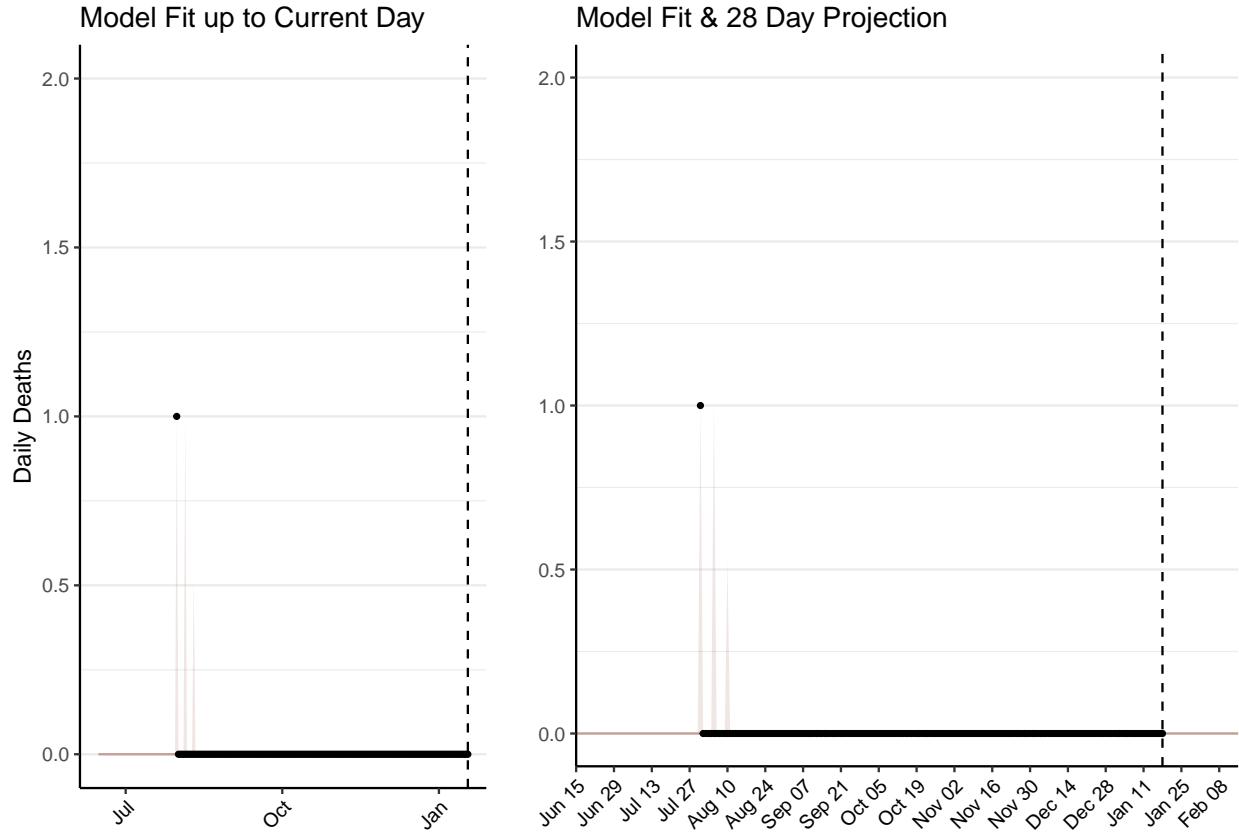


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 0 (95% CI: 0-0) patients requiring treatment with high-pressure oxygen at the current date to 0 (95% CI: 0-0) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 0 (95% CI: 0-0) patients requiring treatment with mechanical ventilation at the current date to 0 (95% CI: 0-0) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

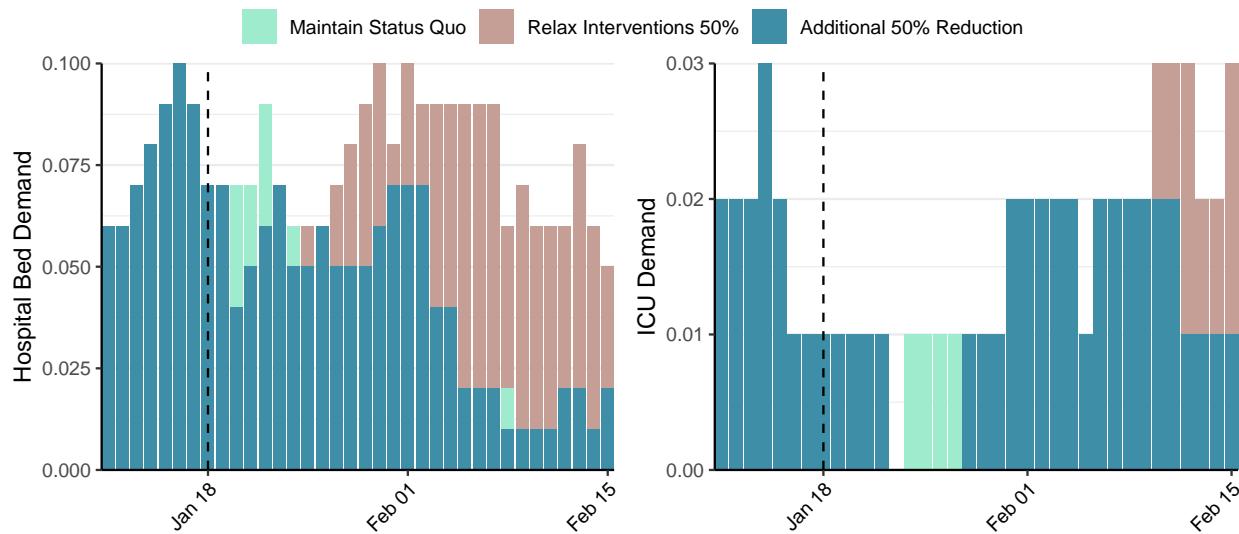


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 0 (95% CI: 0-1) at the current date to 0 (95% CI: 0-0) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 0 (95% CI: 0-1) at the current date to 1 (95% CI: 0-3) by 2021-02-15.

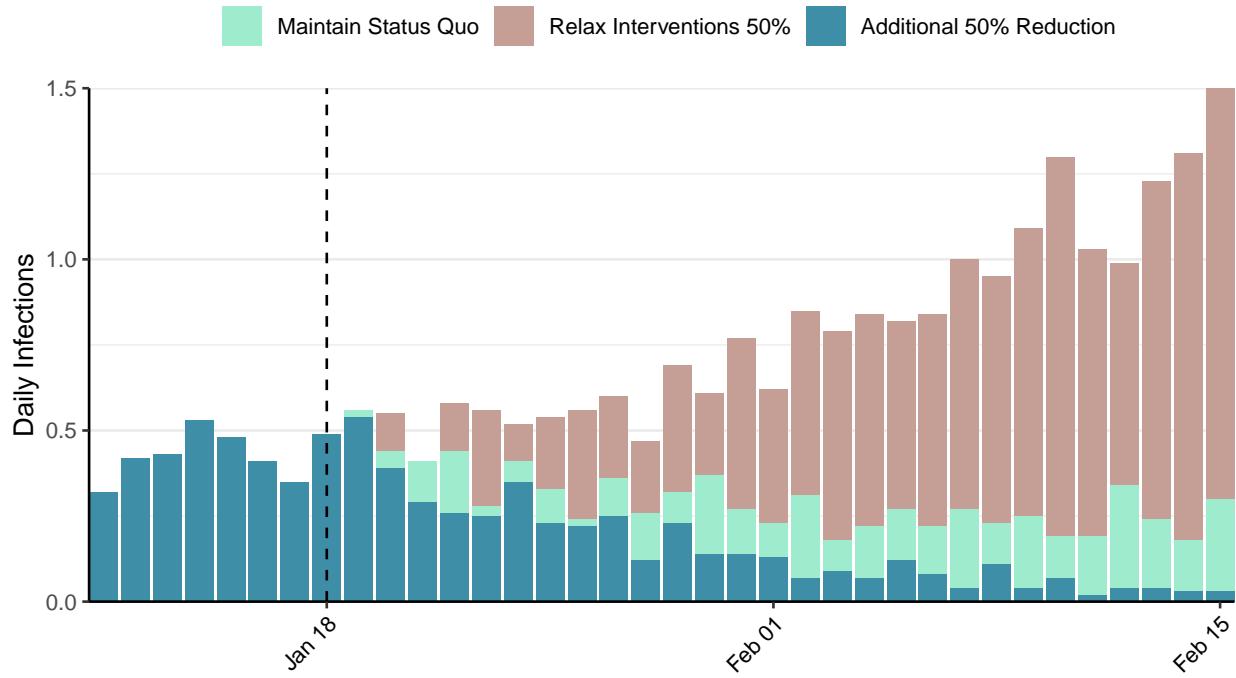


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](#) - <https://covidsim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Gabon, 2021-01-18

[Download the report for Gabon, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.24 (95% CI: 0.93-1.58)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Gabon is not shown in the following plot as only 0 deaths have been reported to date**

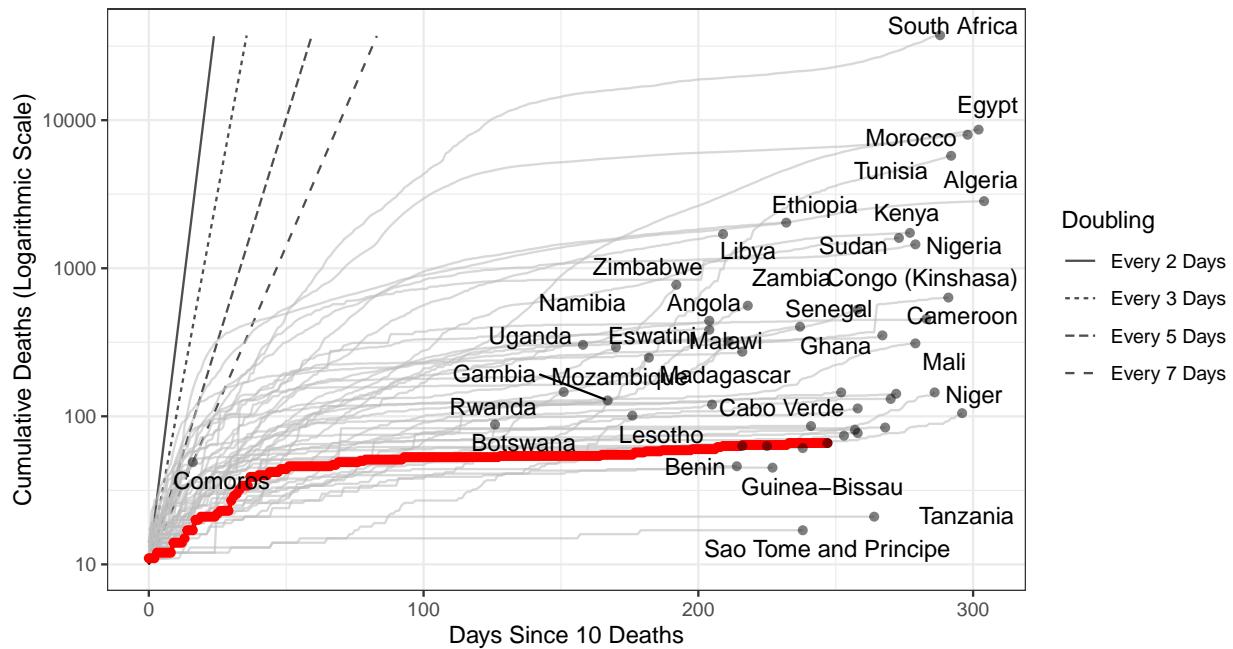


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 4,235 (95% CI: 3,497-4,972) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

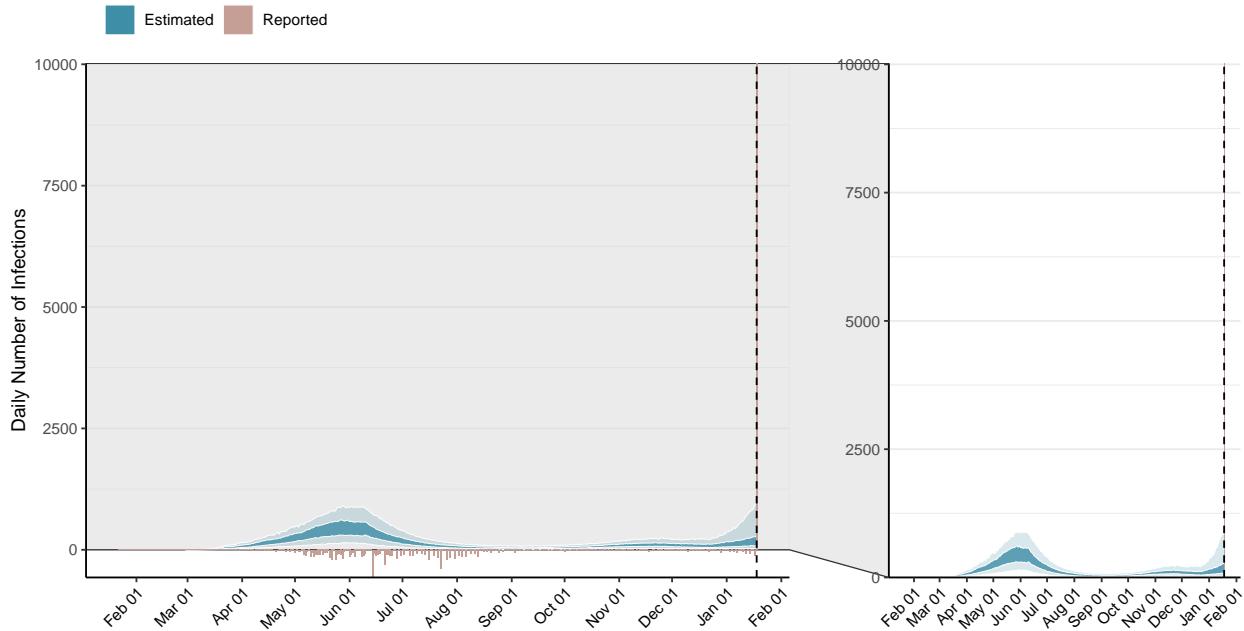


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

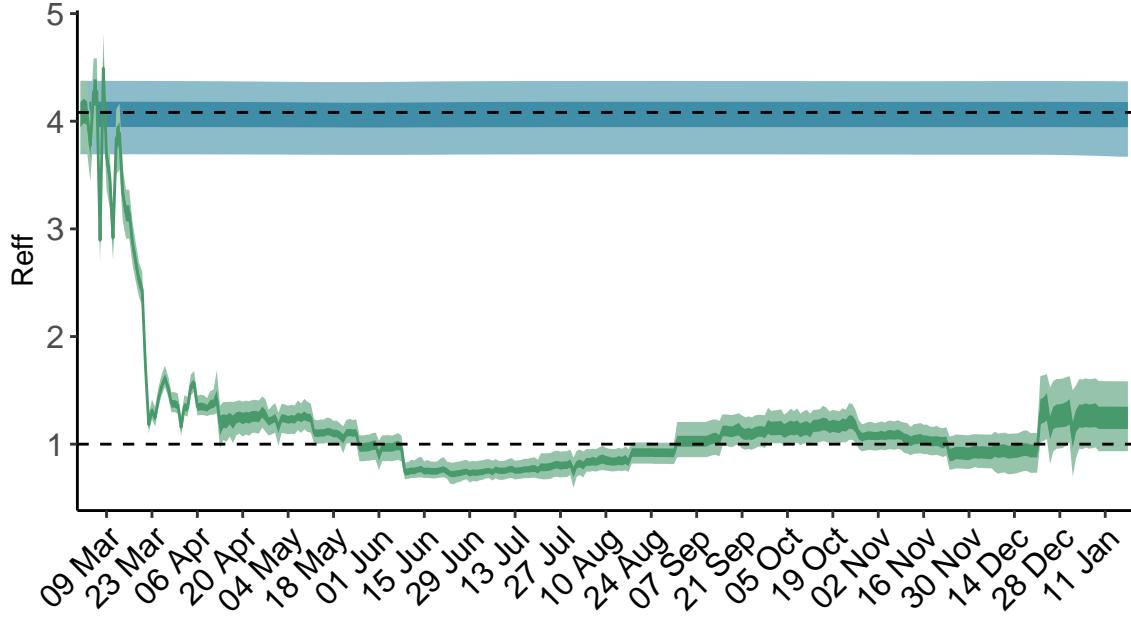


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Gabon is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

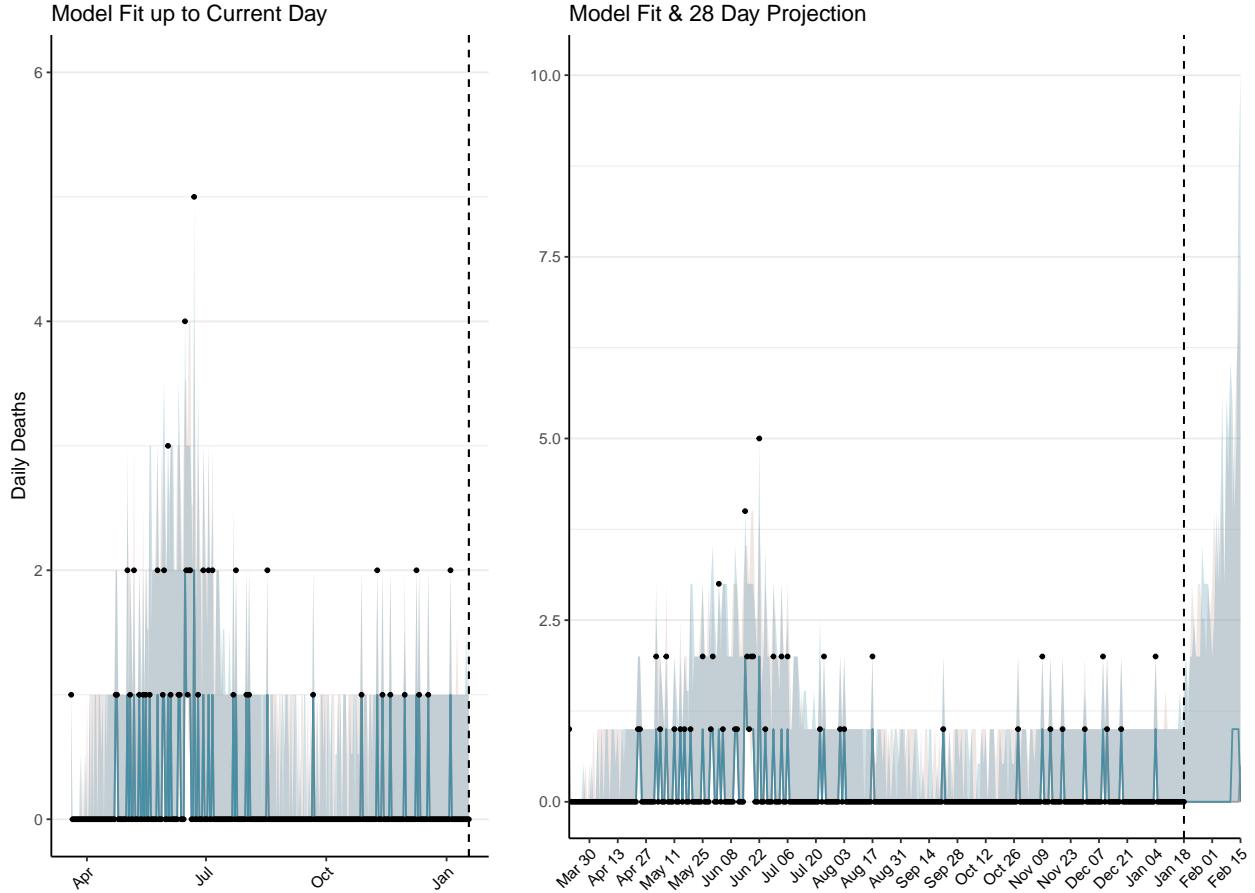


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 13 (95% CI: 11-16) patients requiring treatment with high-pressure oxygen at the current date to 52 (95% CI: 36-67) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 6 (95% CI: 5-7) patients requiring treatment with mechanical ventilation at the current date to 18 (95% CI: 13-24) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

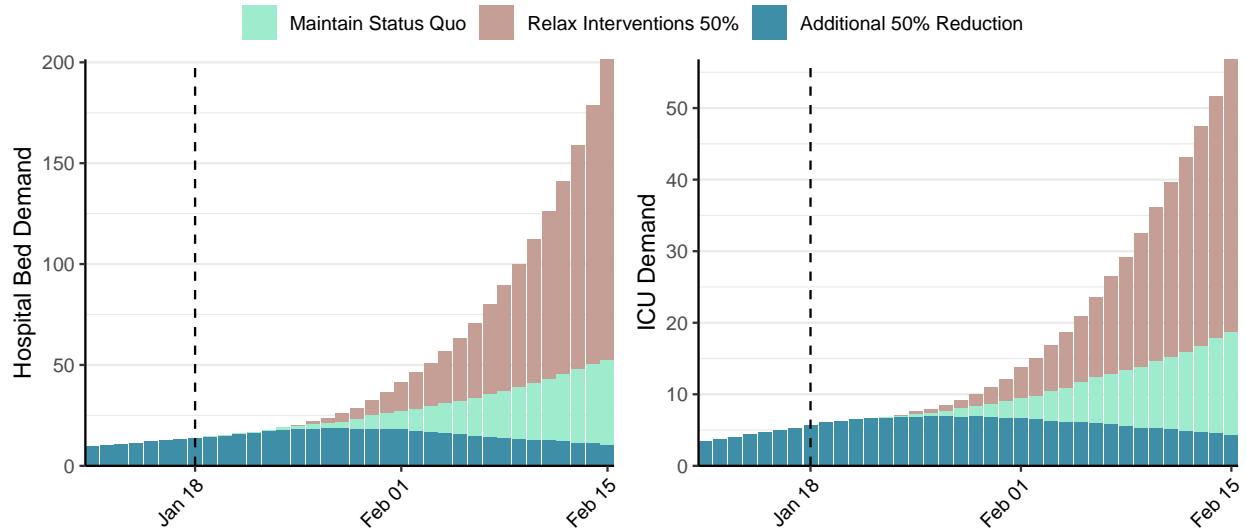


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 256 (95% CI: 201-310) at the current date to 63 (95% CI: 44-82) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 256 (95% CI: 201-310) at the current date to 6,631 (95% CI: 4,634-8,629) by 2021-02-15.

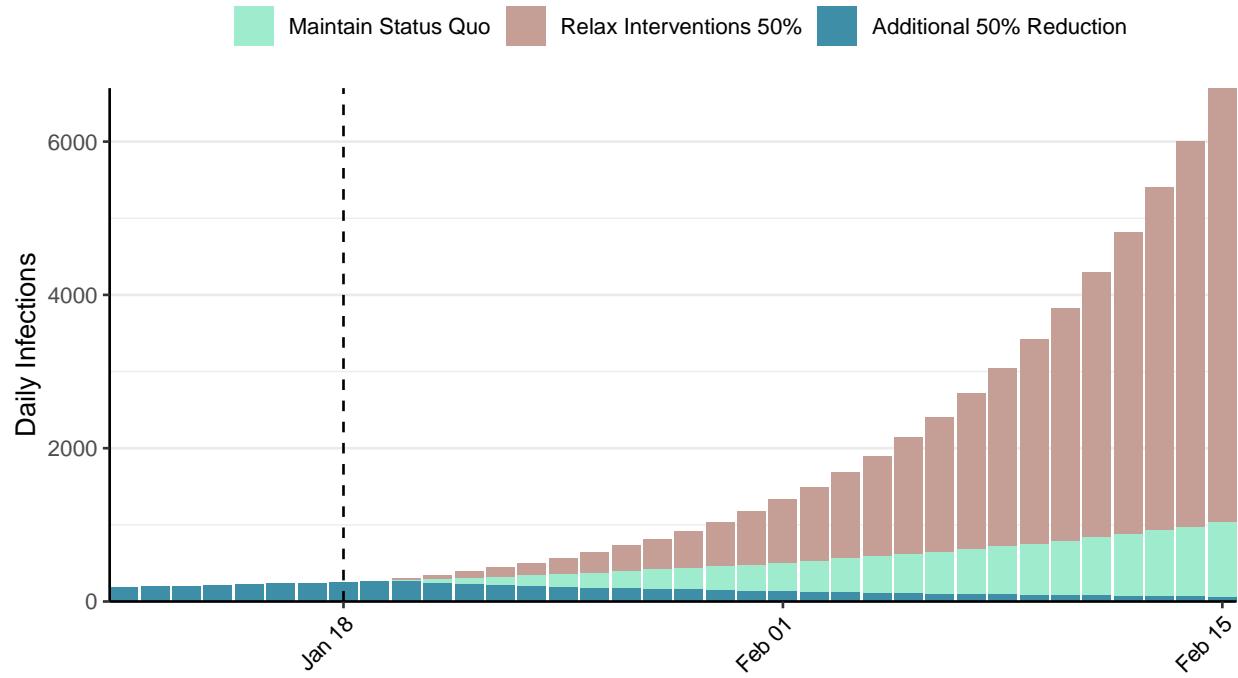


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Georgia, 2021-01-18

[Download the report for Georgia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.81 (95% CI: 0.65-1.05)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Georgia is not shown in the following plot as only 0 deaths have been reported to date**

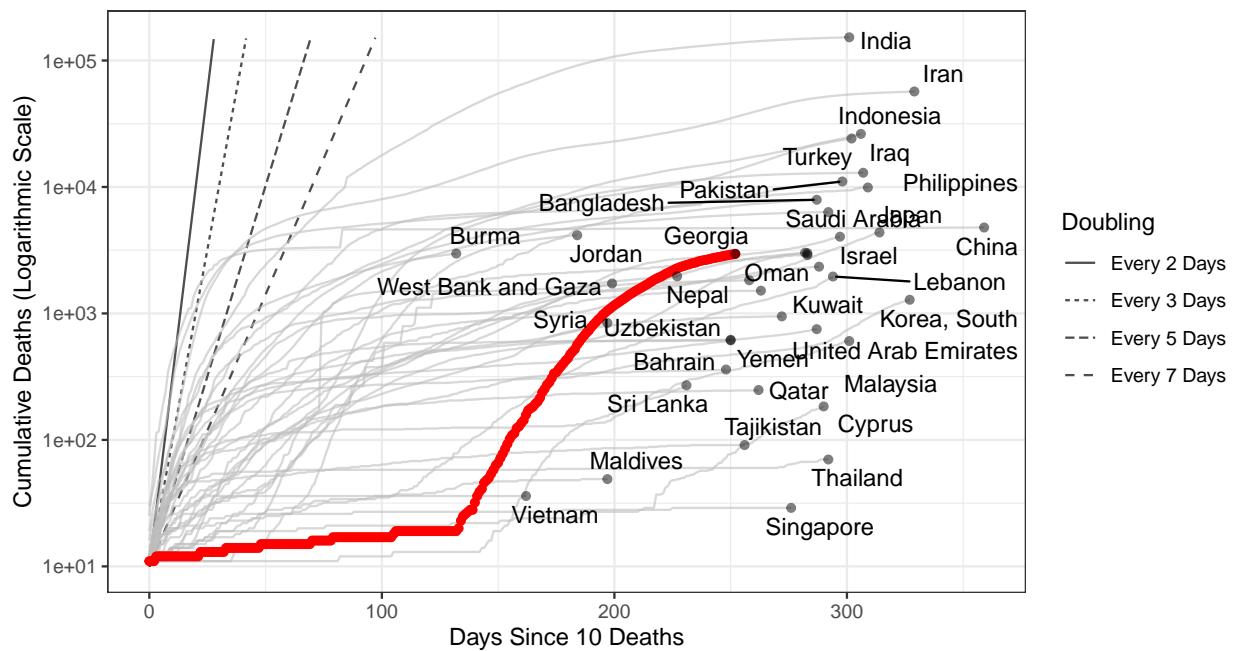


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 124,580 (95% CI: 116,196-132,965) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

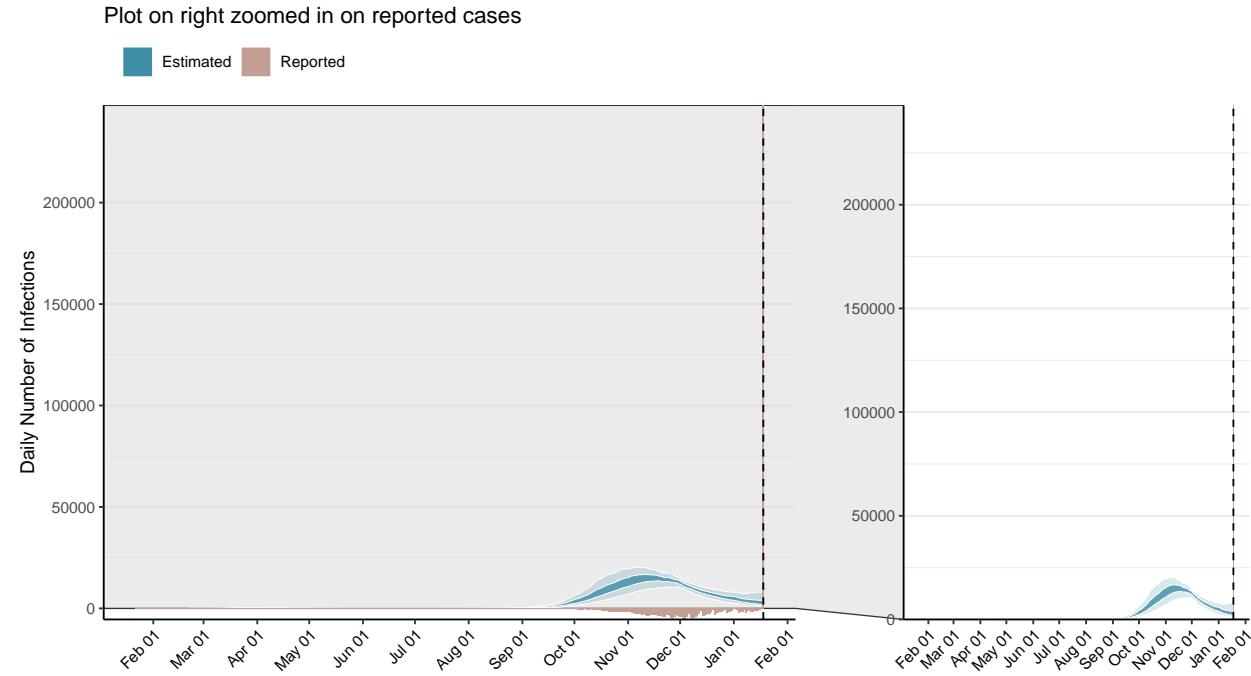


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

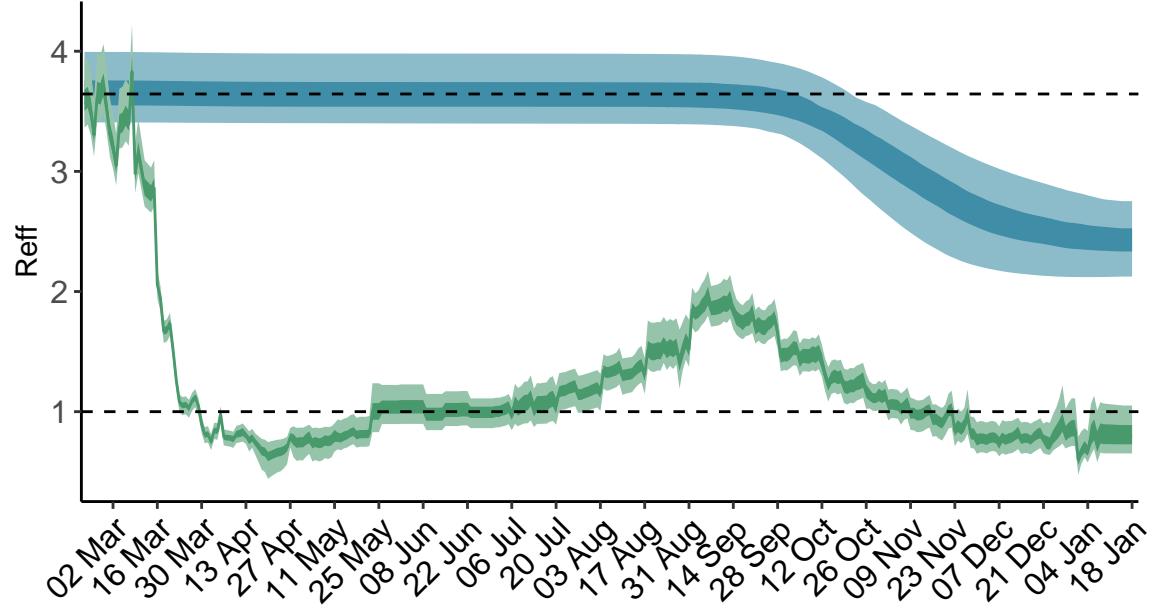


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

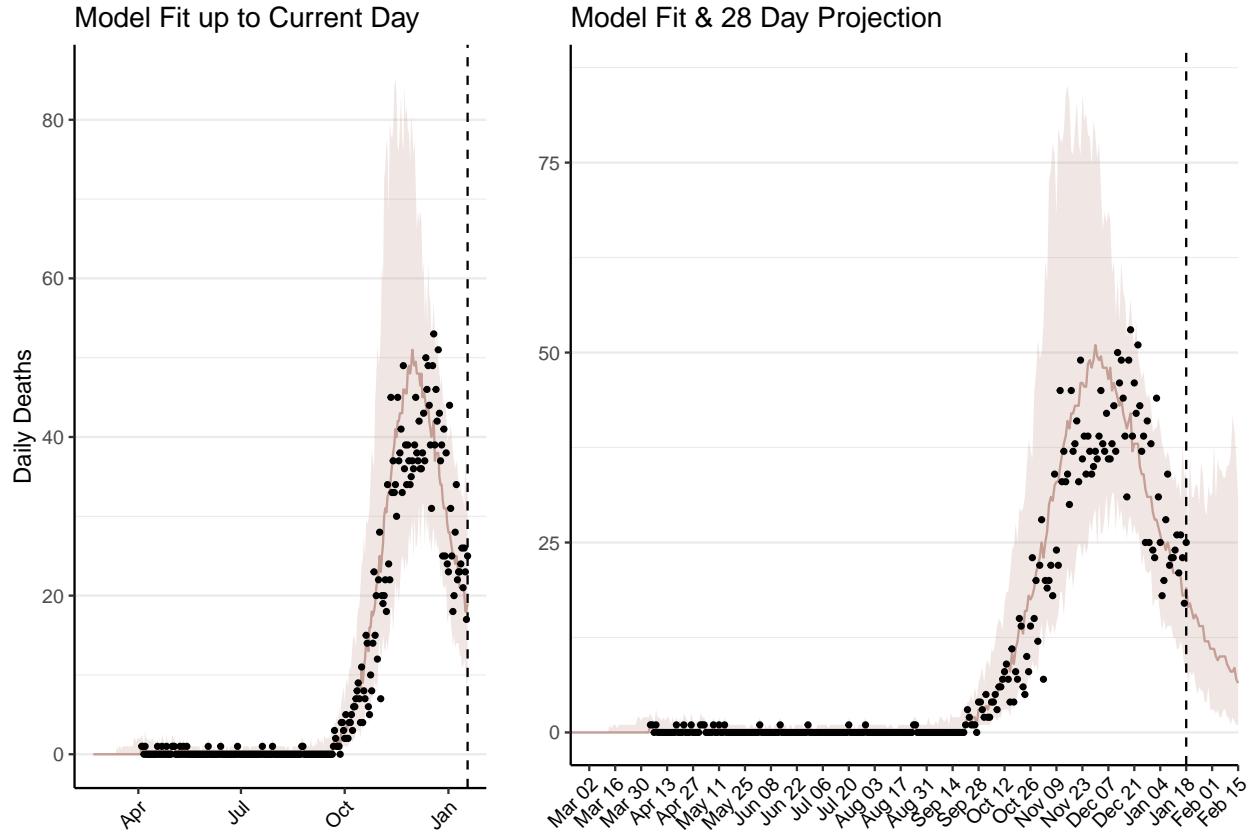


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 592 (95% CI: 551-633) patients requiring treatment with high-pressure oxygen at the current date to 339 (95% CI: 275-403) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 246 (95% CI: 231-260) patients requiring treatment with mechanical ventilation at the current date to 134 (95% CI: 111-157) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

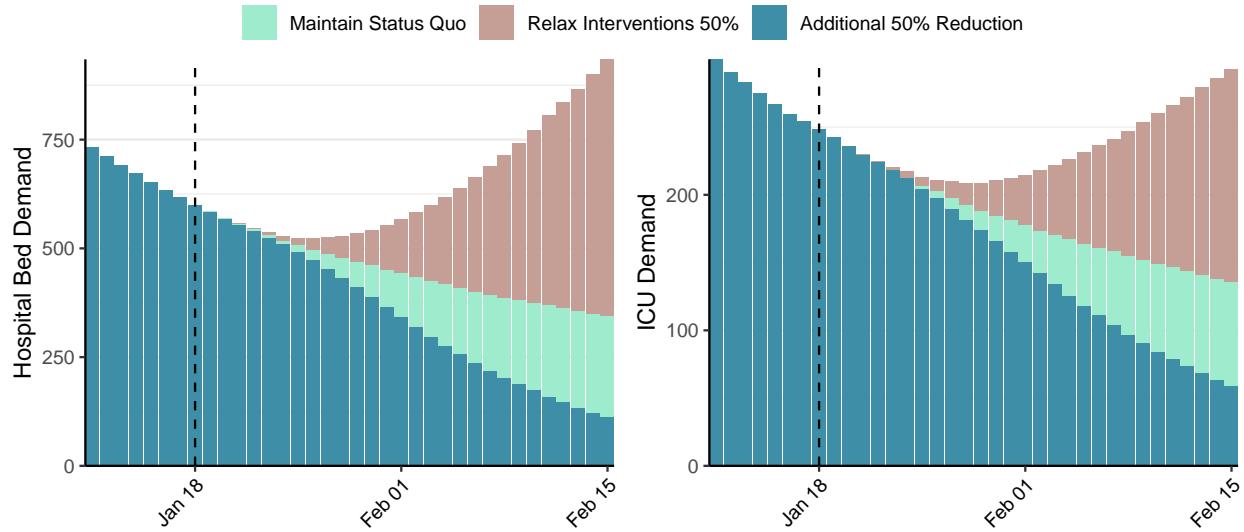


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 3,088 (95% CI: 2,716-3,461) at the current date to 182 (95% CI: 141-223) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,088 (95% CI: 2,716-3,461) at the current date to 8,833 (95% CI: 6,882-10,784) by 2021-02-15.

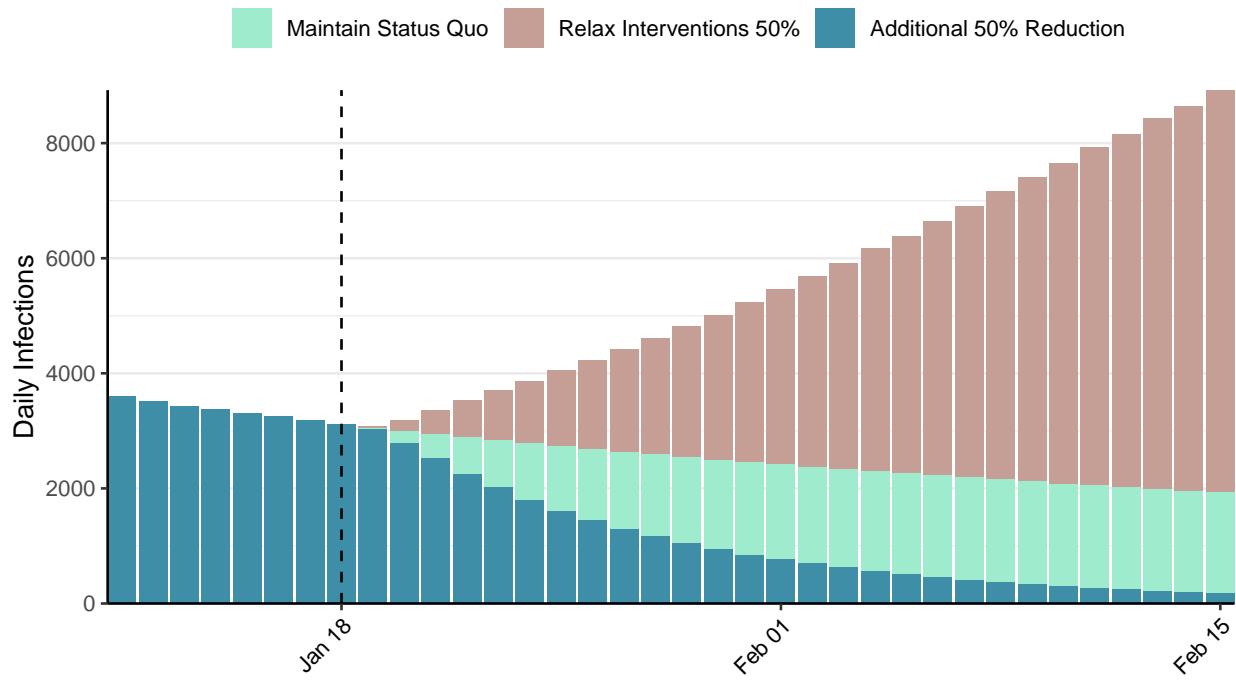


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Ghana, 2021-01-18

[Download the report for Ghana, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.37 (95% CI: 1.16-1.58)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Ghana is not shown in the following plot as only 0 deaths have been reported to date**

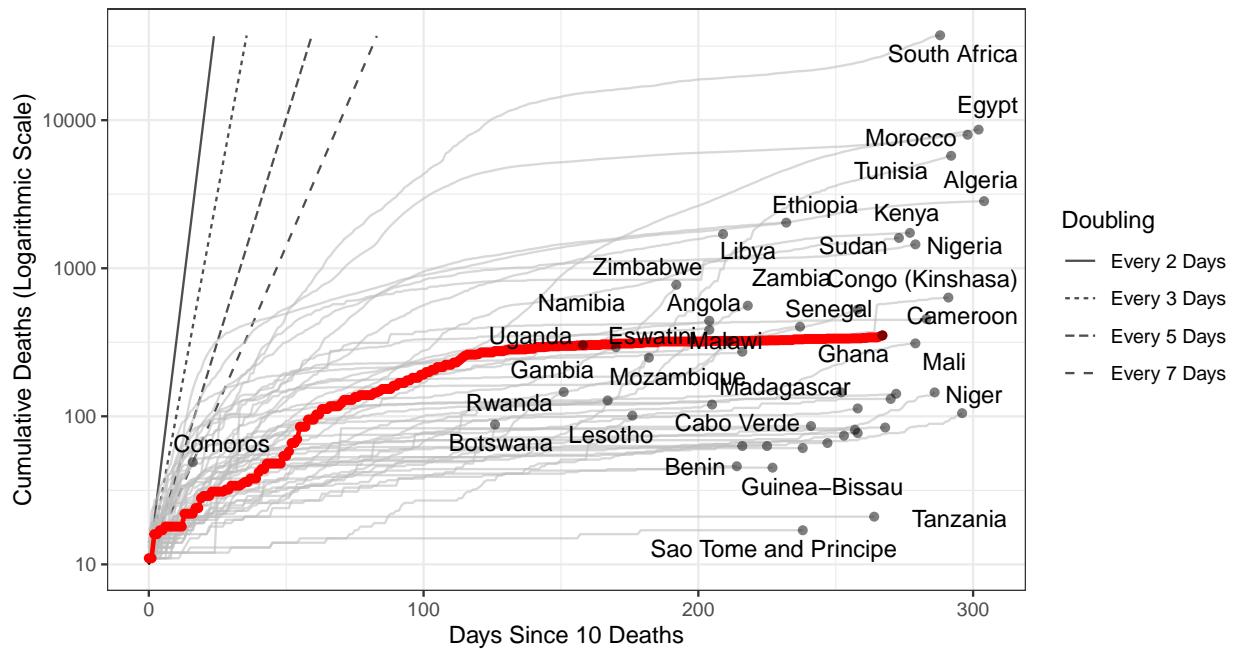


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 44,461 (95% CI: 39,690-49,232) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

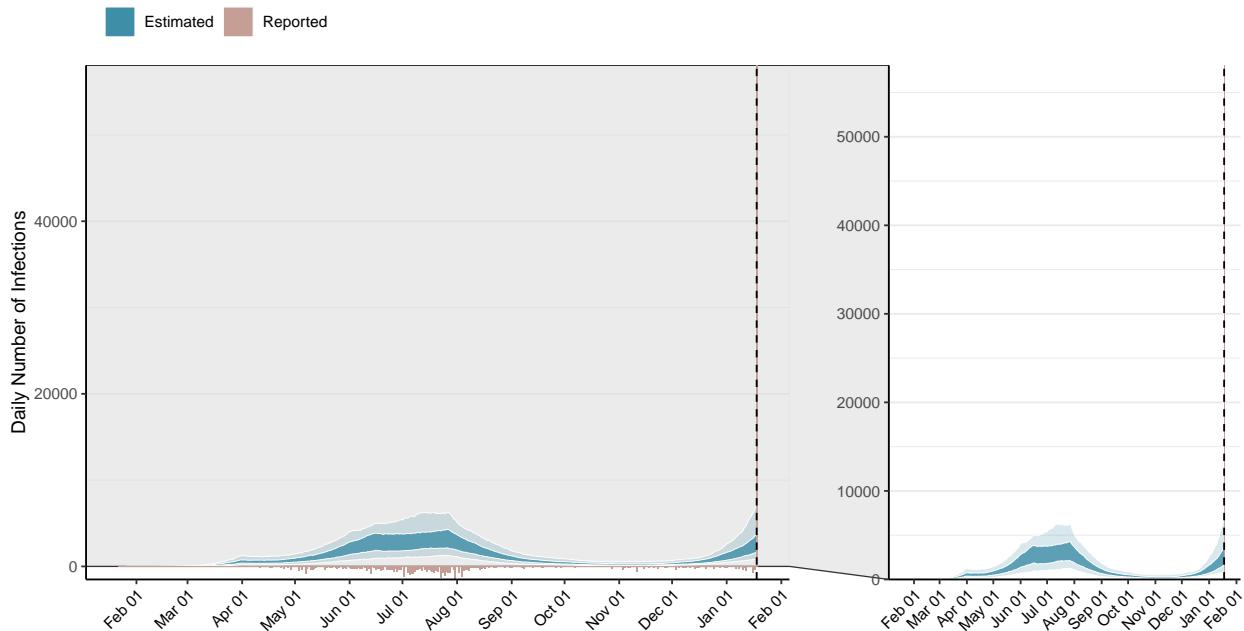


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

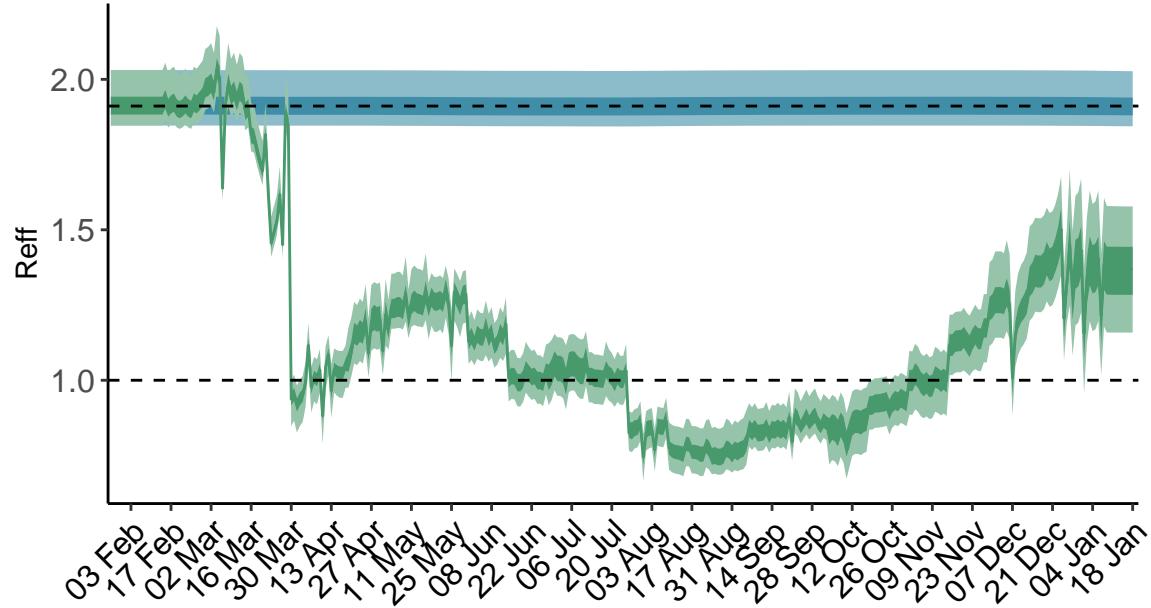


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Ghana is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

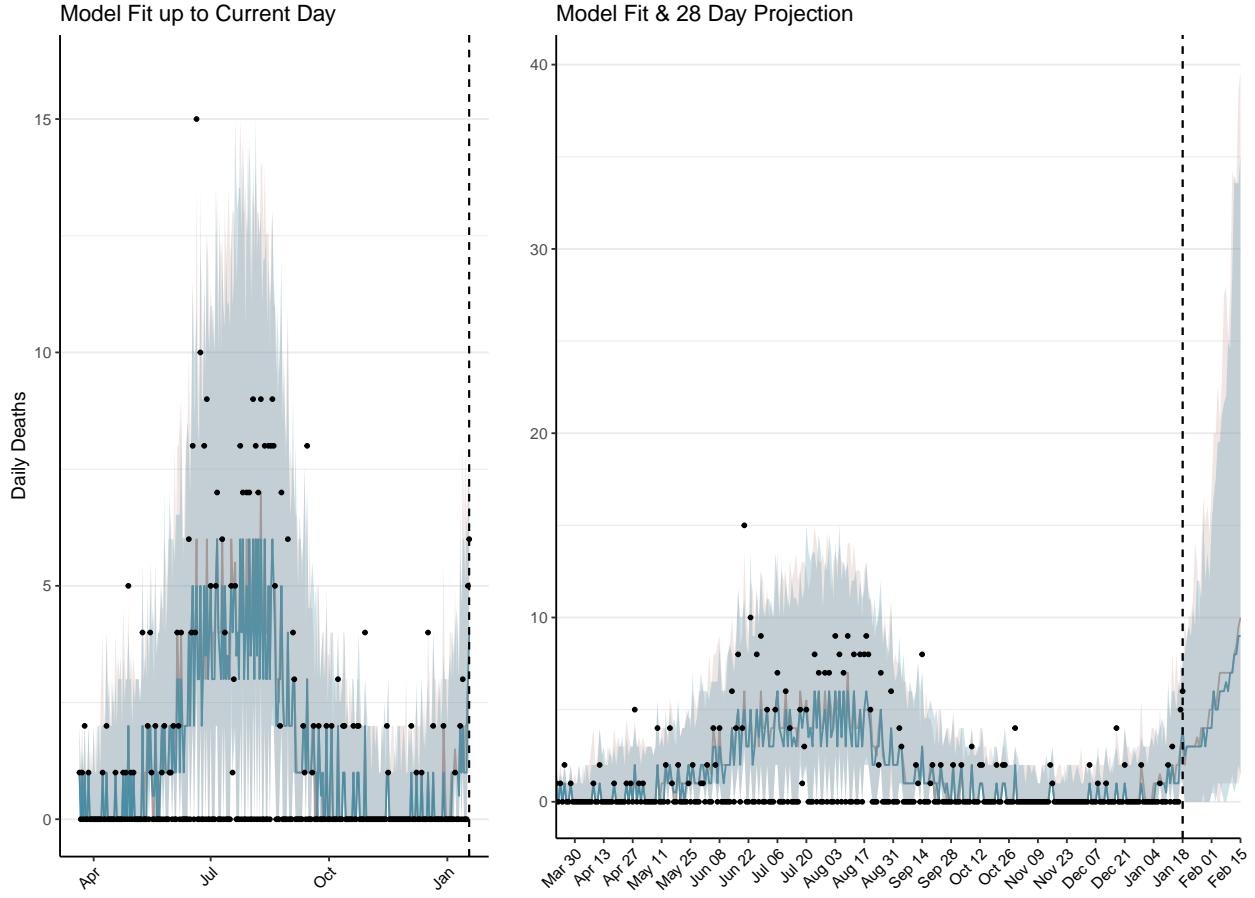


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 142 (95% CI: 127-157) patients requiring treatment with high-pressure oxygen at the current date to 646 (95% CI: 541-752) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 52 (95% CI: 46-58) patients requiring treatment with mechanical ventilation at the current date to 231 (95% CI: 195-267) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

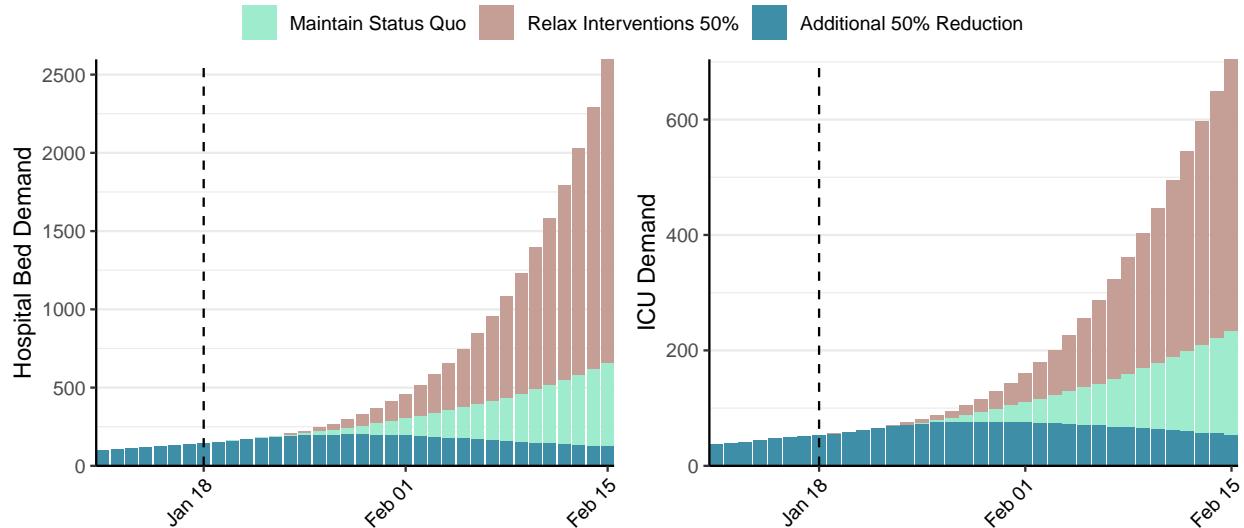


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 2,920 (95% CI: 2,563-3,277) at the current date to 836 (95% CI: 693-978) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,920 (95% CI: 2,563-3,277) at the current date to 94,589 (95% CI: 77,313-111,864) by 2021-02-15.

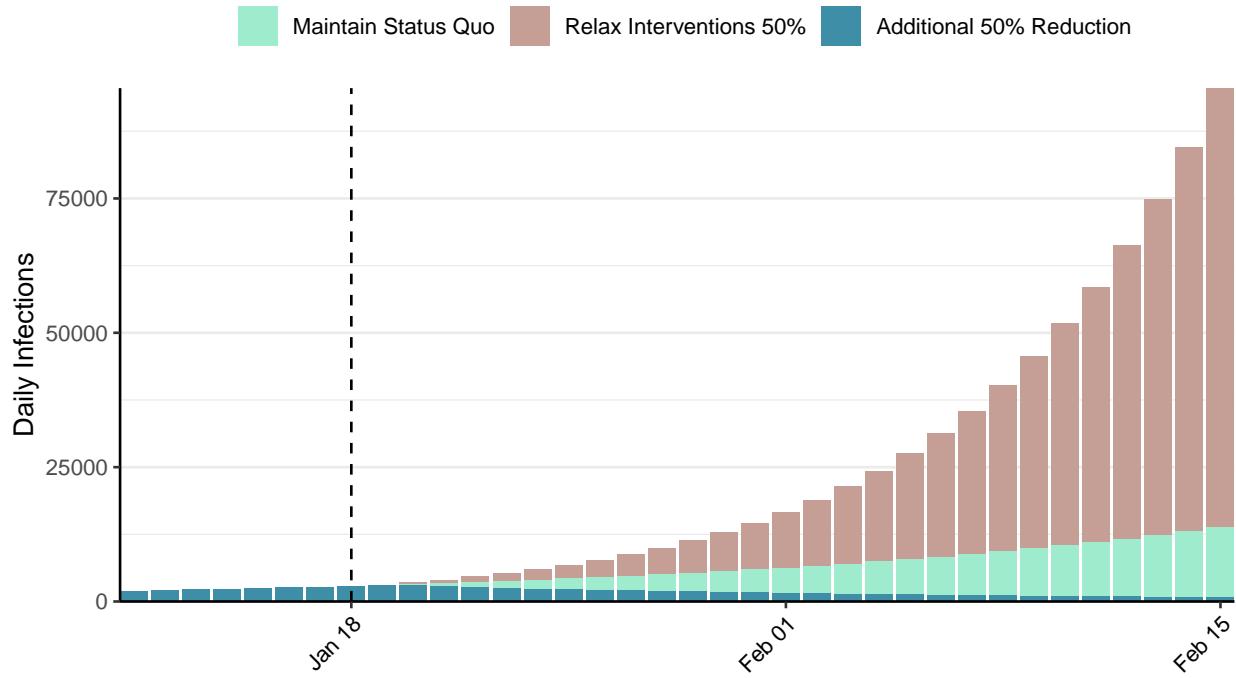


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Guinea, 2021-01-18

[Download the report for Guinea, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.69 (95% CI: 0.5-0.94)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Guinea is not shown in the following plot as only 0 deaths have been reported to date**

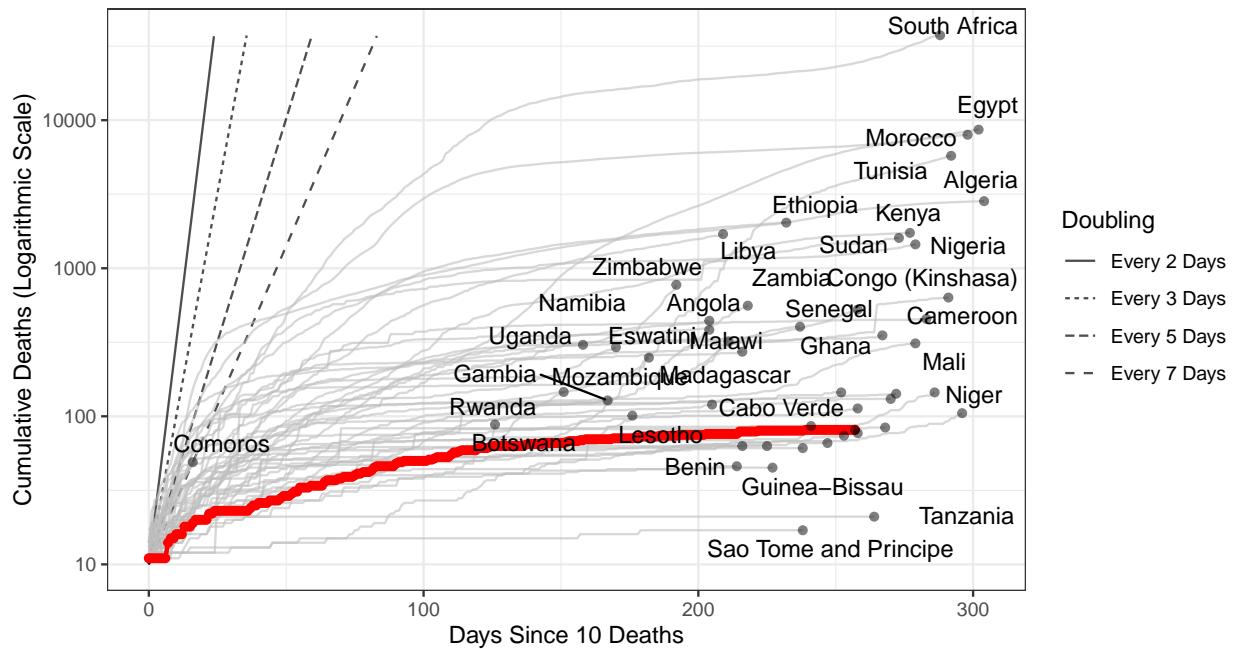


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 238 (95% CI: 206-269) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

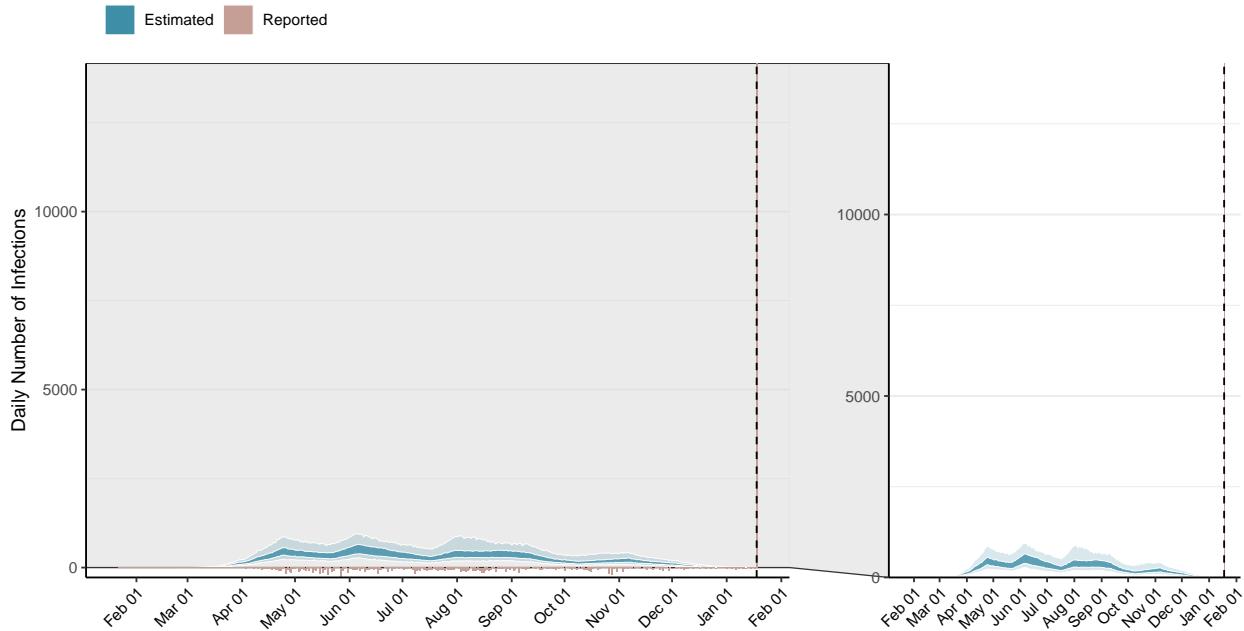


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

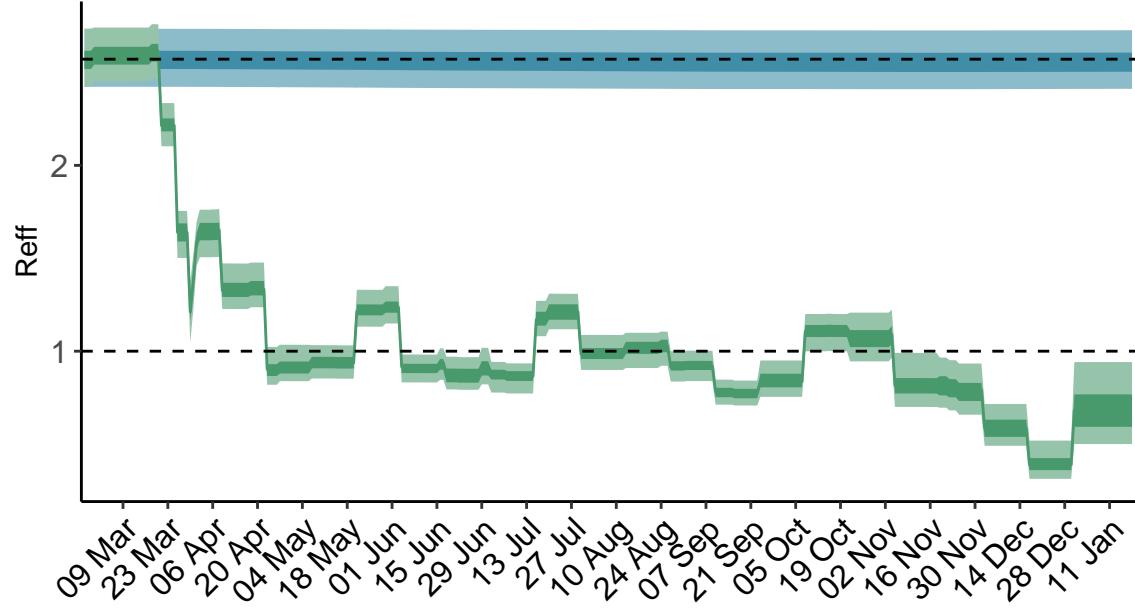


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

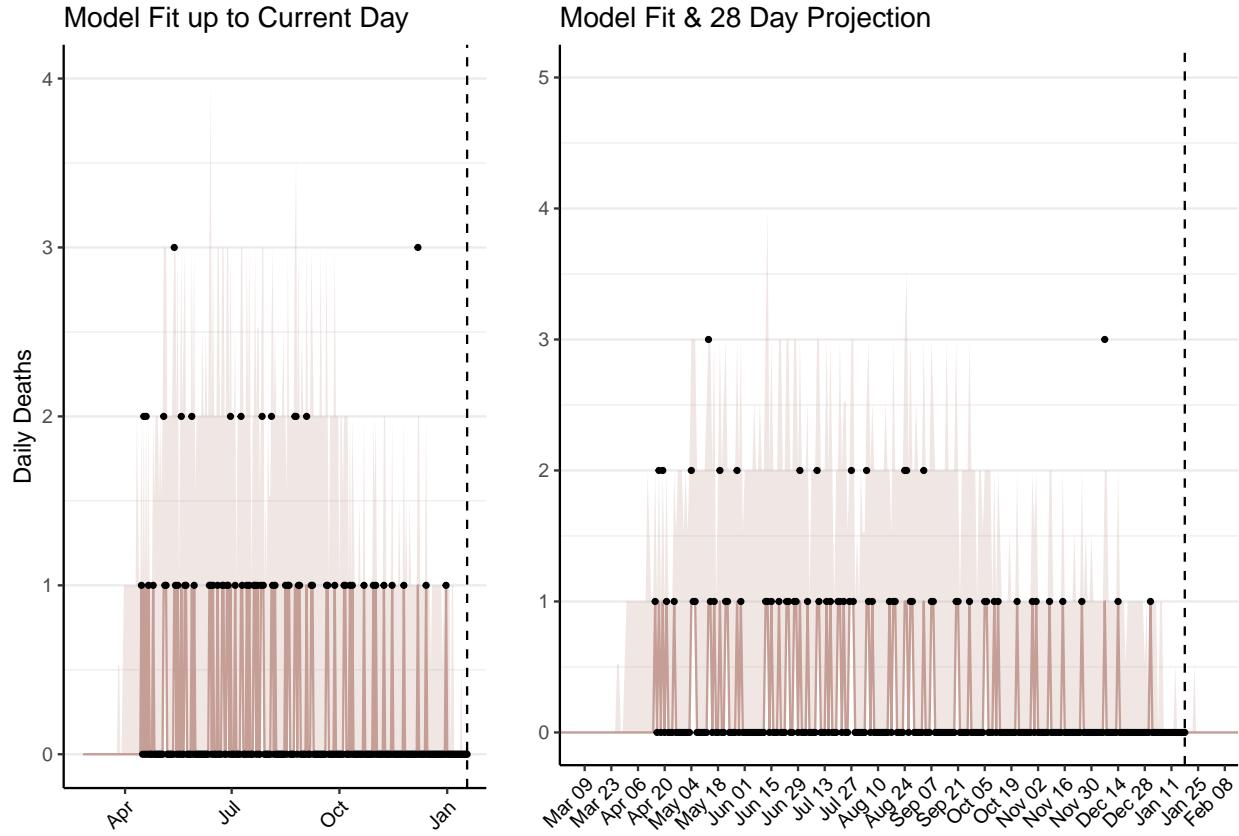


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1 (95% CI: 0-1) patients requiring treatment with high-pressure oxygen at the current date to 0 (95% CI: 0-0) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 0 (95% CI: 0-0) patients requiring treatment with mechanical ventilation at the current date to 0 (95% CI: 0-0) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

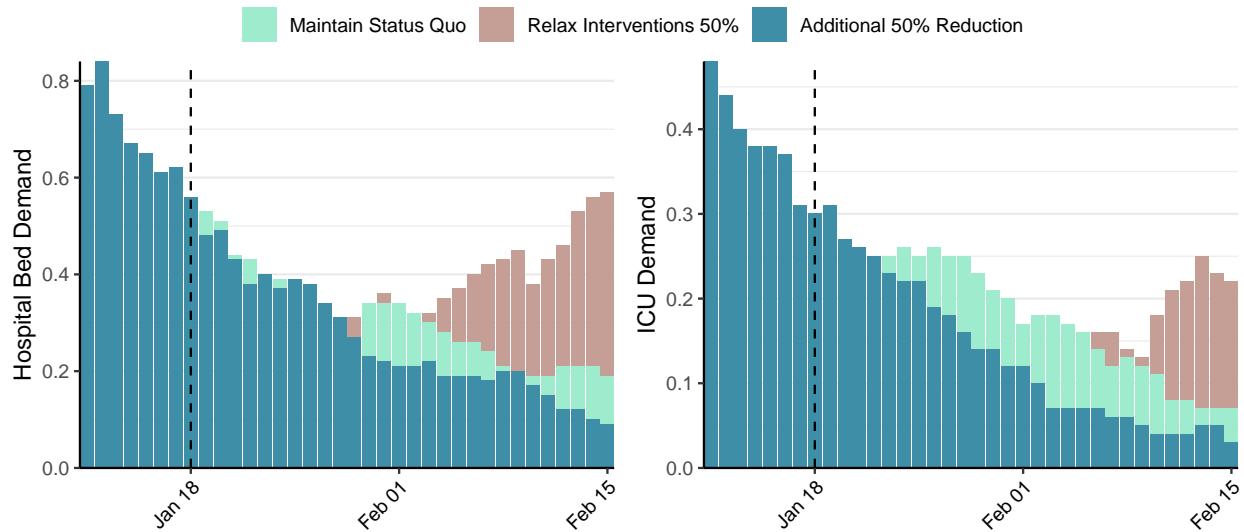


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 4 (95% CI: 3-5) at the current date to 0 (95% CI: 0-0) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 4 (95% CI: 3-5) at the current date to 9 (95% CI: 5-13) by 2021-02-15.

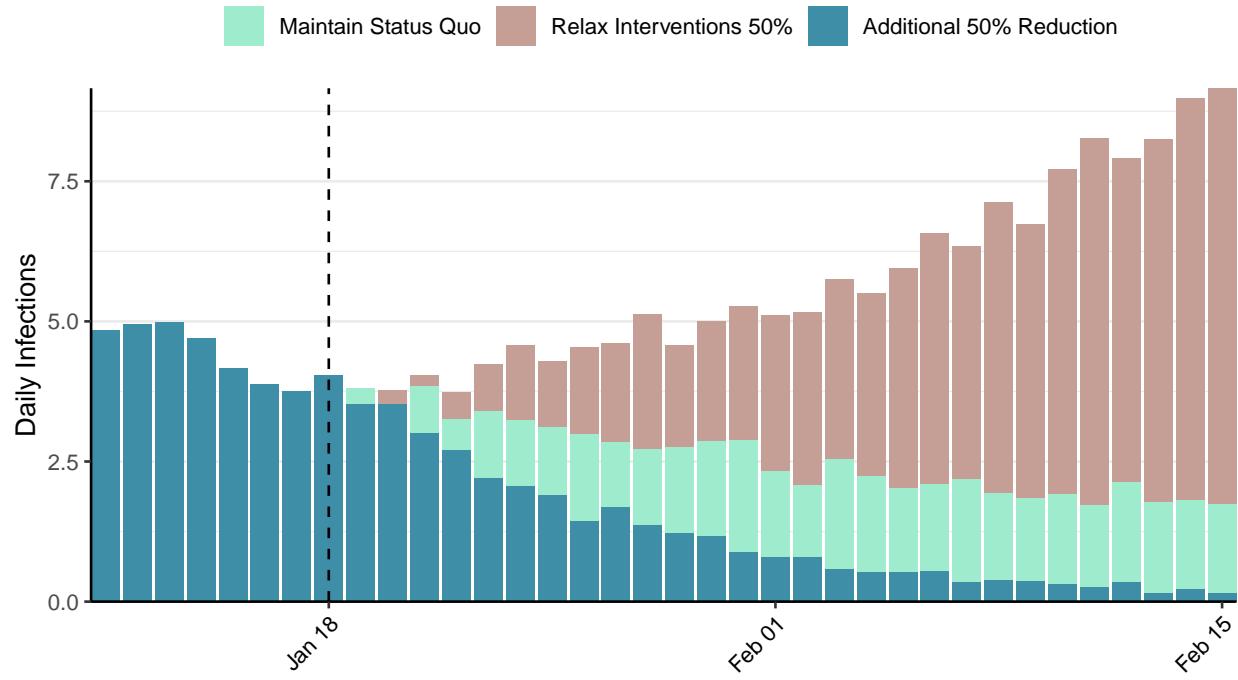


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](#) - <https://covidsim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Gambia, 2021-01-18

[Download the report for Gambia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.73 (95% CI: 1.39-2.17)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Gambia is not shown in the following plot as only 0 deaths have been reported to date**

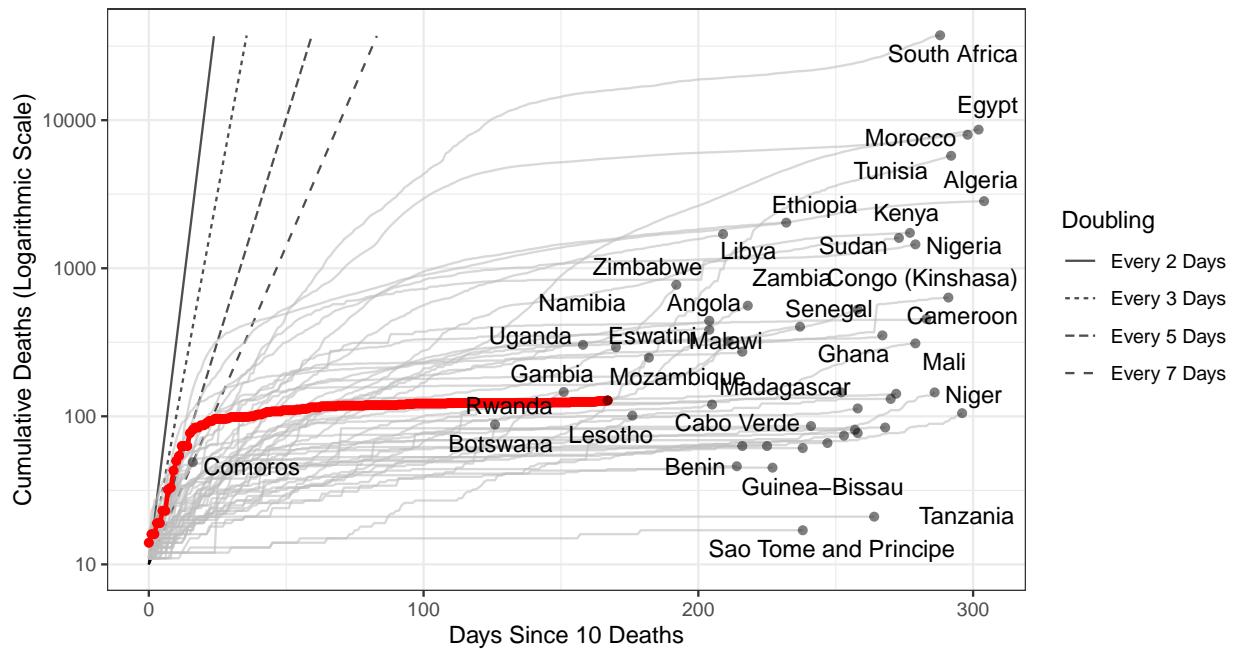


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 6,152 (95% CI: 5,338-6,966) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. Gambia has revised their historic reported cases and thus have reported negative cases.**

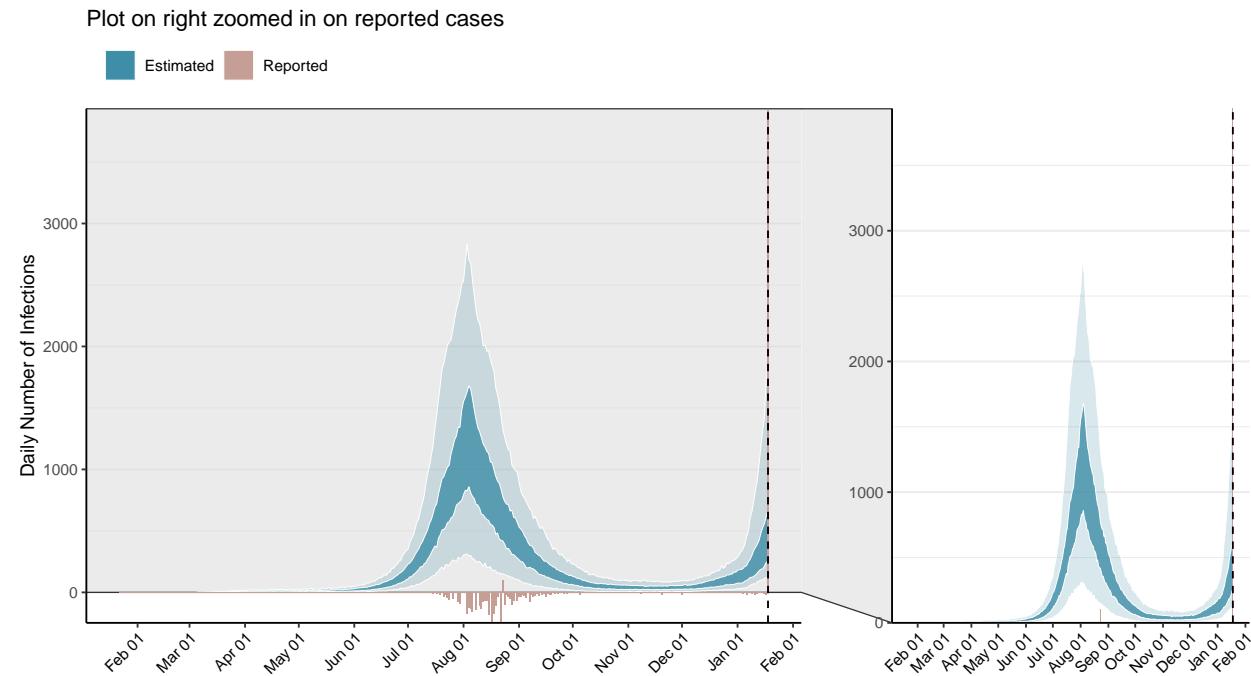


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

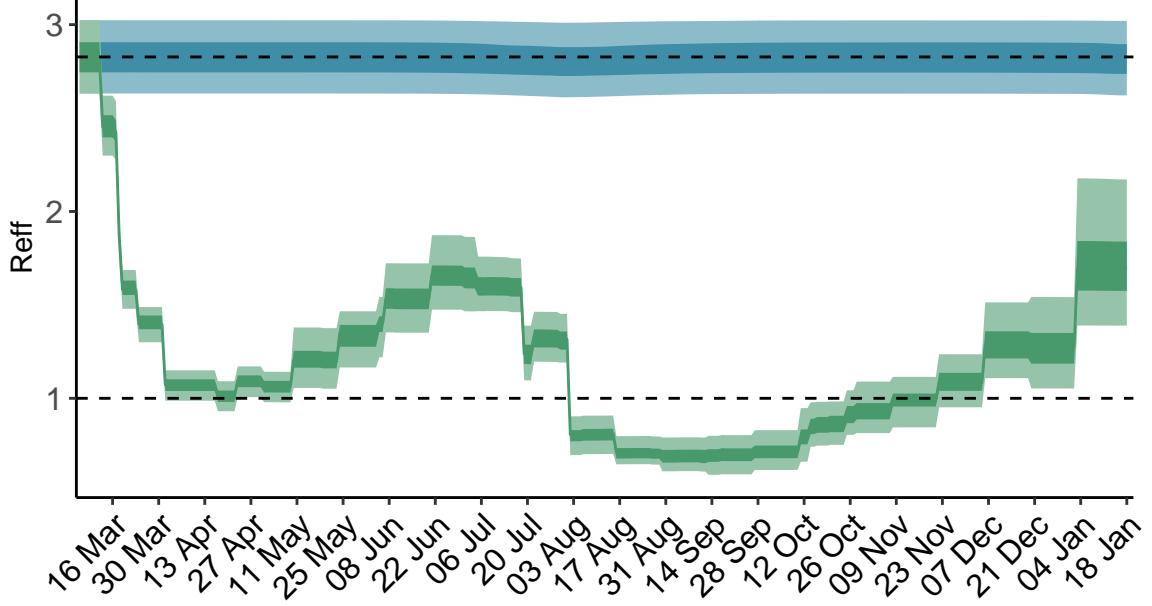


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Gambia is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information](#).

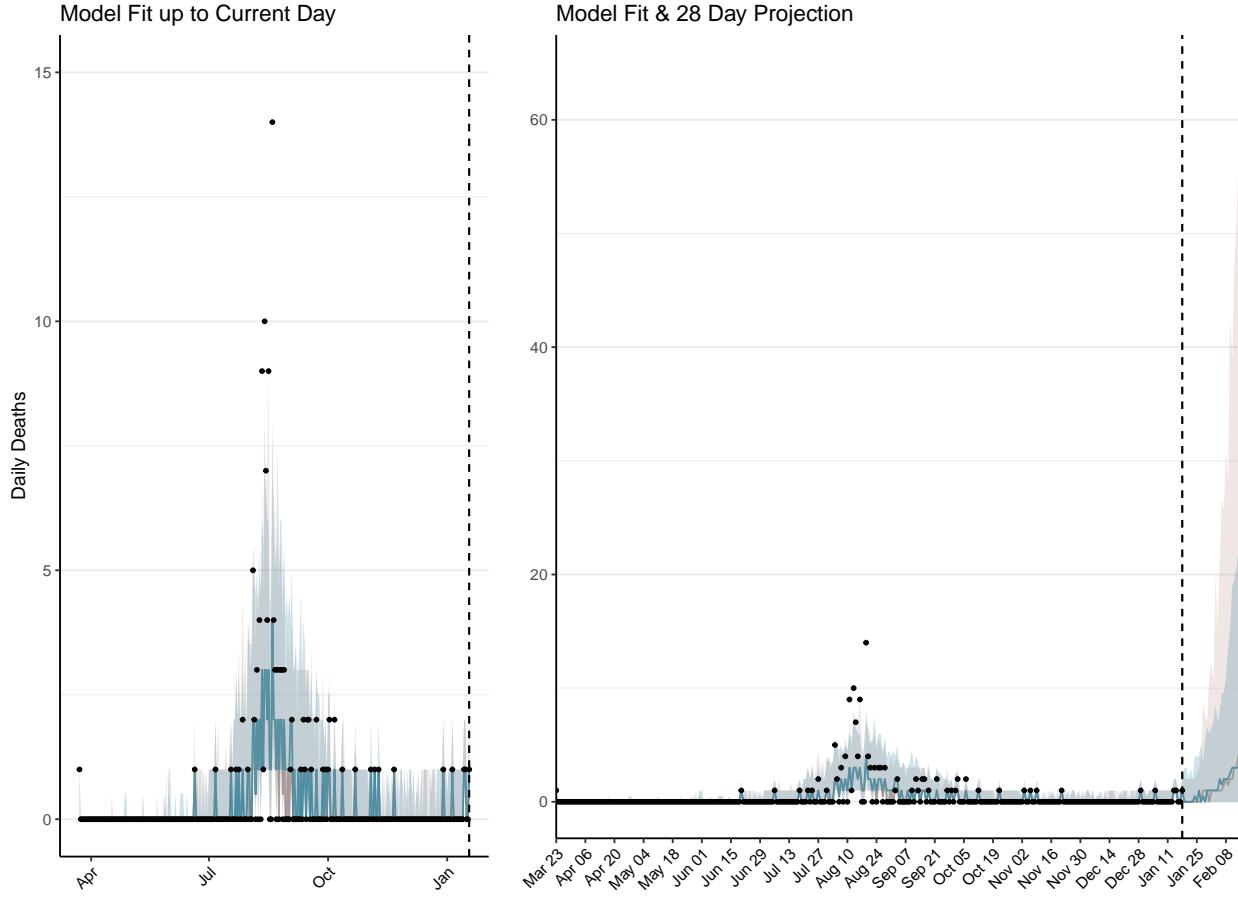


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 18 (95% CI: 15-20) patients requiring treatment with high-pressure oxygen at the current date to 267 (95% CI: 192-341) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 6 (95% CI: 5-7) patients requiring treatment with mechanical ventilation at the current date to 49 (95% CI: 43-55) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

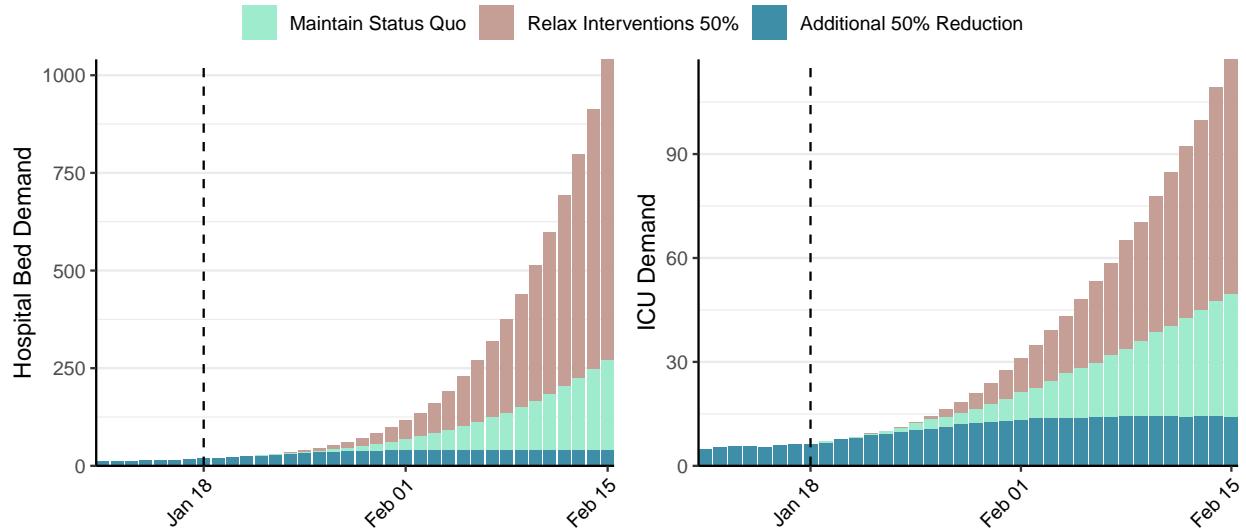


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 564 (95% CI: 468-660) at the current date to 474 (95% CI: 308-640) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 564 (95% CI: 468-660) at the current date to 45,063 (95% CI: 37,486-52,640) by 2021-02-15.

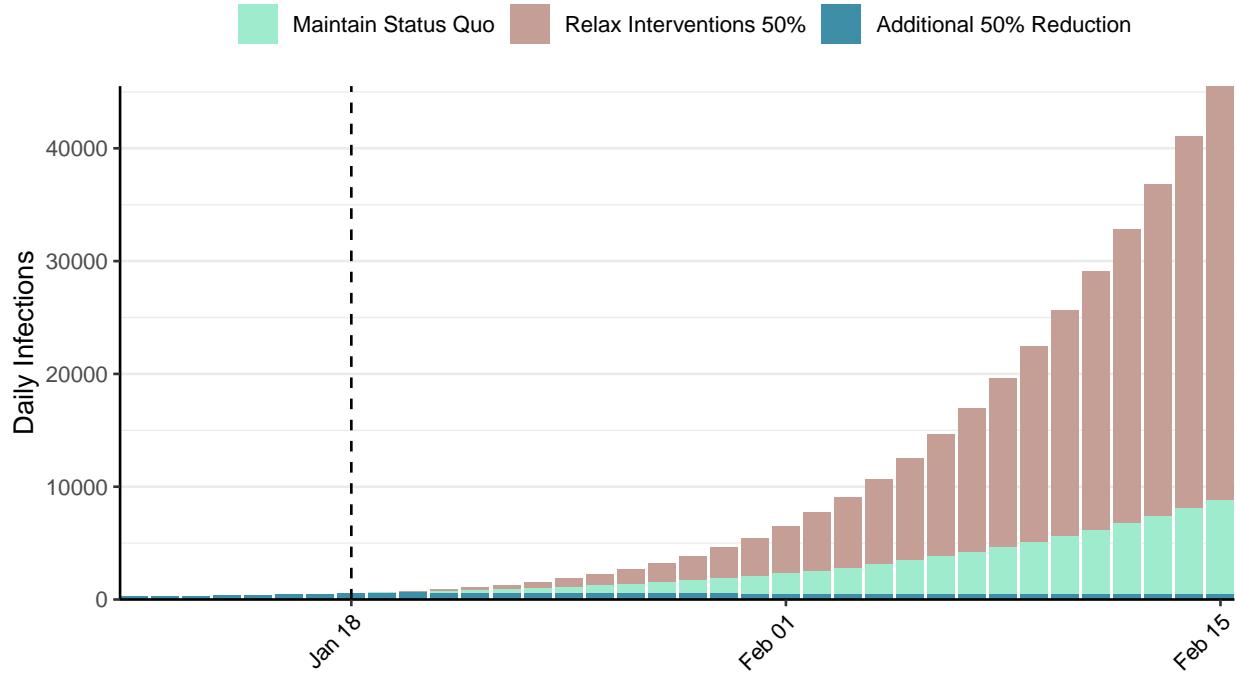


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Guinea-Bissau, 2021-01-18

[Download the report for Guinea-Bissau, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.98 (95% CI: 0.61-1.38)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Guinea-Bissau is not shown in the following plot as only 0 deaths have been reported to date**

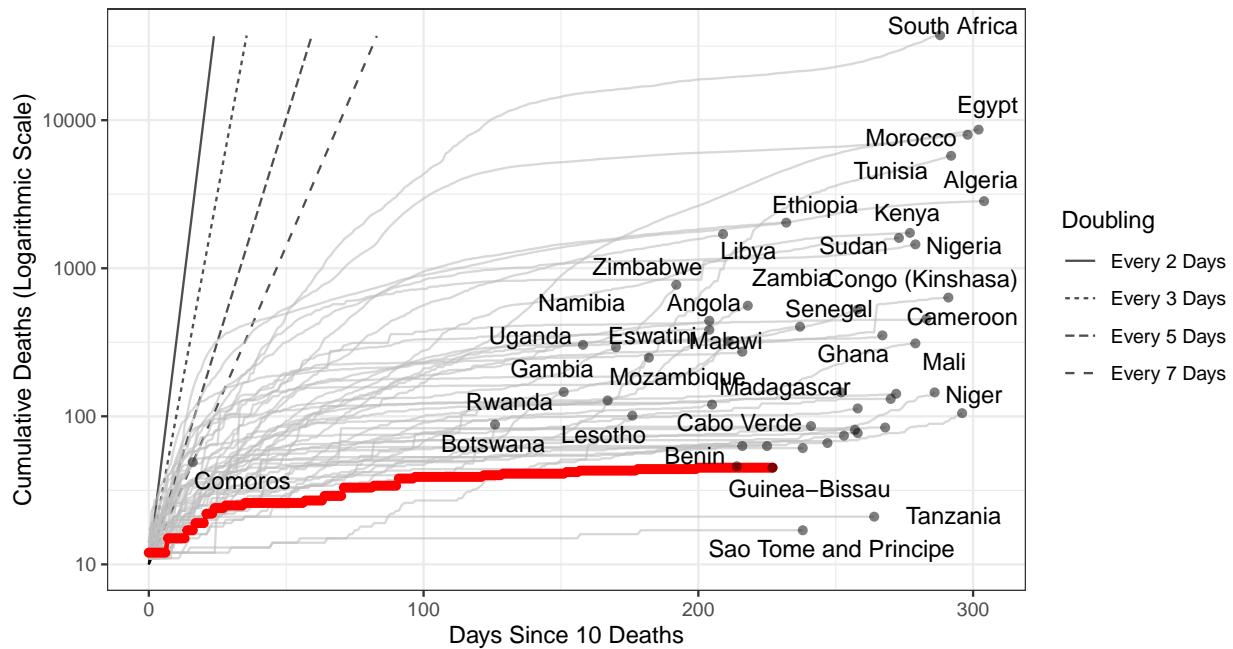


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 157 (95% CI: 110-205) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

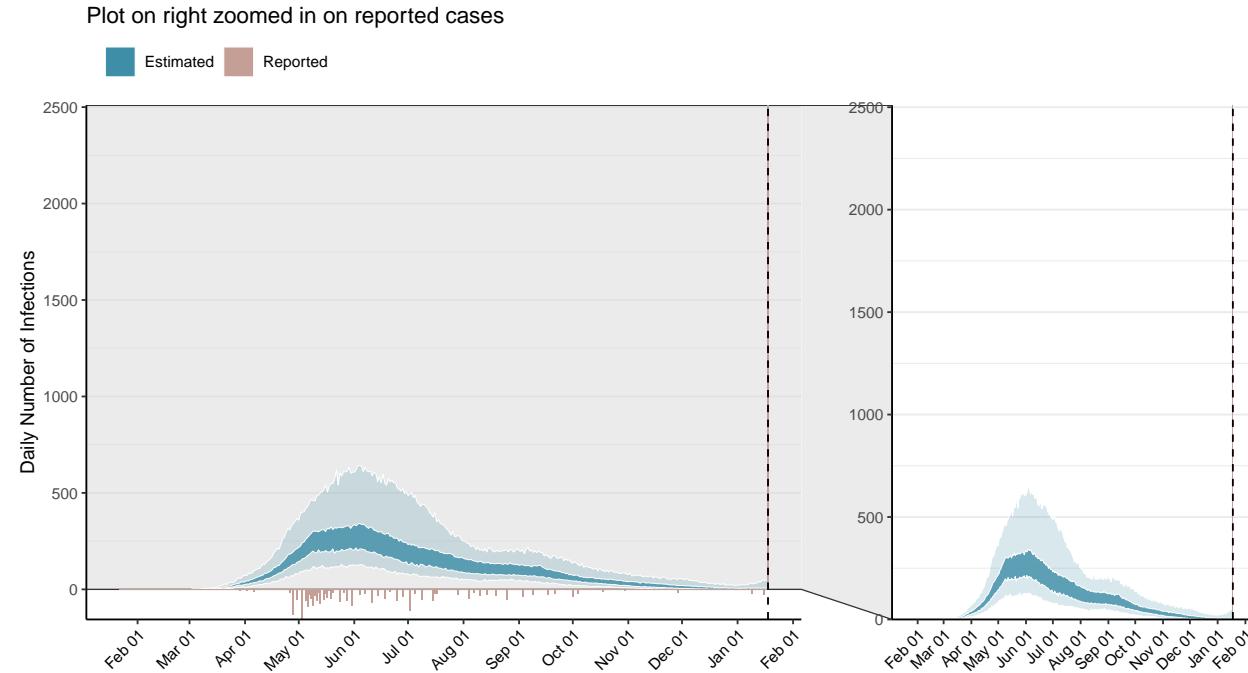


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

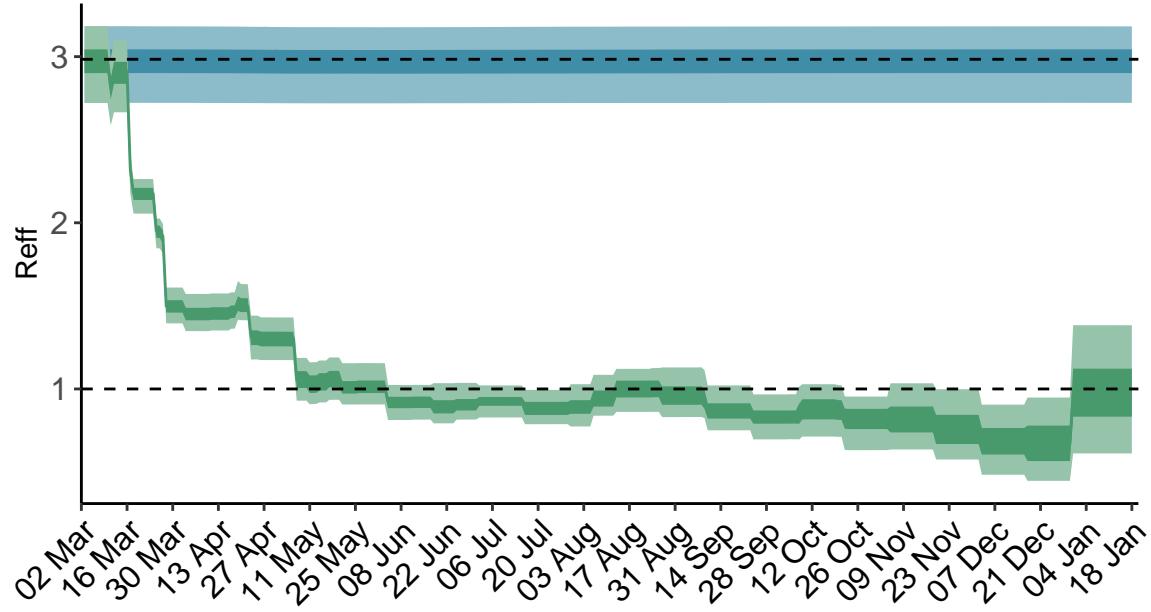


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

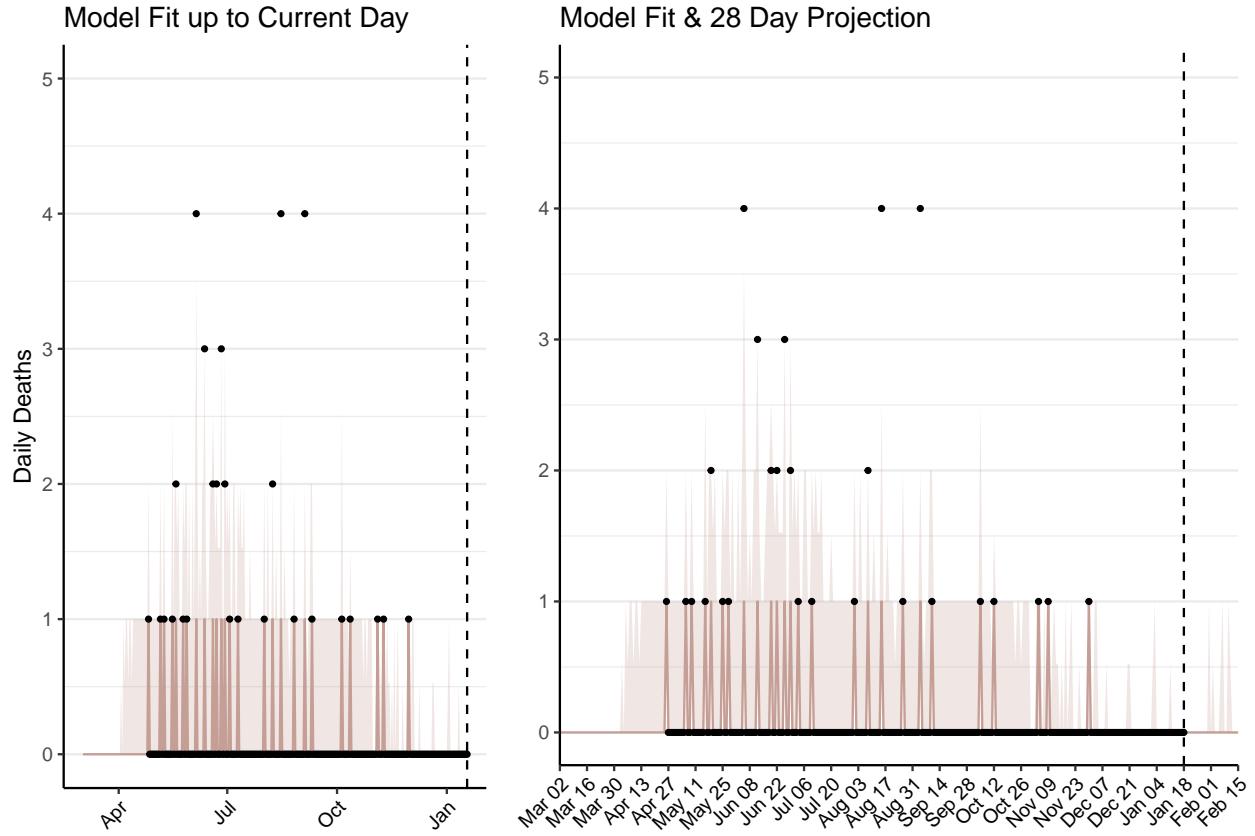


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 0 (95% CI: 0-1) patients requiring treatment with high-pressure oxygen at the current date to 1 (95% CI: 0-1) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 0 (95% CI: 0-0) patients requiring treatment with mechanical ventilation at the current date to 0 (95% CI: 0-0) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

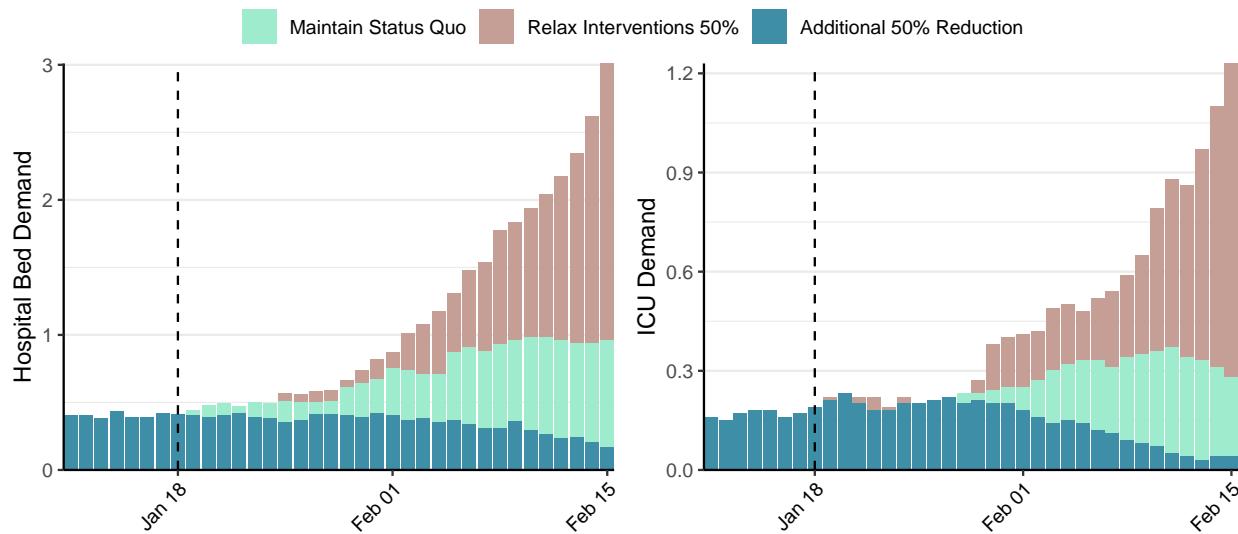


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 7 (95% CI: 4-9) at the current date to 1 (95% CI: 1-2) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 7 (95% CI: 4-9) at the current date to 117 (95% CI: 53-181) by 2021-02-15.

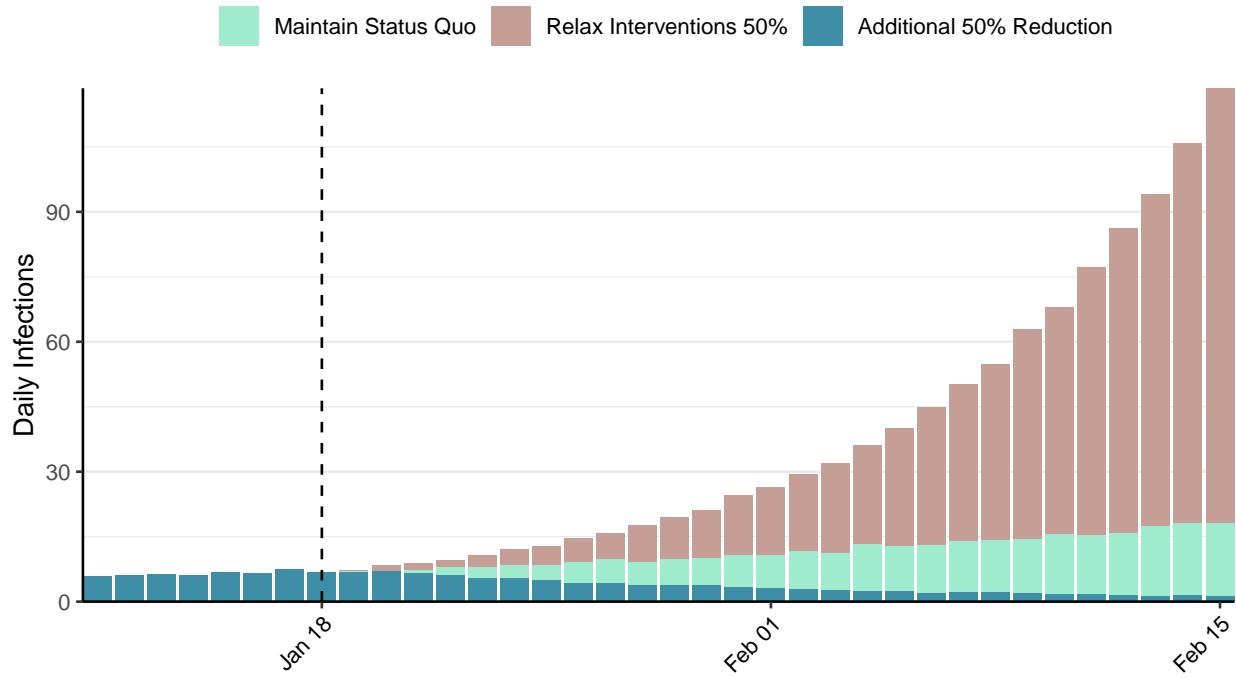


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](#) - <https://covidsim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Equatorial Guinea, 2021-01-18

[Download the report for Equatorial Guinea, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.77 (95% CI: 0.49-1.06)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B.** Equatorial Guinea is not shown in the following plot as only 0 deaths have been reported to date

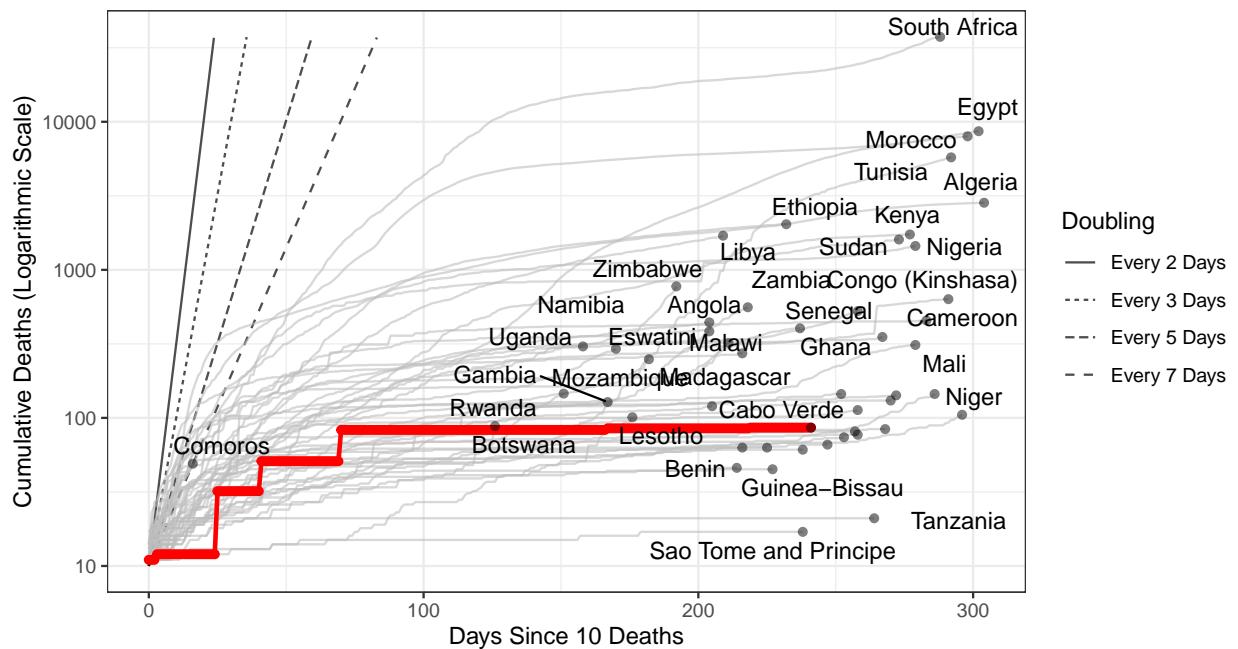


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 35 (95% CI: 21-49) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

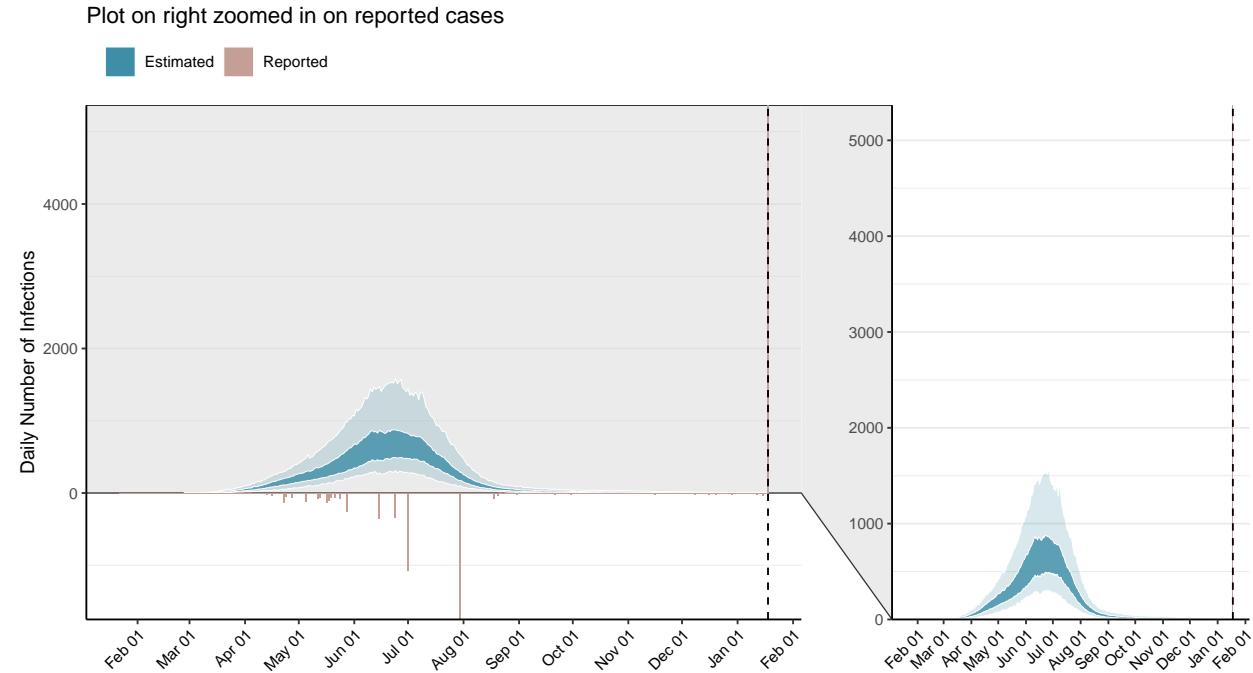


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

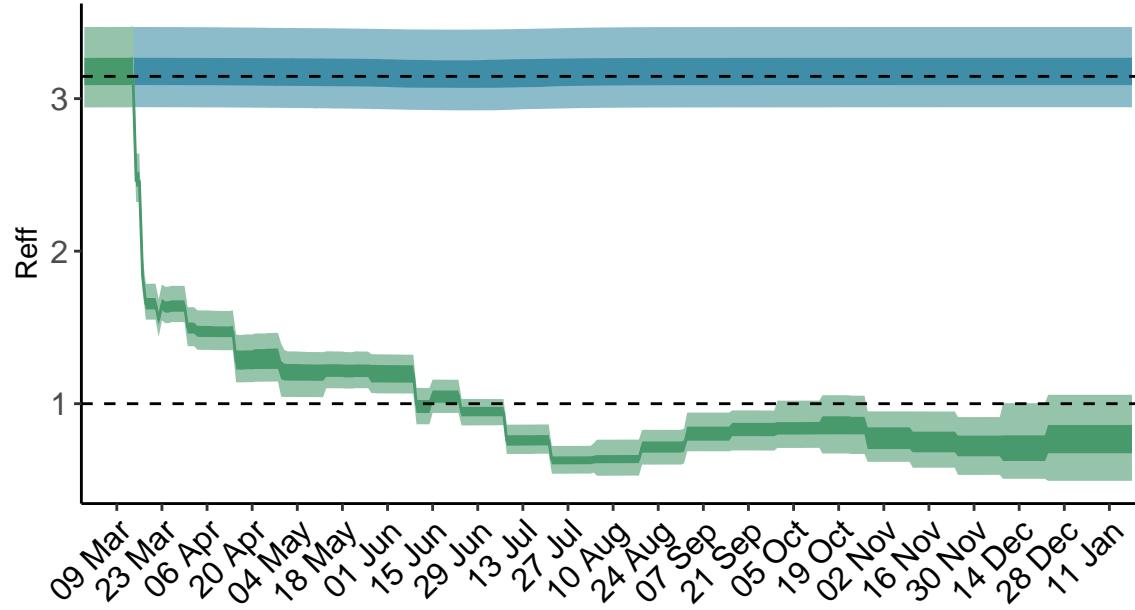


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

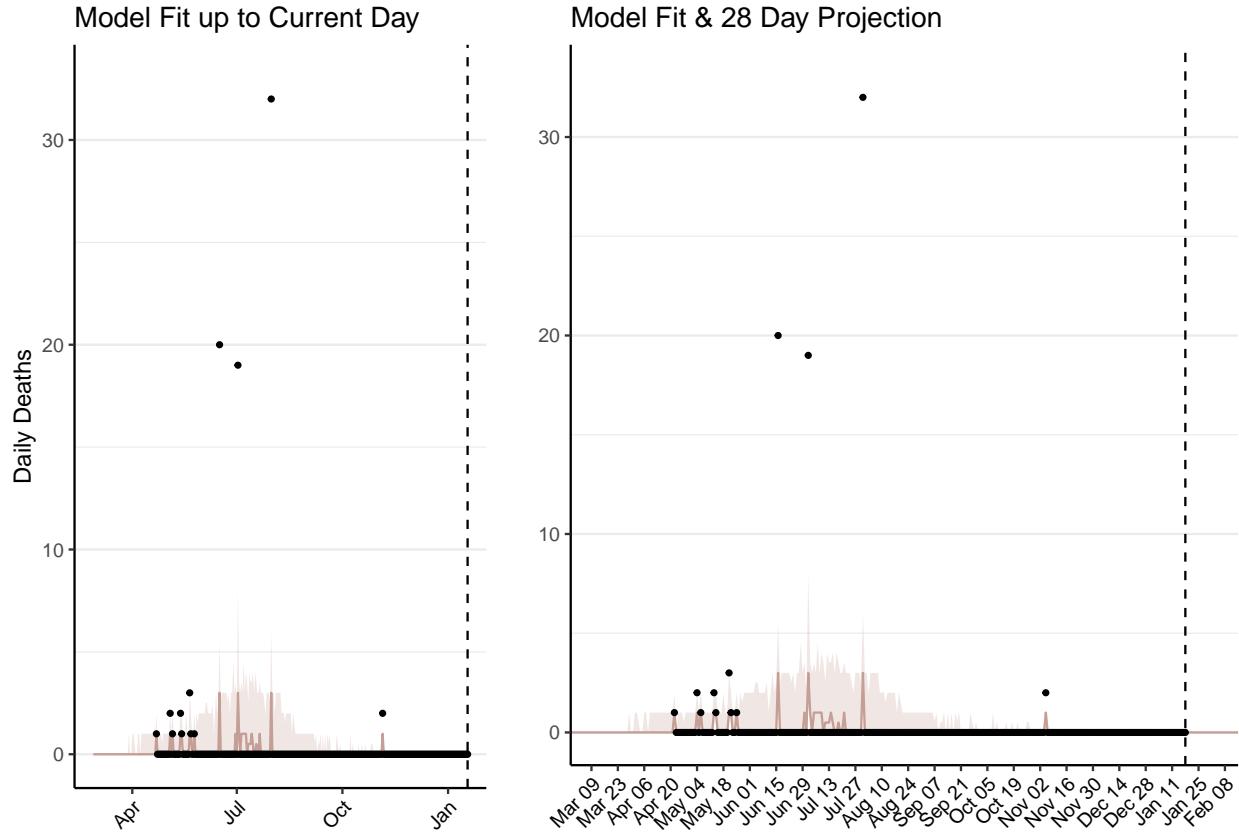


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 0 (95% CI: 0-0) patients requiring treatment with high-pressure oxygen at the current date to 0 (95% CI: 0-0) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 0 (95% CI: 0-0) patients requiring treatment with mechanical ventilation at the current date to 0 (95% CI: 0-0) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

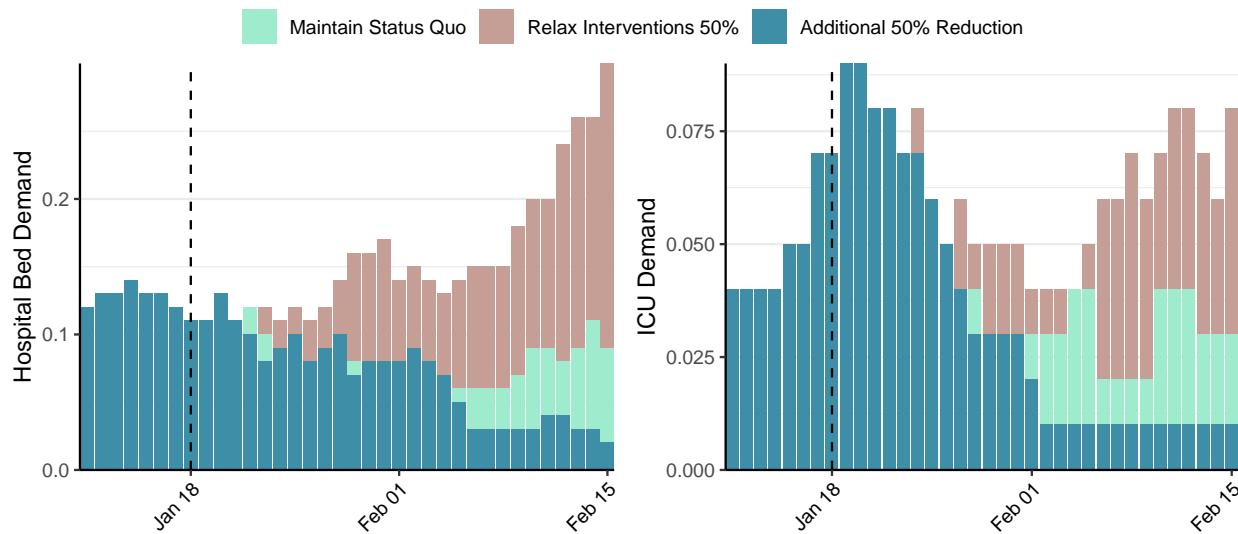


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 1 (95% CI: 1-2) at the current date to 0 (95% CI: 0-0) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1 (95% CI: 1-2) at the current date to 7 (95% CI: 1-13) by 2021-02-15.

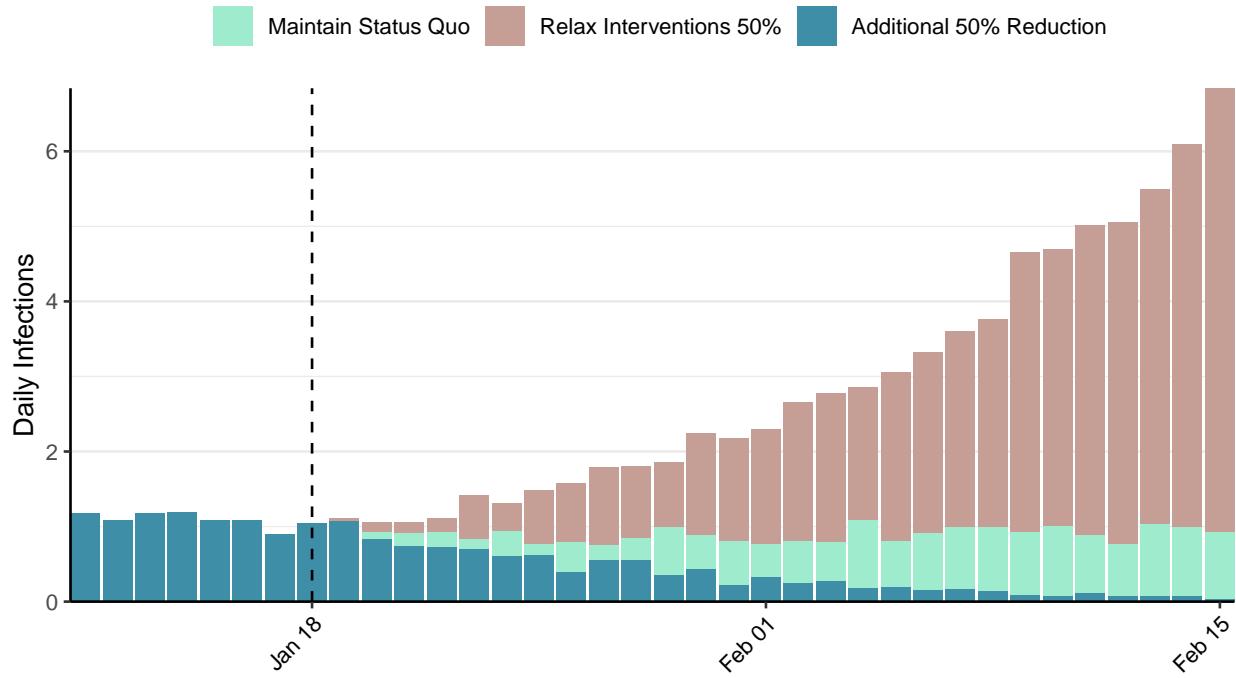


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](#) - <https://covidsim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Grenada, 2021-01-18

[Download the report for Grenada, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.64 (95% CI: 1.16-2.23)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Grenada is not shown in the following plot as only 0 deaths have been reported to date**

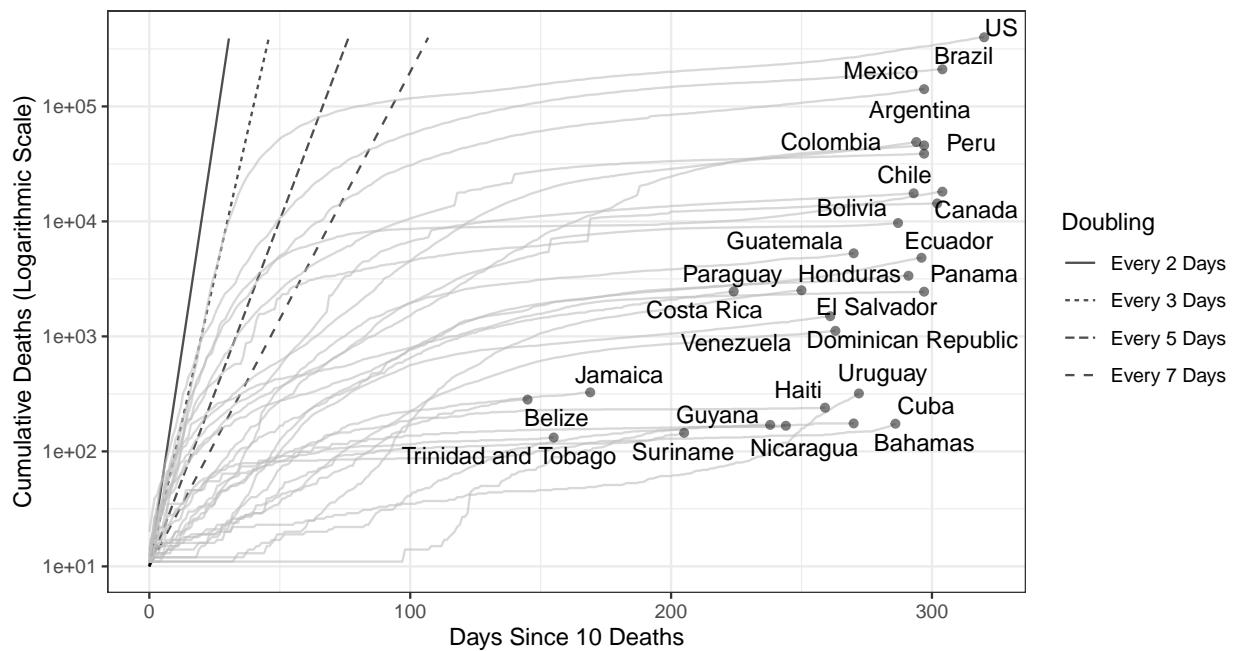


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 1,688 (95% CI: 1,271-2,104) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

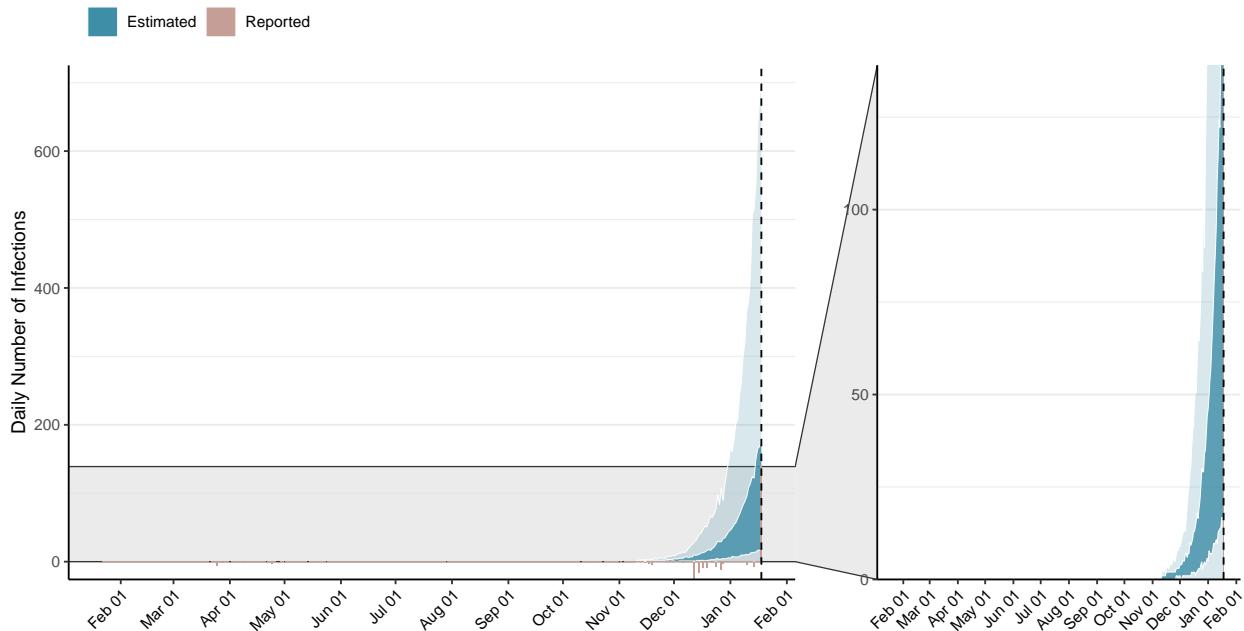


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

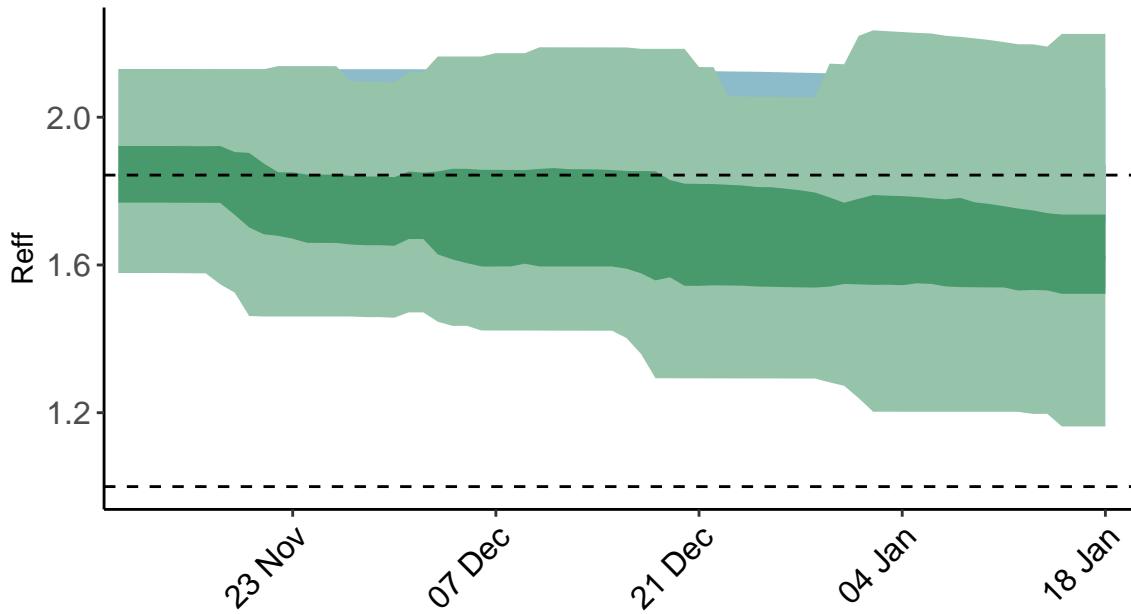


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

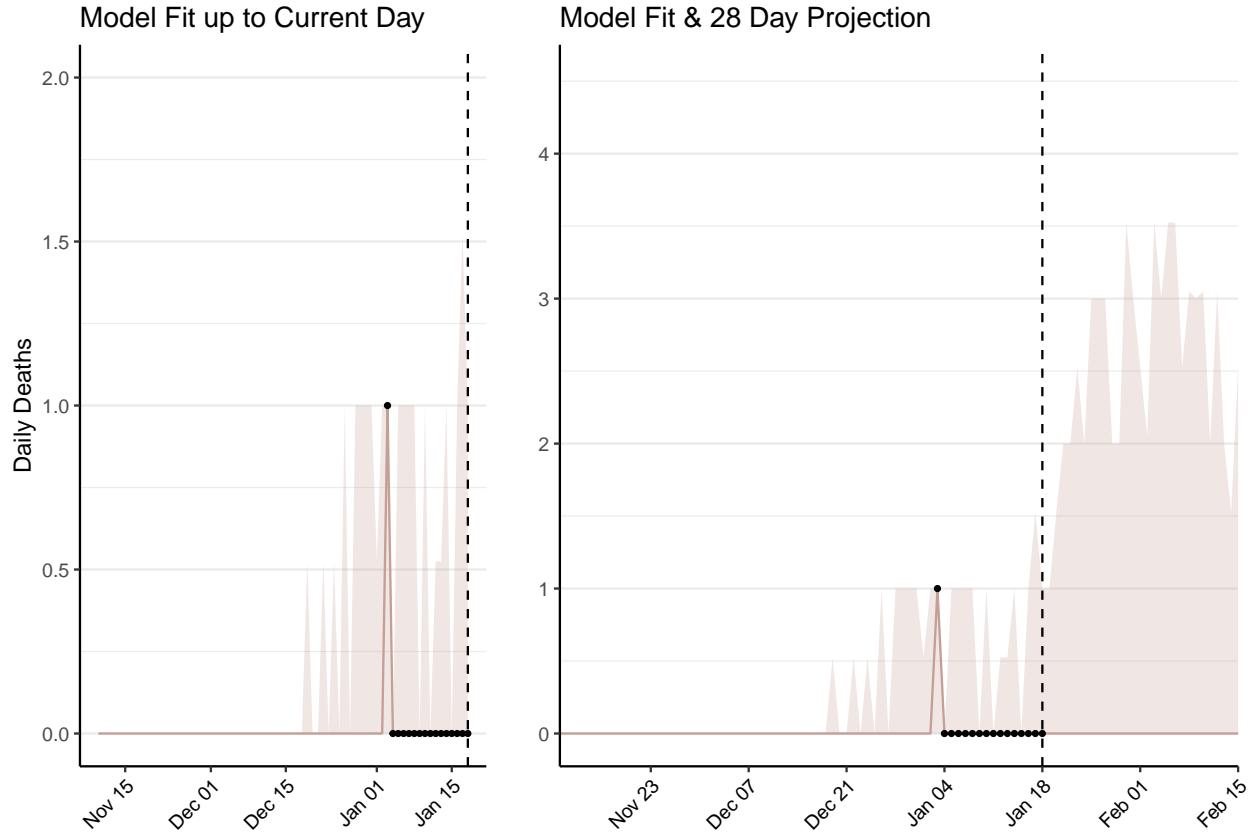


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 7 (95% CI: 5-8) patients requiring treatment with high-pressure oxygen at the current date to 10 (95% CI: 4-15) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 2 (95% CI: 2-3) patients requiring treatment with mechanical ventilation at the current date to 3 (95% CI: 2-4) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

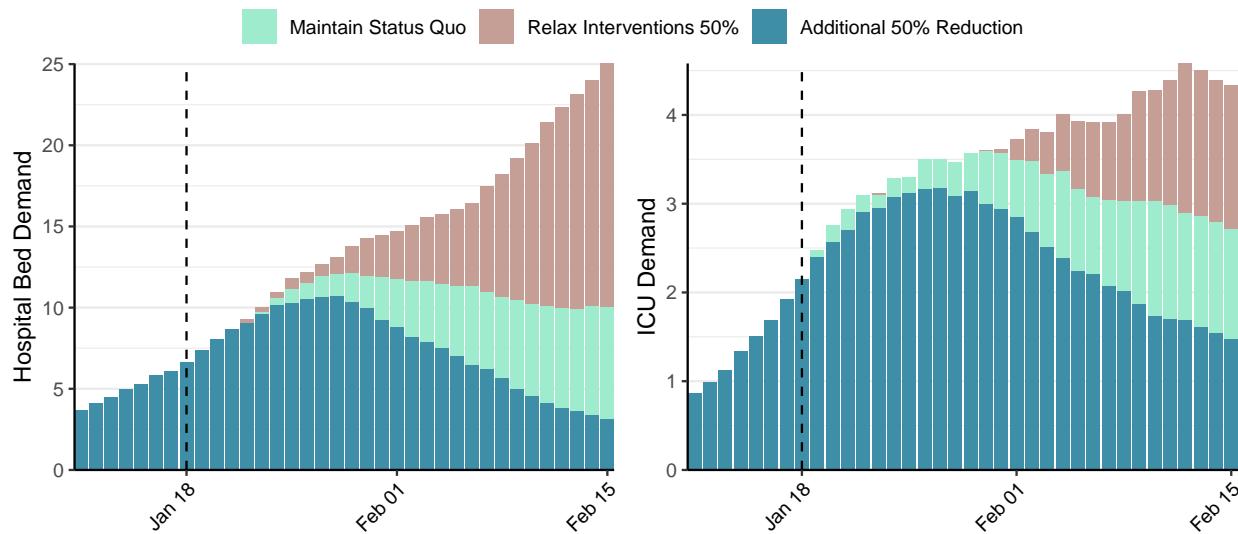


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 153 (95% CI: 115-192) at the current date to 10 (95% CI: 2-19) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 153 (95% CI: 115-192) at the current date to 340 (95% CI: 150-530) by 2021-02-15.

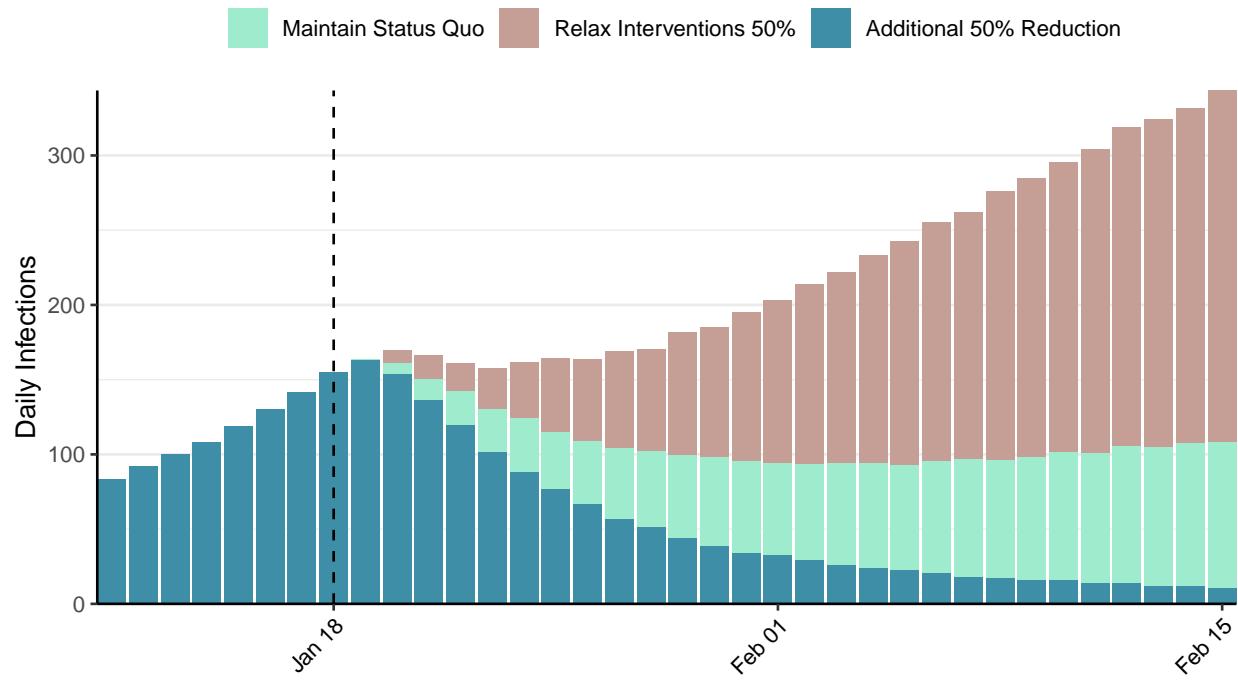


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Guatemala, 2021-01-18

[Download the report for Guatemala, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.9 (95% CI: 0.73-1.09)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Guatemala is not shown in the following plot as only 0 deaths have been reported to date**

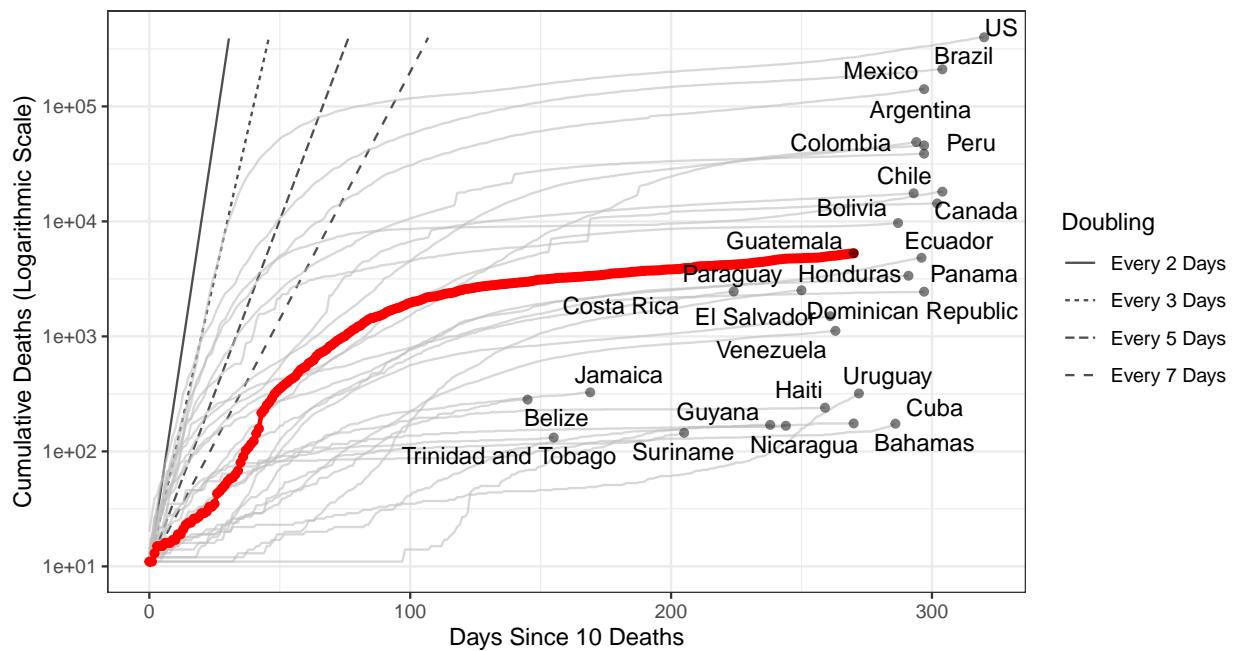


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 365,139 (95% CI: 330,096-400,183) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

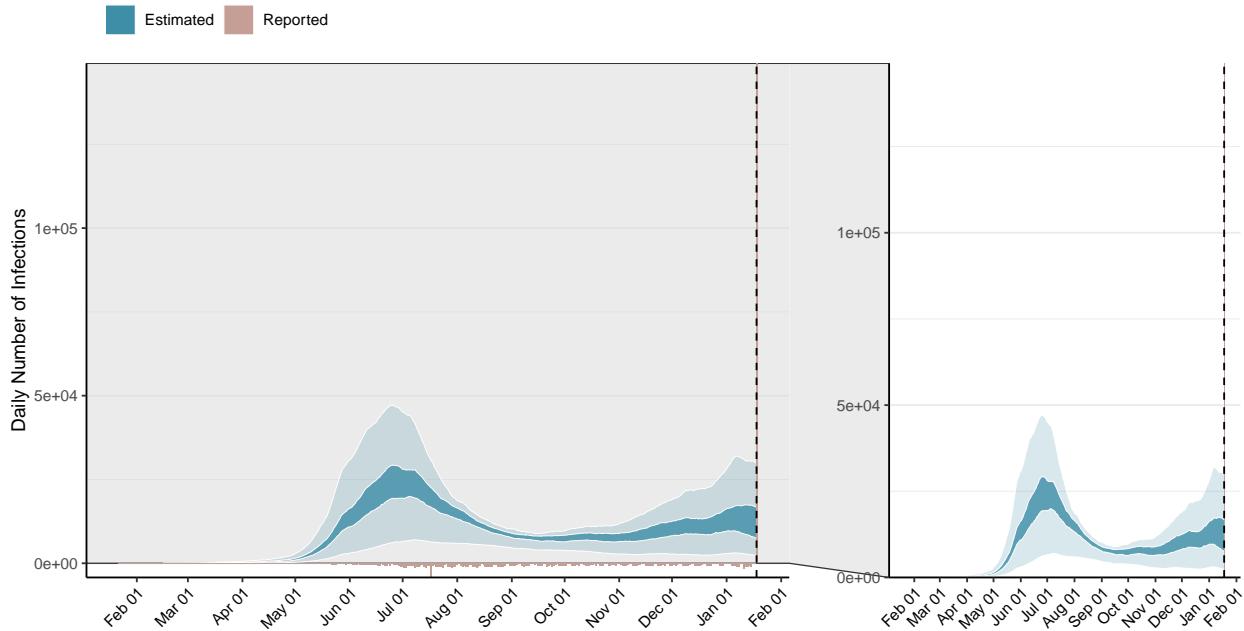


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

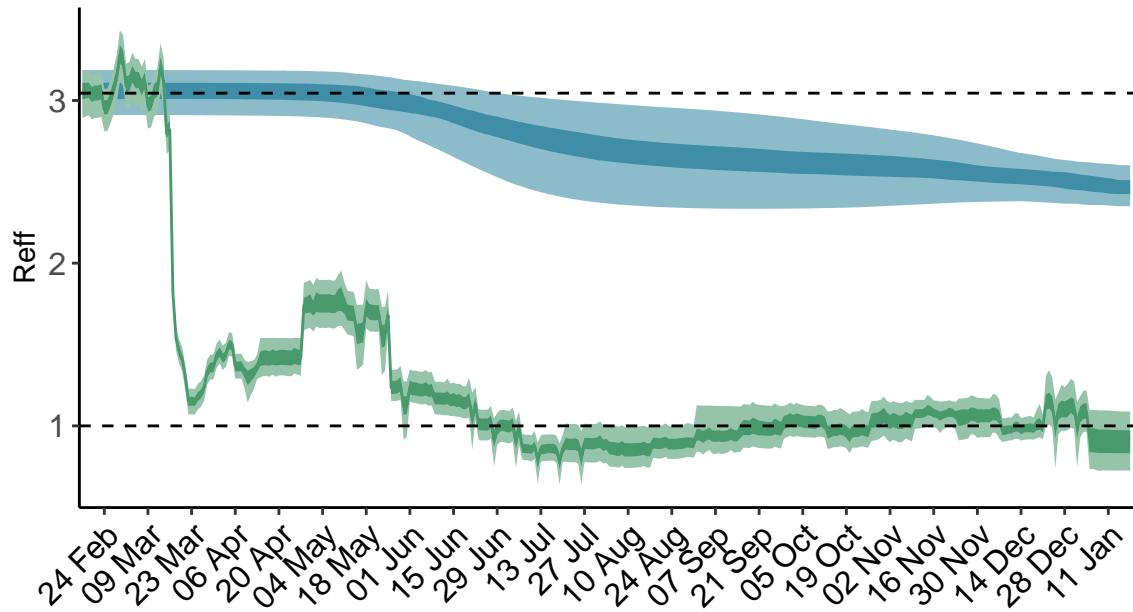


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

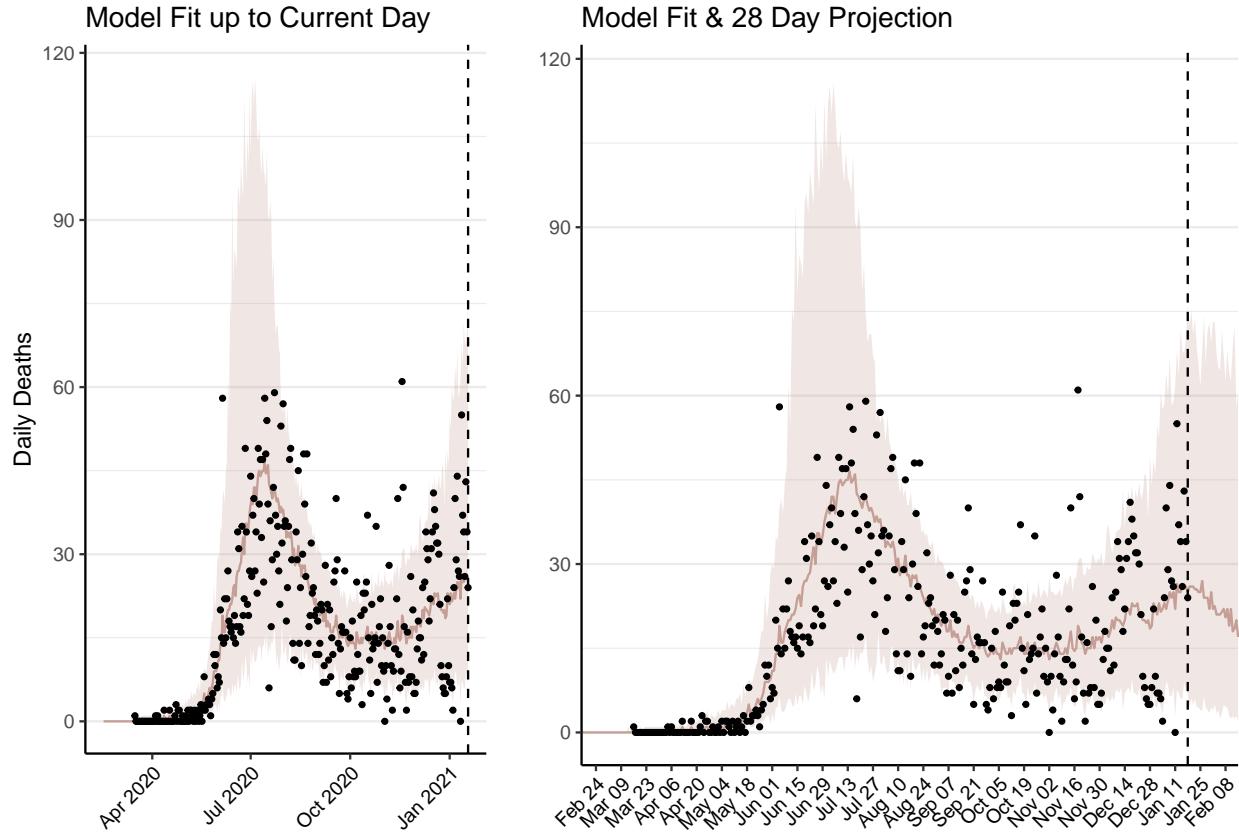


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1,046 (95% CI: 945-1,146) patients requiring treatment with high-pressure oxygen at the current date to 830 (95% CI: 718-942) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 350 (95% CI: 321-380) patients requiring treatment with mechanical ventilation at the current date to 289 (95% CI: 255-323) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

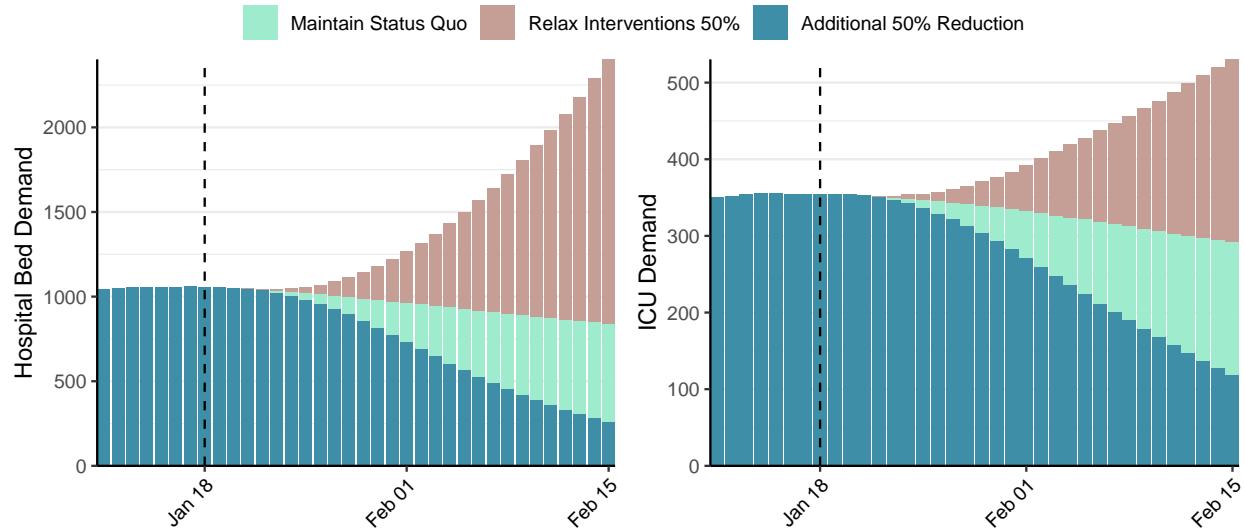


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 12,491 (95% CI: 11,097-13,885) at the current date to 852 (95% CI: 726-978) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 12,491 (95% CI: 11,097-13,885) at the current date to 47,597 (95% CI: 40,584-54,609) by 2021-02-15.

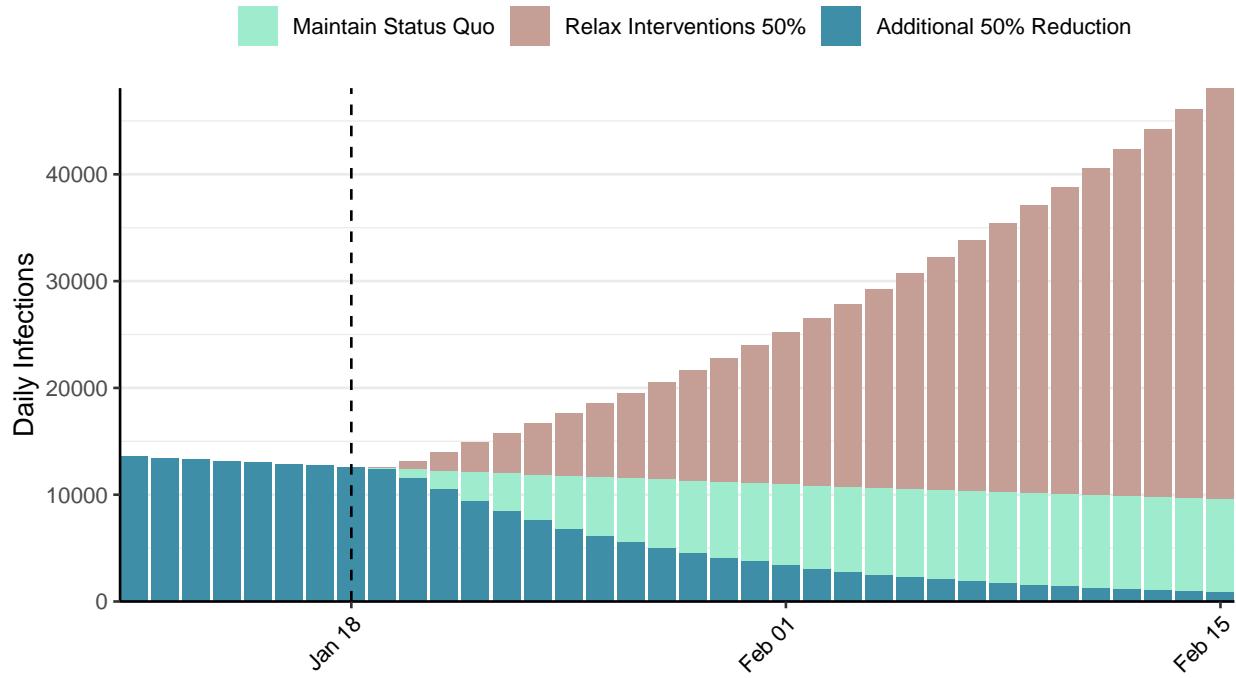


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool - https://covid19sim.org/](https://covid19sim.org/), which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: French Guiana, 2021-01-18

[Download the report for French Guiana, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.14 (95% CI: 0.78-1.57)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. French Guiana is not shown in the following plot as only 0 deaths have been reported to date**

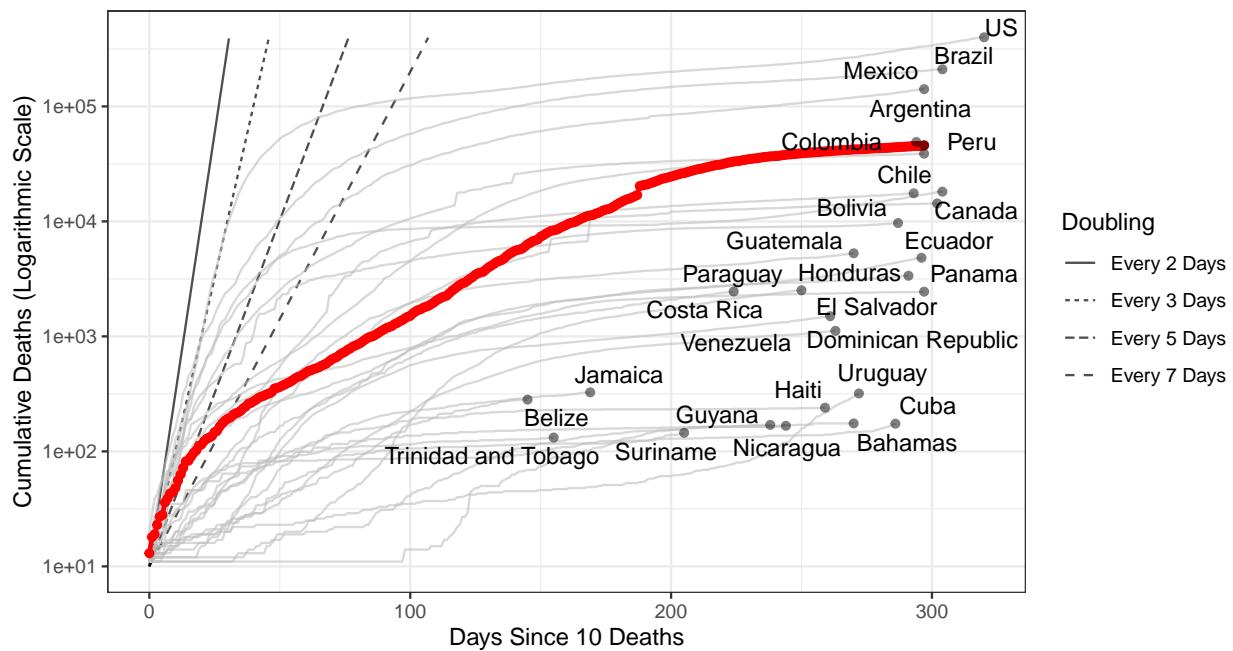


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 5,082 (95% CI: 4,574-5,591) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

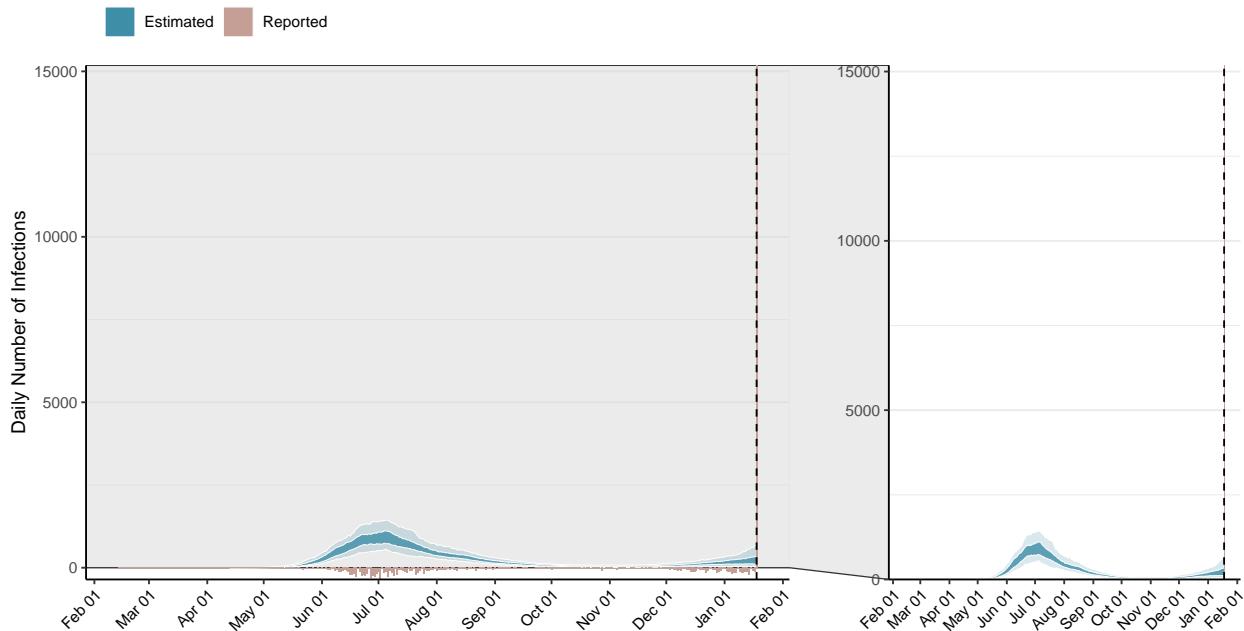


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

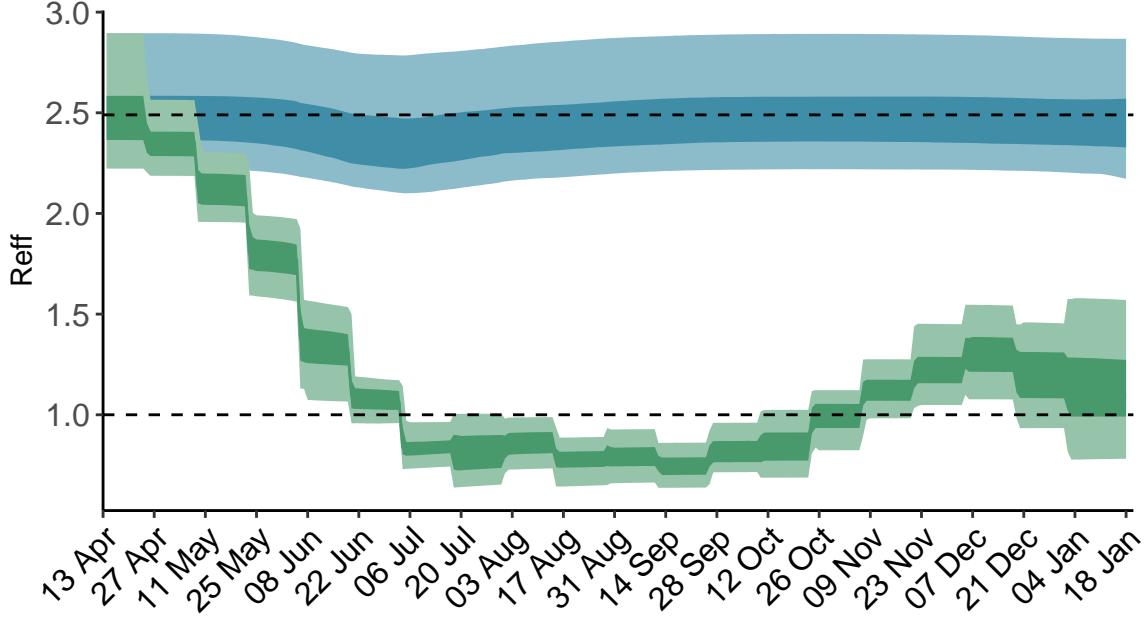


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

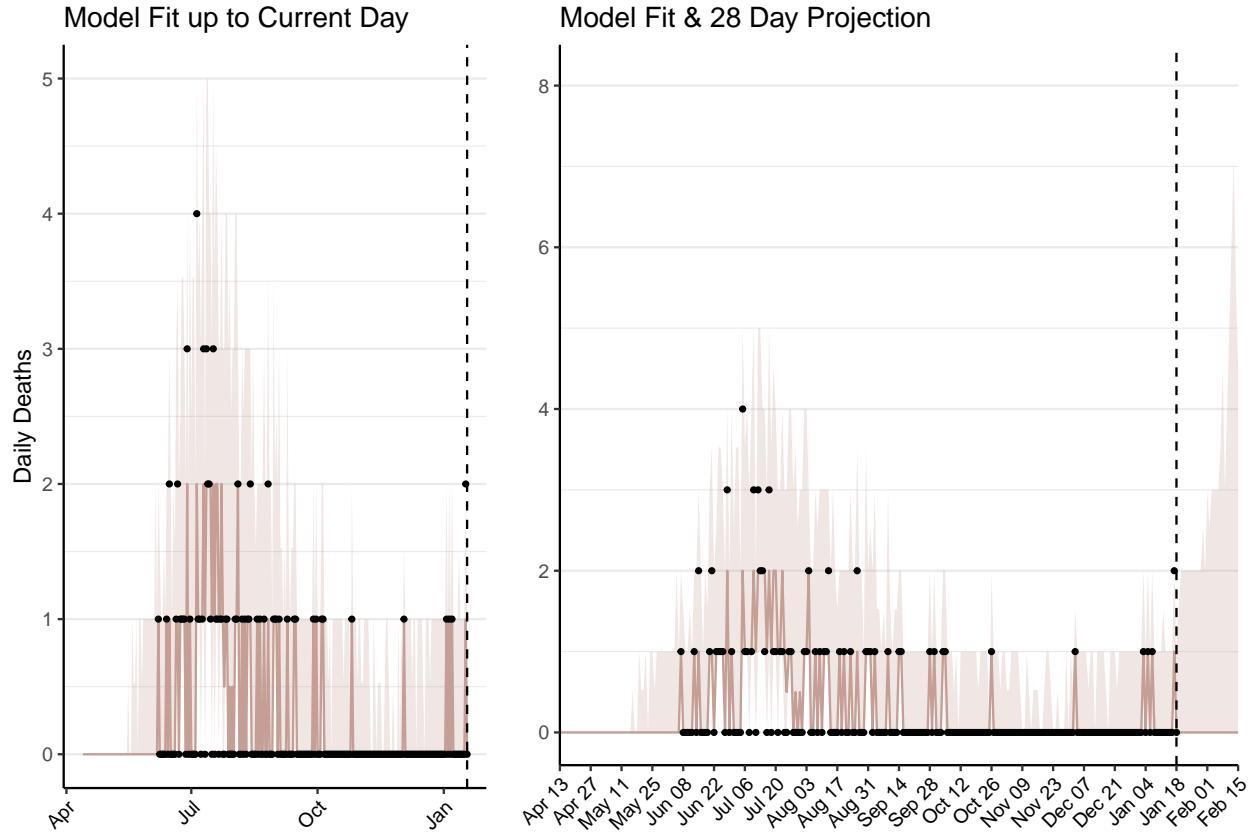


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 15 (95% CI: 13-16) patients requiring treatment with high-pressure oxygen at the current date to 37 (95% CI: 28-47) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 5 (95% CI: 4-6) patients requiring treatment with mechanical ventilation at the current date to 12 (95% CI: 10-14) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

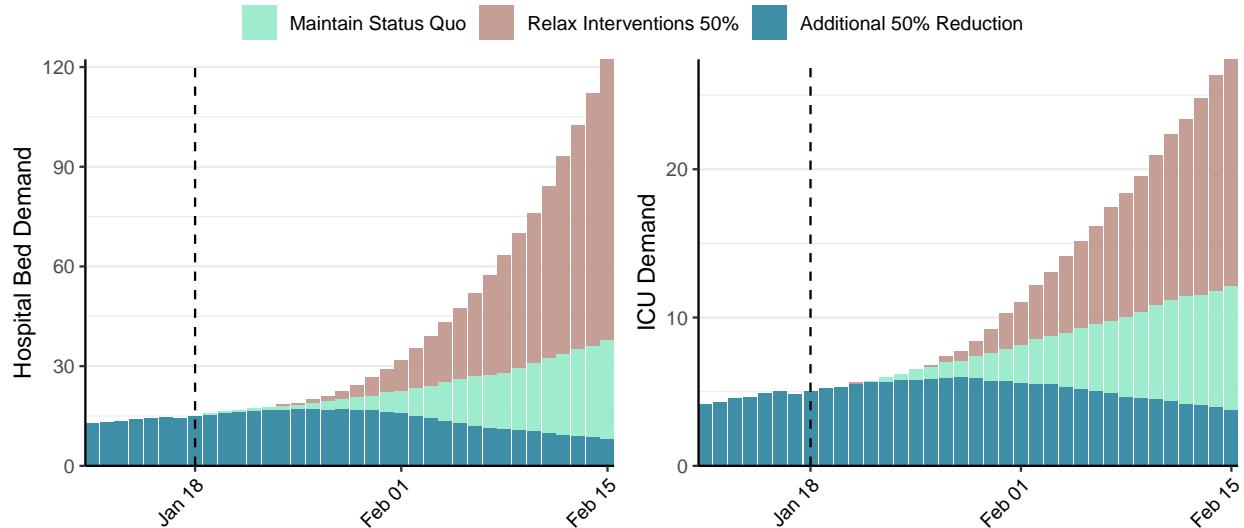


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 261 (95% CI: 224-297) at the current date to 55 (95% CI: 38-73) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 261 (95% CI: 224-297) at the current date to 3,167 (95% CI: 2,514-3,820) by 2021-02-15.

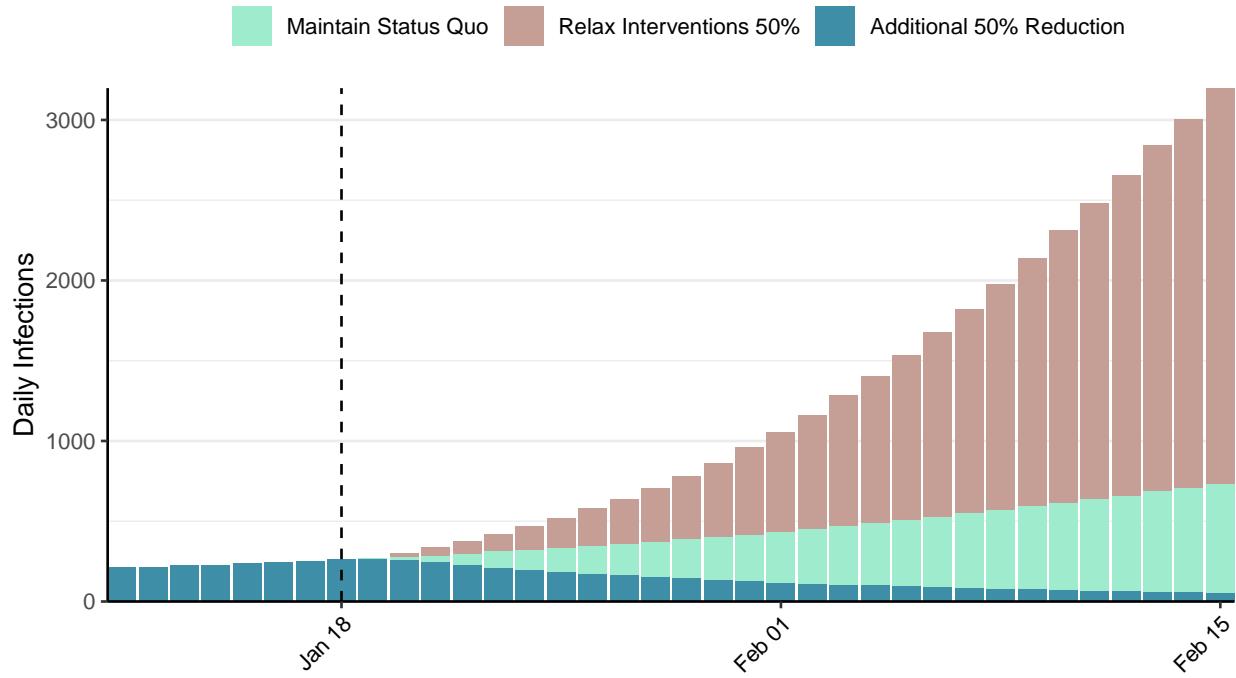


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Guyana, 2021-01-18

[Download the report for Guyana, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.08 (95% CI: 0.75-1.36)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Guyana is not shown in the following plot as only 0 deaths have been reported to date**

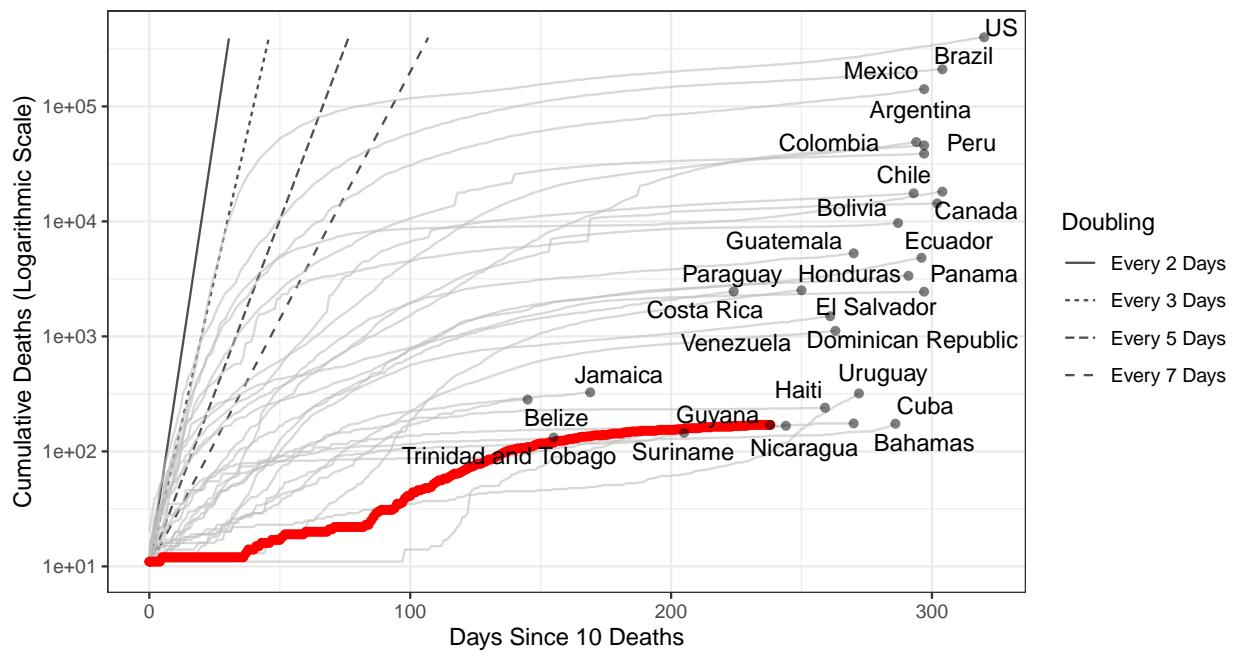


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 6,146 (95% CI: 5,504-6,788) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. Guyana has revised their historic reported cases and thus have reported negative cases.**

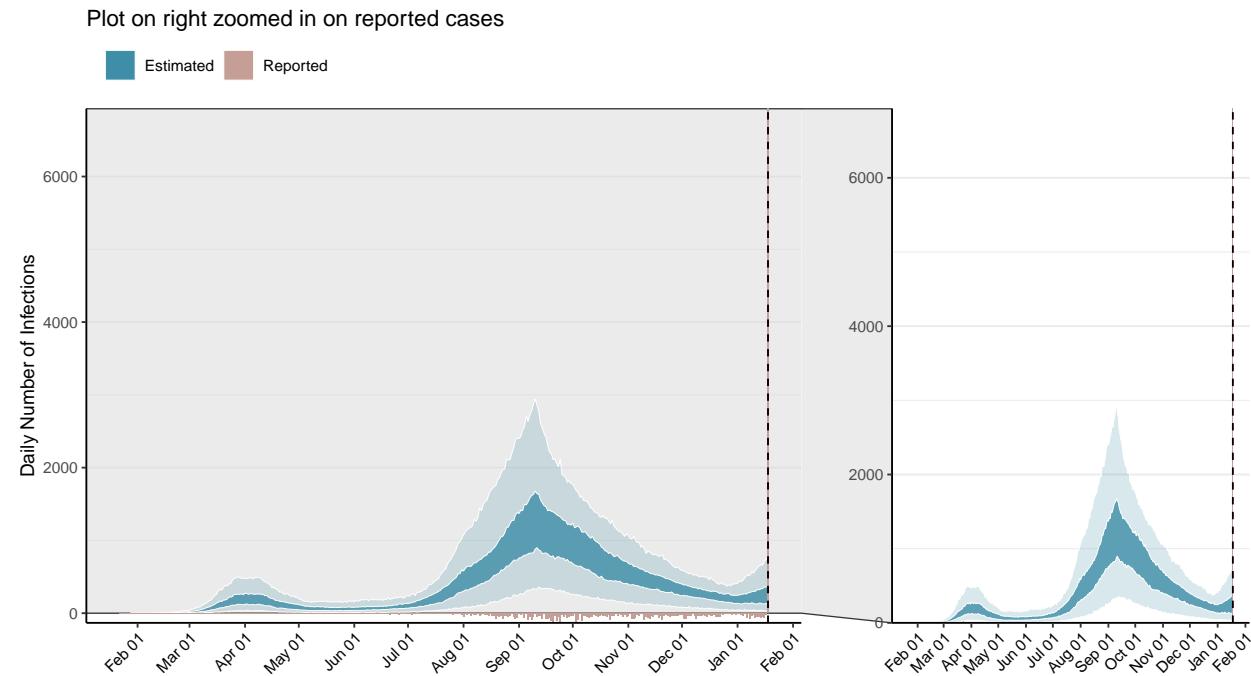


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

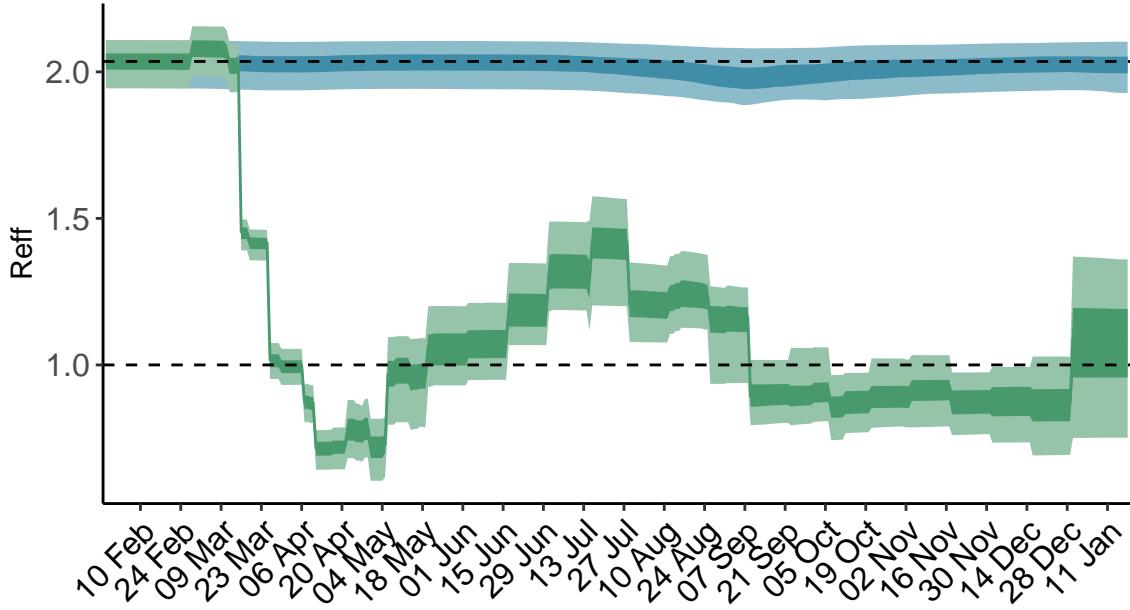


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

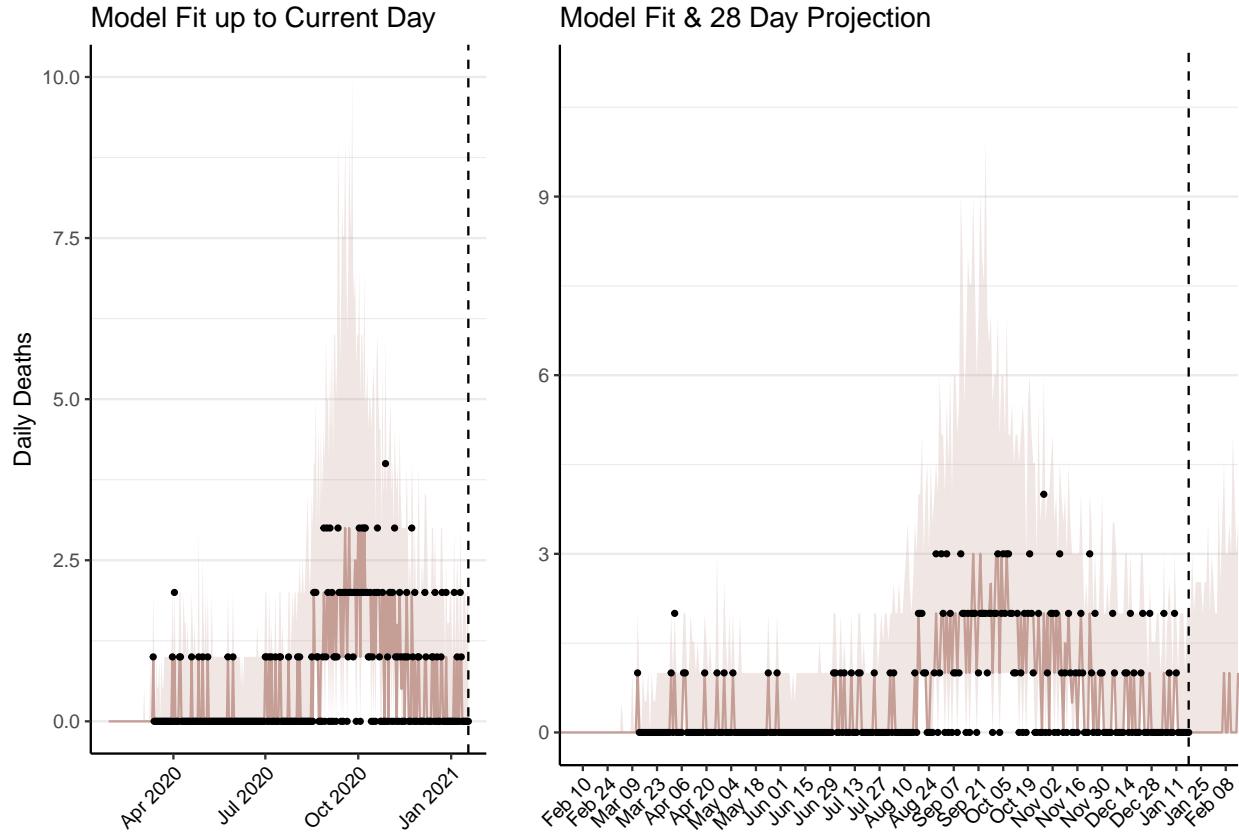


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 20 (95% CI: 18-22) patients requiring treatment with high-pressure oxygen at the current date to 35 (95% CI: 28-42) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 7 (95% CI: 6-7) patients requiring treatment with mechanical ventilation at the current date to 12 (95% CI: 9-14) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

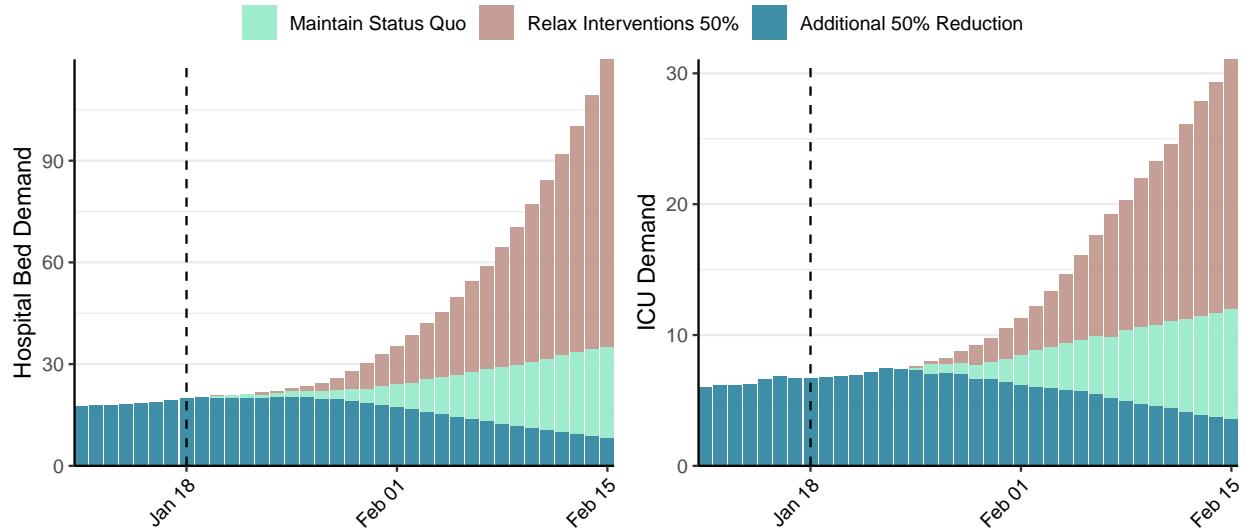


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 269 (95% CI: 231-306) at the current date to 40 (95% CI: 31-48) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 269 (95% CI: 231-306) at the current date to 3,166 (95% CI: 2,479-3,853) by 2021-02-15.

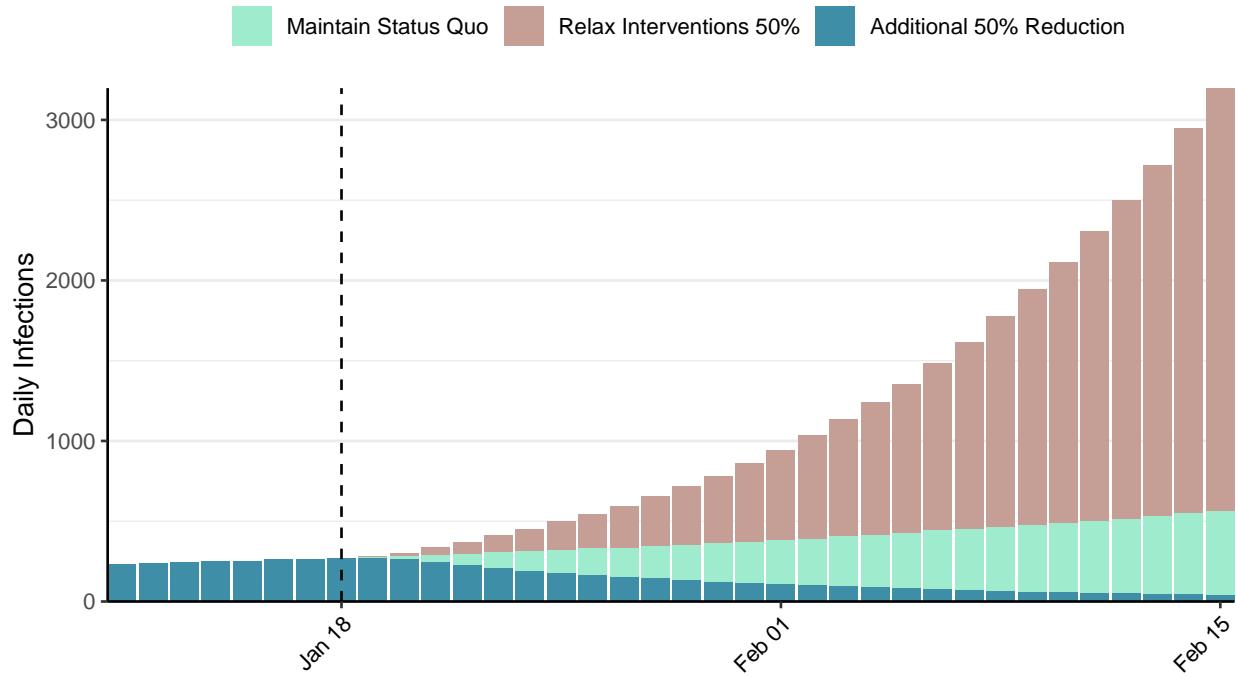


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Honduras, 2021-01-18

[Download the report for Honduras, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.13 (95% CI: 0.95-1.34)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Honduras is not shown in the following plot as only 0 deaths have been reported to date**

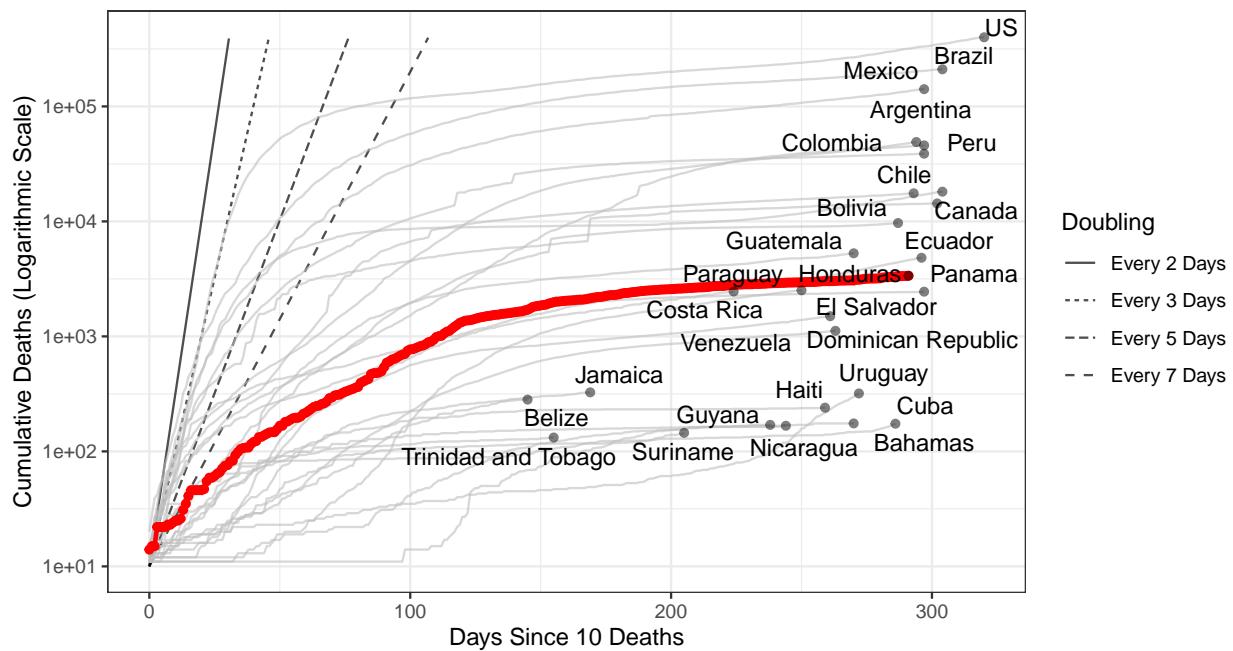


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 219,048 (95% CI: 207,530-230,566) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. Honduras has revised their historic reported cases and thus have reported negative cases.**

Plot on right zoomed in on reported cases

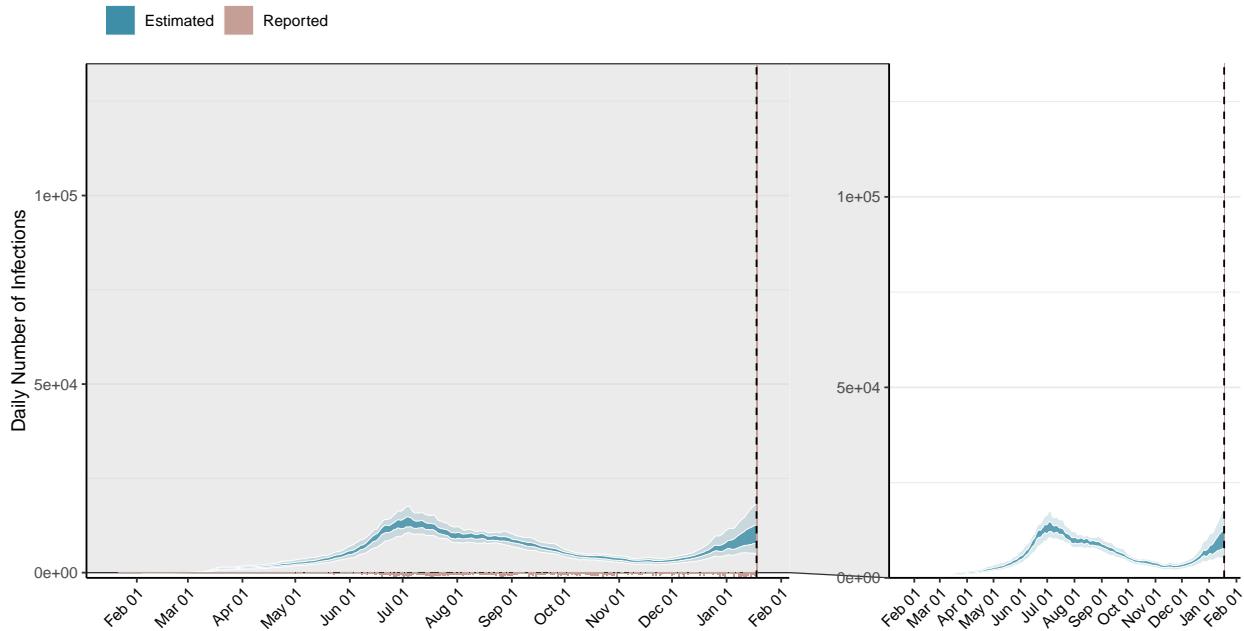


Figure 2: Daily number of infections estimated by fitting to the current total of deaths. Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

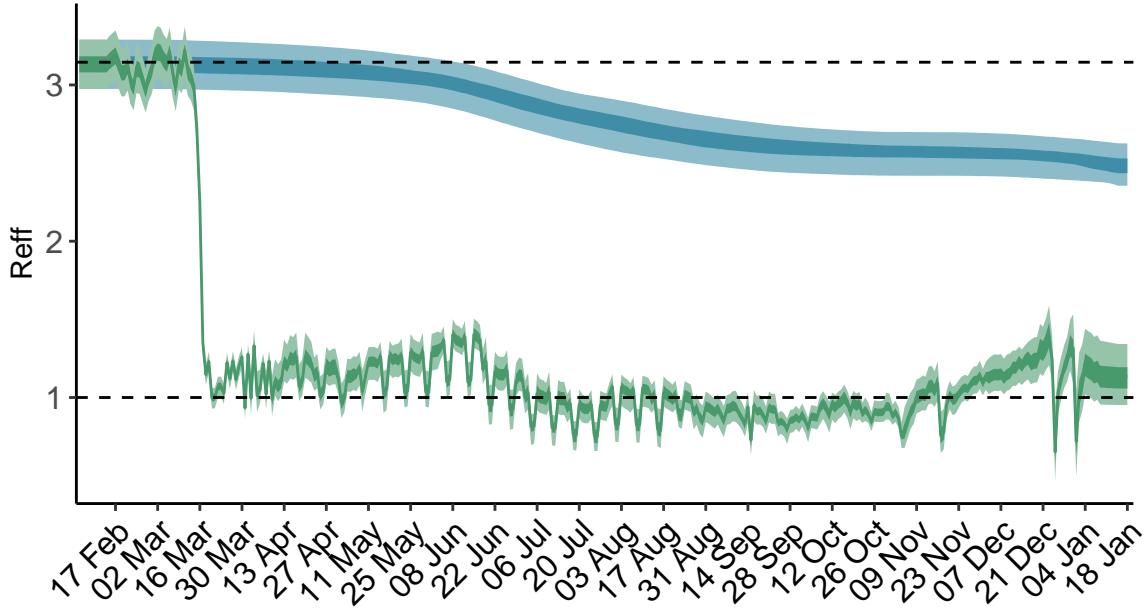


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

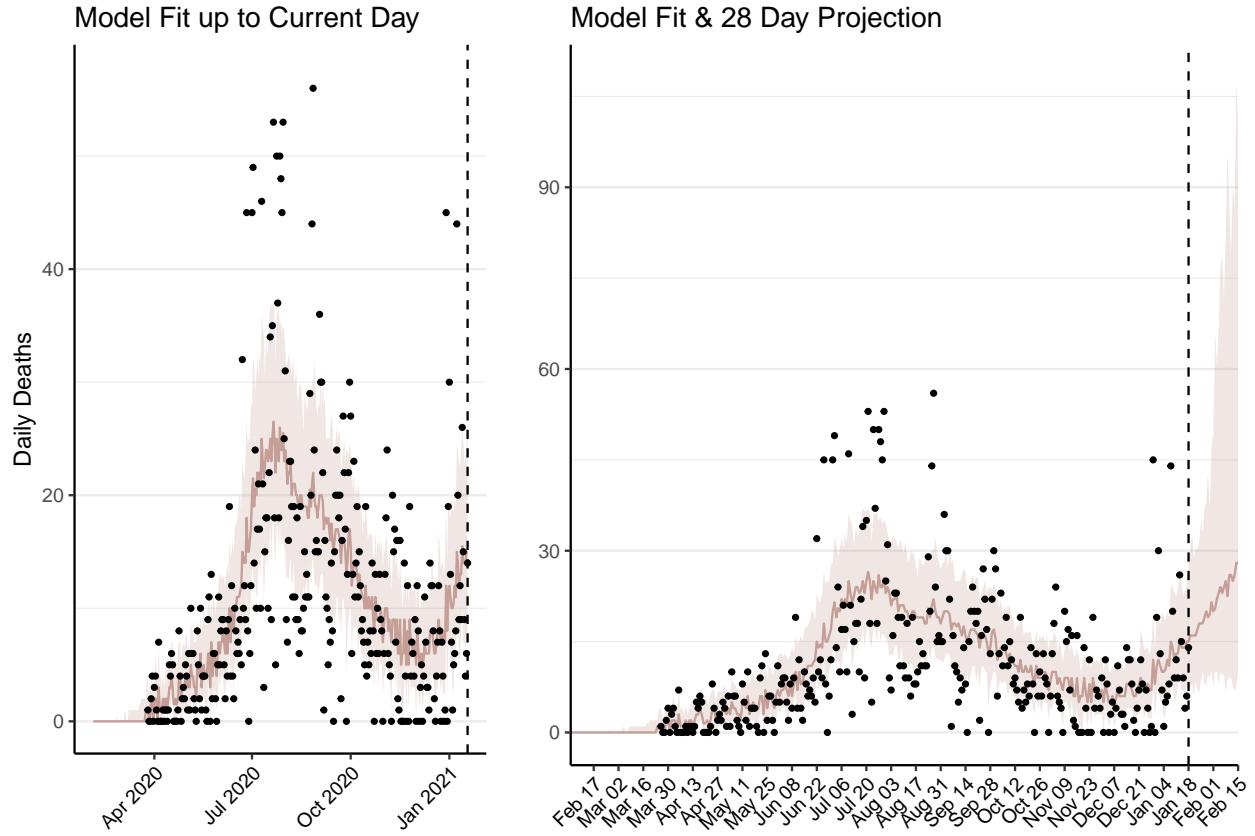


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 662 (95% CI: 624-699) patients requiring treatment with high-pressure oxygen at the current date to 1,261 (95% CI: 1,120-1,402) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 226 (95% CI: 213-238) patients requiring treatment with mechanical ventilation at the current date to 386 (95% CI: 355-417) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

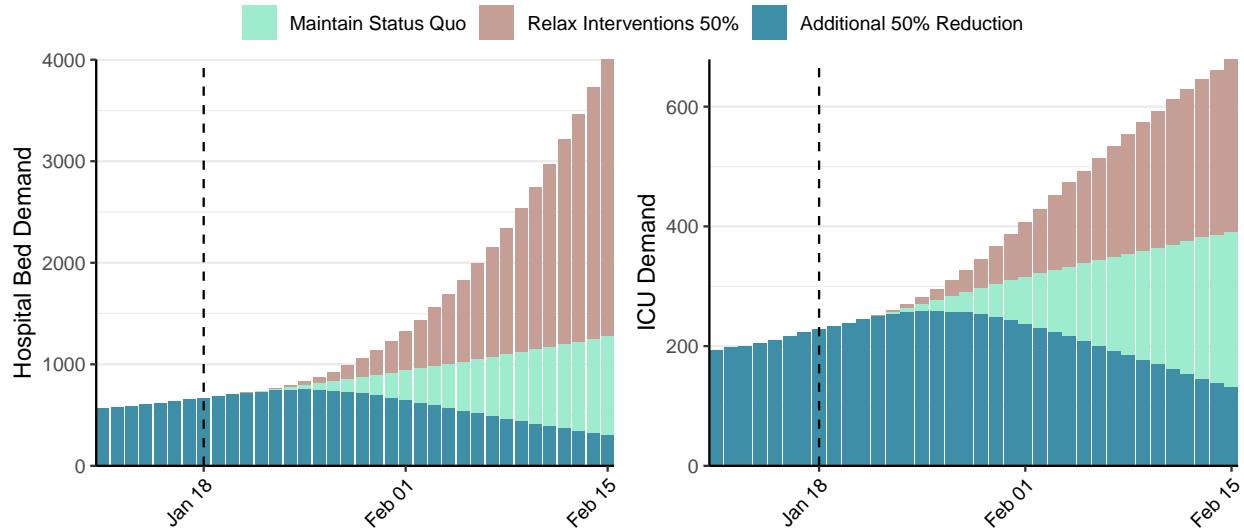


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 10,495 (95% CI: 9,709-11,281) at the current date to 1,513 (95% CI: 1,318-1,708) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 10,495 (95% CI: 9,709-11,281) at the current date to 86,086 (95% CI: 77,277-94,896) by 2021-02-15.

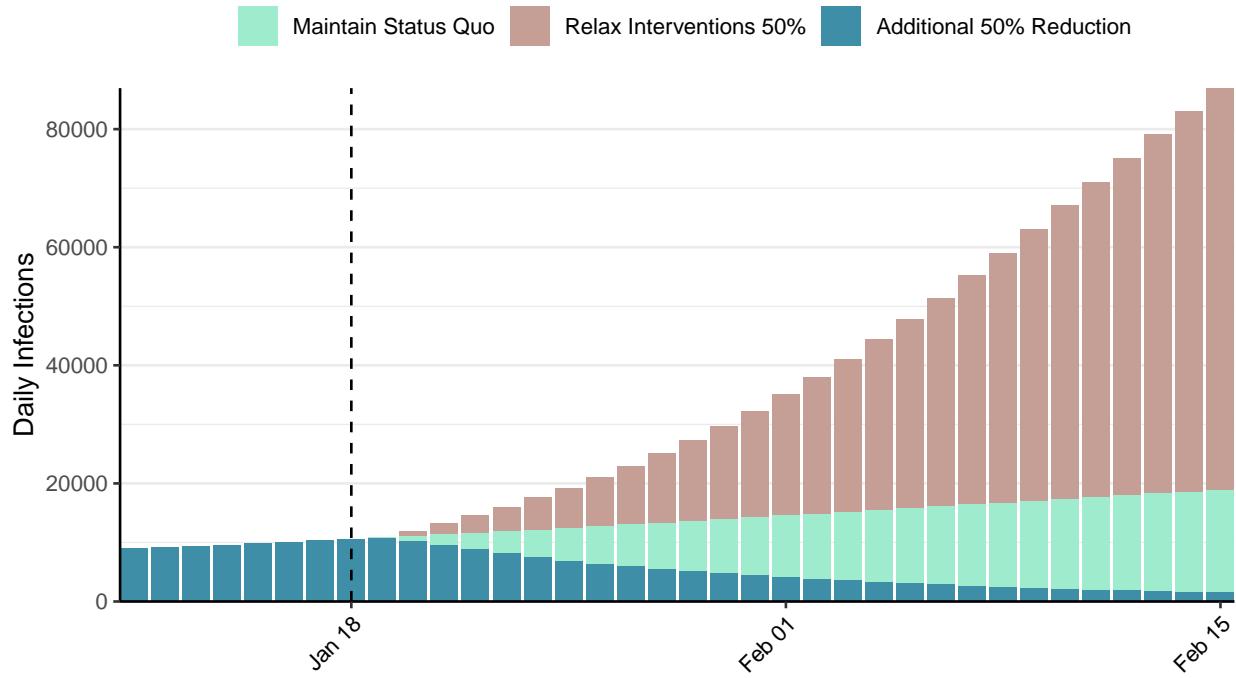


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Haiti, 2021-01-18

[Download the report for Haiti, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.12 (95% CI: 0.91-1.35)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Haiti is not shown in the following plot as only 0 deaths have been reported to date**

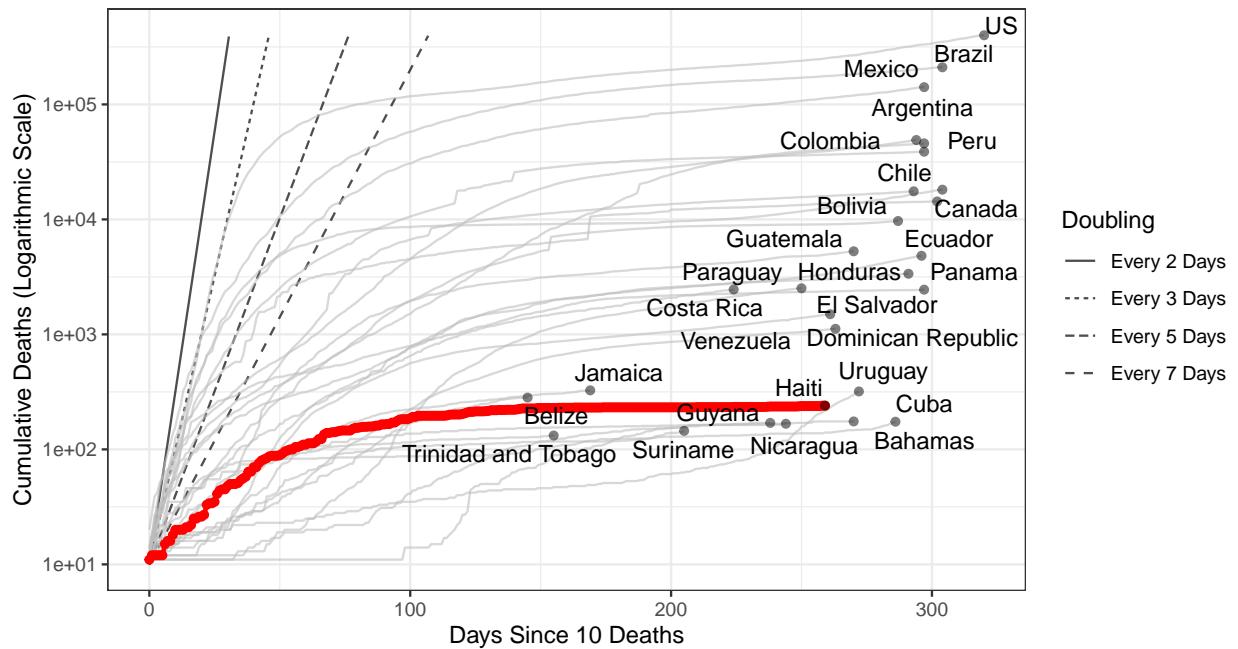


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 4,582 (95% CI: 4,107-5,058) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

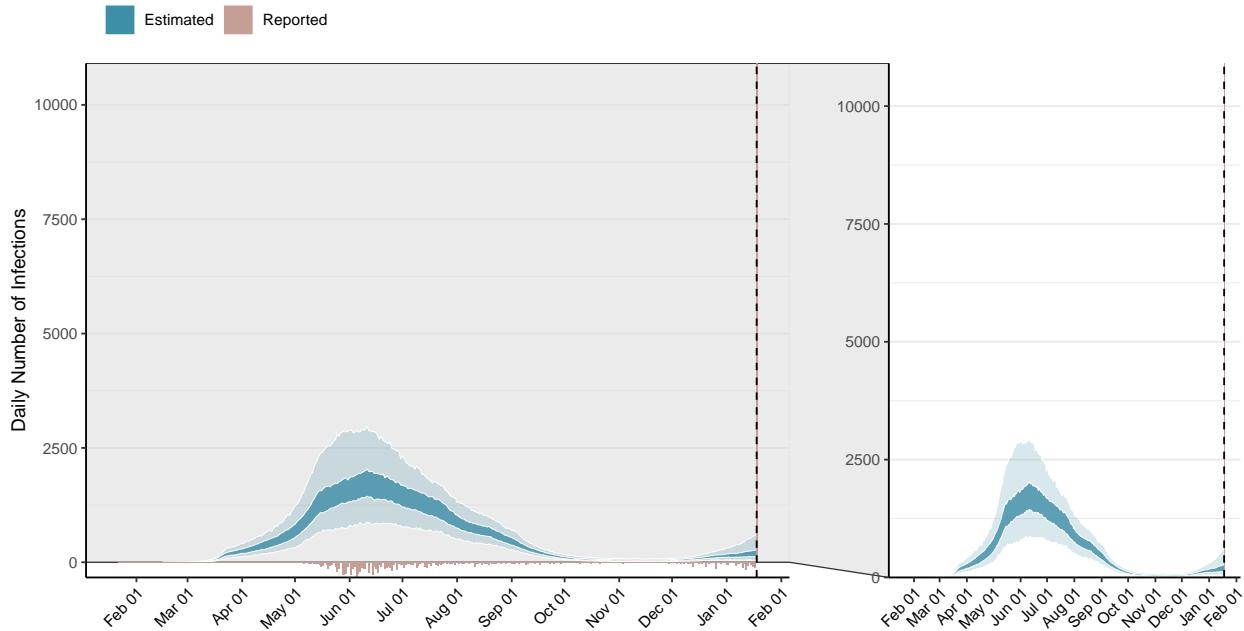


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

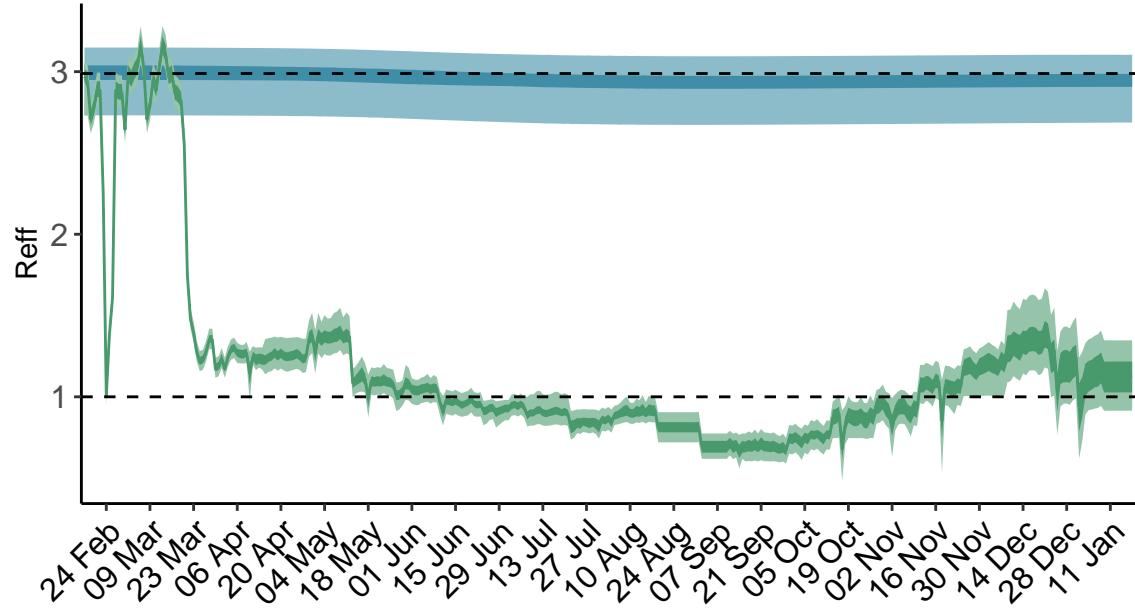


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

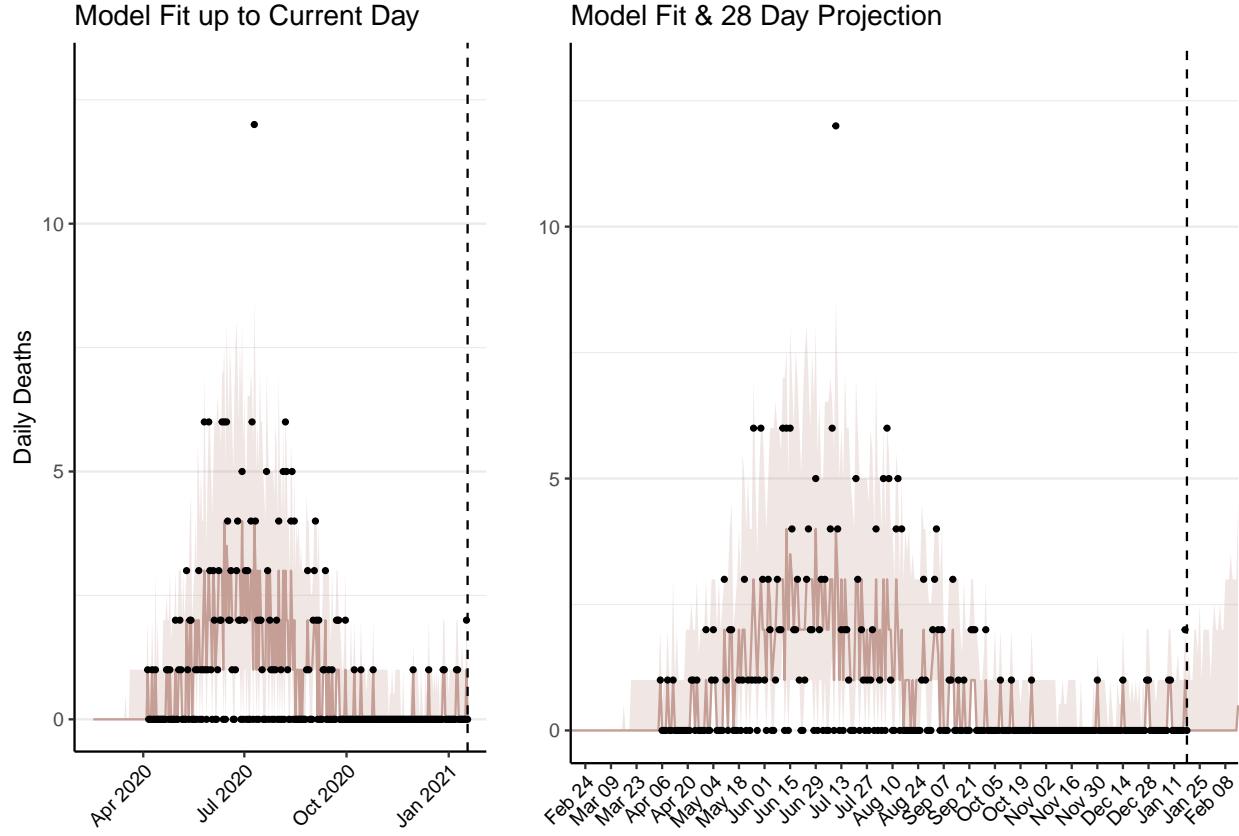


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 13 (95% CI: 11-14) patients requiring treatment with high-pressure oxygen at the current date to 26 (95% CI: 21-31) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 4 (95% CI: 4-5) patients requiring treatment with mechanical ventilation at the current date to 9 (95% CI: 7-11) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

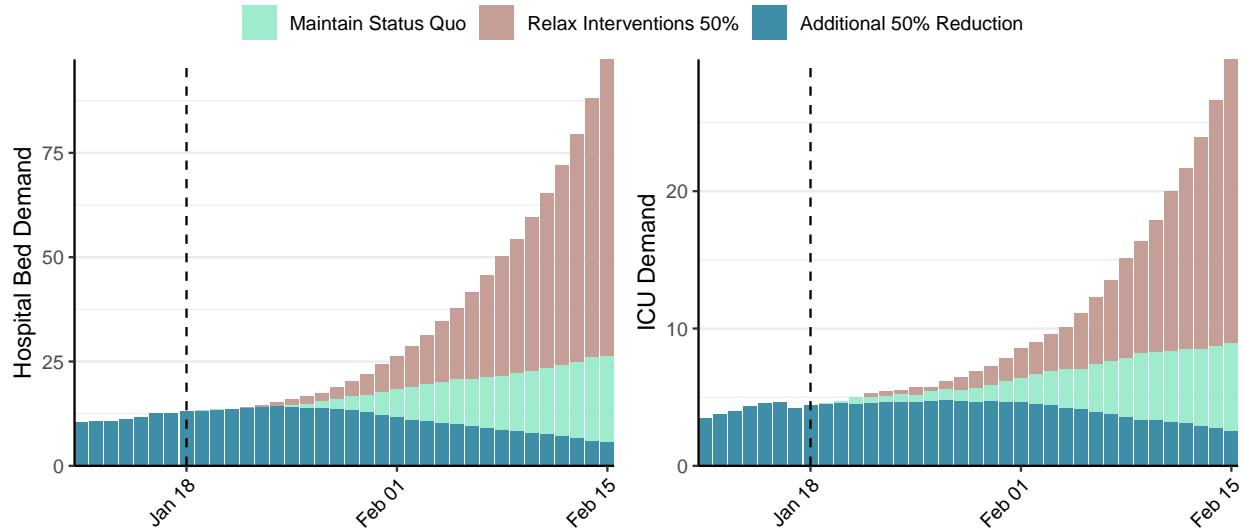


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 220 (95% CI: 189-250) at the current date to 34 (95% CI: 26-41) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 220 (95% CI: 189-250) at the current date to 3,232 (95% CI: 2,454-4,010) by 2021-02-15.

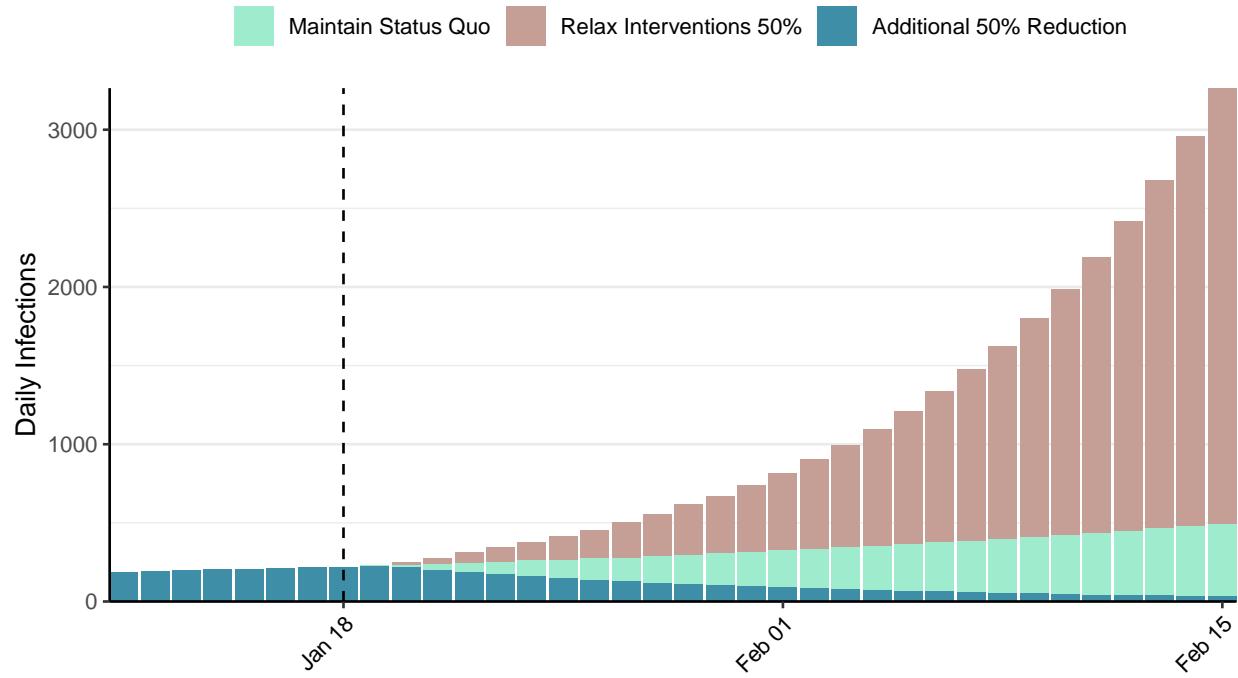


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Indonesia, 2021-01-18

[Download the report for Indonesia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.37 (95% CI: 1.23-1.53)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Indonesia is not shown in the following plot as only 0 deaths have been reported to date**

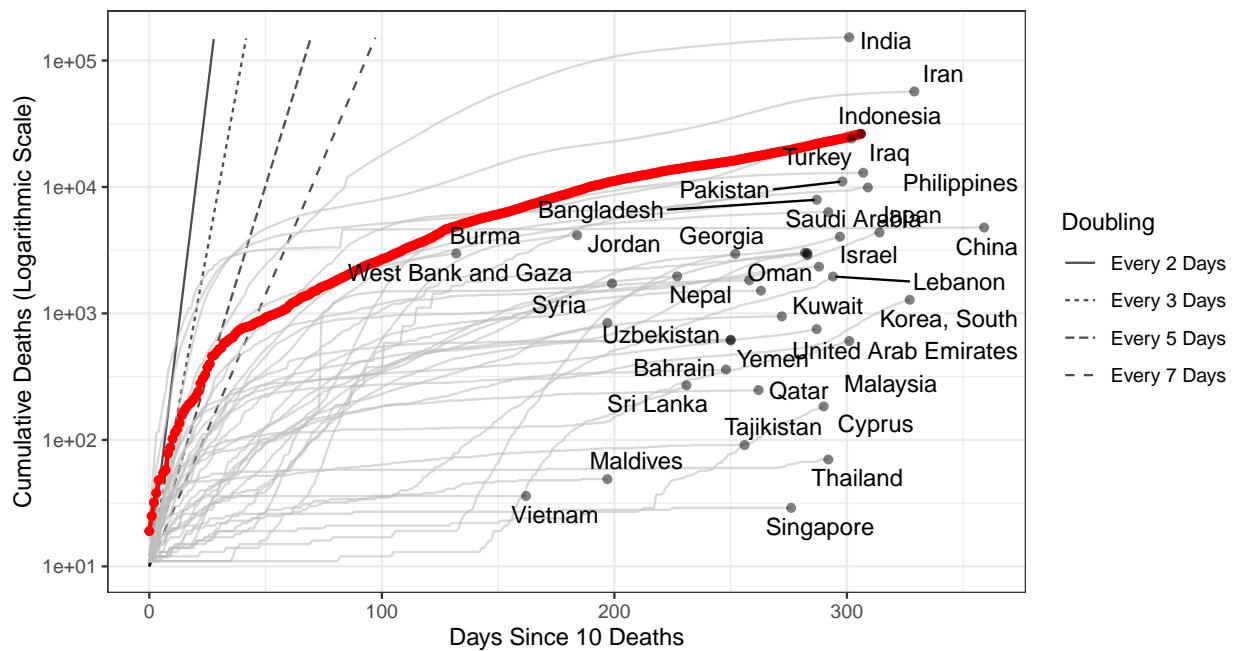


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 3,970,016 (95% CI: 3,857,168-4,082,865) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

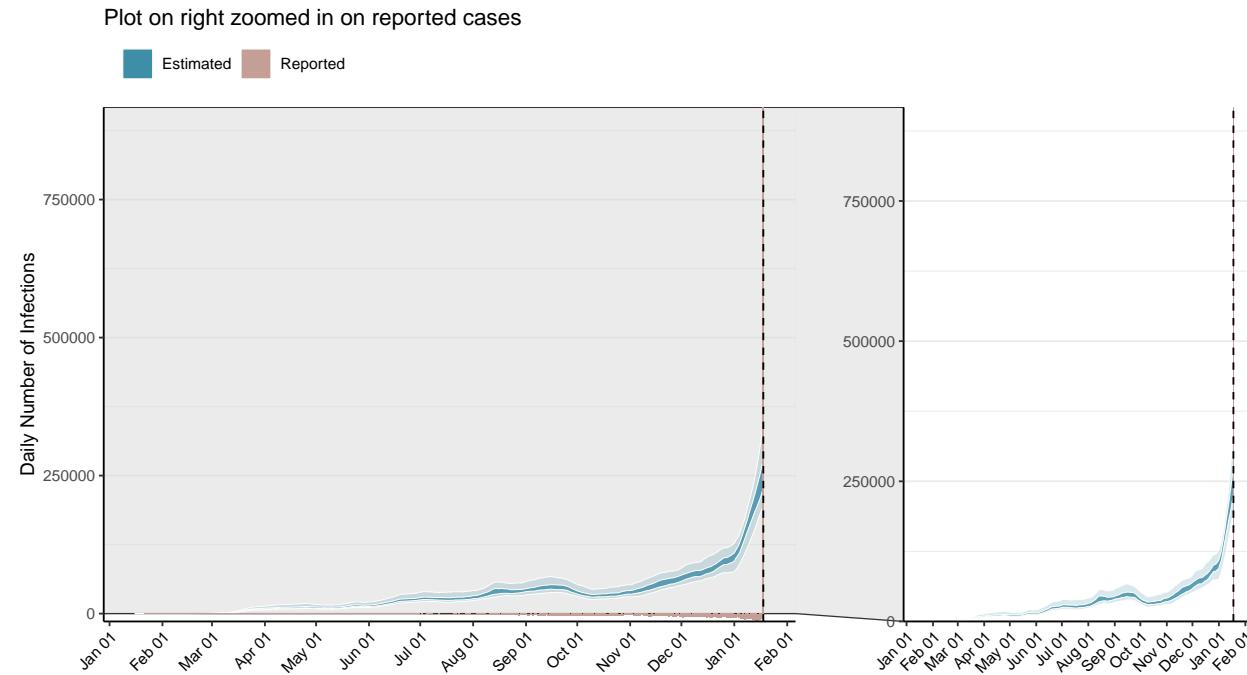


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

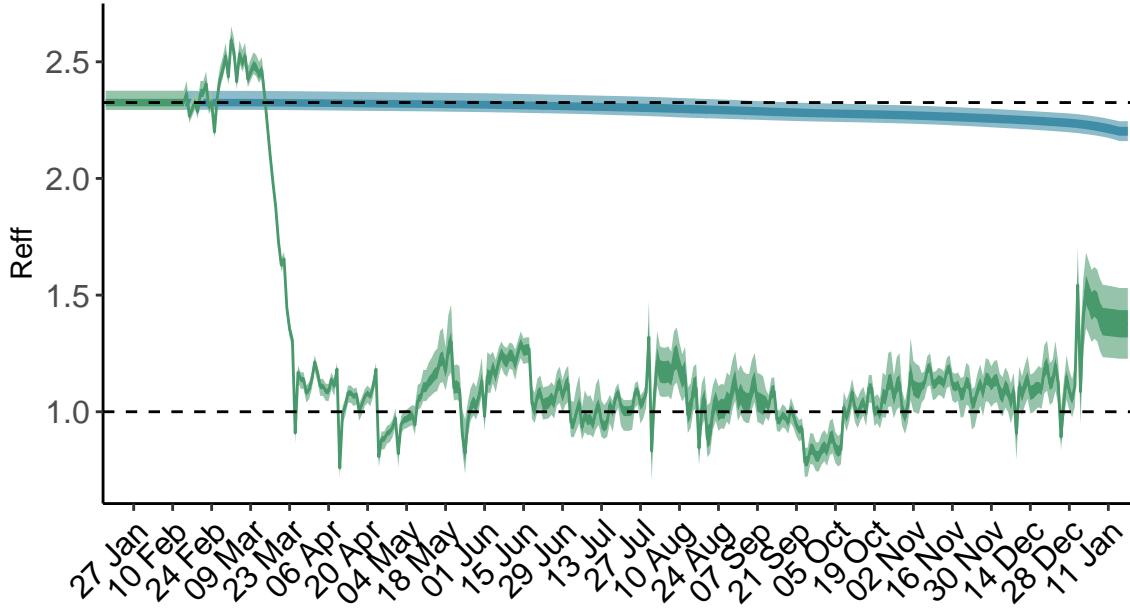


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Indonesia is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

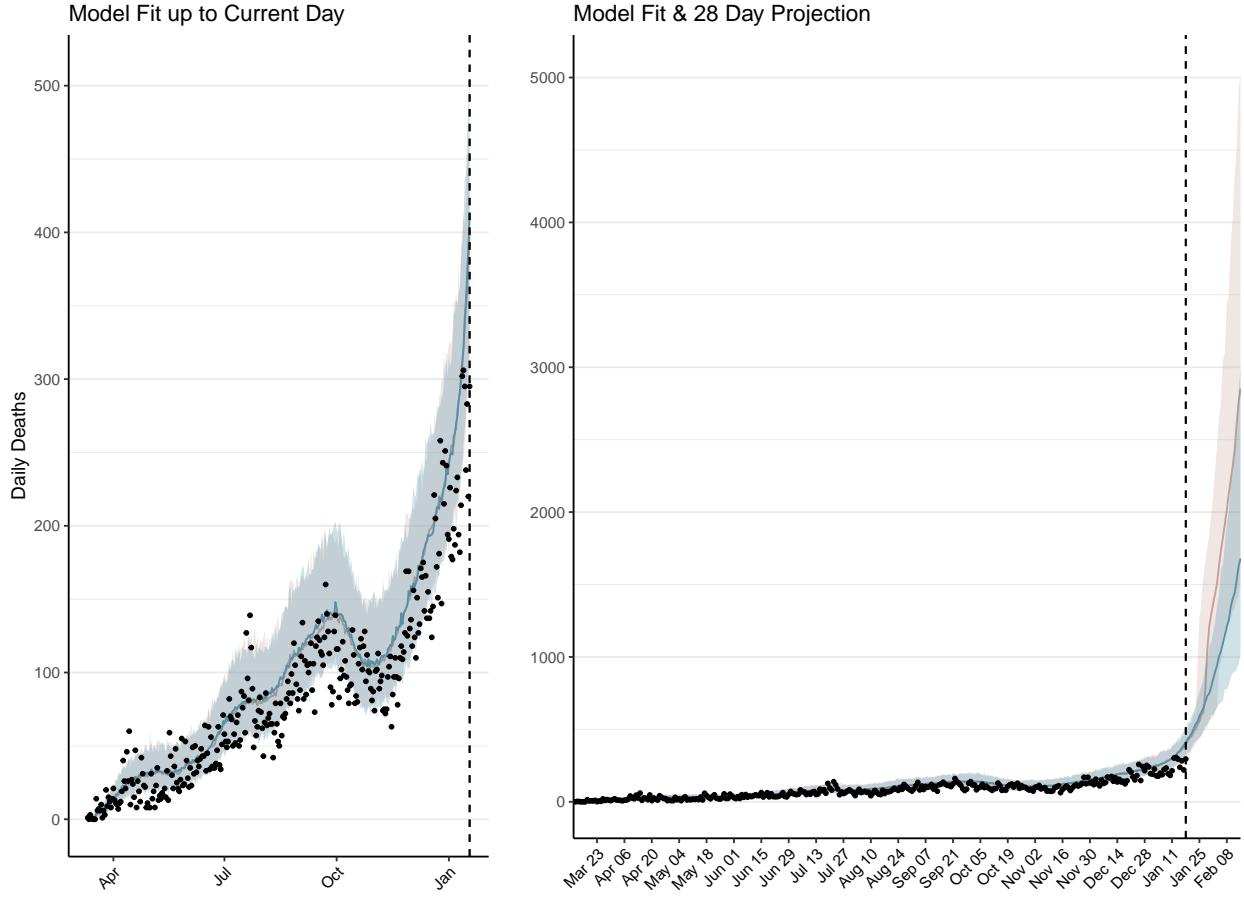


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 18,307 (95% CI: 17,776-18,837) patients requiring treatment with high-pressure oxygen at the current date to 71,958 (95% CI: 67,703-76,213) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 6,706 (95% CI: 6,510-6,901) patients requiring treatment with mechanical ventilation at the current date to 13,326 (95% CI: 12,959-13,693) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B.** These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.

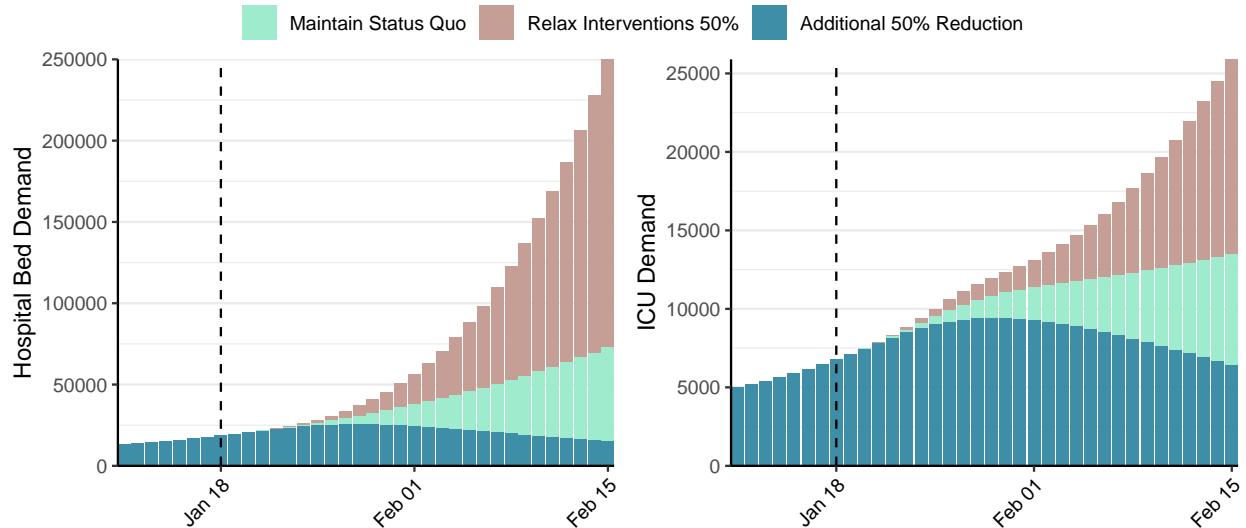


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 255,196 (95% CI: 246,250-264,142) at the current date to 66,106 (95% CI: 61,634-70,579) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 255,196 (95% CI: 246,250-264,142) at the current date to 4,580,058 (95% CI: 4,326,059-4,834,057) by 2021-02-15.

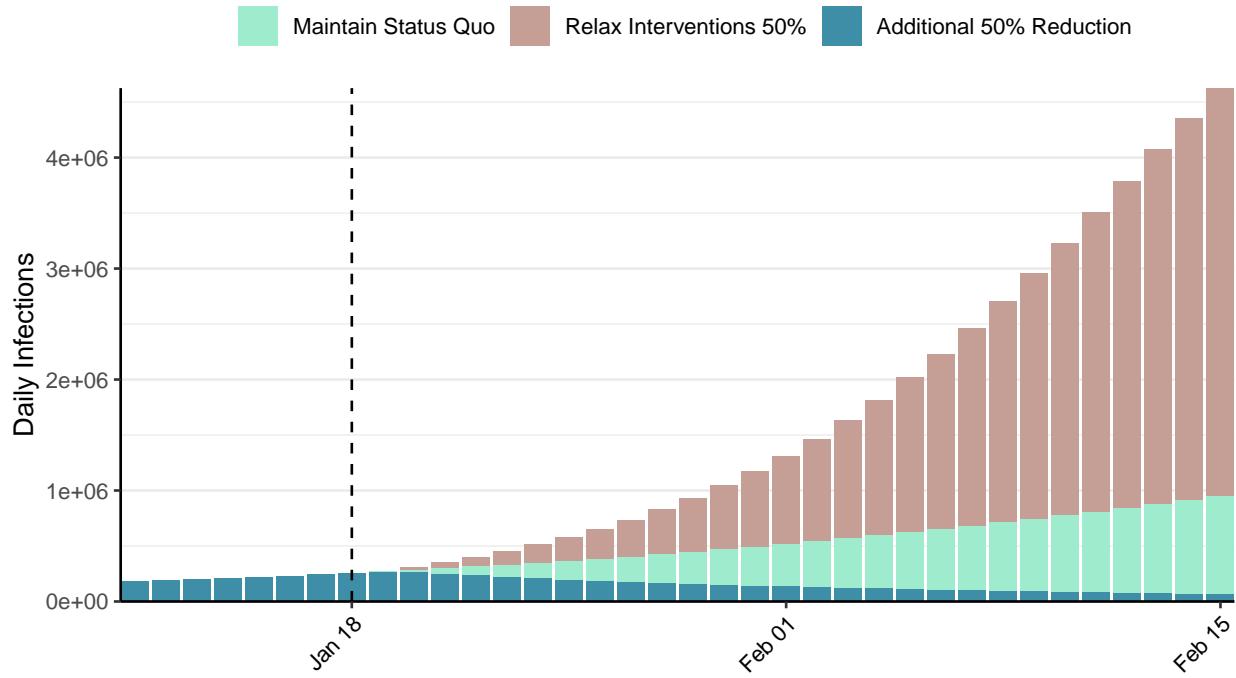


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: India, 2021-01-18

[Download the report for India, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.86 (95% CI: 0.74-1.02)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. India is not shown in the following plot as only 0 deaths have been reported to date**

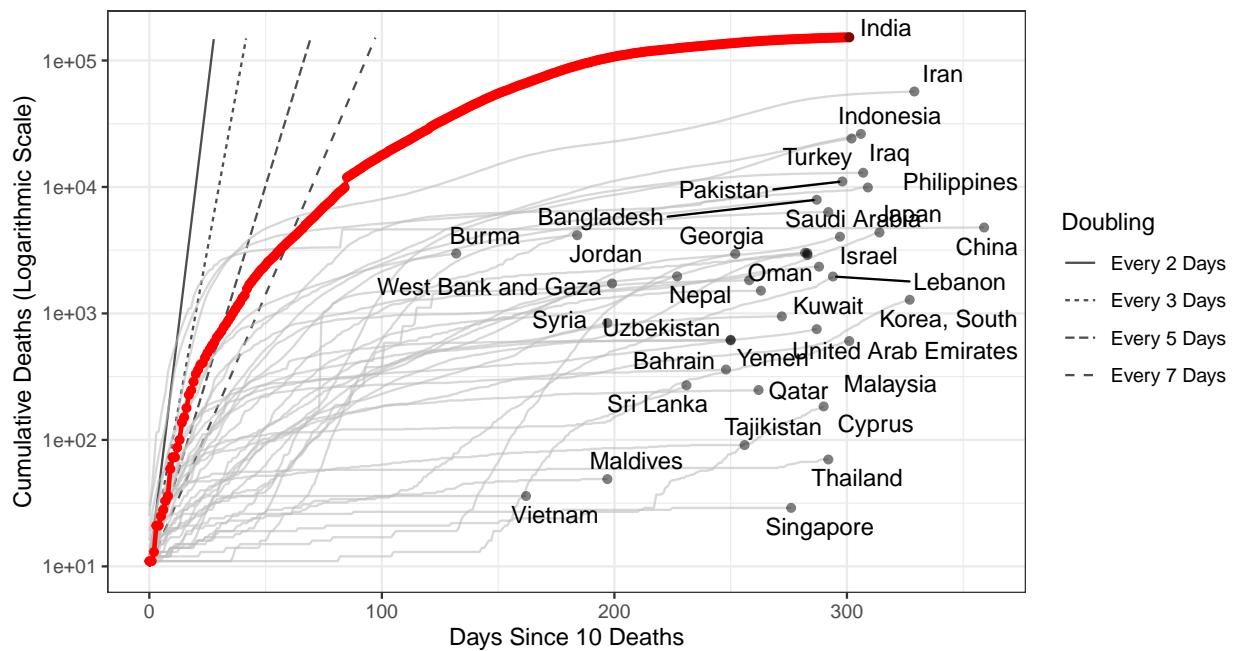


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 1,874,829 (95% CI: 1,761,734-1,987,924) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

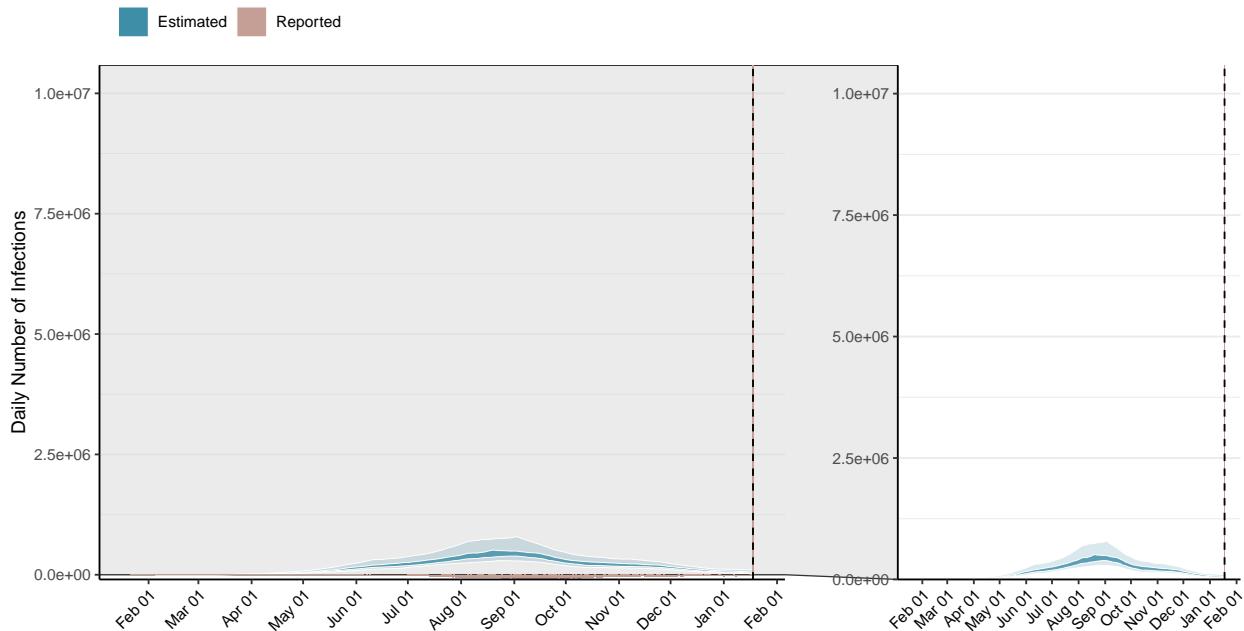


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

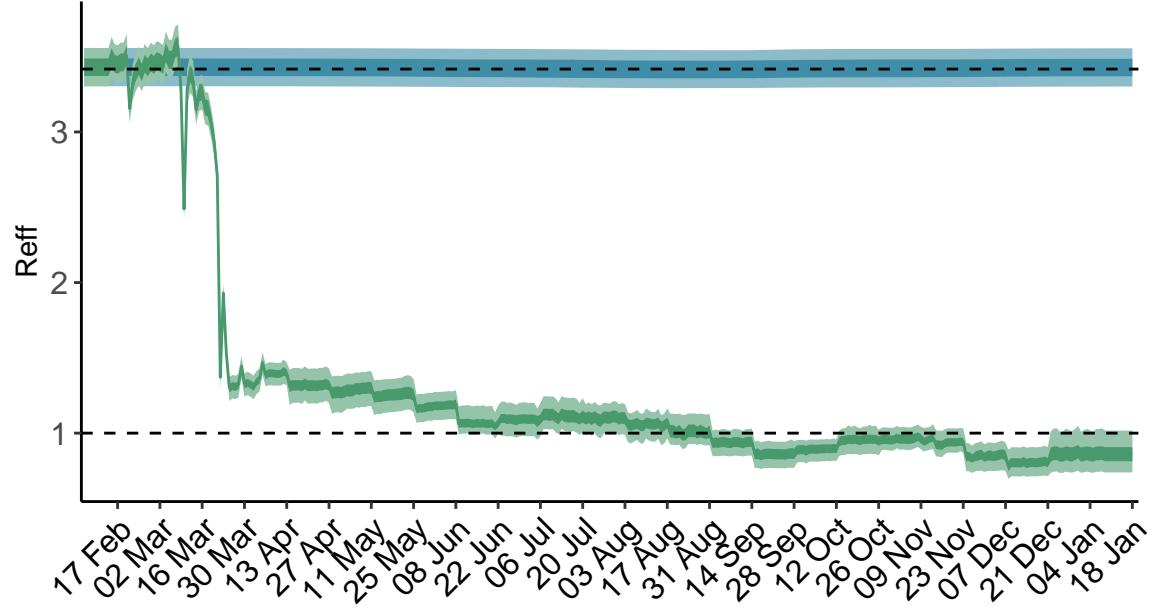


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

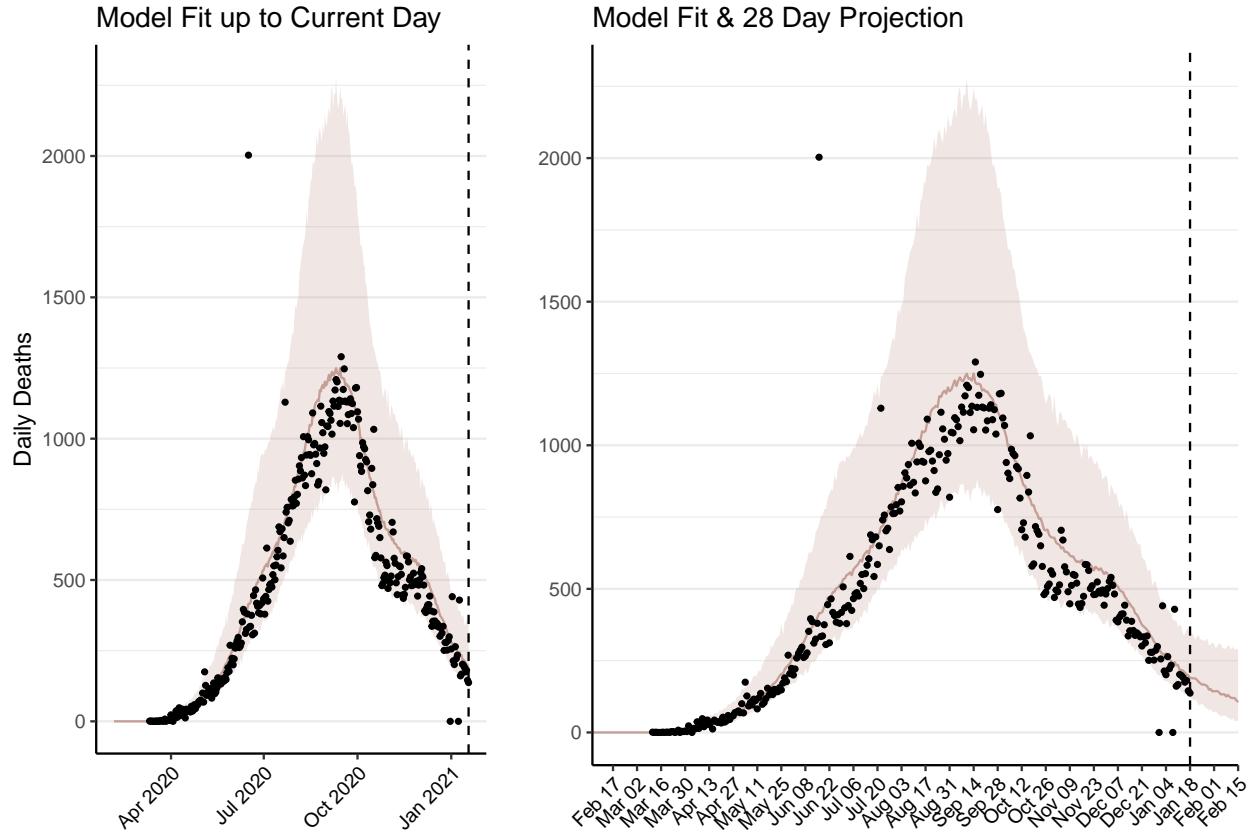


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 7,208 (95% CI: 6,750-7,666) patients requiring treatment with high-pressure oxygen at the current date to 4,480 (95% CI: 3,966-4,995) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 3,032 (95% CI: 2,851-3,213) patients requiring treatment with mechanical ventilation at the current date to 1,852 (95% CI: 1,653-2,051) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

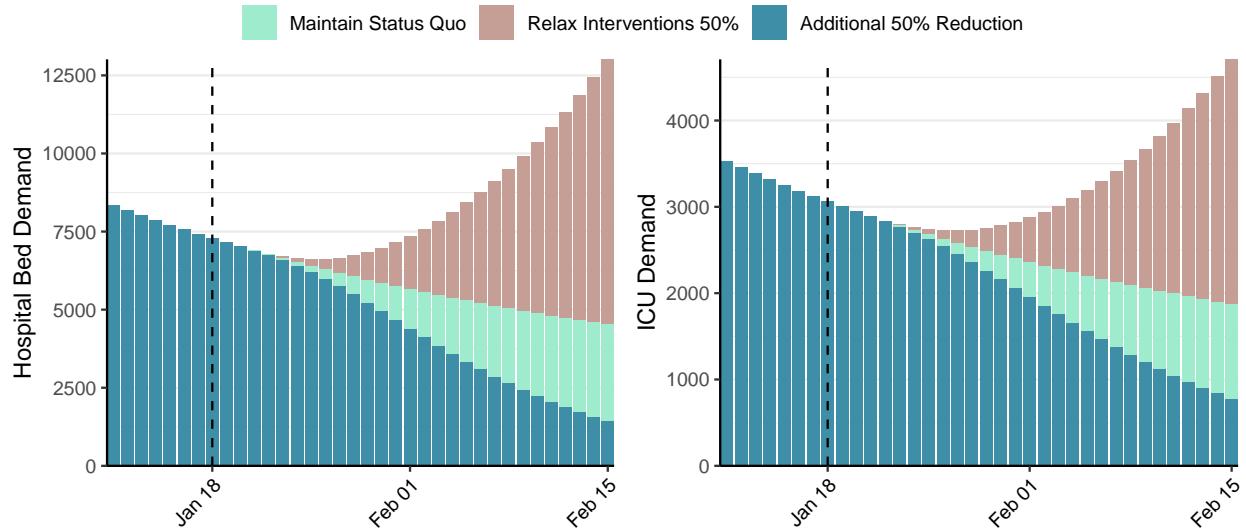


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 51,816 (95% CI: 47,593-56,039) at the current date to 3,055 (95% CI: 2,657-3,453) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 51,816 (95% CI: 47,593-56,039) at the current date to 186,621 (95% CI: 157,637-215,605) by 2021-02-15.

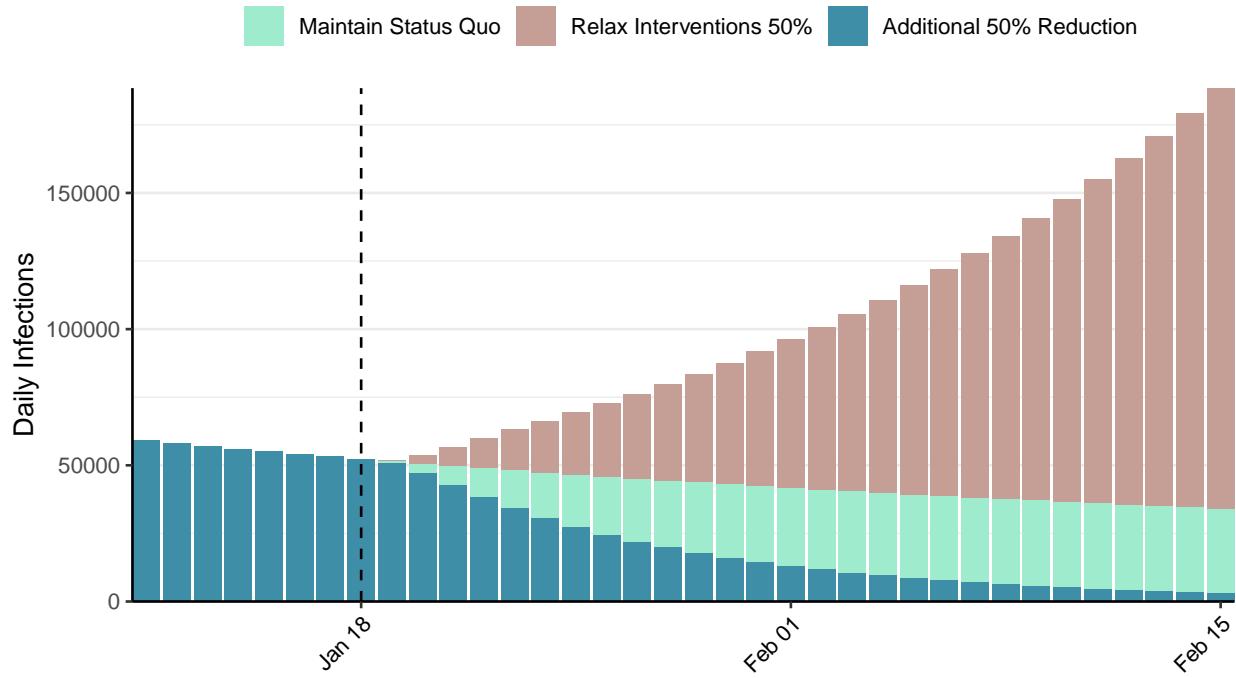


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Iraq, 2021-01-18

[Download the report for Iraq, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.85 (95% CI: 0.71-1.01)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Iraq is not shown in the following plot as only 0 deaths have been reported to date**

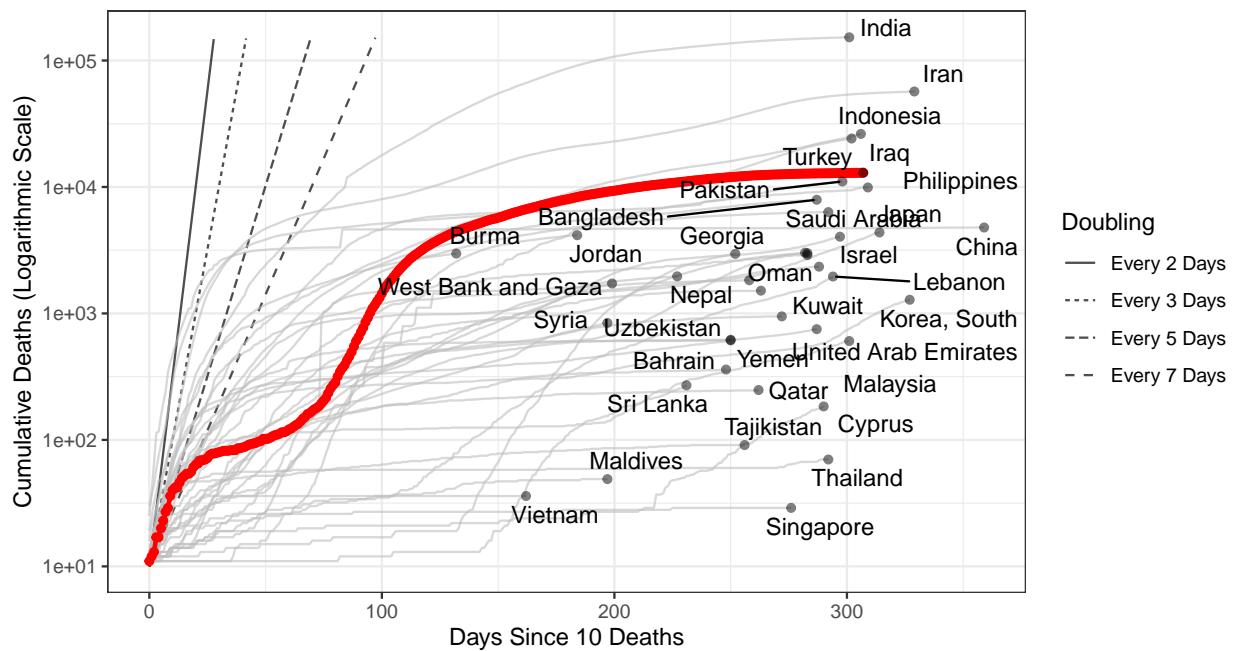


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 106,840 (95% CI: 100,782-112,899) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

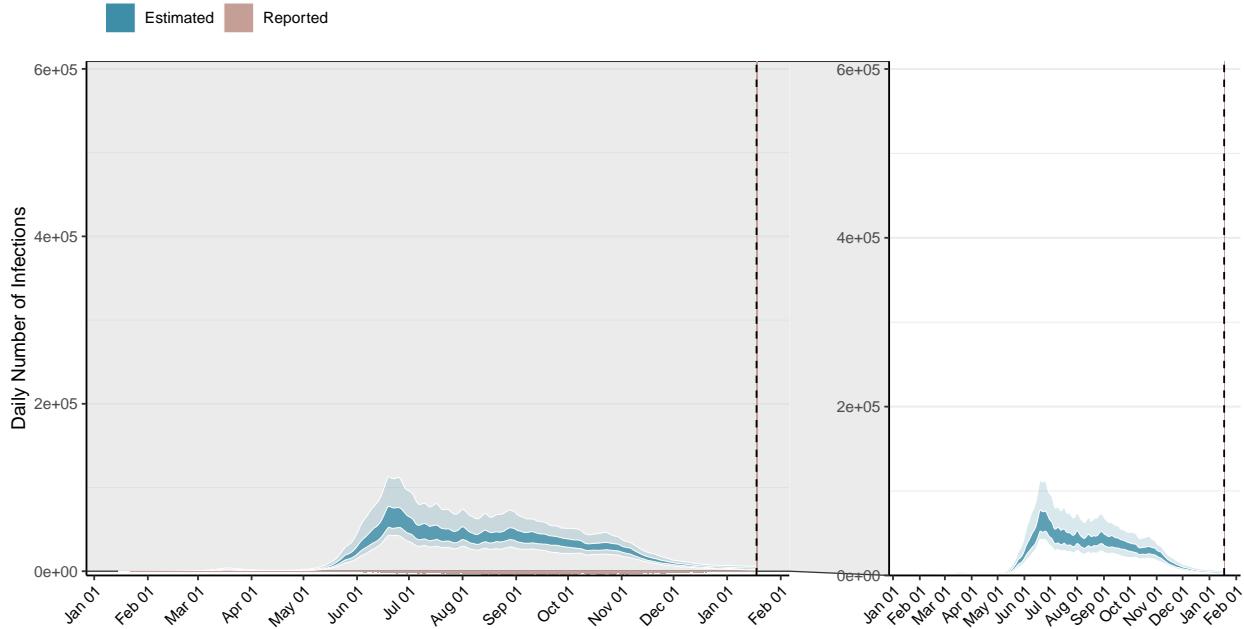


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

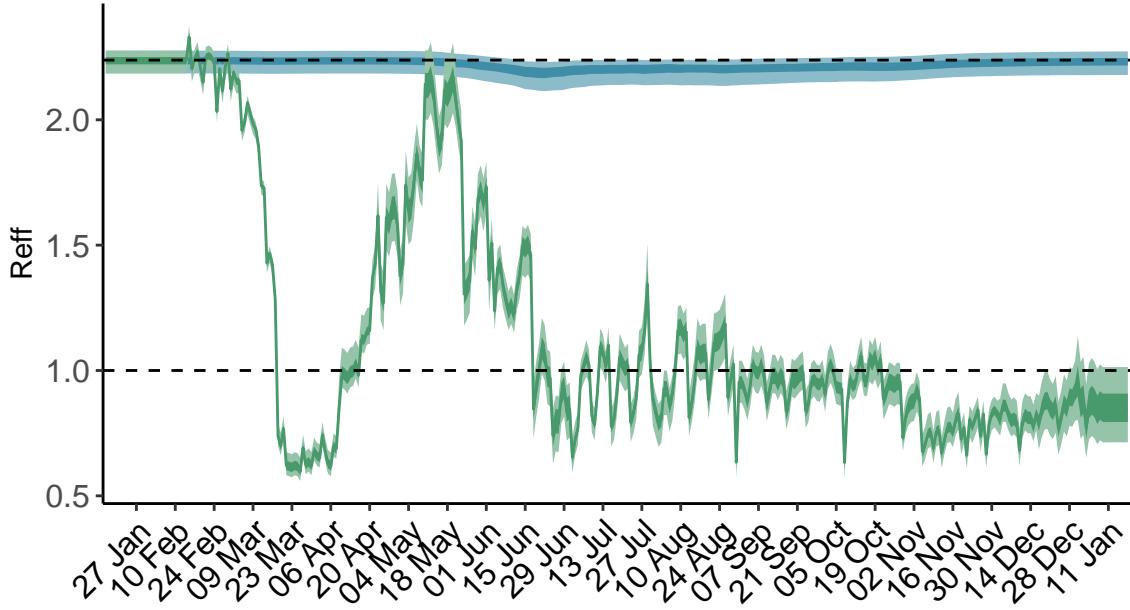


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Iraq is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

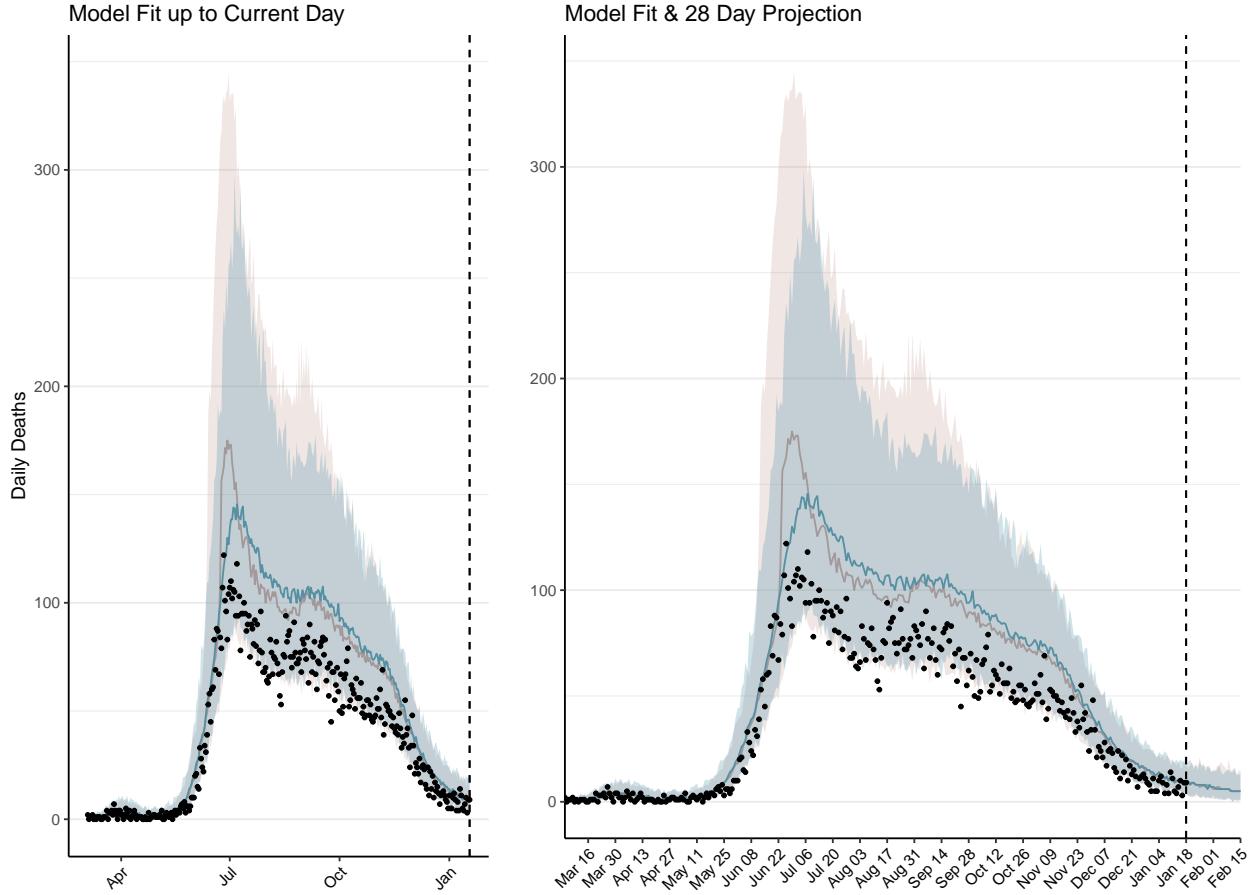


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 363 (95% CI: 342-385) patients requiring treatment with high-pressure oxygen at the current date to 220 (95% CI: 193-247) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 154 (95% CI: 145-162) patients requiring treatment with mechanical ventilation at the current date to 91 (95% CI: 80-101) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

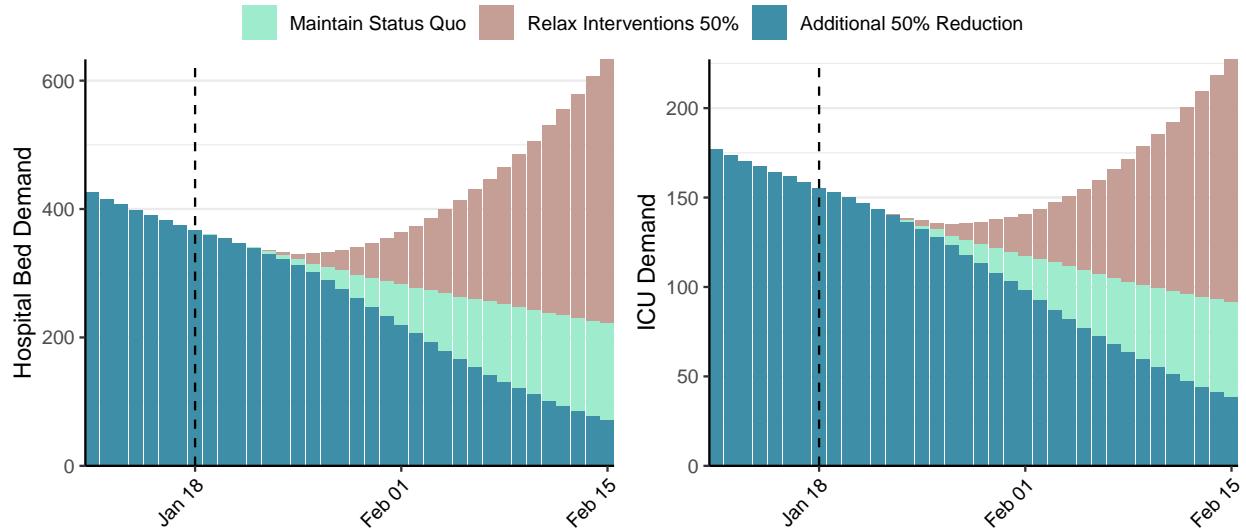


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 2,917 (95% CI: 2,681-3,153) at the current date to 168 (95% CI: 144-192) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,917 (95% CI: 2,681-3,153) at the current date to 10,149 (95% CI: 8,454-11,844) by 2021-02-15.

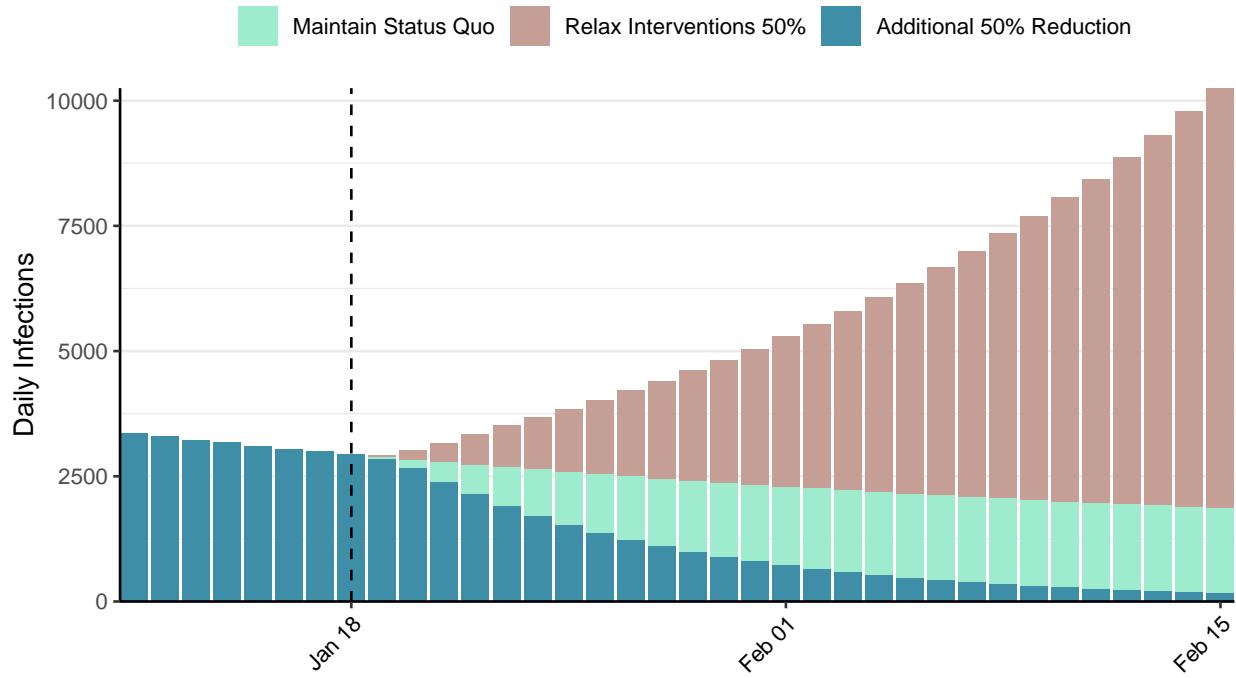


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Jamaica, 2021-01-18

[Download the report for Jamaica, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.2 (95% CI: 1.03-1.38)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Jamaica is not shown in the following plot as only 0 deaths have been reported to date**

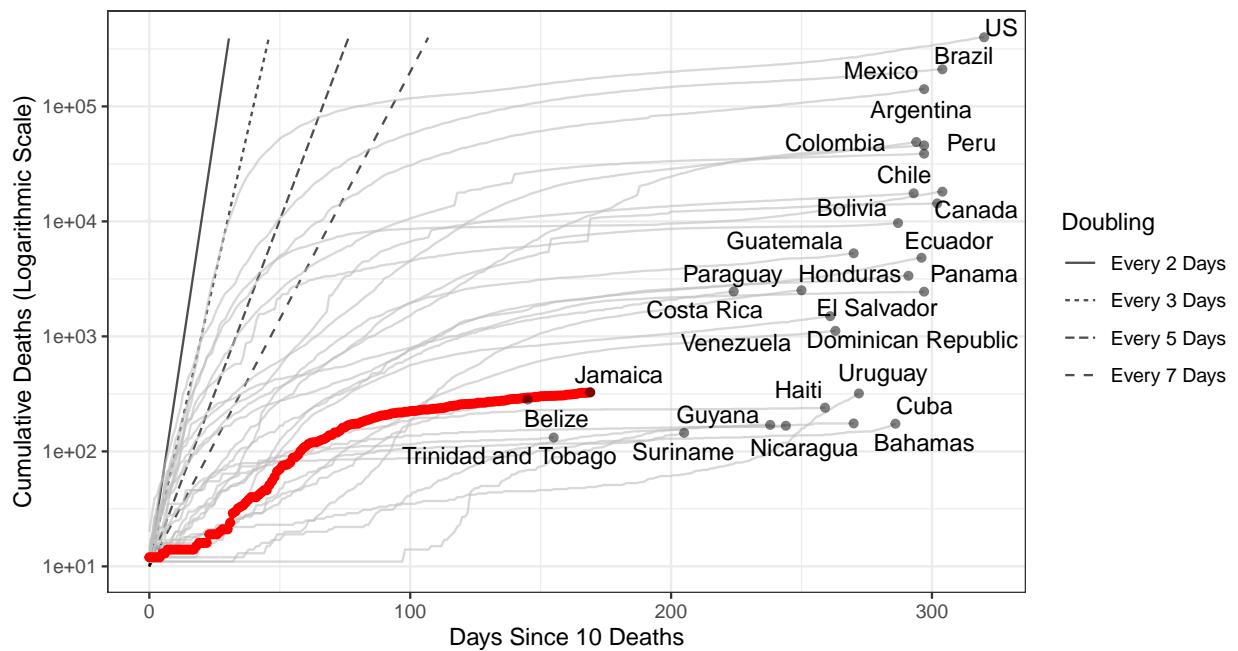


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 44,462 (95% CI: 41,132-47,792) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

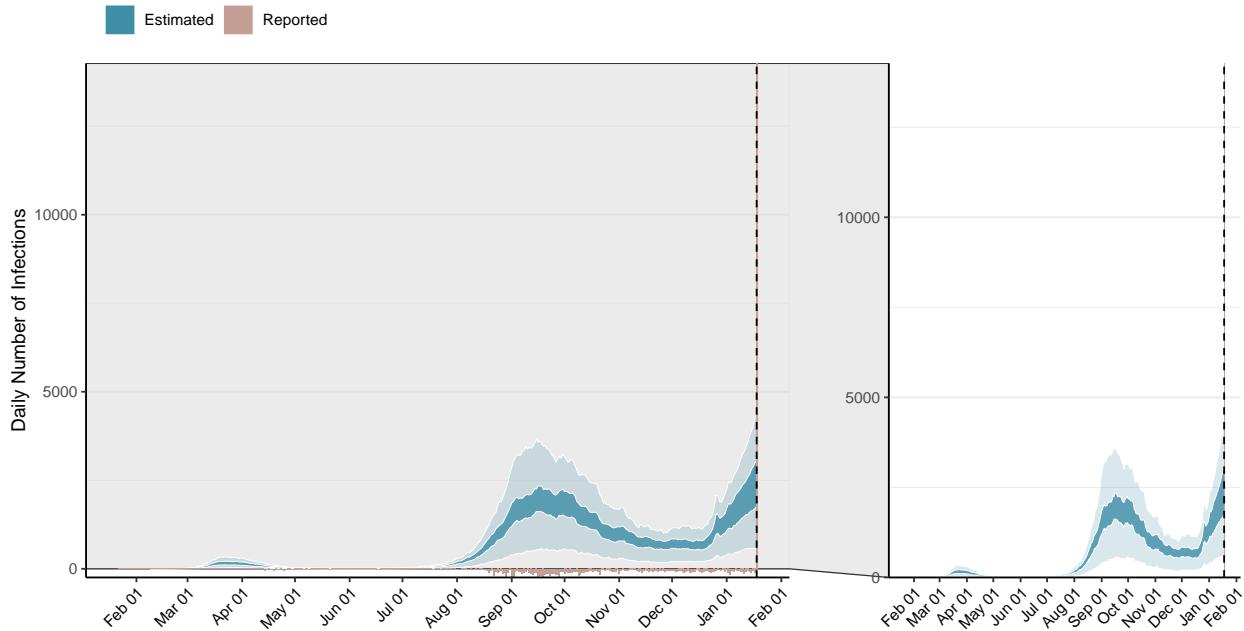


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

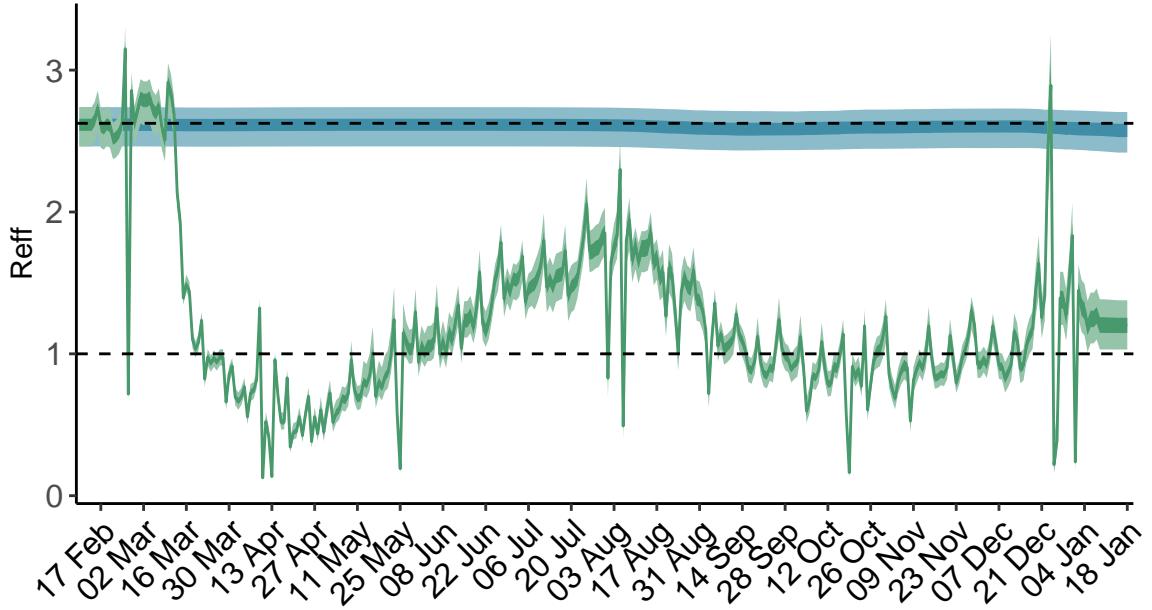


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Jamaica is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

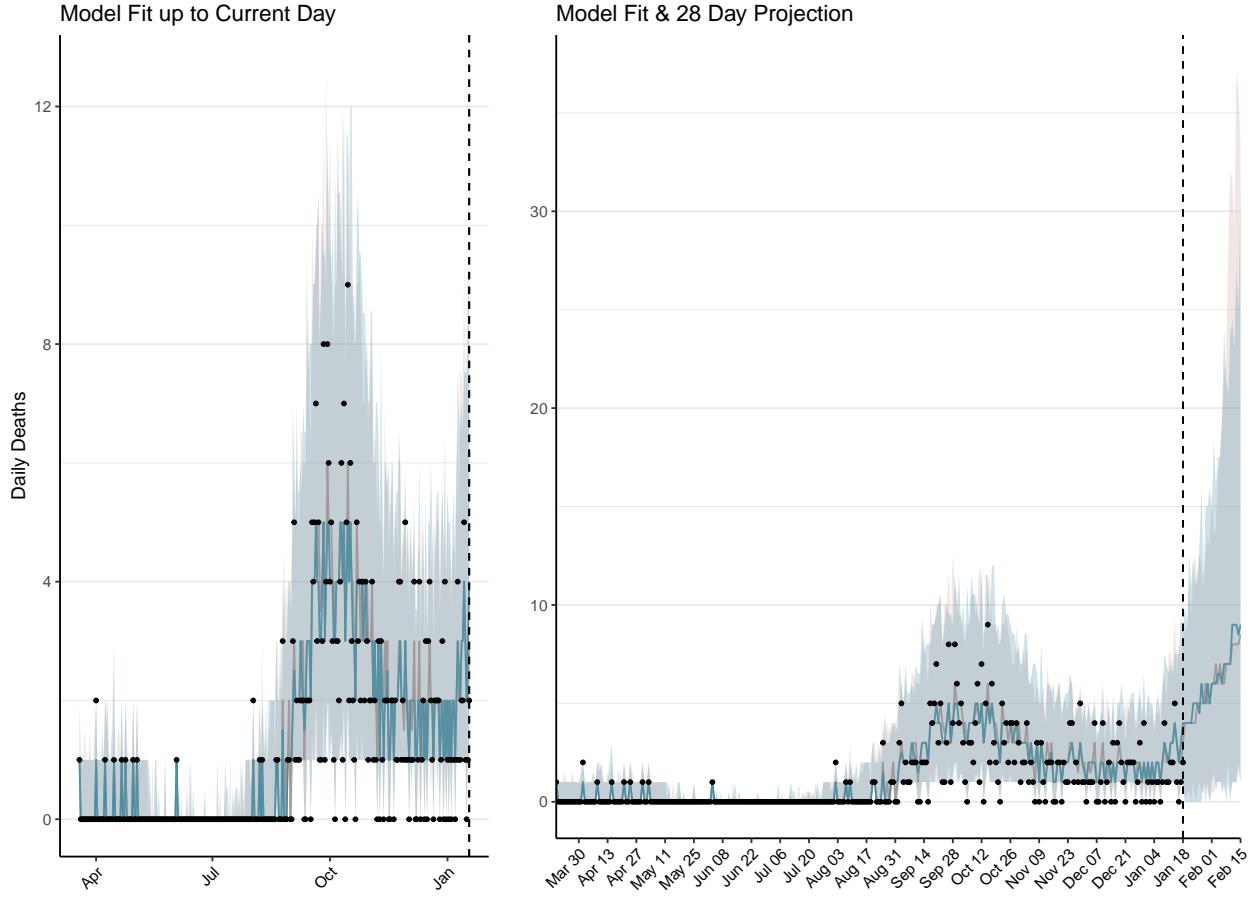


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 161 (95% CI: 148-173) patients requiring treatment with high-pressure oxygen at the current date to 394 (95% CI: 348-439) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 54 (95% CI: 50-58) patients requiring treatment with mechanical ventilation at the current date to 124 (95% CI: 112-136) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

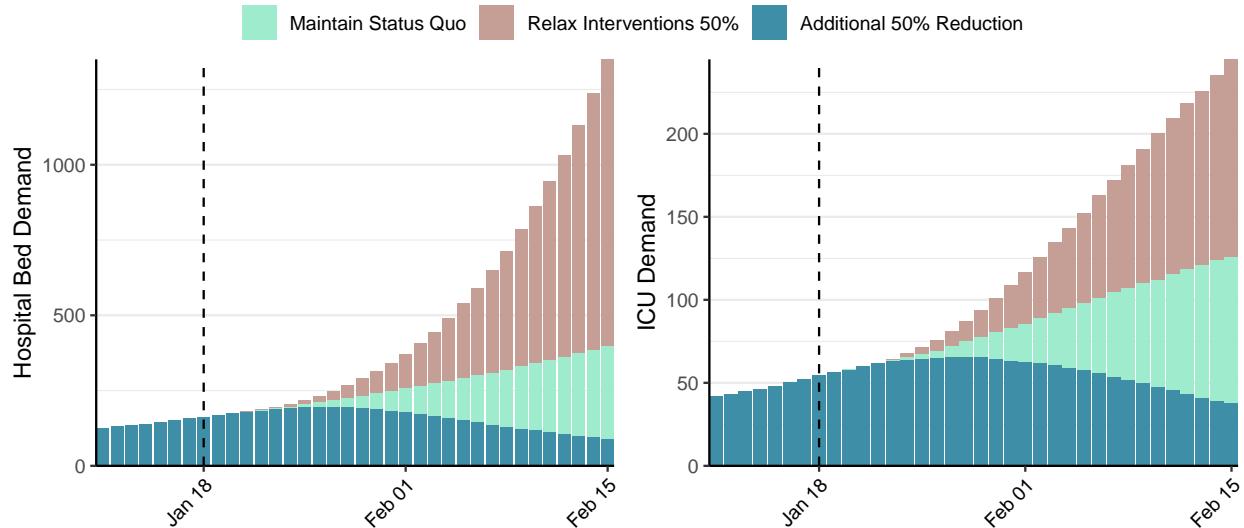


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 2,410 (95% CI: 2,199-2,621) at the current date to 425 (95% CI: 370-480) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,410 (95% CI: 2,199-2,621) at the current date to 29,948 (95% CI: 26,541-33,355) by 2021-02-15.

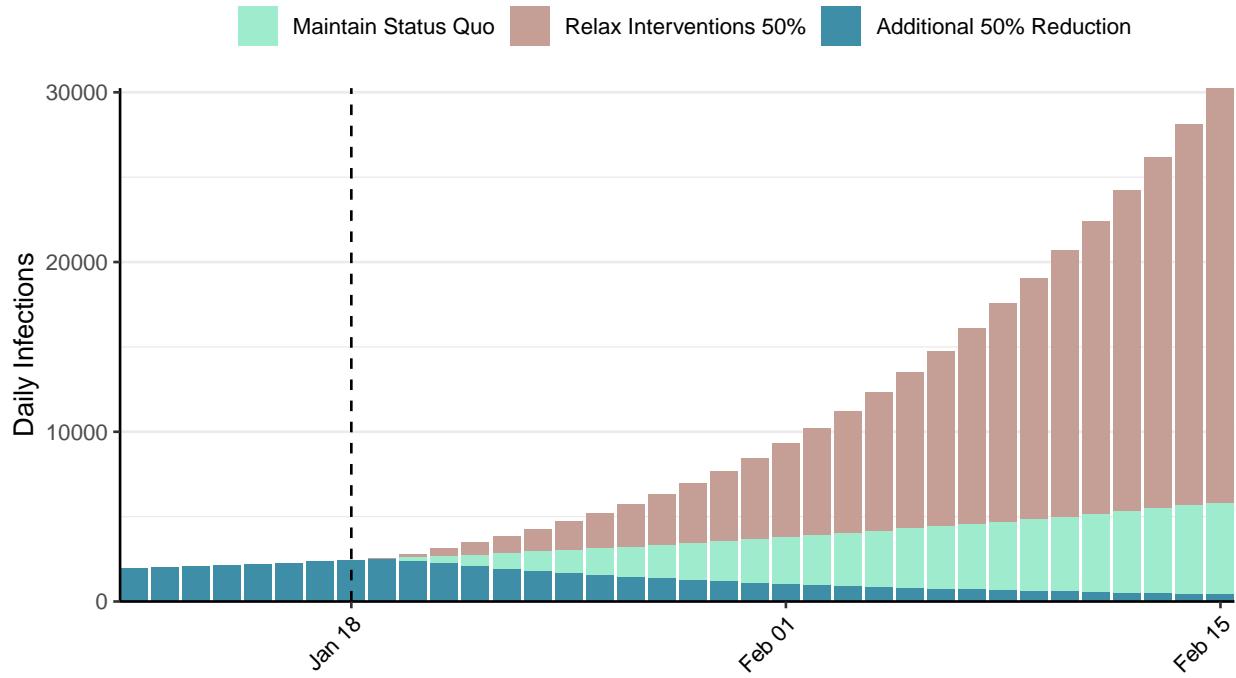


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Jordan, 2021-01-18

[Download the report for Jordan, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.89 (95% CI: 0.76-1.05)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Jordan is not shown in the following plot as only 0 deaths have been reported to date**

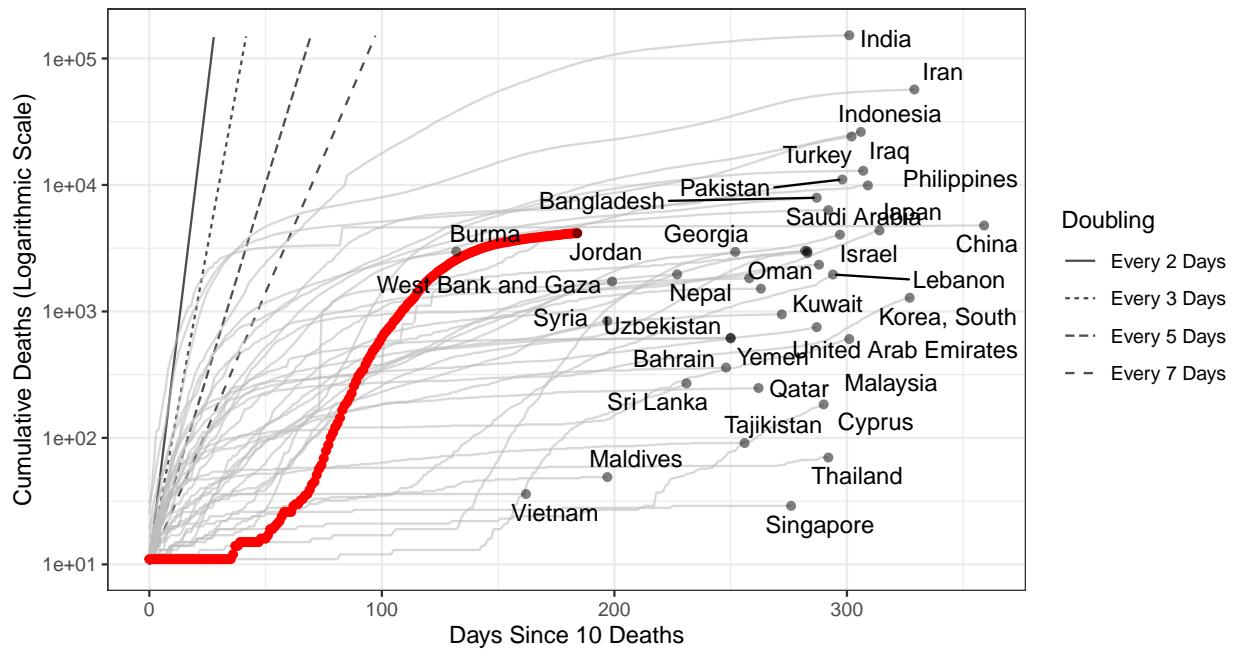


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 224,984 (95% CI: 206,807-243,161) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. Jordan has revised their historic reported cases and thus have reported negative cases.**

Plot on right zoomed in on reported cases

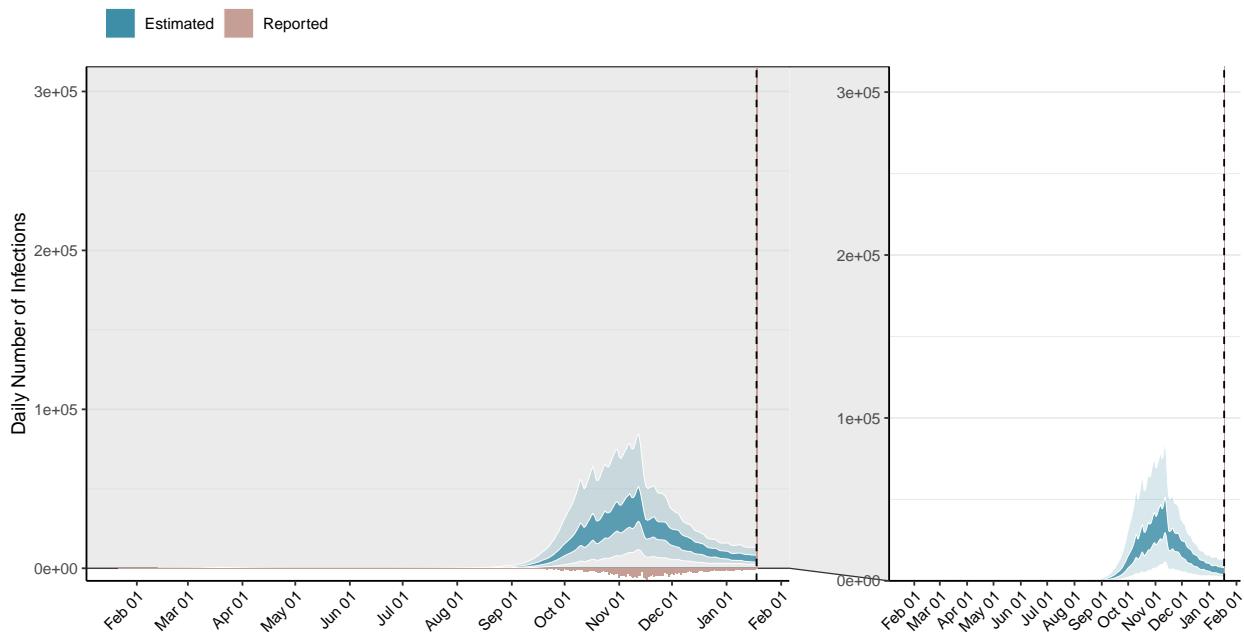


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

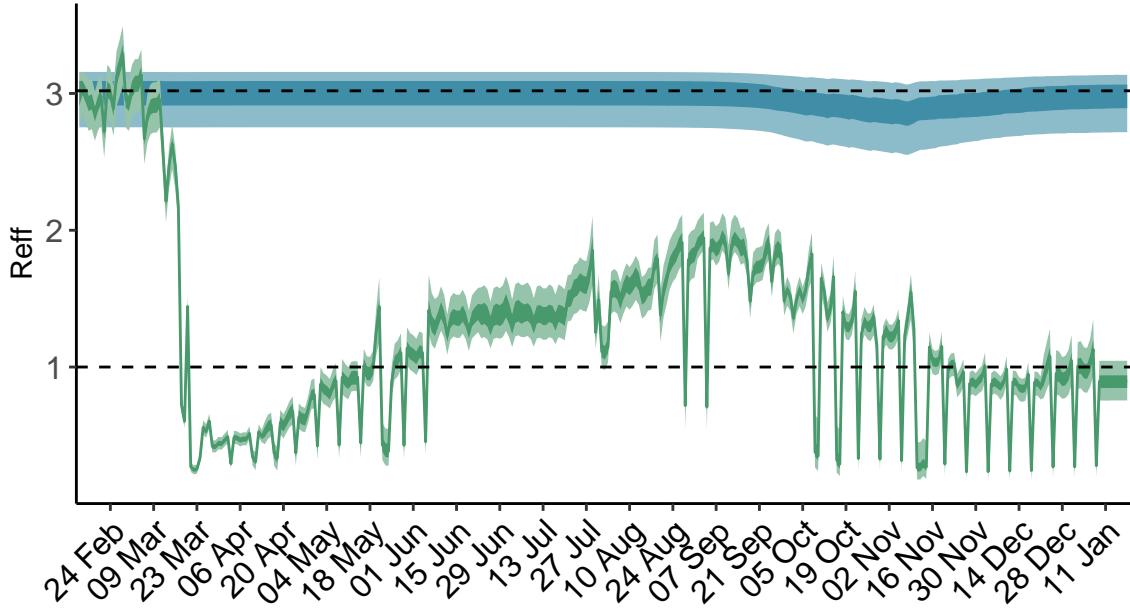


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Jordan is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

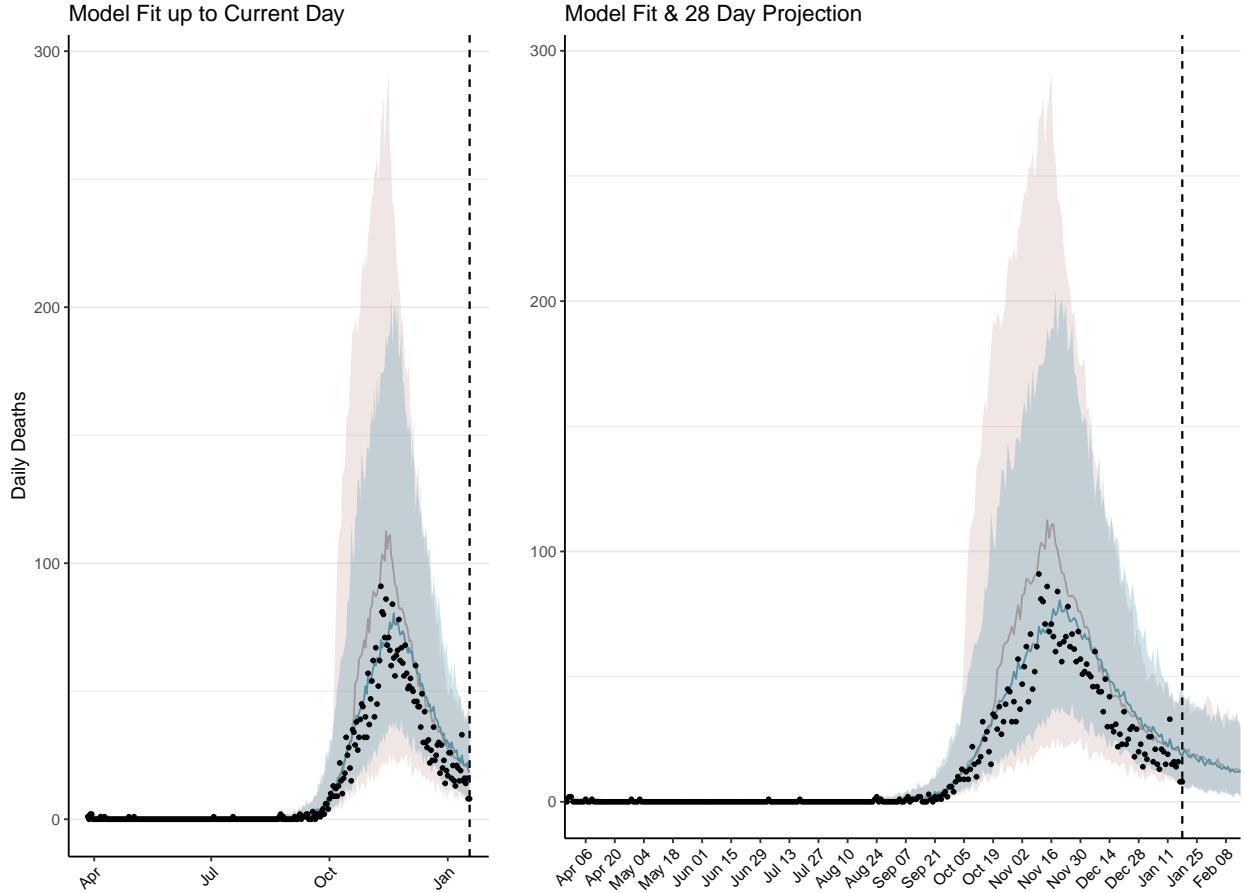


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 807 (95% CI: 742-871) patients requiring treatment with high-pressure oxygen at the current date to 547 (95% CI: 474-621) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 327 (95% CI: 303-351) patients requiring treatment with mechanical ventilation at the current date to 218 (95% CI: 195-242) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

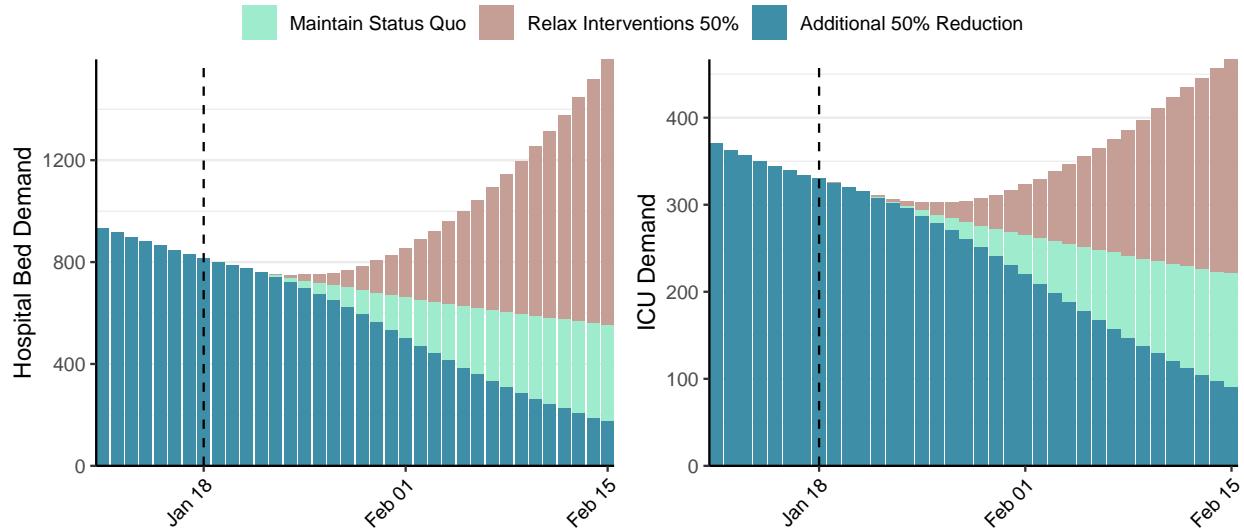


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 6,321 (95% CI: 5,736-6,905) at the current date to 420 (95% CI: 350-489) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 6,321 (95% CI: 5,736-6,905) at the current date to 25,036 (95% CI: 20,387-29,685) by 2021-02-15.

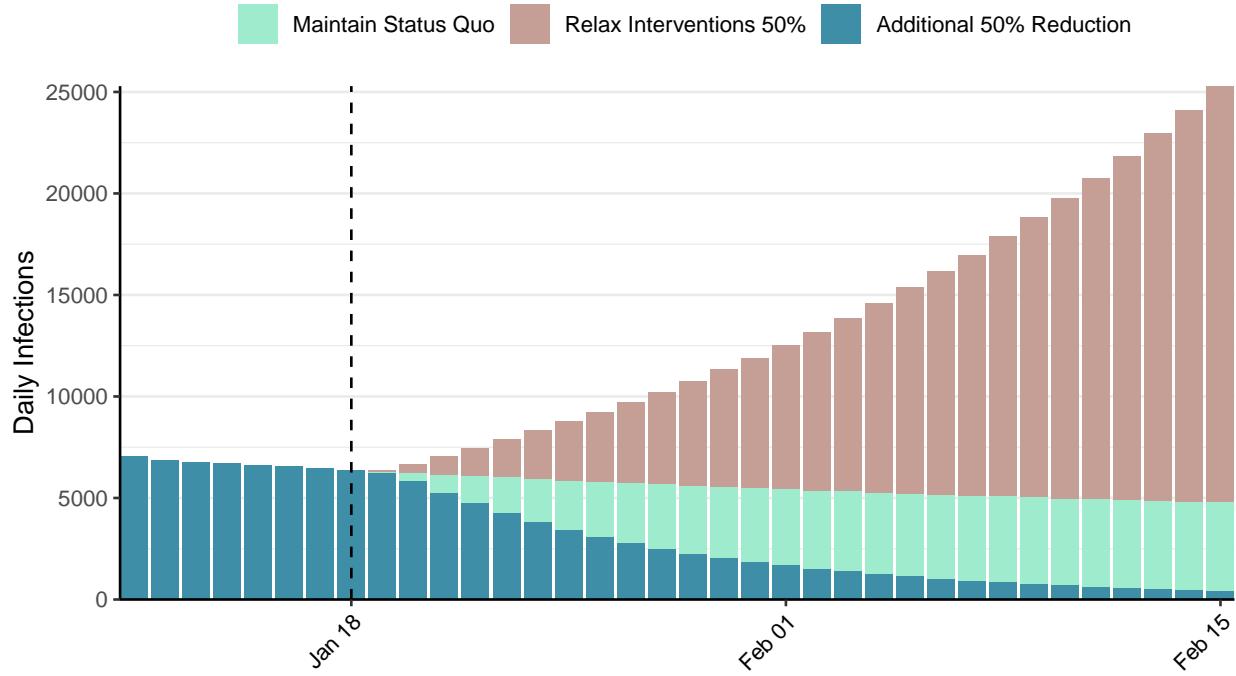


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Kazakhstan, 2021-01-18

[Download the report for Kazakhstan, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.05 (95% CI: 0.89-1.32)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Kazakhstan is not shown in the following plot as only 0 deaths have been reported to date**

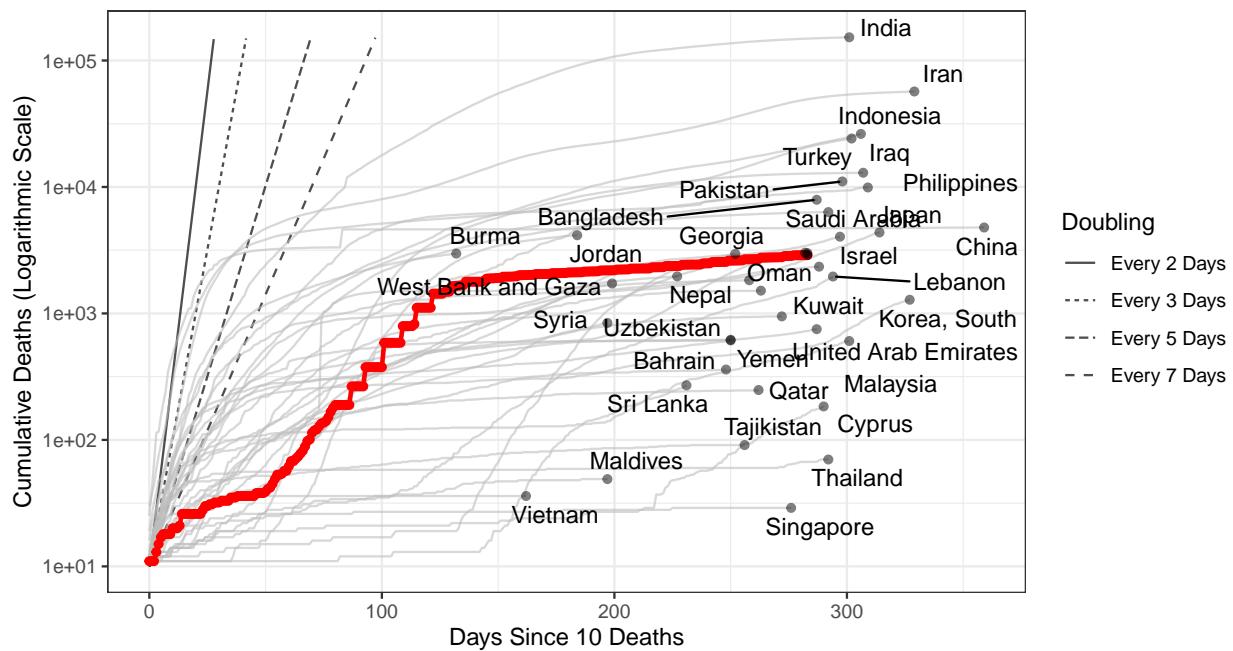


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 122,769 (95% CI: 115,732-129,805) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

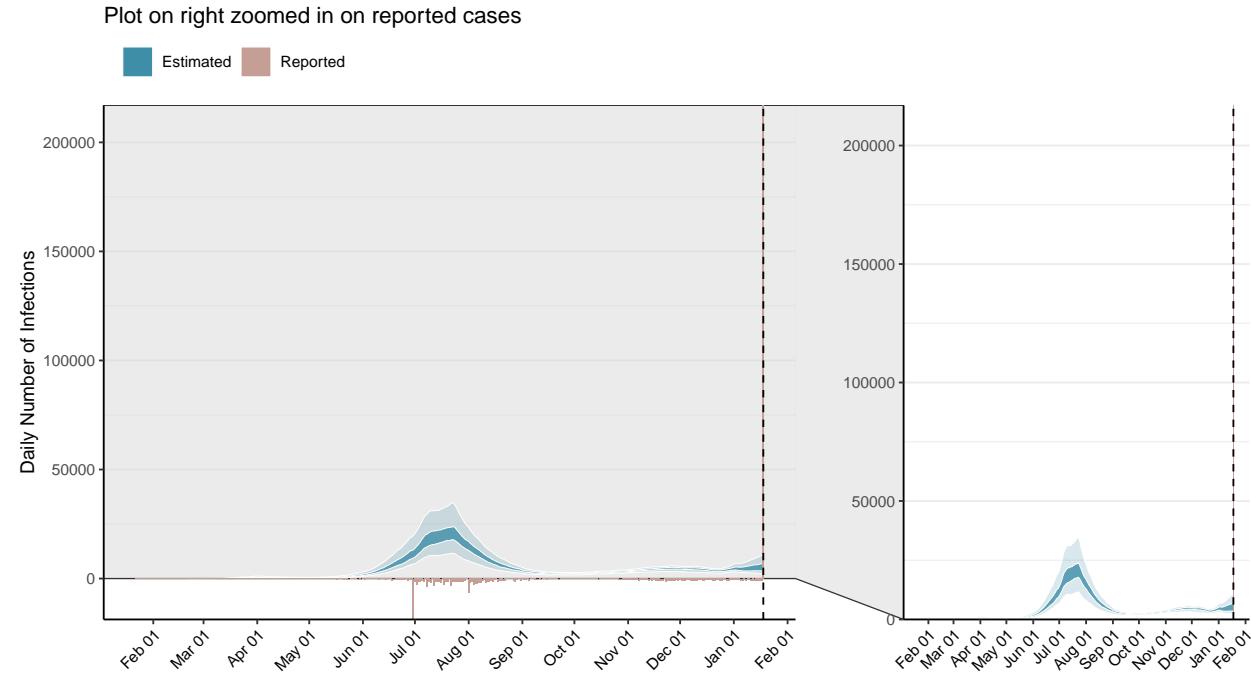


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

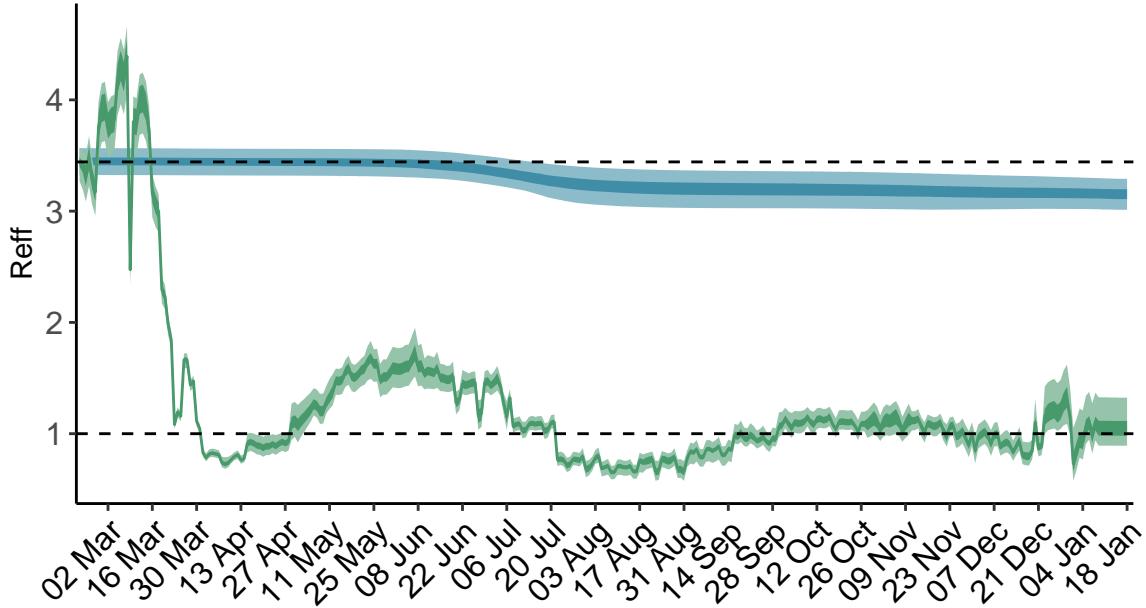


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

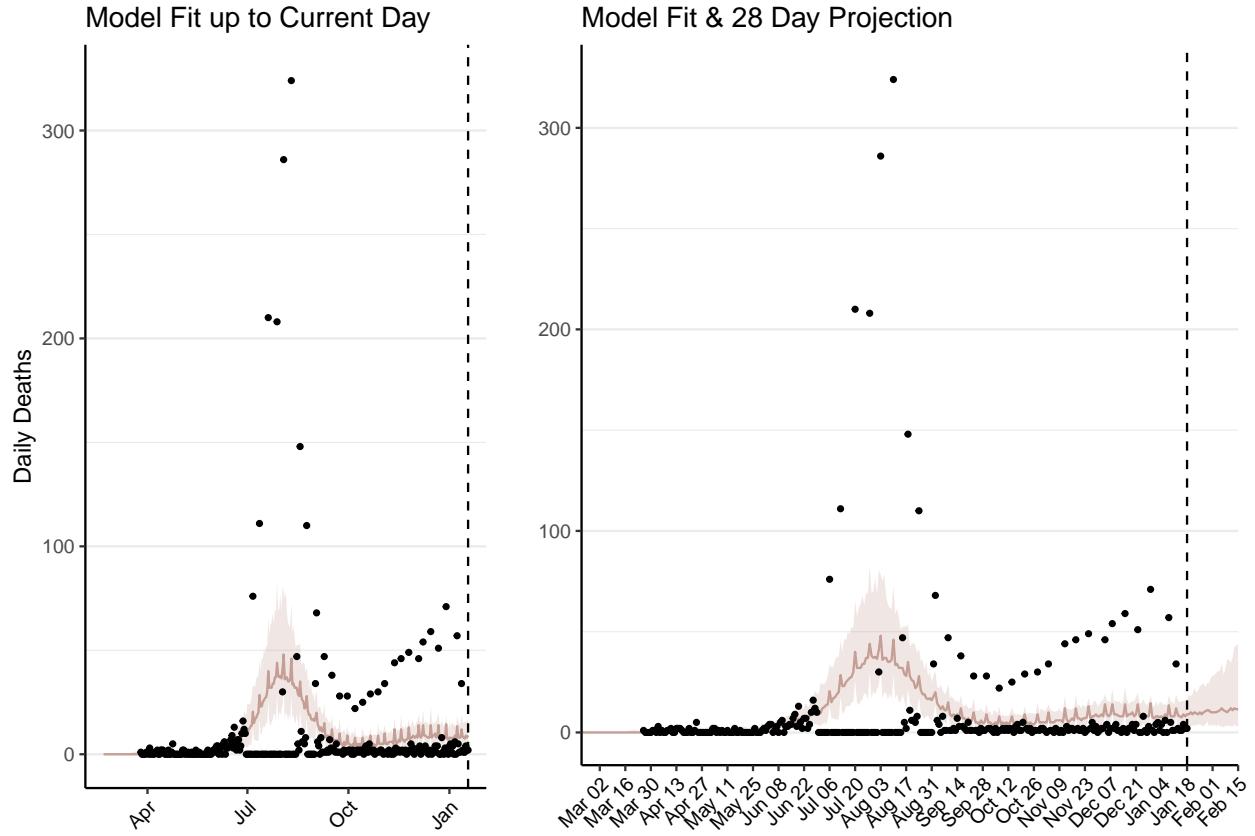


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 421 (95% CI: 395-447) patients requiring treatment with high-pressure oxygen at the current date to 655 (95% CI: 543-767) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 161 (95% CI: 152-171) patients requiring treatment with mechanical ventilation at the current date to 243 (95% CI: 203-282) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

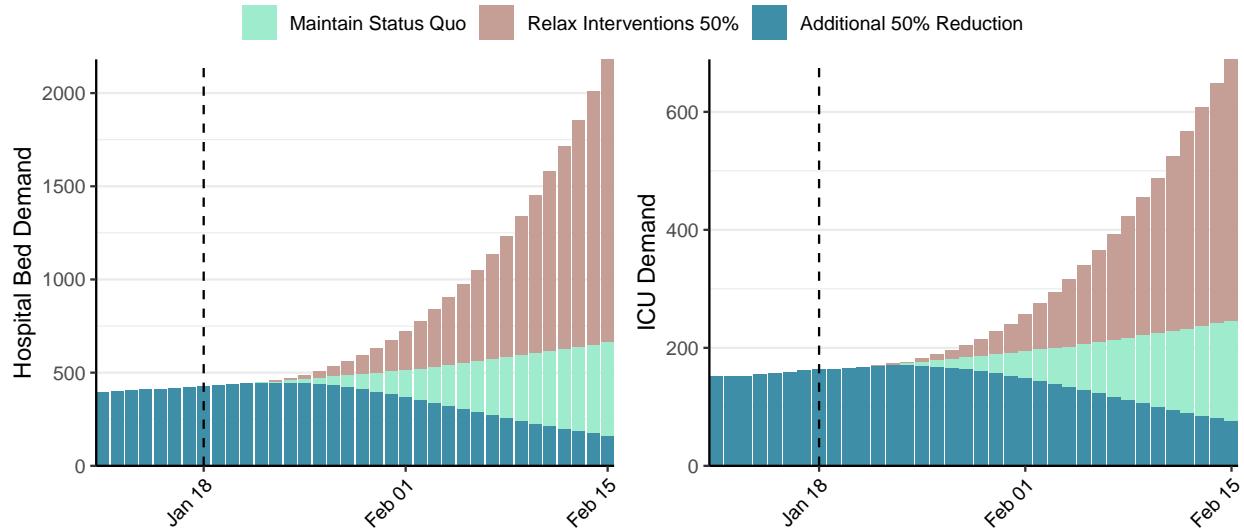


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 5,199 (95% CI: 4,698-5,700) at the current date to 648 (95% CI: 521-775) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 5,199 (95% CI: 4,698-5,700) at the current date to 47,920 (95% CI: 38,091-57,749) by 2021-02-15.

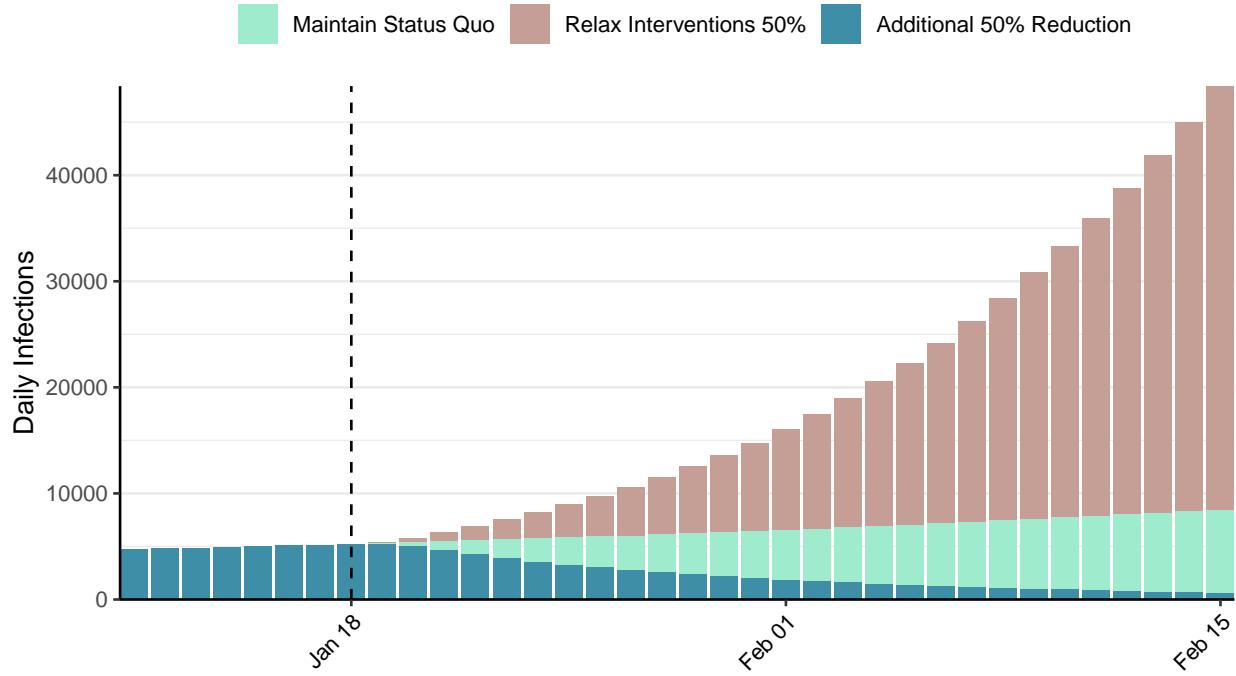


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Kenya, 2021-01-18

[Download the report for Kenya, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.89 (95% CI: 0.75-1.04)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Kenya is not shown in the following plot as only 0 deaths have been reported to date**

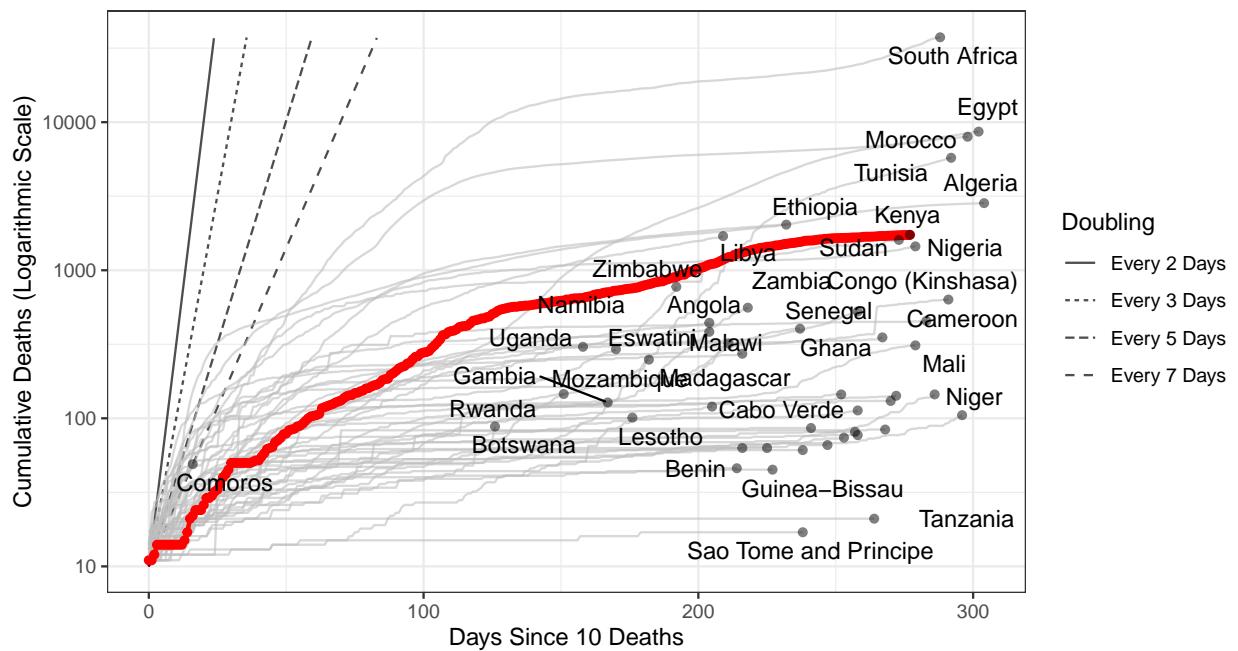


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 52,274 (95% CI: 48,781-55,768) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

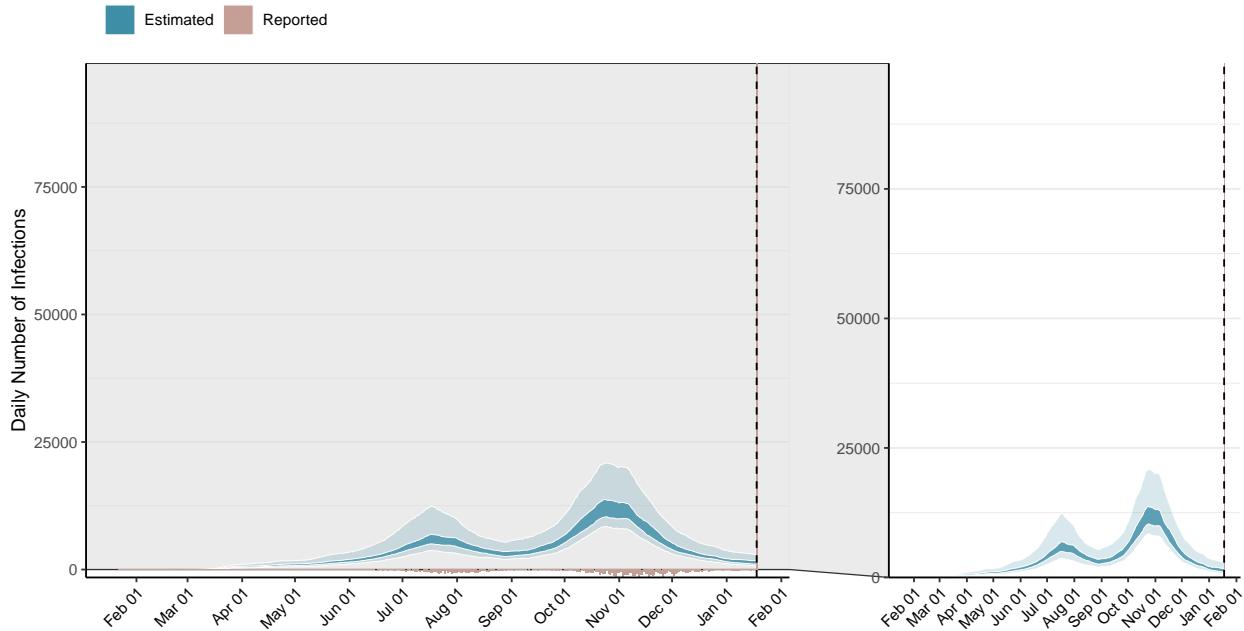


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

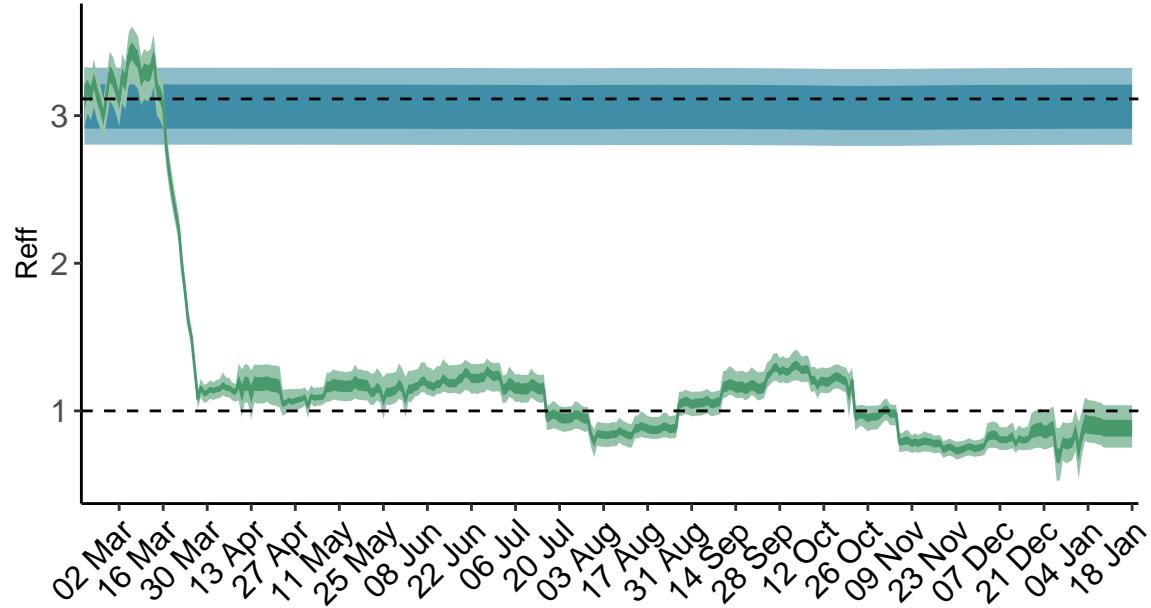


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

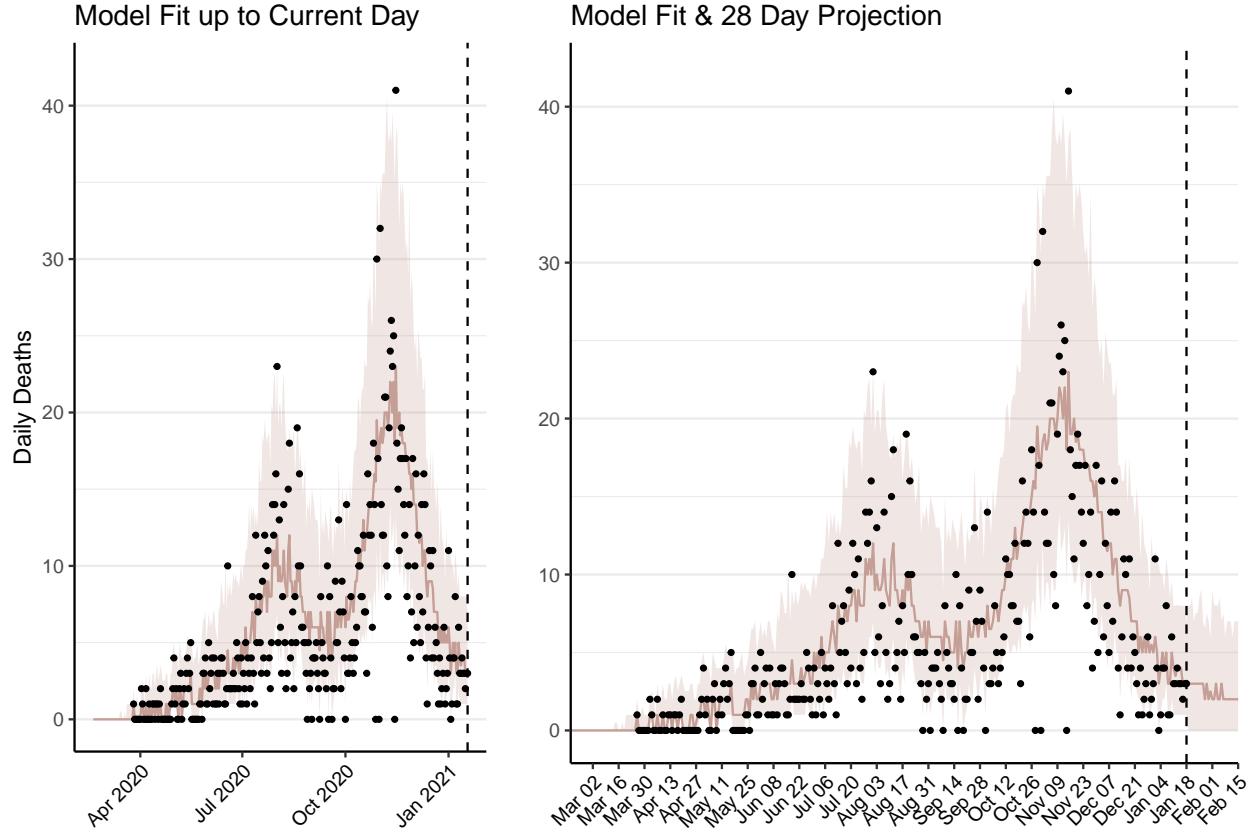


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 138 (95% CI: 128-148) patients requiring treatment with high-pressure oxygen at the current date to 95 (95% CI: 84-106) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 59 (95% CI: 55-63) patients requiring treatment with mechanical ventilation at the current date to 38 (95% CI: 34-43) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

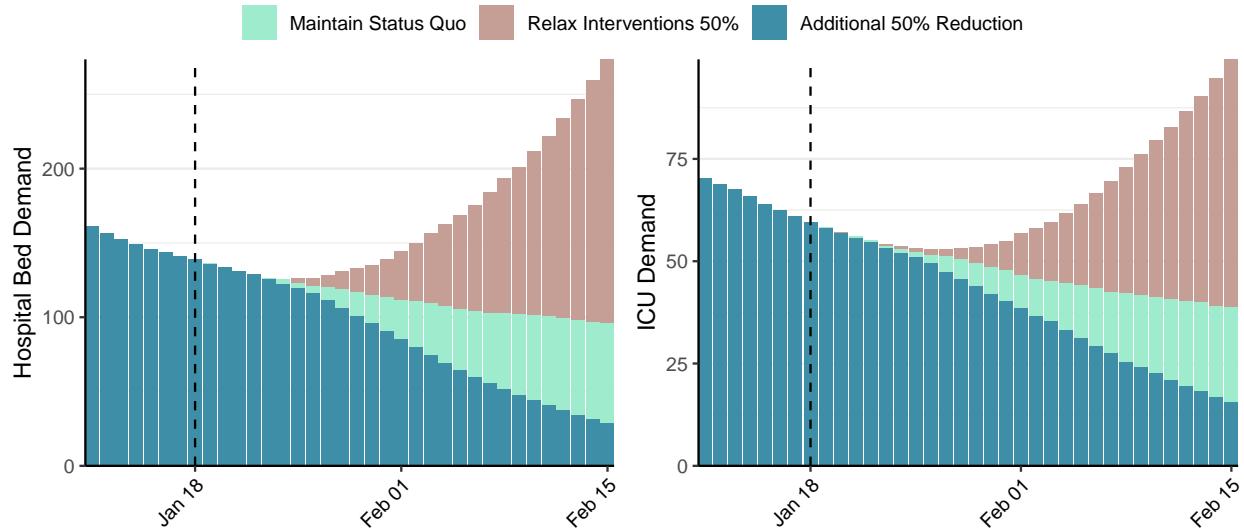


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 1,453 (95% CI: 1,329-1,578) at the current date to 94 (95% CI: 81-106) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,453 (95% CI: 1,329-1,578) at the current date to 5,961 (95% CI: 5,037-6,884) by 2021-02-15.

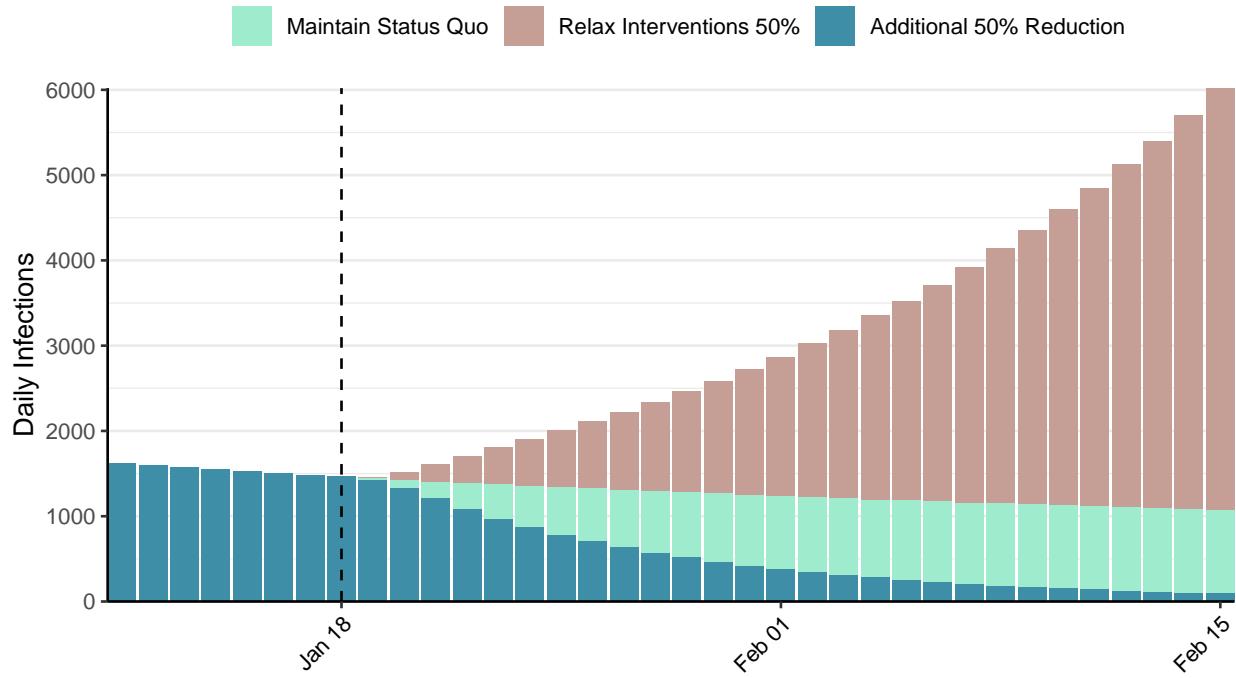


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Kyrgyz Republic, 2021-01-18

[Download the report for Kyrgyz Republic, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.09 (95% CI: 0.93-1.24)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Kyrgyz Republic is not shown in the following plot as only 0 deaths have been reported to date**

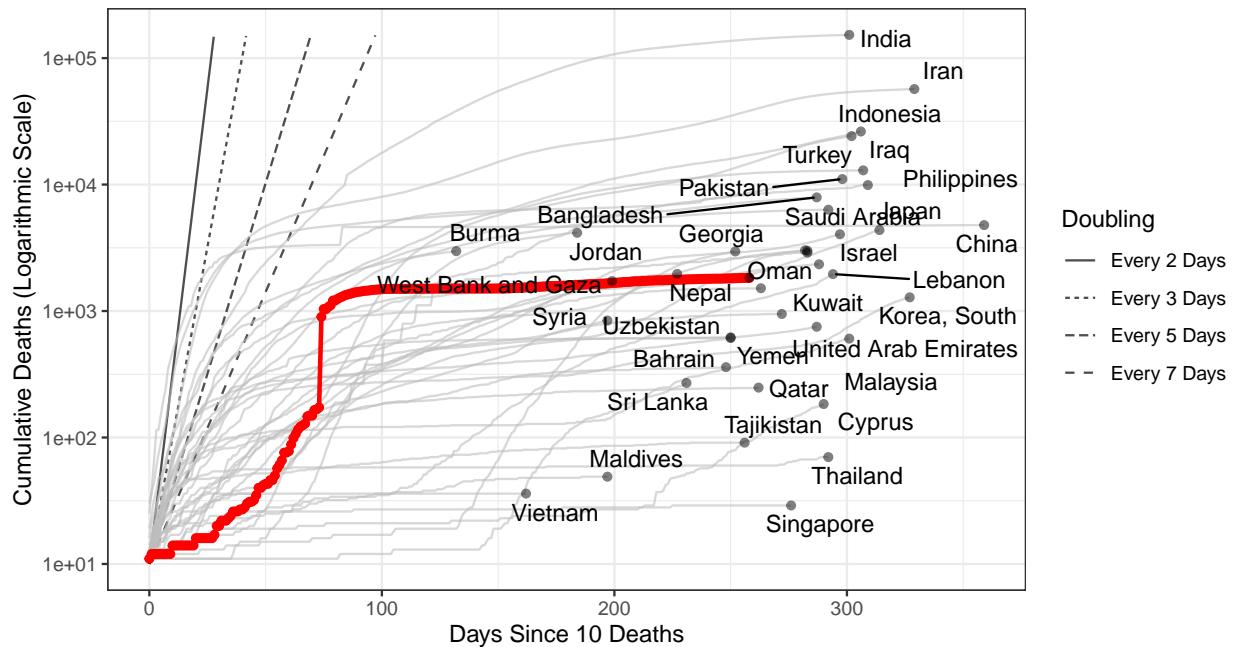


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 40,226 (95% CI: 37,523-42,930) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

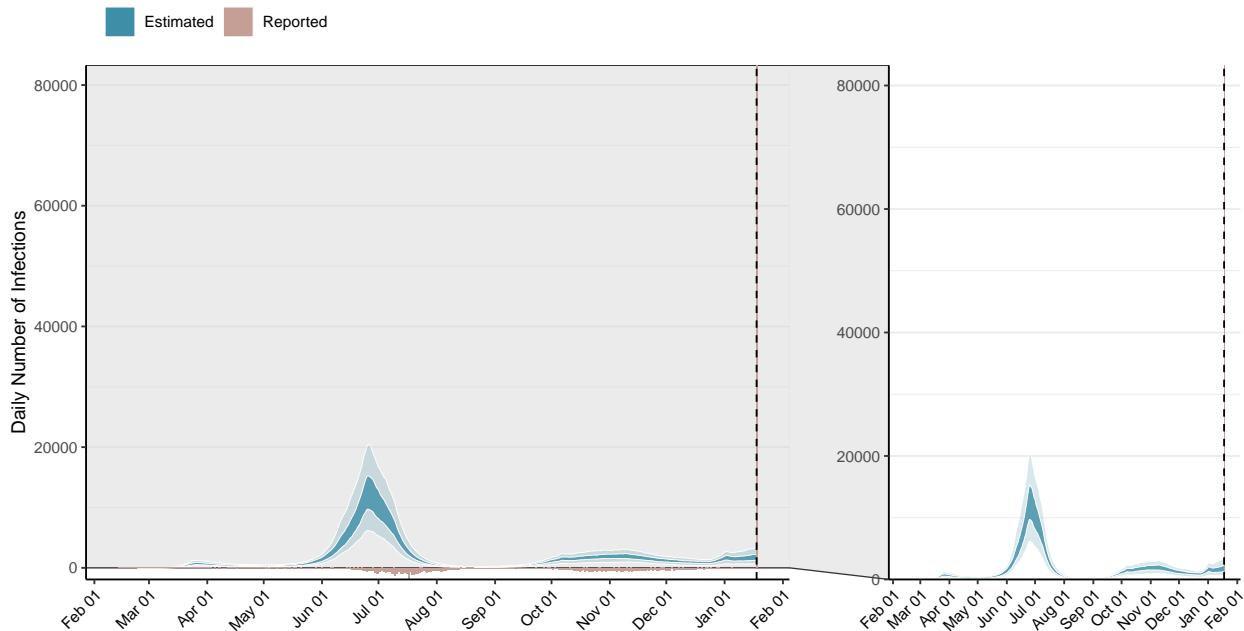


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

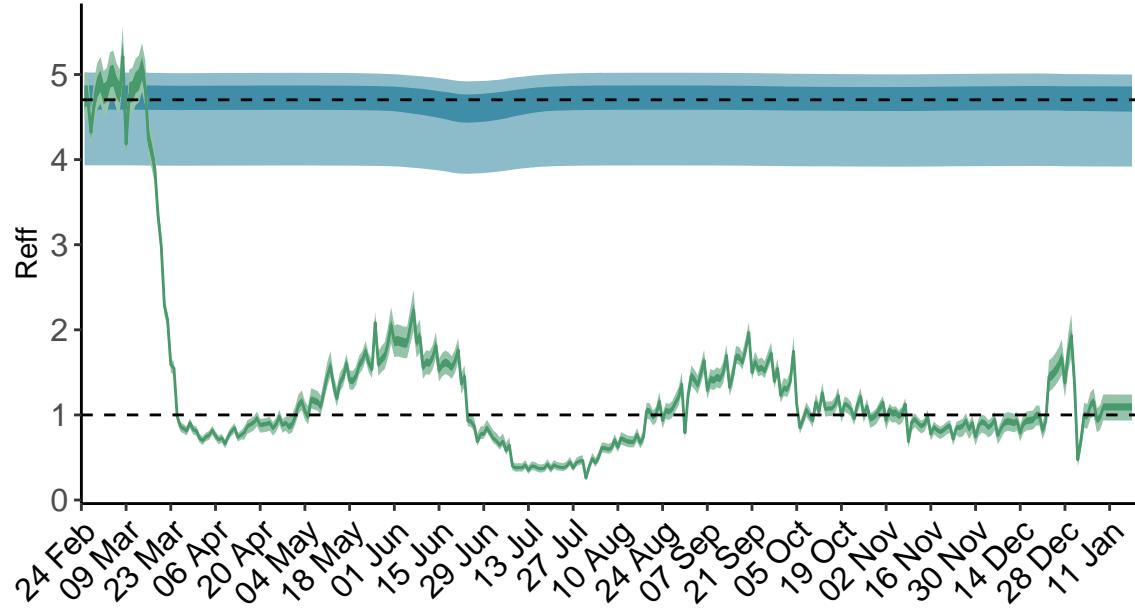


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

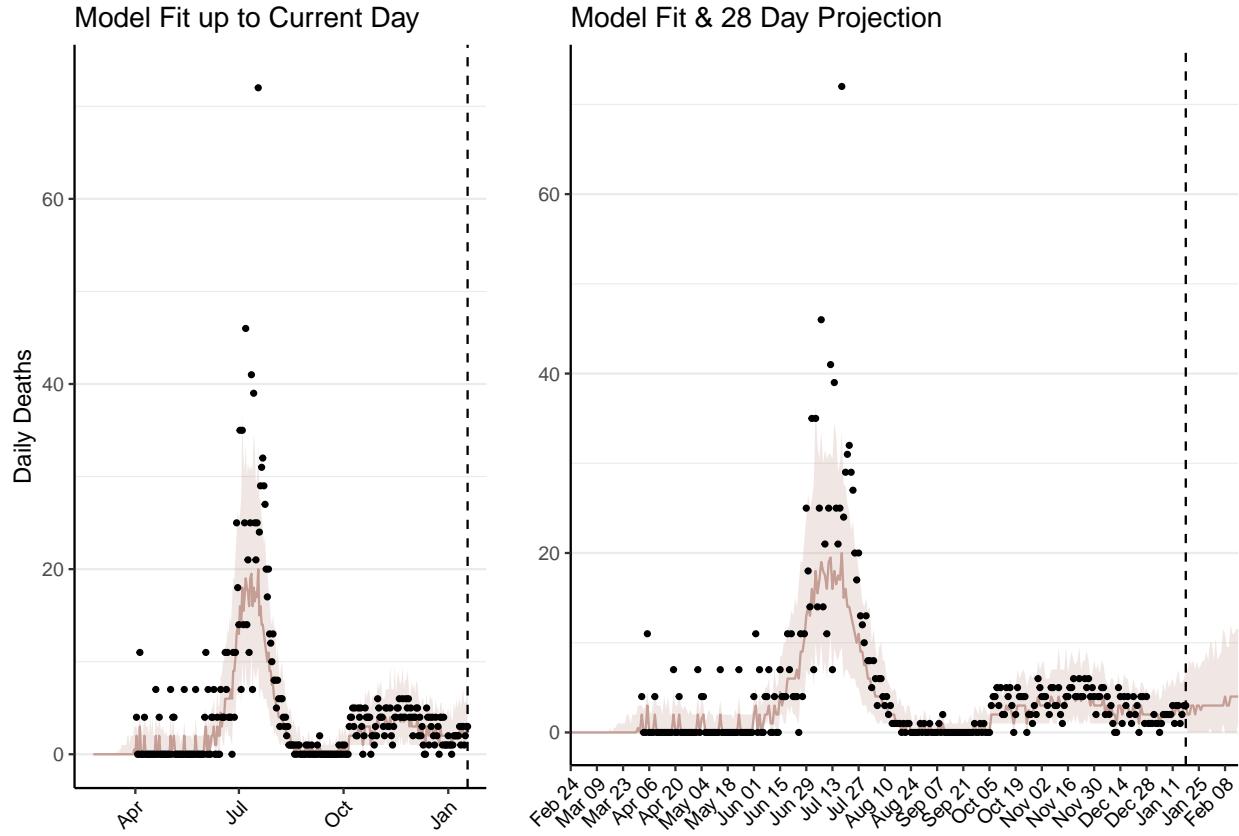


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 123 (95% CI: 114-132) patients requiring treatment with high-pressure oxygen at the current date to 195 (95% CI: 173-217) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 45 (95% CI: 41-48) patients requiring treatment with mechanical ventilation at the current date to 74 (95% CI: 66-82) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

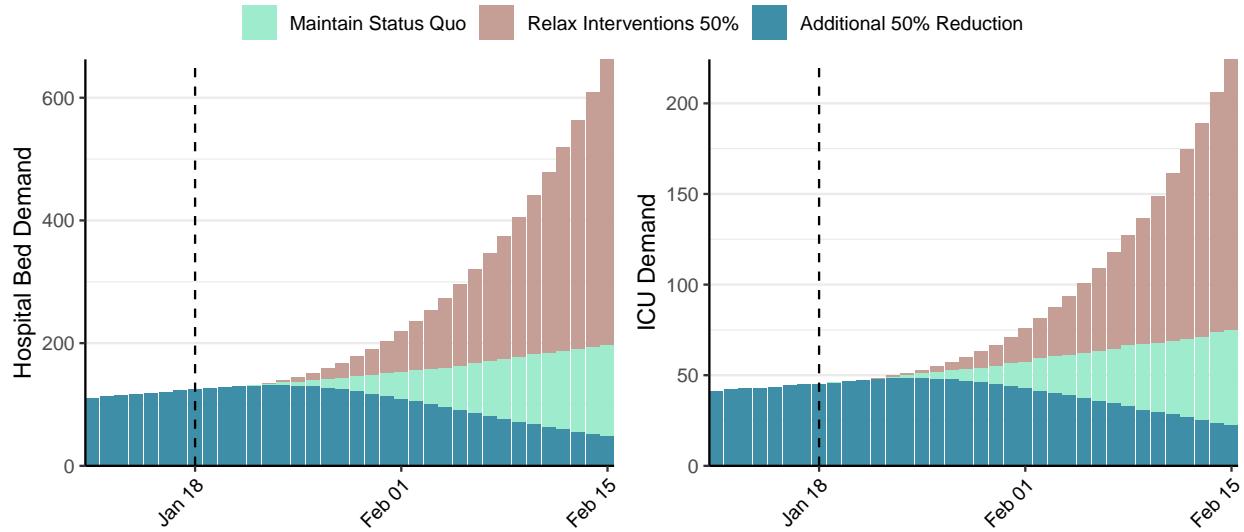


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 1,799 (95% CI: 1,650-1,947) at the current date to 226 (95% CI: 198-254) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,799 (95% CI: 1,650-1,947) at the current date to 17,812 (95% CI: 15,400-20,224) by 2021-02-15.

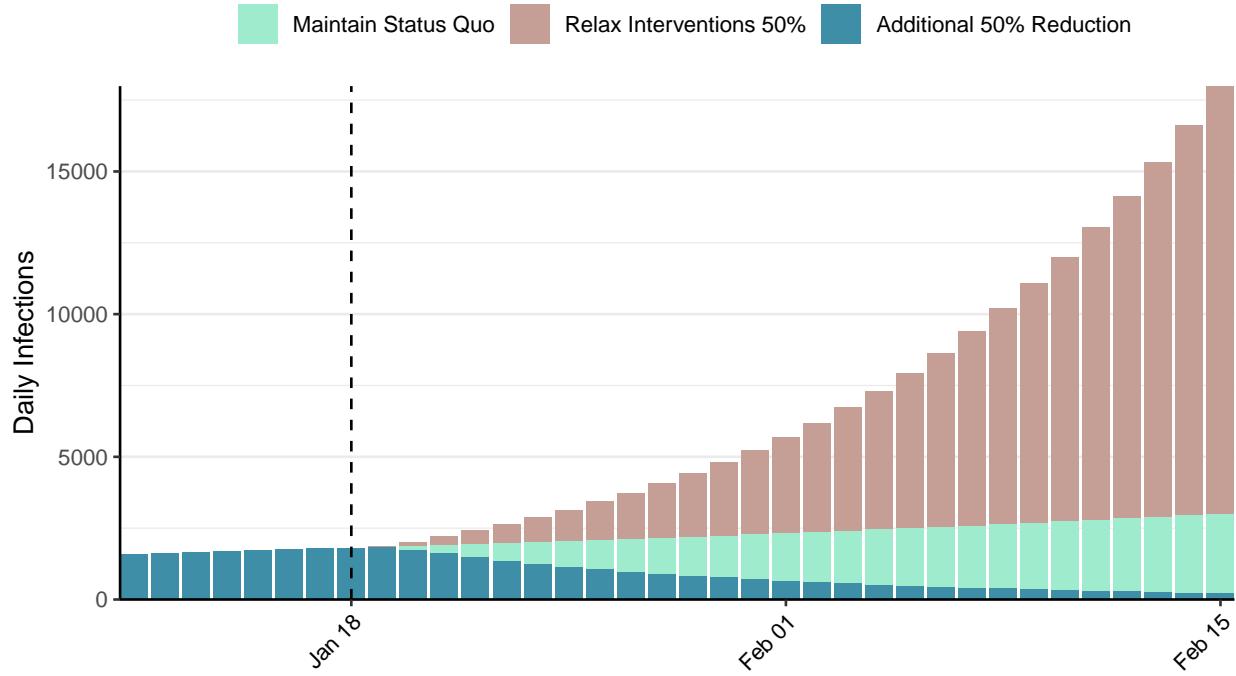


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: South Korea, 2021-01-18

[Download the report for South Korea, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.75 (95% CI: 0.6-0.88)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. South Korea is not shown in the following plot as only 0 deaths have been reported to date**

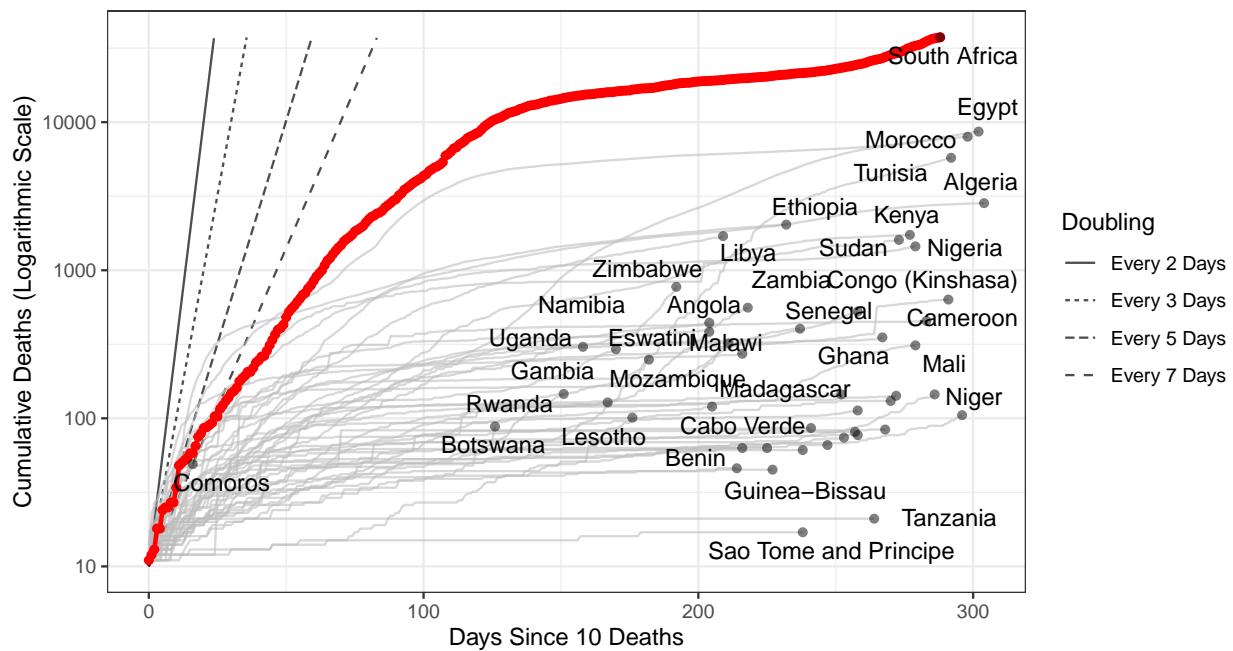


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 254,909 (95% CI: 242,121-267,697) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

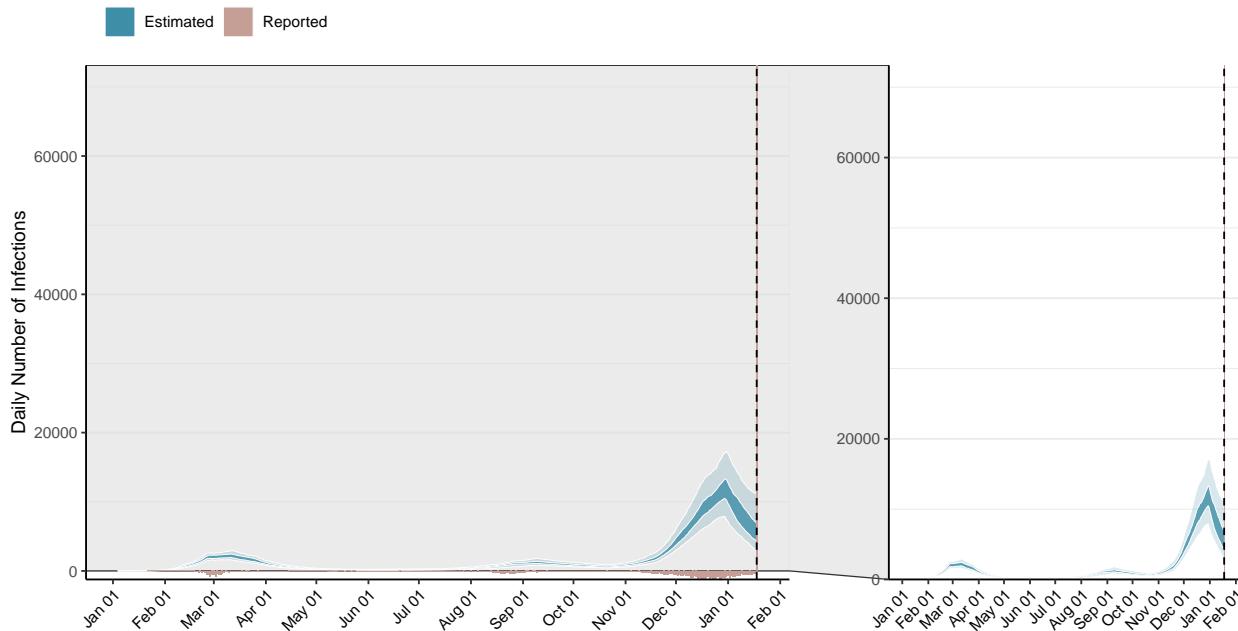


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

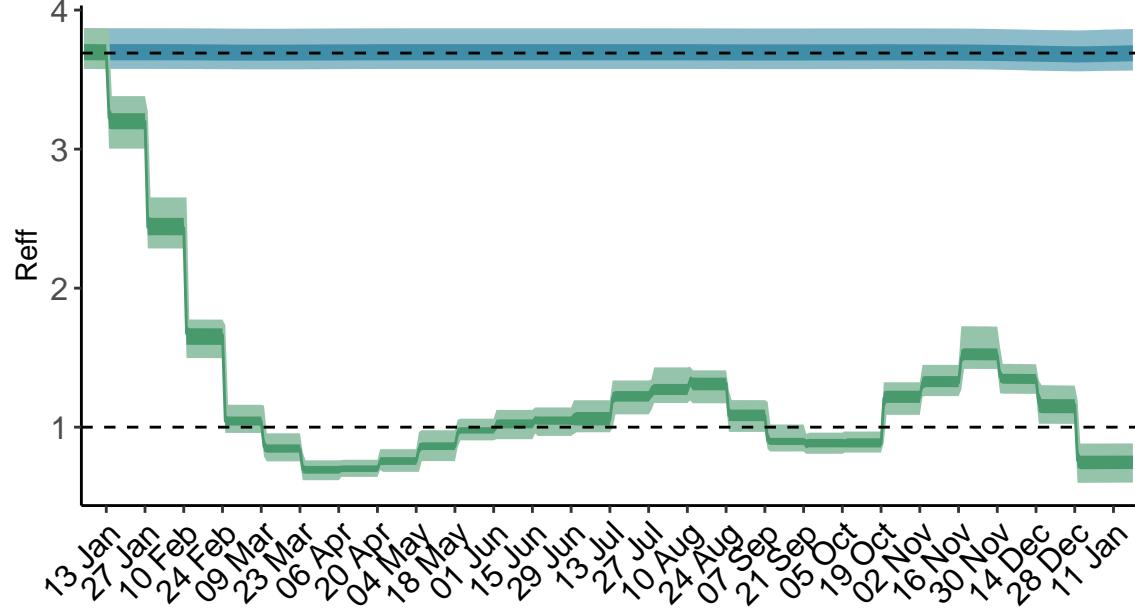


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

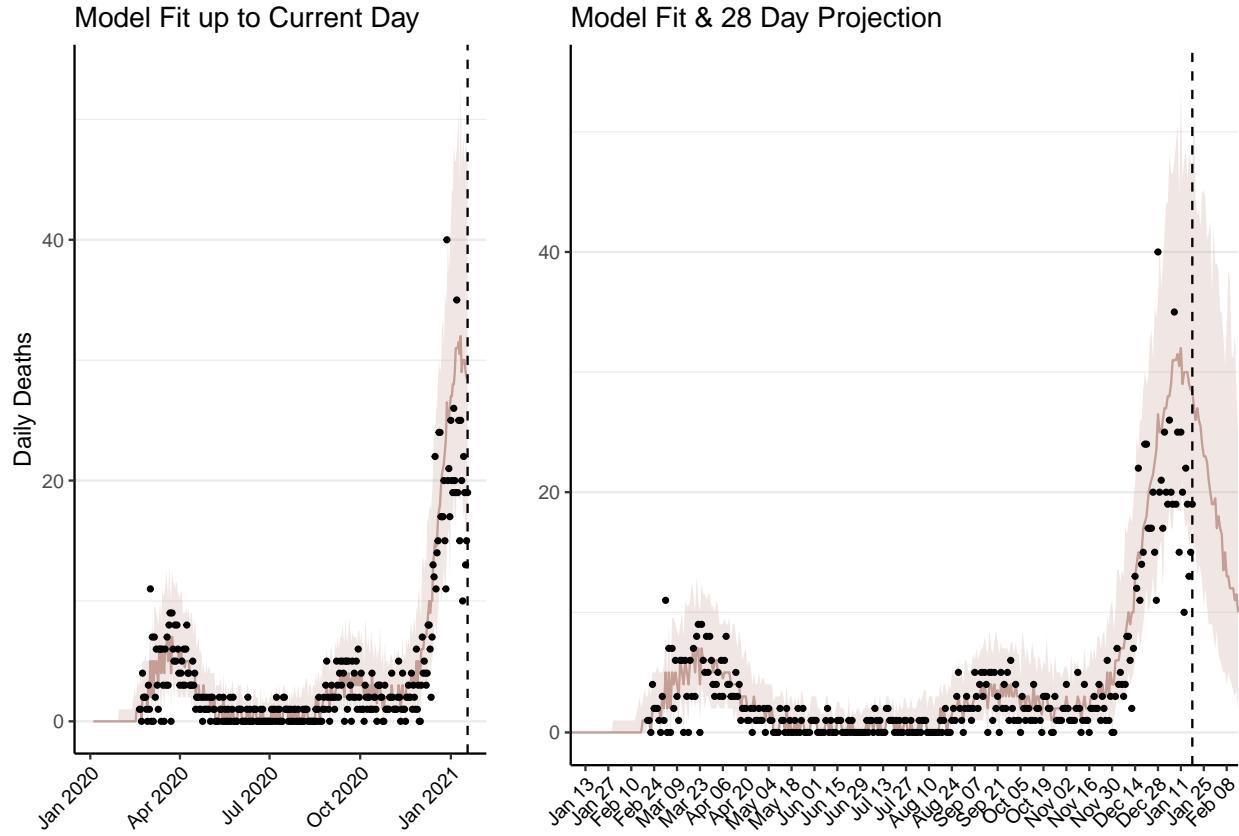


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1,022 (95% CI: 966-1,077) patients requiring treatment with high-pressure oxygen at the current date to 401 (95% CI: 353-448) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 399 (95% CI: 378-420) patients requiring treatment with mechanical ventilation at the current date to 171 (95% CI: 152-190) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

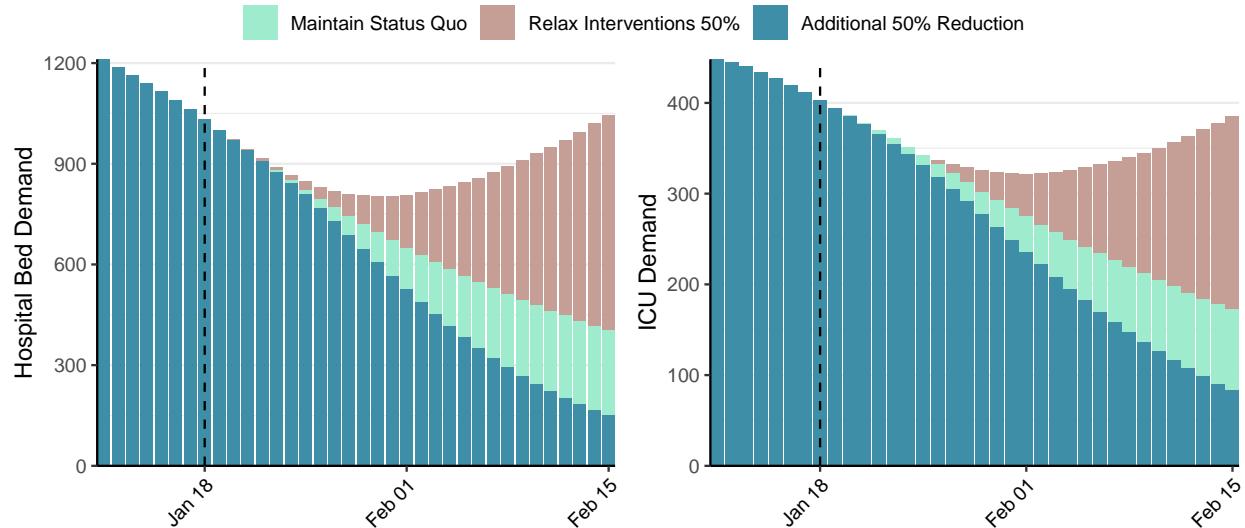


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 5,713 (95% CI: 5,254-6,171) at the current date to 222 (95% CI: 190-253) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 5,713 (95% CI: 5,254-6,171) at the current date to 11,274 (95% CI: 9,370-13,178) by 2021-02-15.

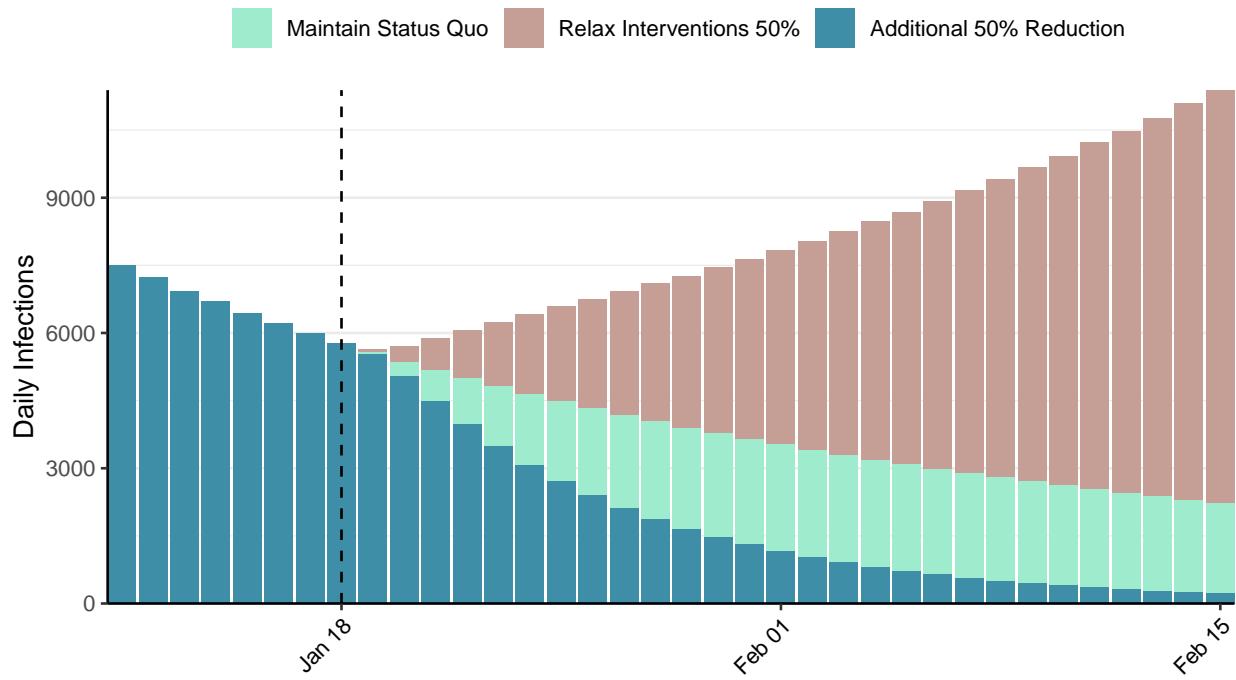


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Lebanon, 2021-01-18

[Download the report for Lebanon, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.93 (95% CI: 0.75-1.12)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Lebanon is not shown in the following plot as only 0 deaths have been reported to date**

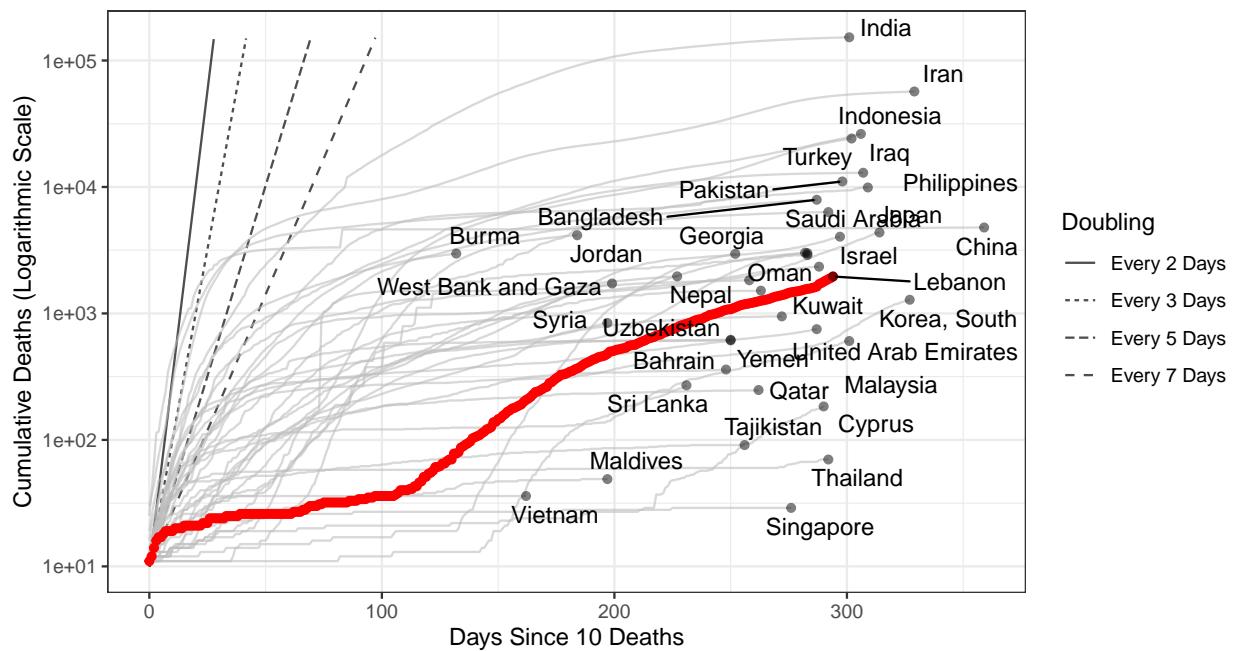


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 361,078 (95% CI: 350,328–371,828) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

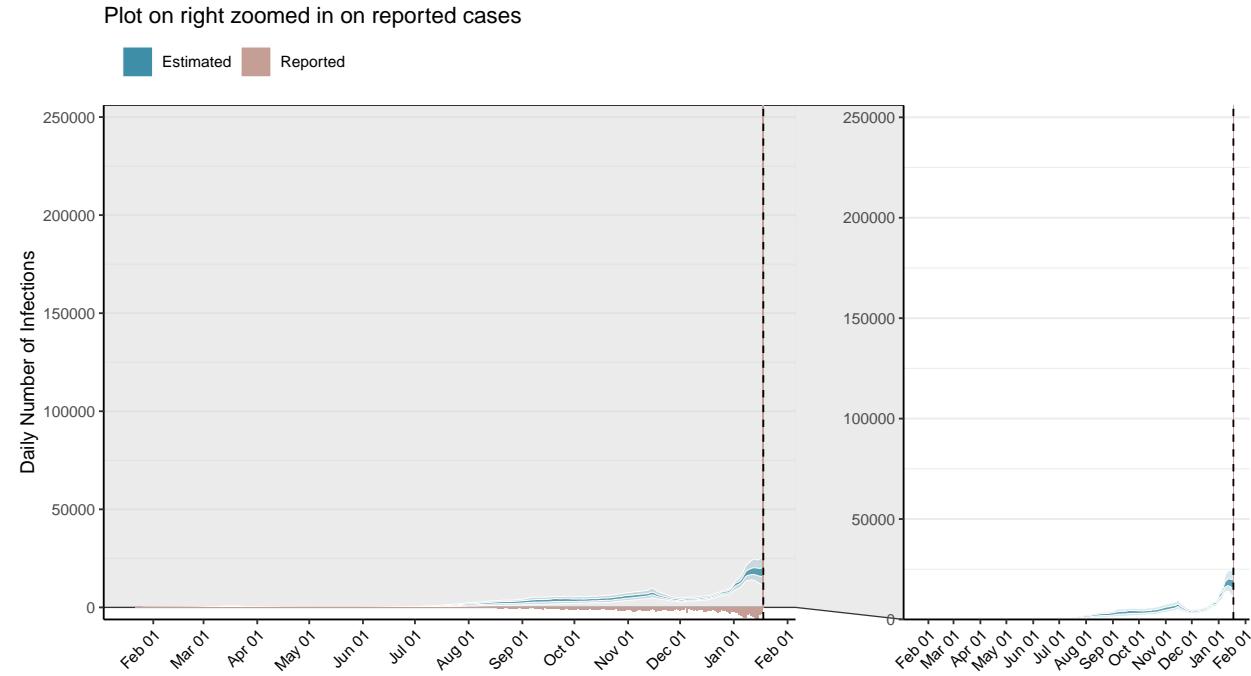


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

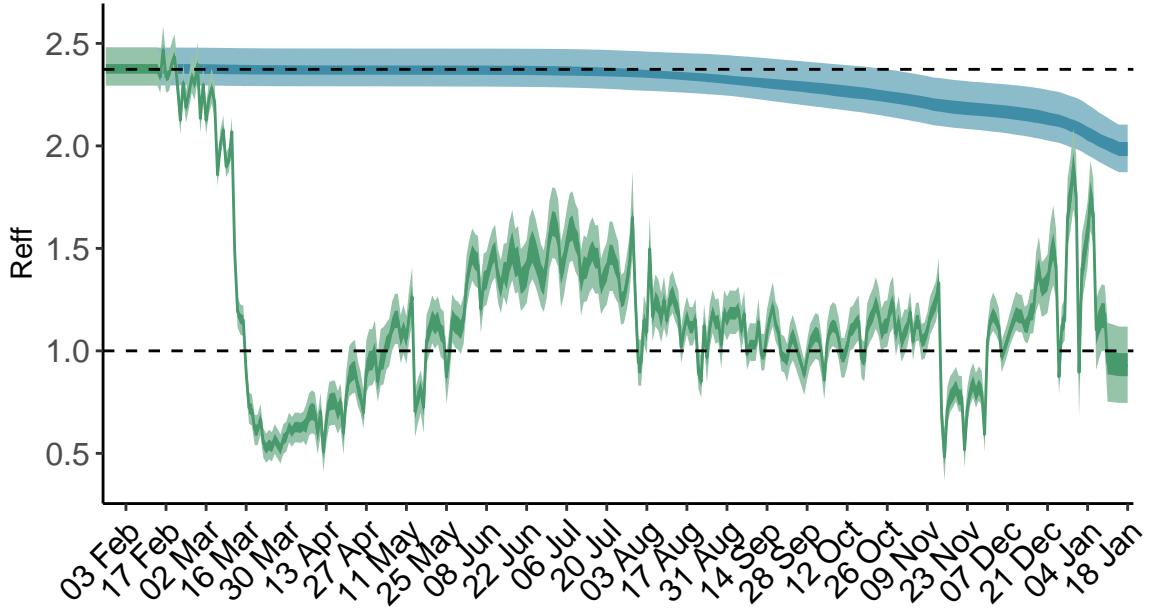


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Lebanon is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

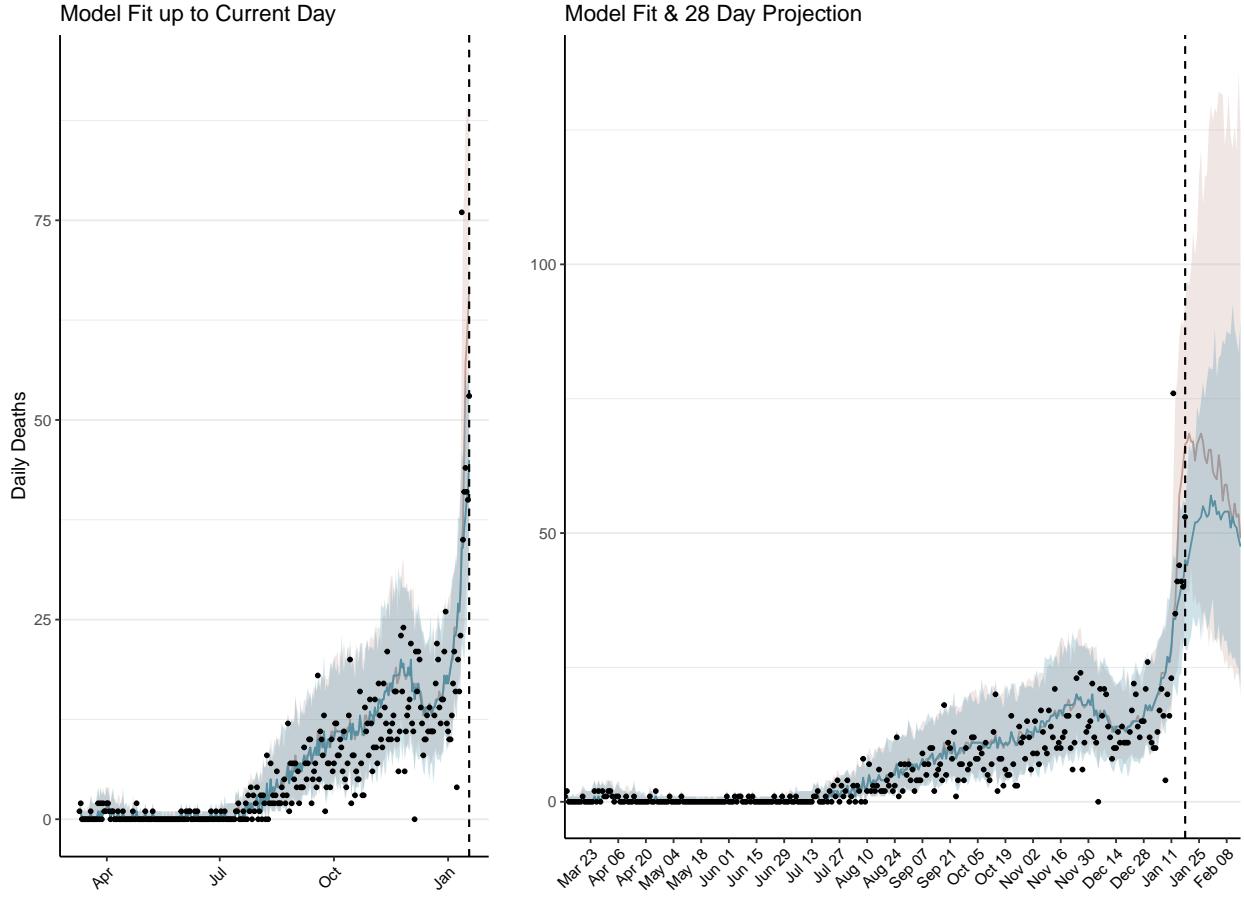


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1,861 (95% CI: 1,802-1,920) patients requiring treatment with high-pressure oxygen at the current date to 1,851 (95% CI: 1,700-2,002) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 544 (95% CI: 532-555) patients requiring treatment with mechanical ventilation at the current date to 514 (95% CI: 496-533) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

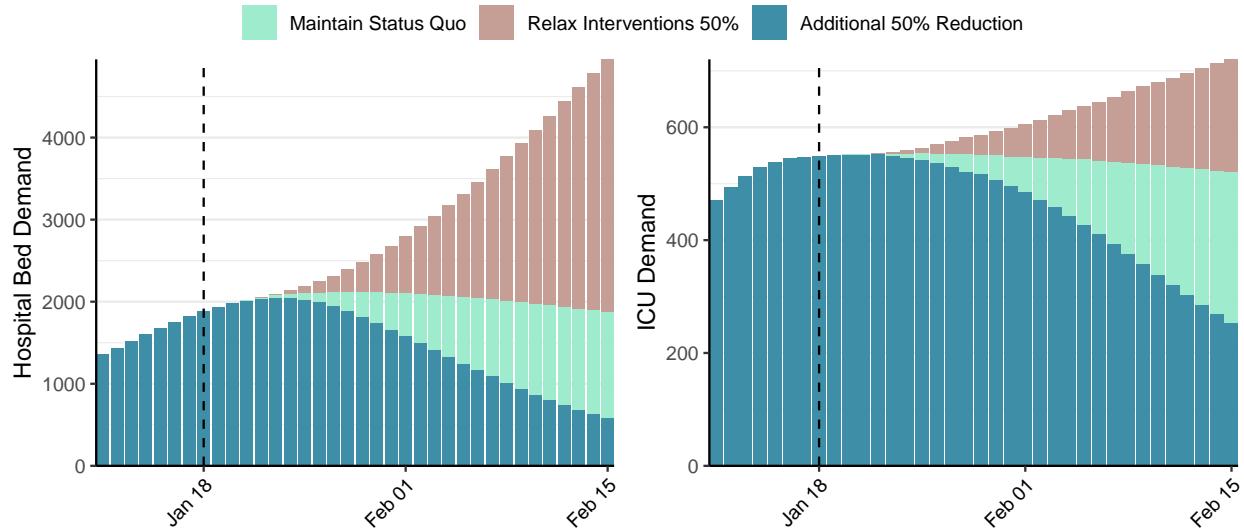


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 17,505 (95% CI: 16,722-18,288) at the current date to 1,241 (95% CI: 1,111-1,372) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 17,505 (95% CI: 16,722-18,288) at the current date to 51,443 (95% CI: 46,957-55,929) by 2021-02-15.

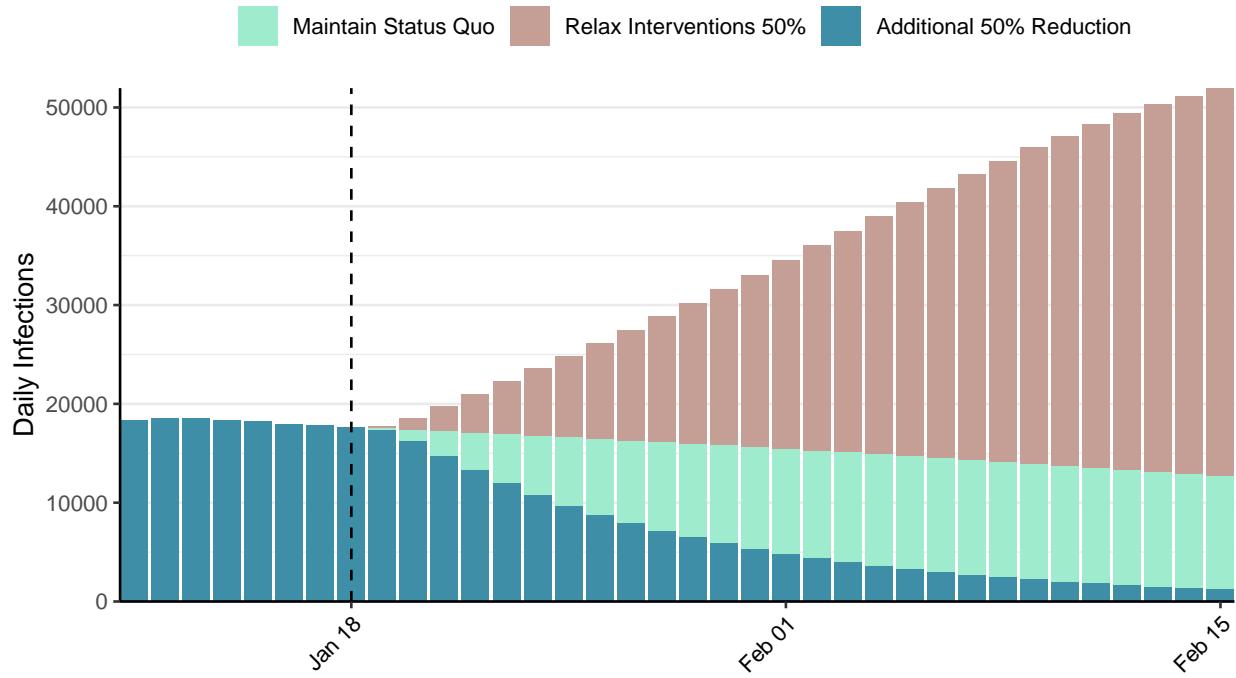


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Liberia, 2021-01-18

[Download the report for Liberia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.28 (95% CI: 0.82-1.82)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Liberia is not shown in the following plot as only 0 deaths have been reported to date**

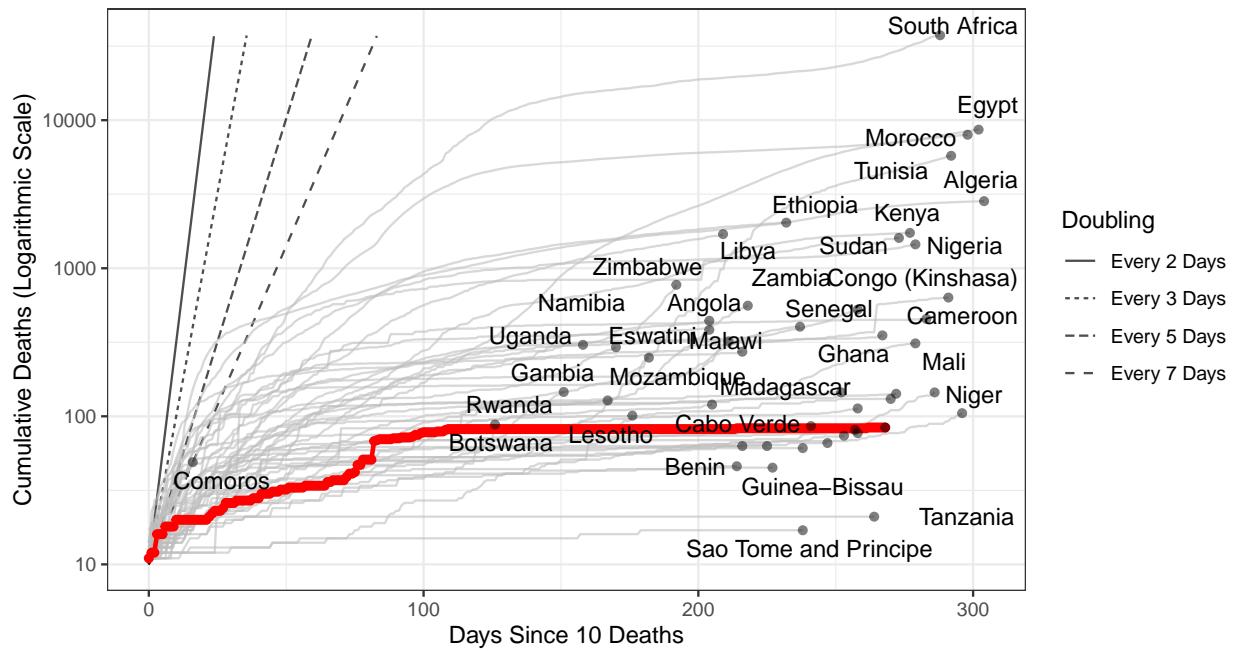


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 280 (95% CI: 98-462) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

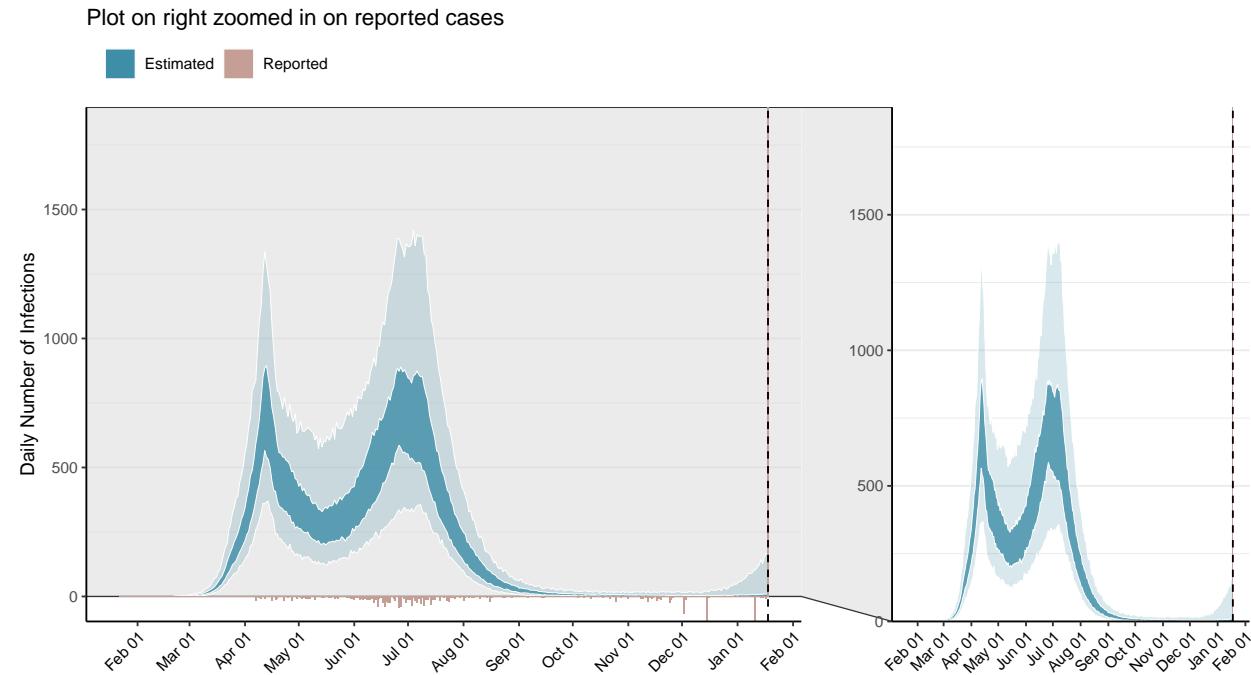


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

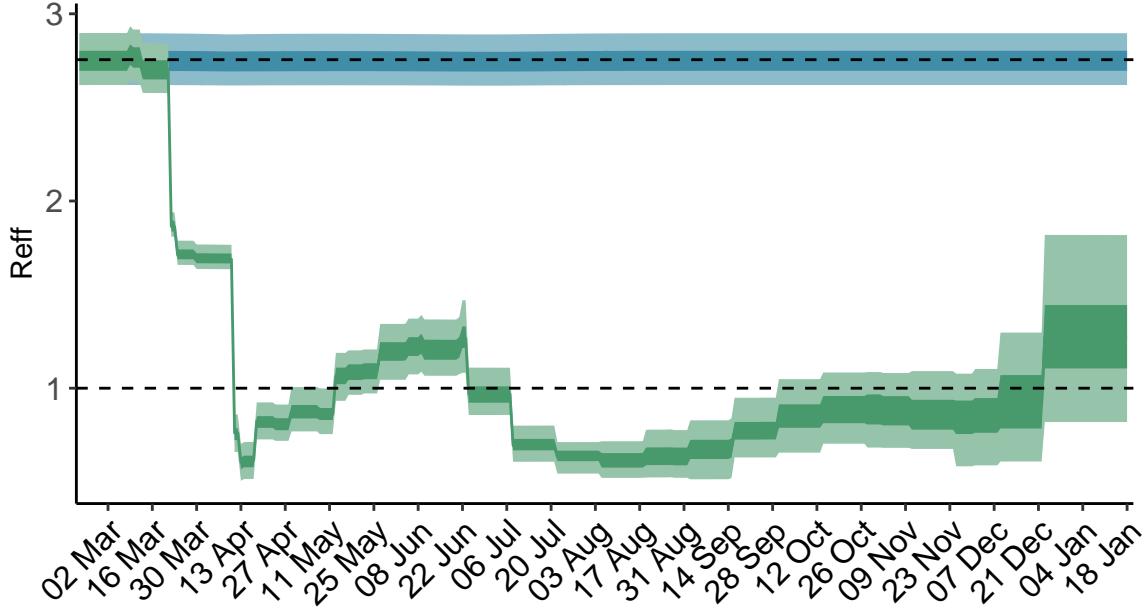


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Liberia is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

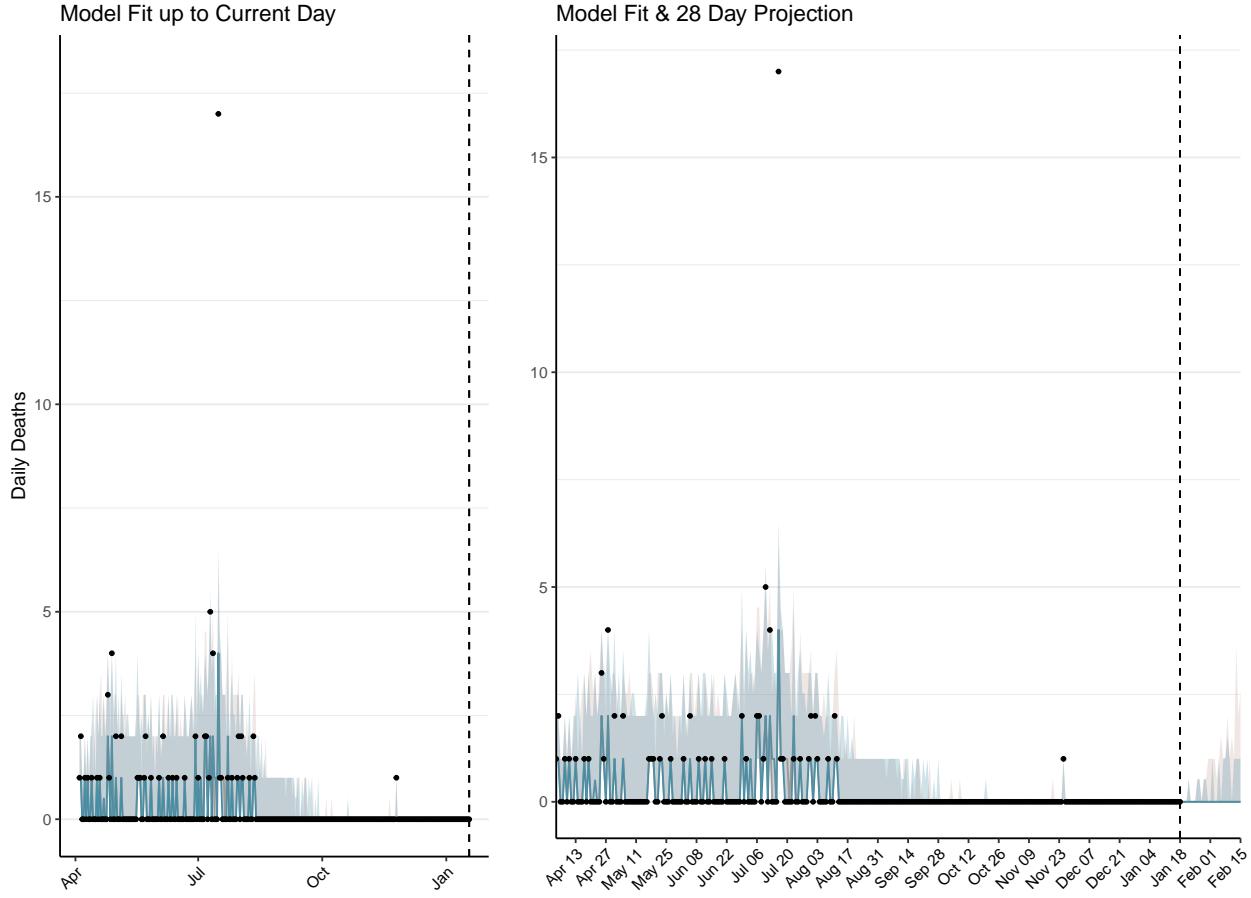


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1 (95% CI: 0-1) patients requiring treatment with high-pressure oxygen at the current date to 11 (95% CI: 0-23) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 0 (95% CI: 0-1) patients requiring treatment with mechanical ventilation at the current date to 3 (95% CI: 1-5) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

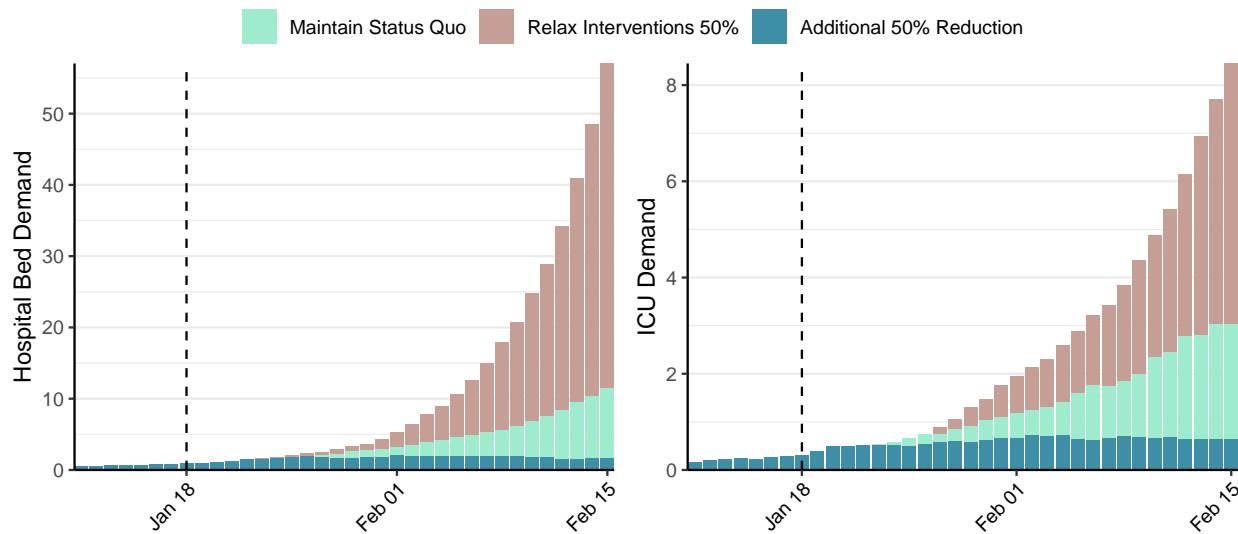


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 25 (95% CI: 5-44) at the current date to 17 (95% CI: -1-34) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 25 (95% CI: 5-44) at the current date to 2,793 (95% CI: 0-5,586) by 2021-02-15.

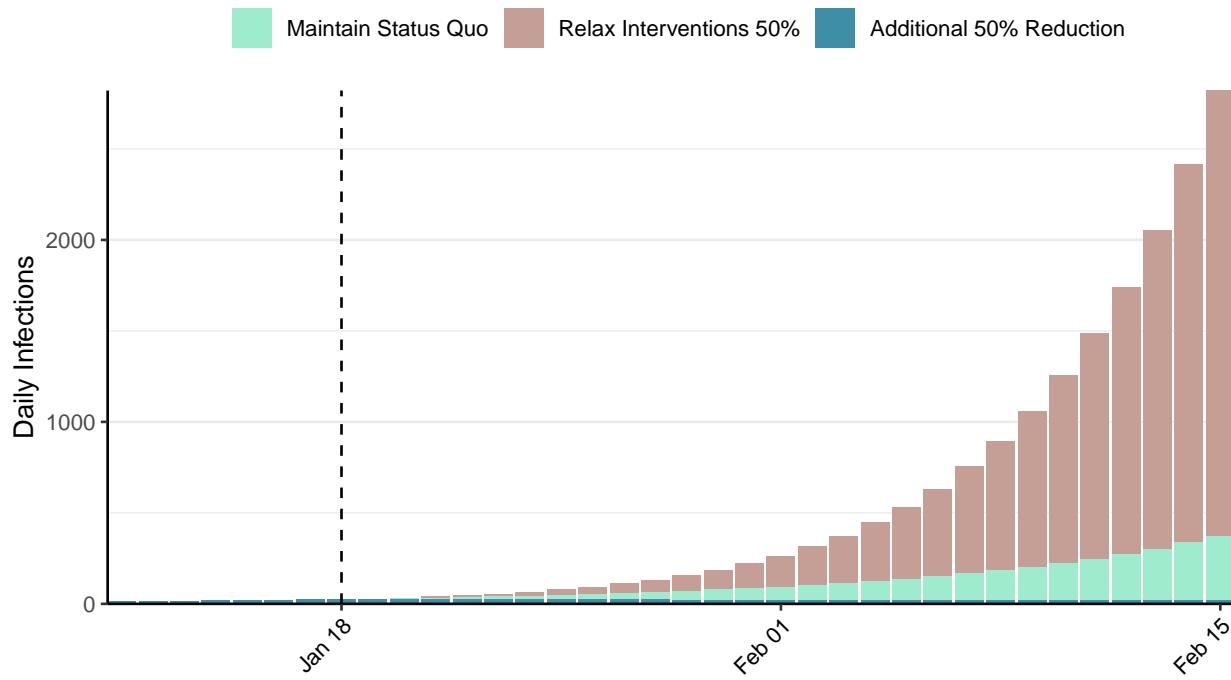


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Libya, 2021-01-18

[Download the report for Libya, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.04 (95% CI: 0.92-1.2)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Libya is not shown in the following plot as only 0 deaths have been reported to date**

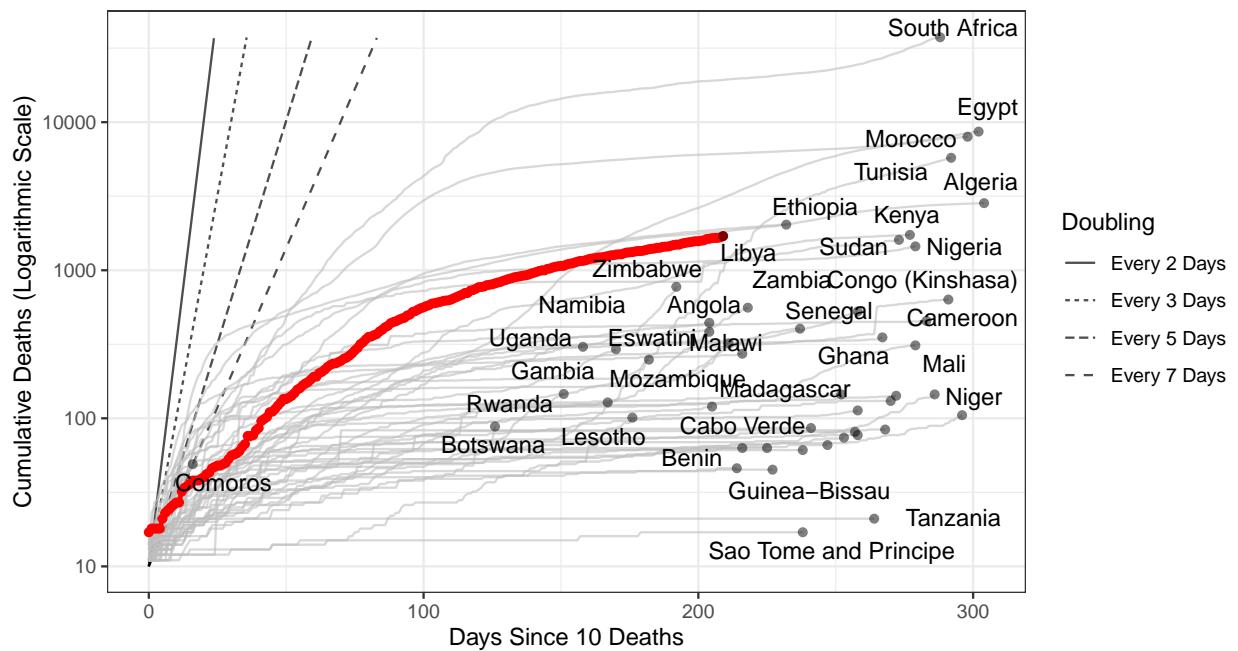


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 153,090 (95% CI: 141,736-164,443) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

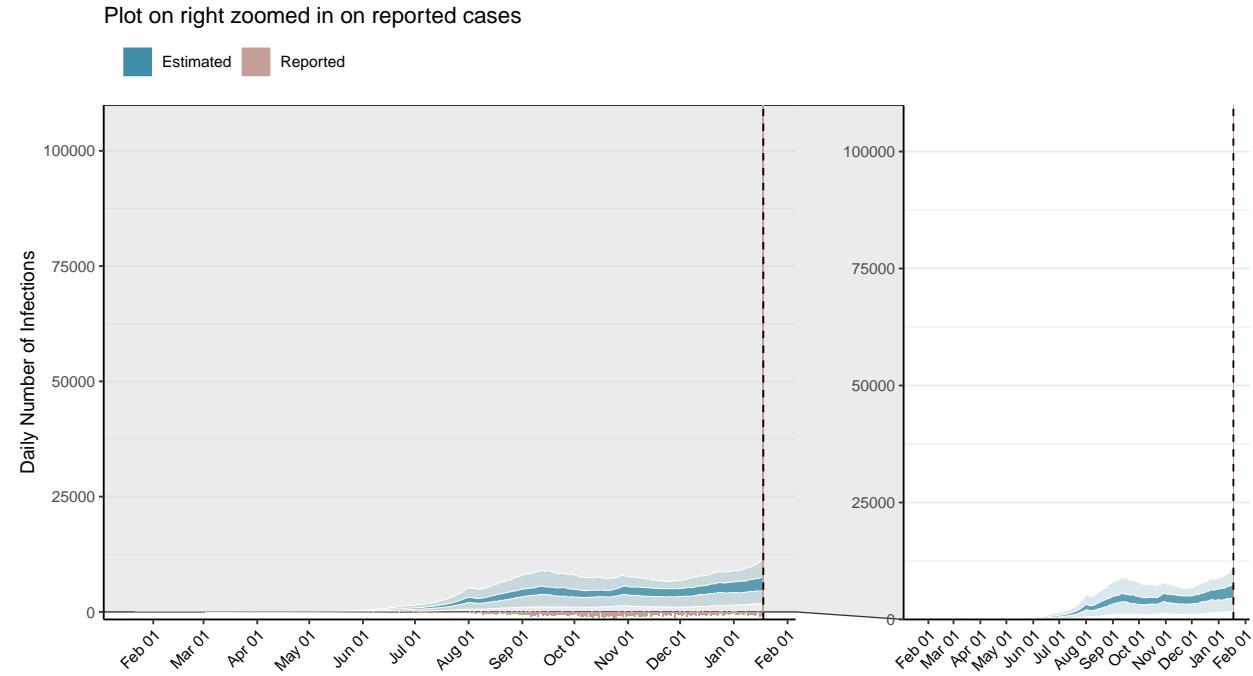


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

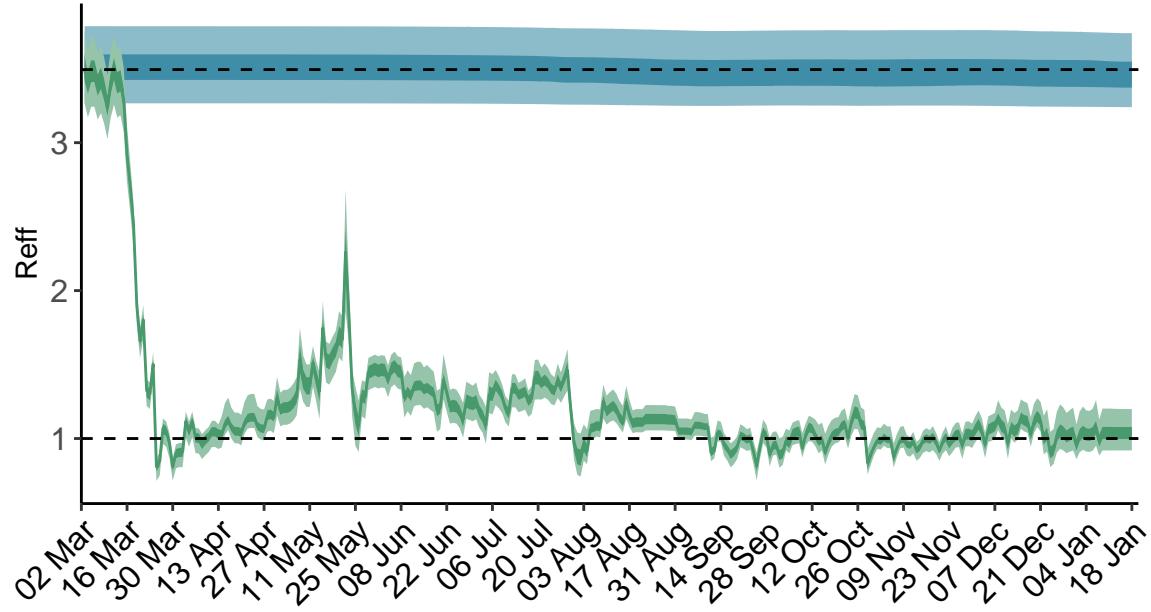


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

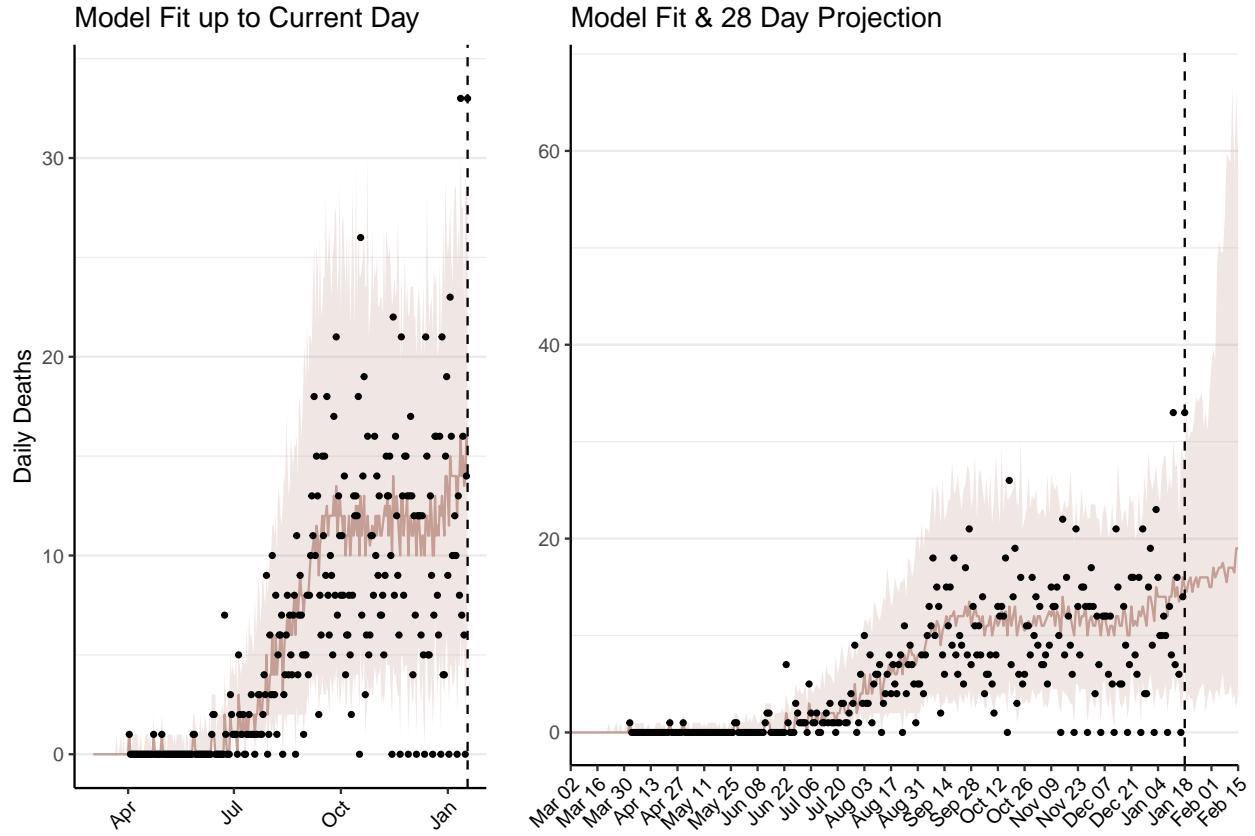


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 635 (95% CI: 587-682) patients requiring treatment with high-pressure oxygen at the current date to 800 (95% CI: 711-889) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 244 (95% CI: 226-263) patients requiring treatment with mechanical ventilation at the current date to 295 (95% CI: 268-322) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

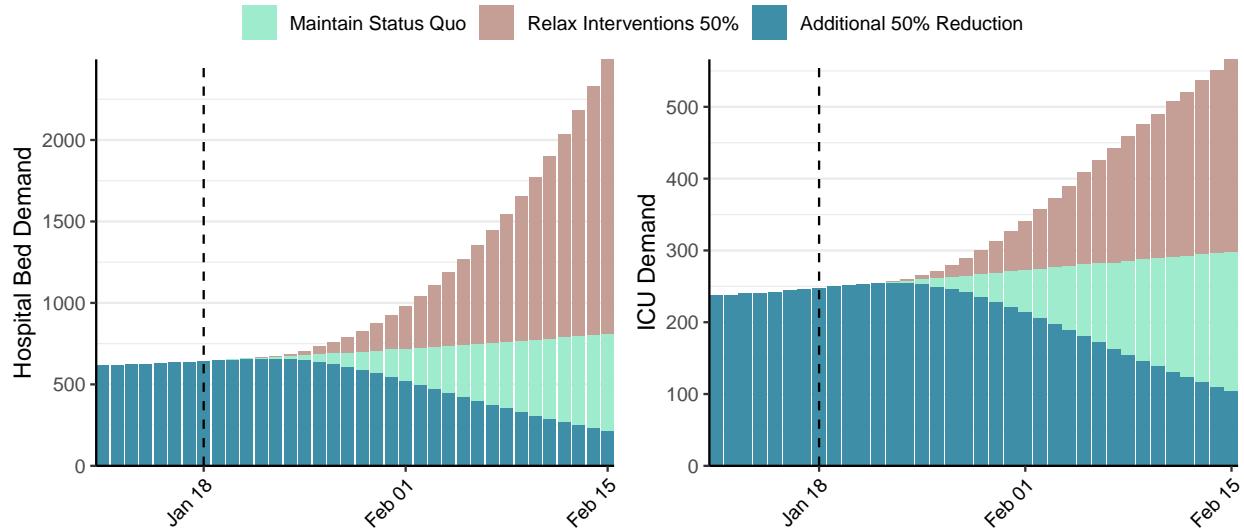


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 5,964 (95% CI: 5,453-6,476) at the current date to 630 (95% CI: 551-709) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 5,964 (95% CI: 5,453-6,476) at the current date to 41,978 (95% CI: 36,705-47,251) by 2021-02-15.

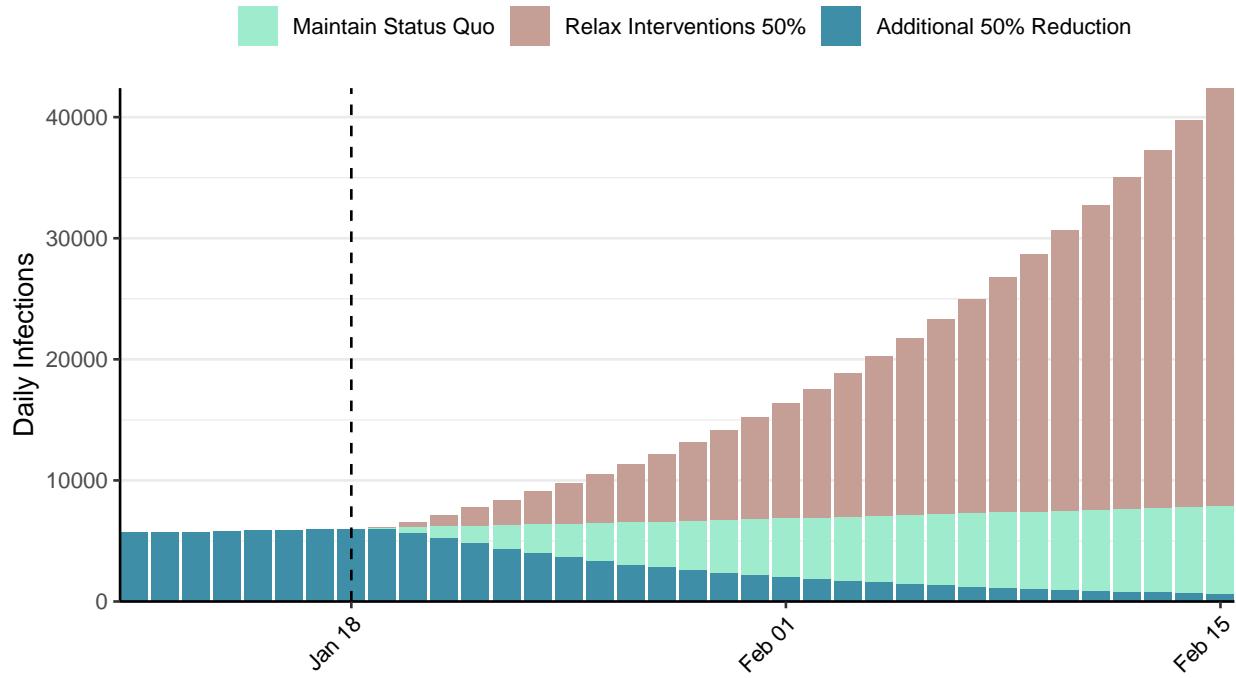


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: St. Lucia, 2021-01-18

[Download the report for St. Lucia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.16 (95% CI: 0.79-1.52)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. St. Lucia is not shown in the following plot as only 0 deaths have been reported to date**

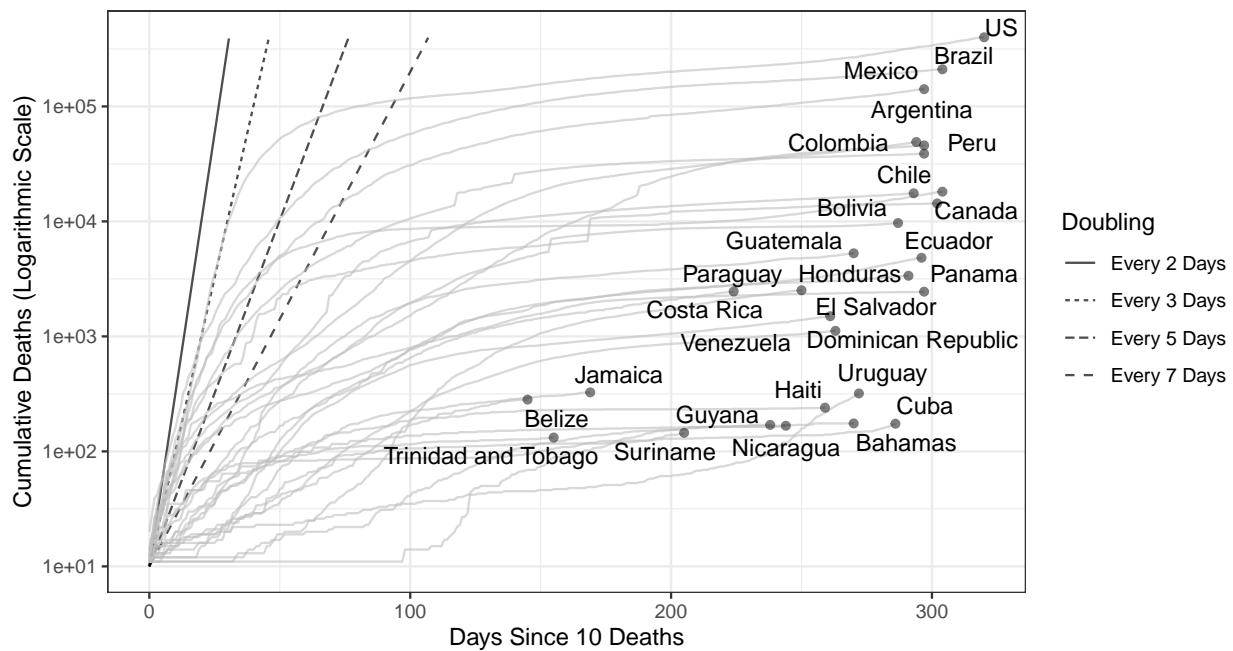


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 4,521 (95% CI: 3,907-5,135) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

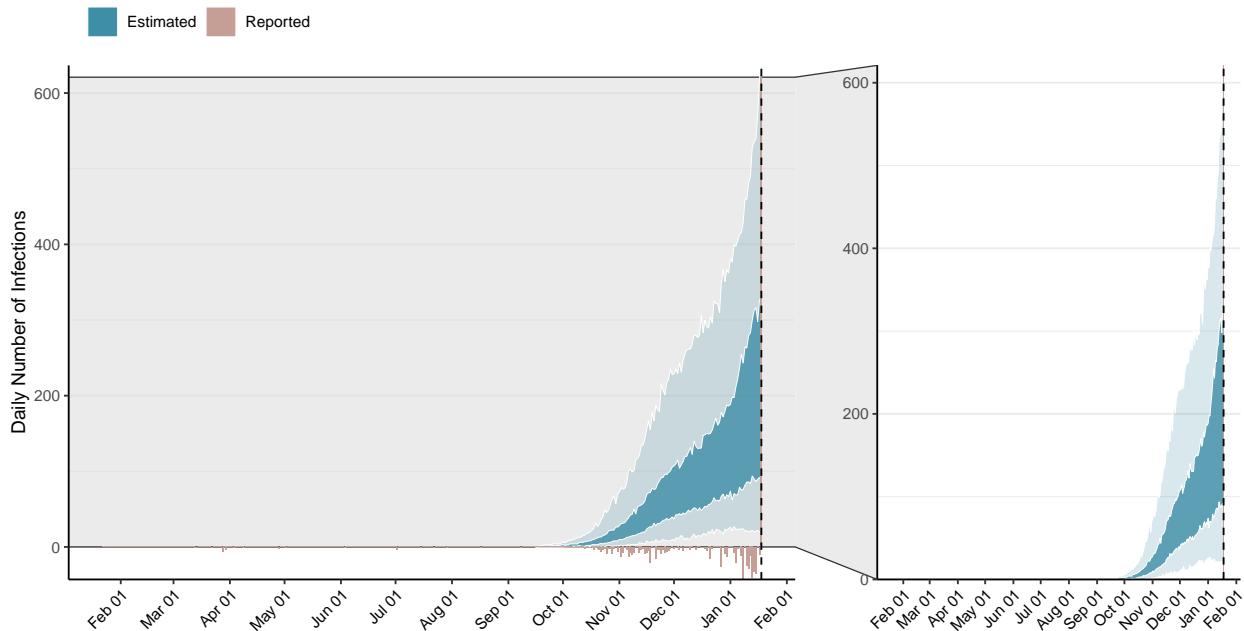


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

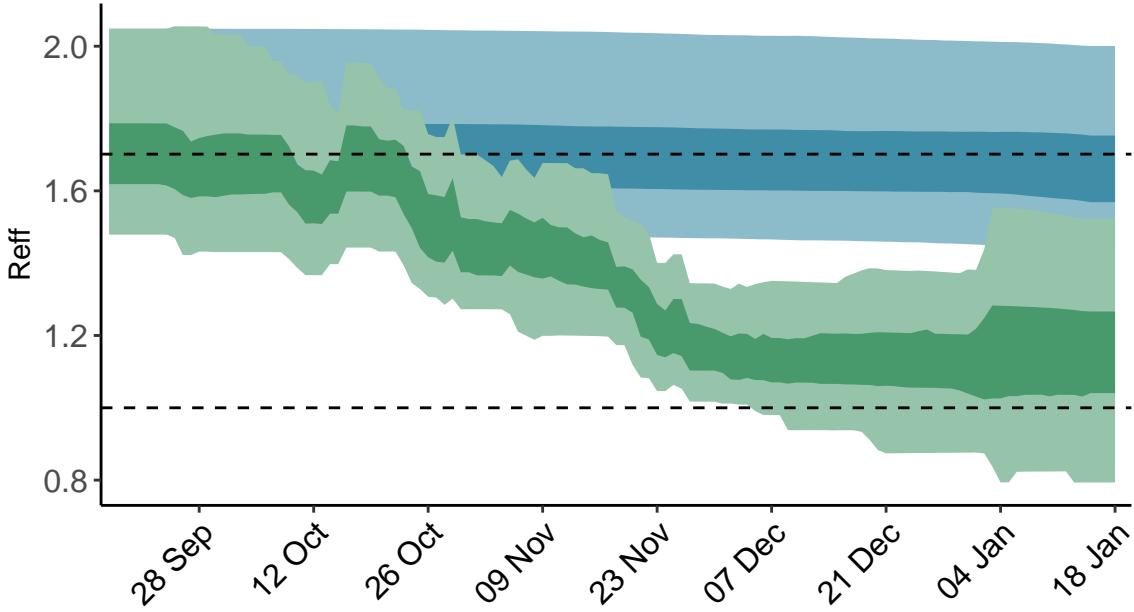


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

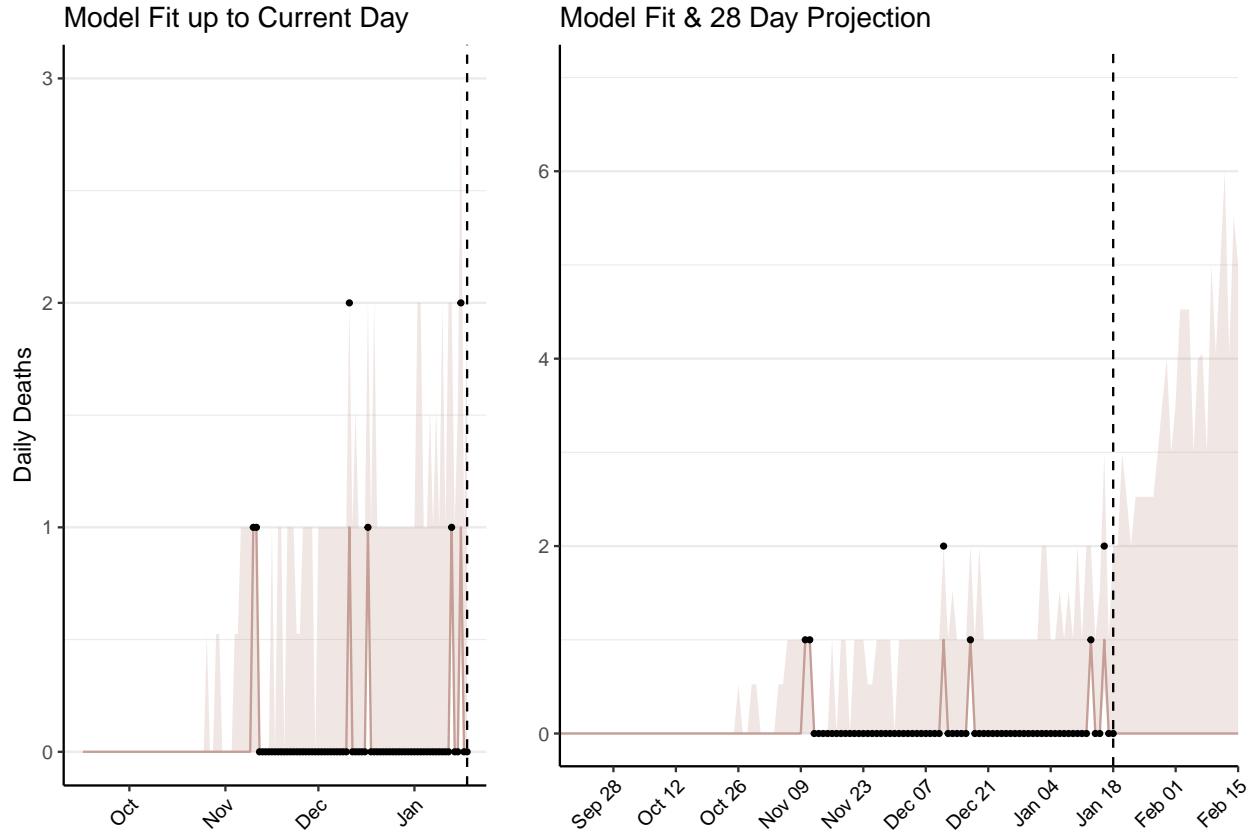


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 17 (95% CI: 15-20) patients requiring treatment with high-pressure oxygen at the current date to 25 (95% CI: 12-38) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 6 (95% CI: 5-7) patients requiring treatment with mechanical ventilation at the current date to 6 (95% CI: 5-8) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

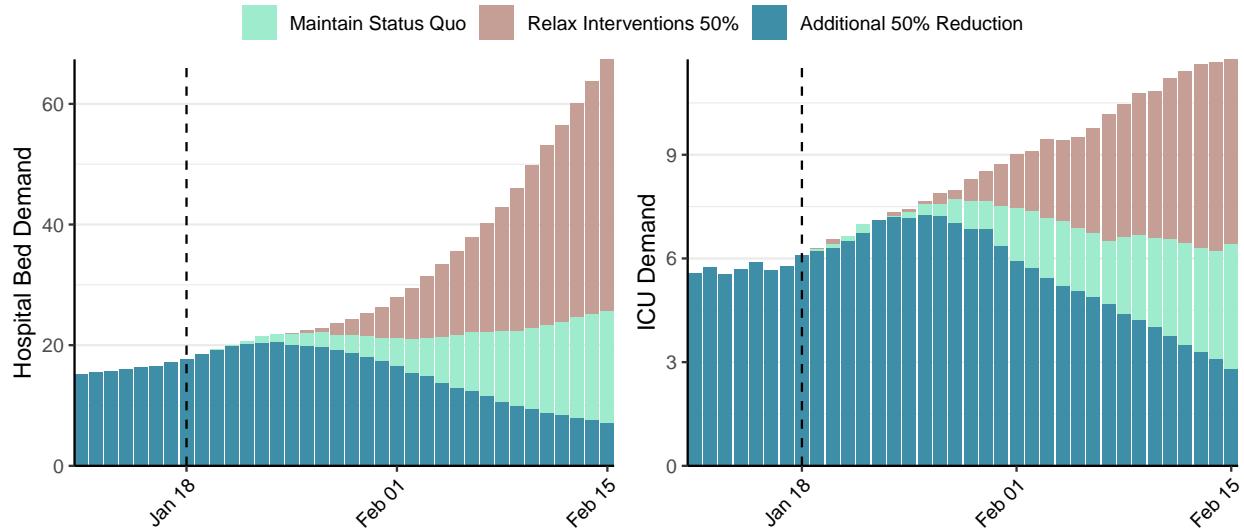


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 229 (95% CI: 194-264) at the current date to 29 (95% CI: 4-54) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 229 (95% CI: 194-264) at the current date to 942 (95% CI: 559-1,325) by 2021-02-15.

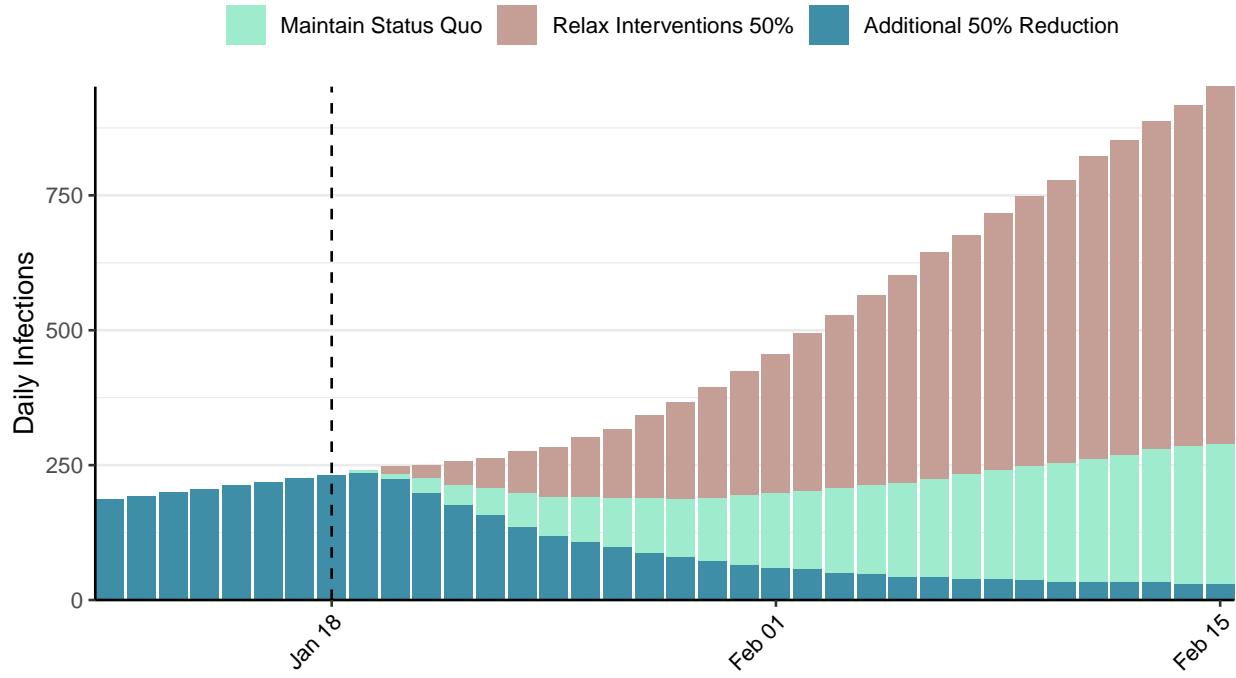


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Sri Lanka, 2021-01-18

[Download the report for Sri Lanka, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.06 (95% CI: 0.9-1.24)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Sri Lanka is not shown in the following plot as only 0 deaths have been reported to date**

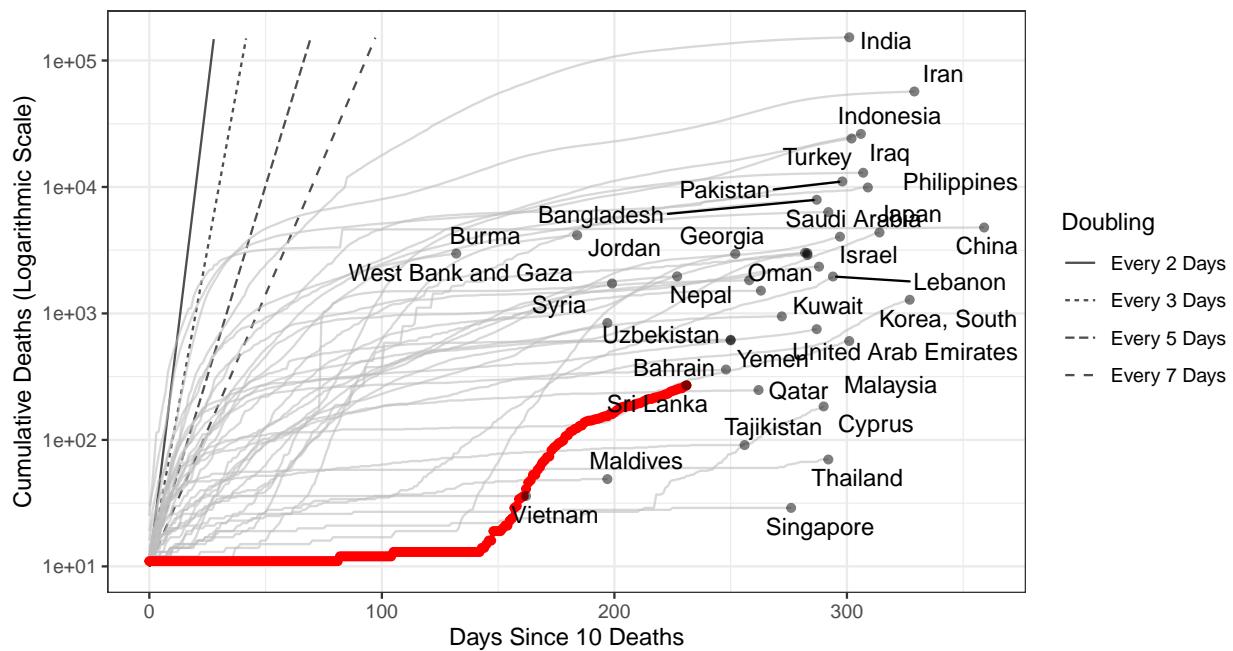


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 60,958 (95% CI: 50,084-71,832) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

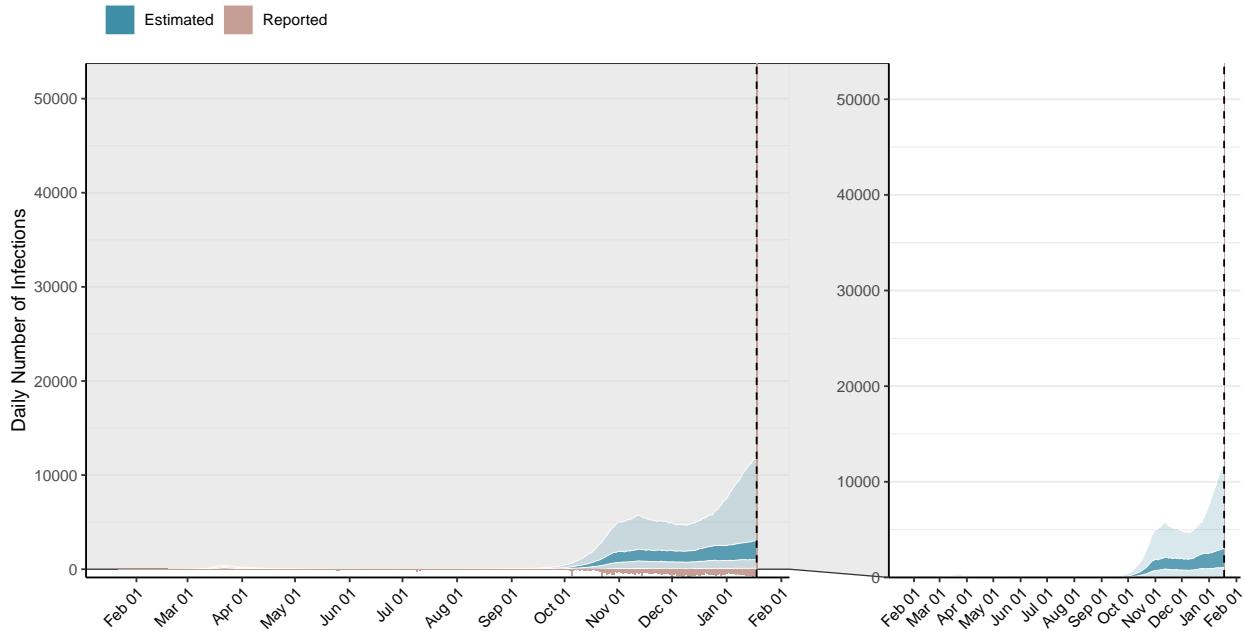


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

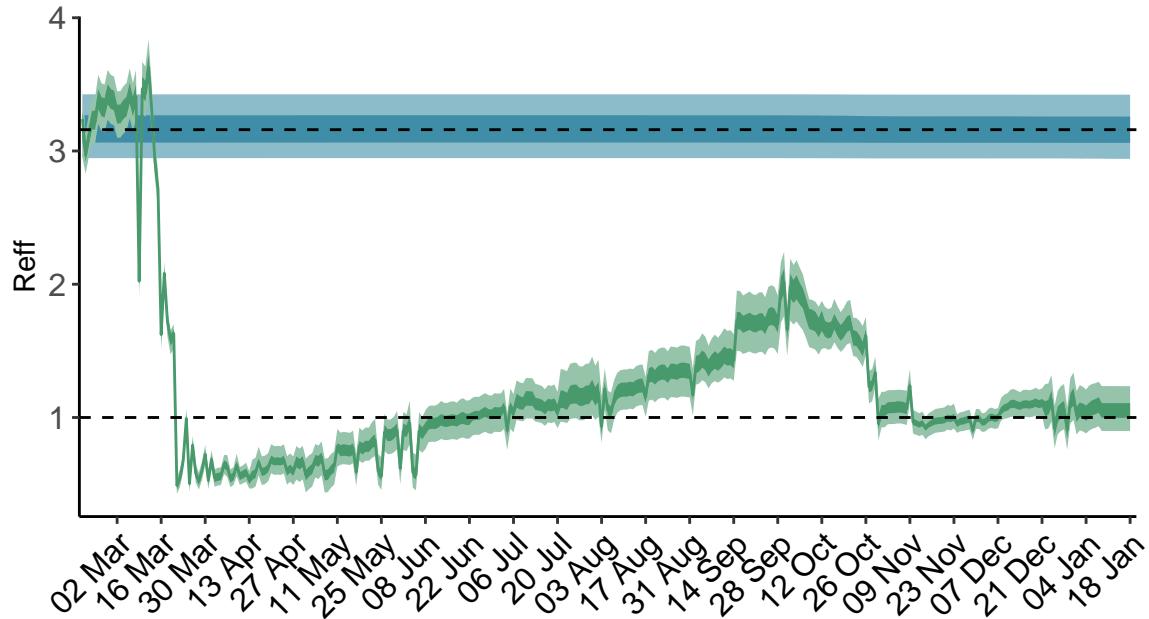


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

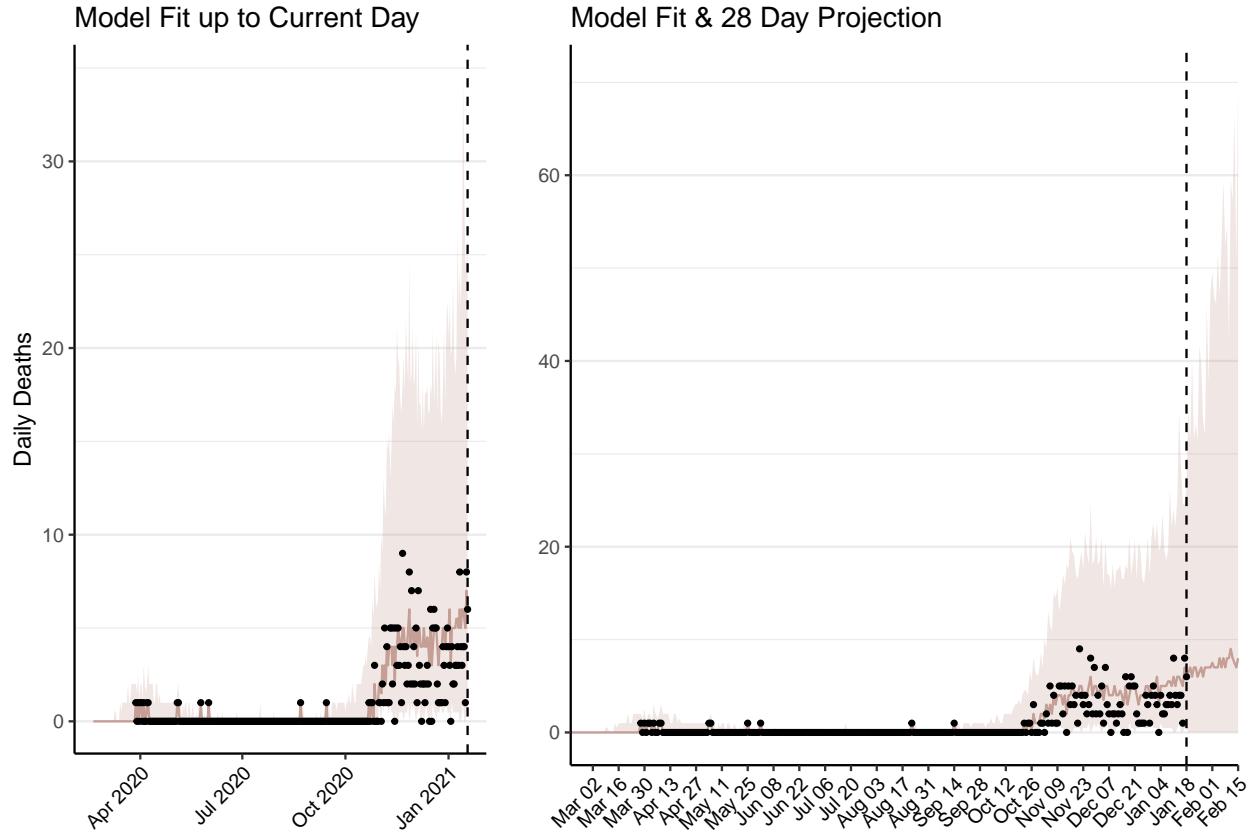


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 296 (95% CI: 242-350) patients requiring treatment with high-pressure oxygen at the current date to 449 (95% CI: 330-568) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 113 (95% CI: 93-133) patients requiring treatment with mechanical ventilation at the current date to 172 (95% CI: 128-216) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

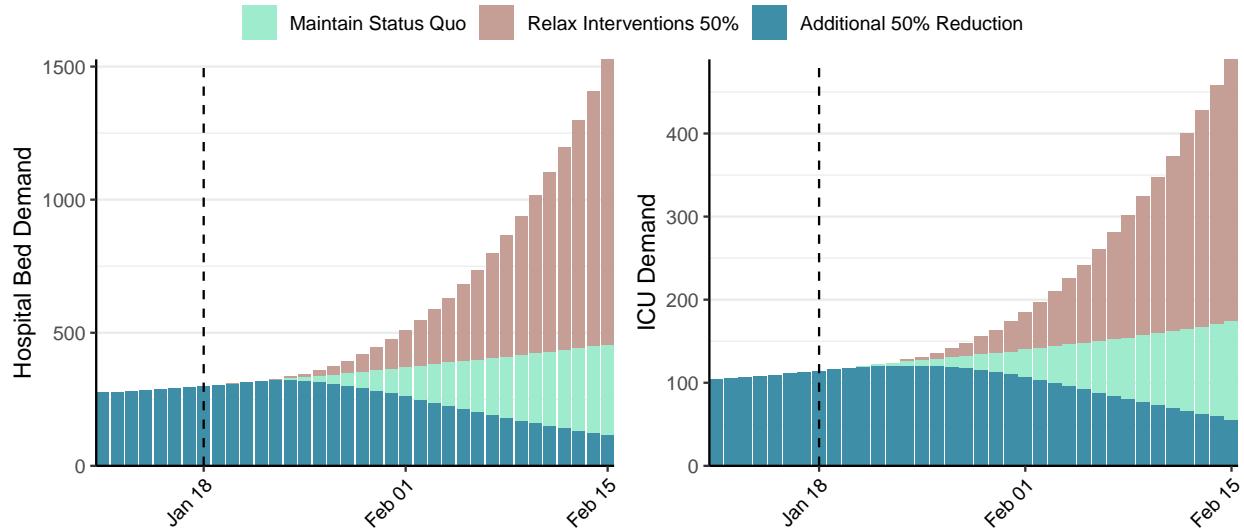


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 2,596 (95% CI: 2,051-3,141) at the current date to 313 (95% CI: 224-401) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,596 (95% CI: 2,051-3,141) at the current date to 24,686 (95% CI: 17,489-31,884) by 2021-02-15.

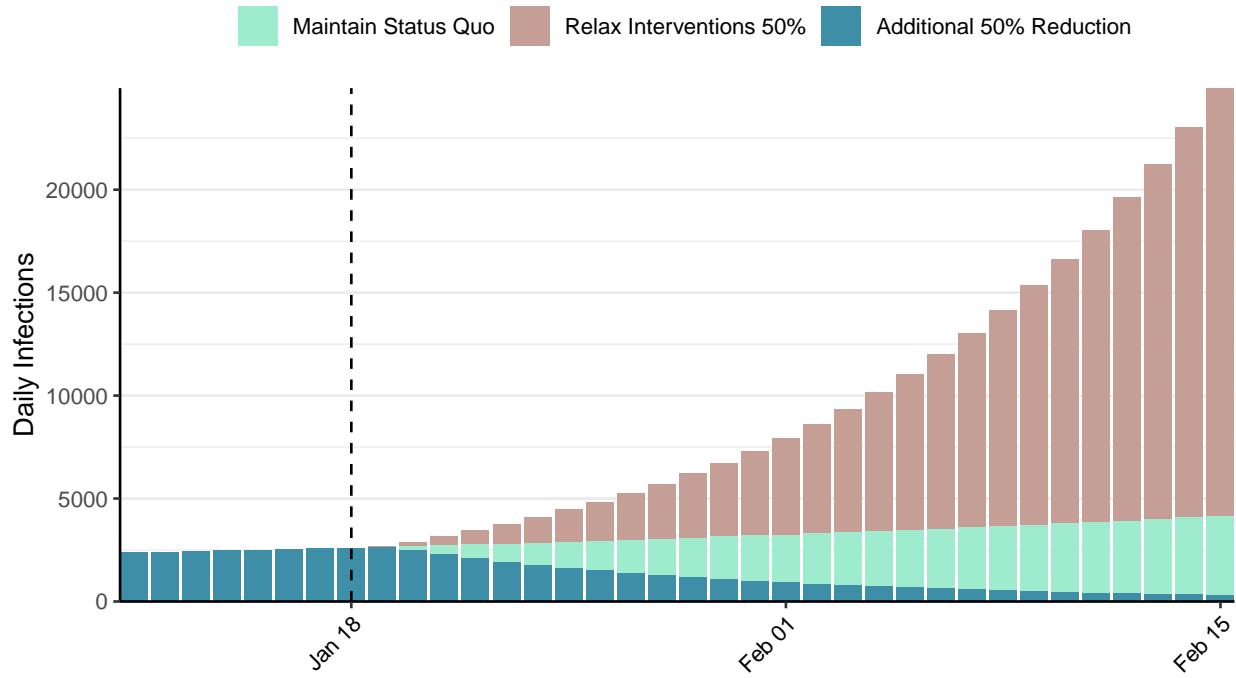


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Lesotho, 2021-01-18

[Download the report for Lesotho, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.48 (95% CI: 1.26-1.71)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Lesotho is not shown in the following plot as only 0 deaths have been reported to date**

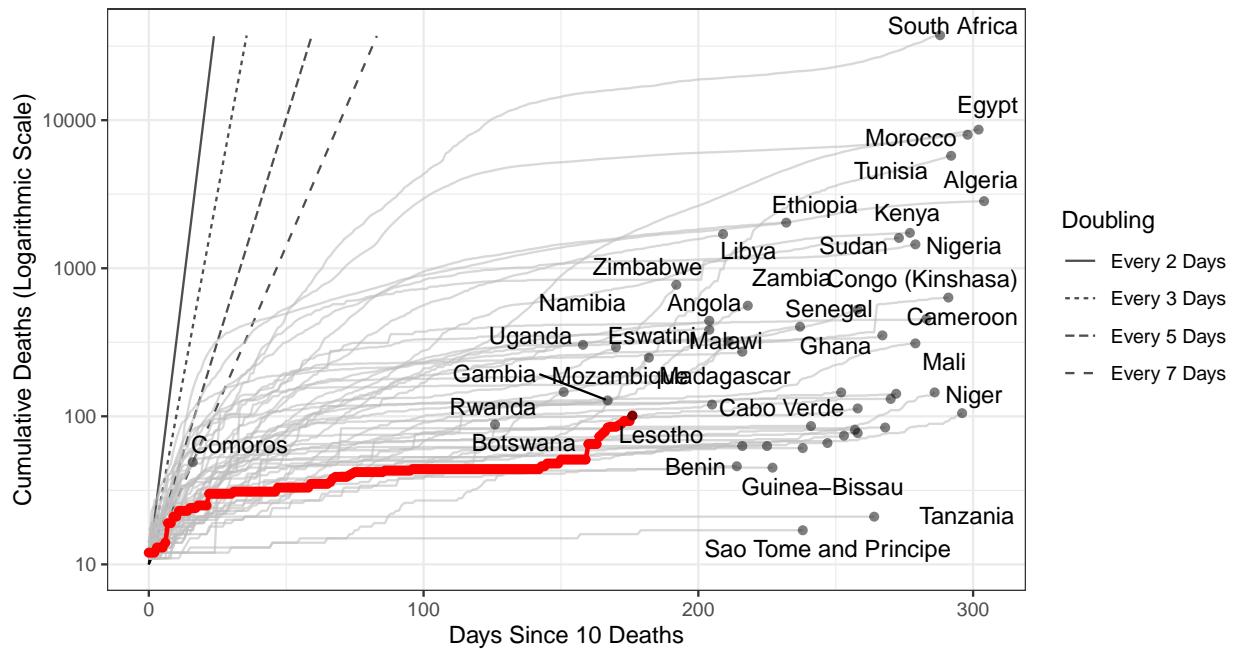


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 60,119 (95% CI: 56,857-63,381) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

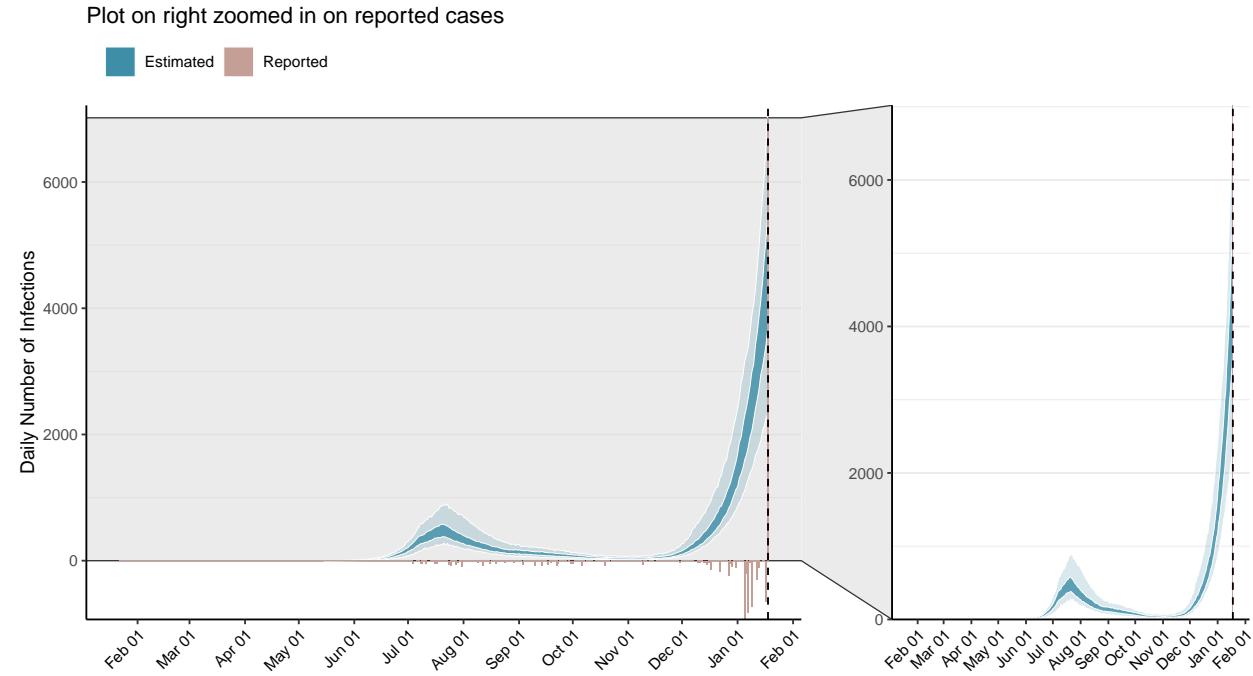


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

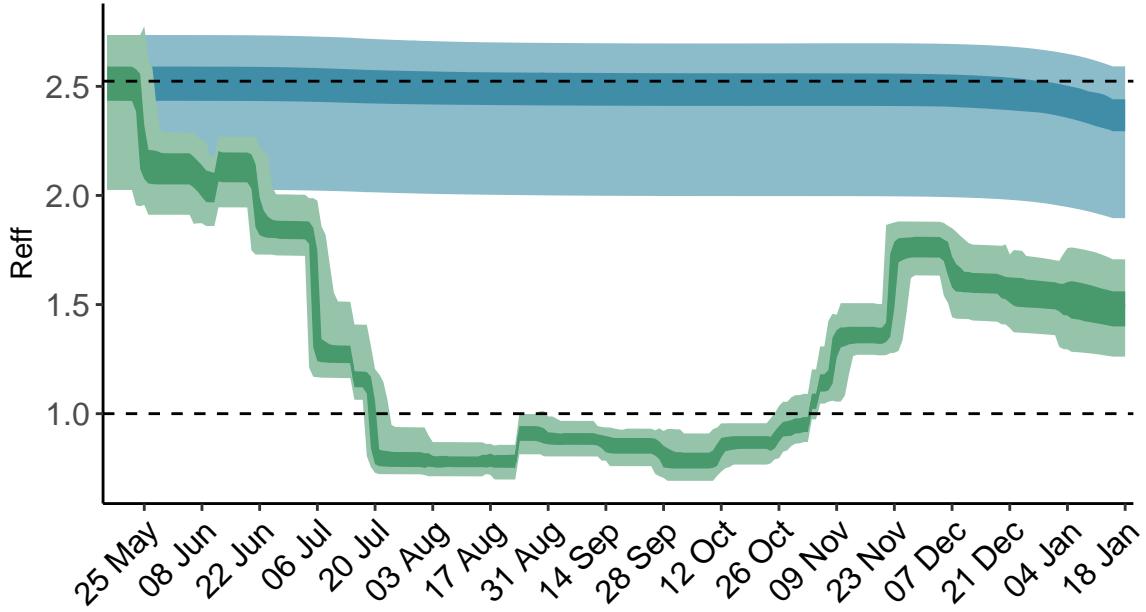


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Lesotho is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

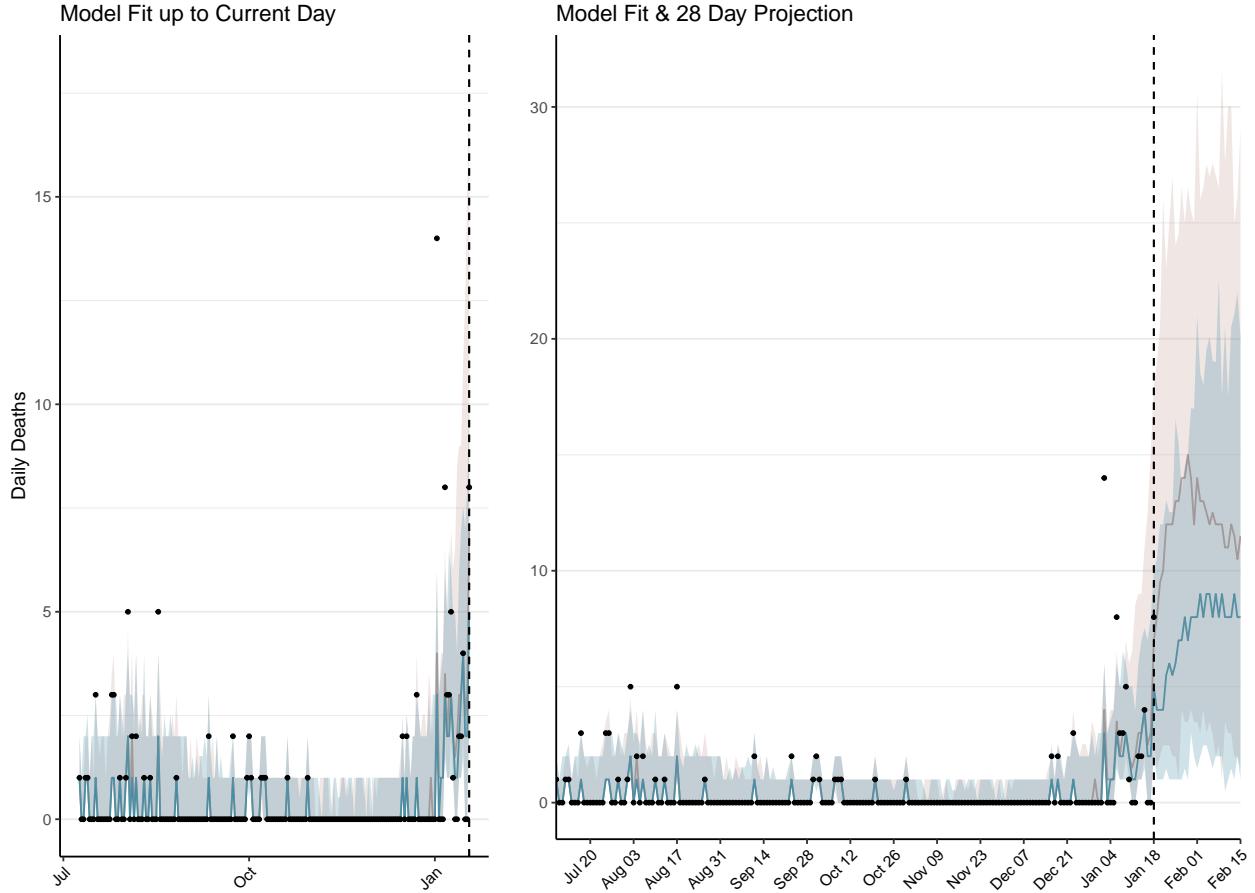


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 225 (95% CI: 212-238) patients requiring treatment with high-pressure oxygen at the current date to 364 (95% CI: 330-397) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 67 (95% CI: 64-69) patients requiring treatment with mechanical ventilation at the current date to 74 (95% CI: 71-77) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

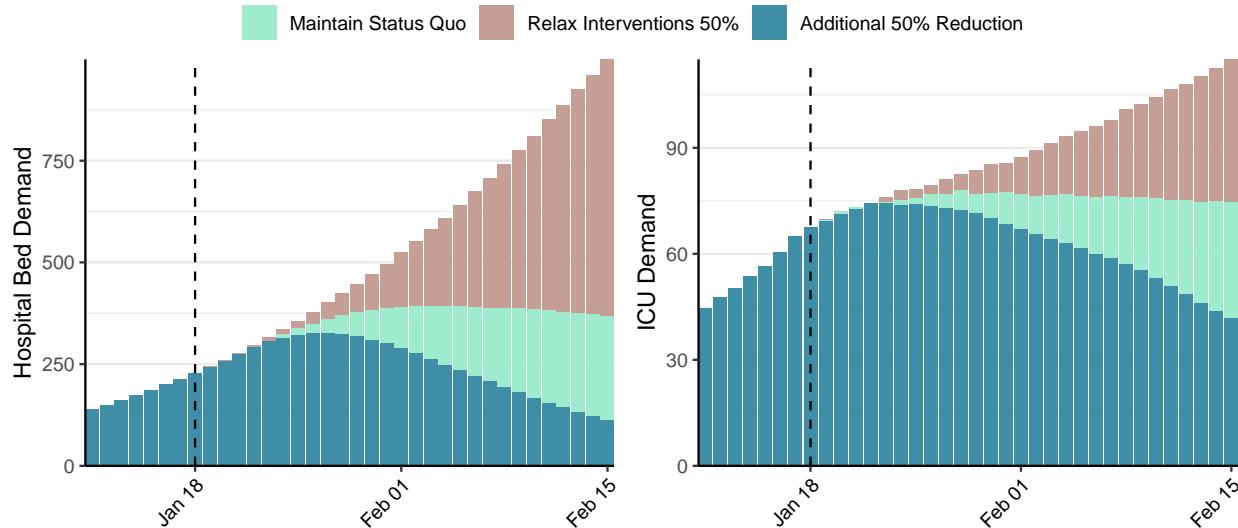


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 4,591 (95% CI: 4,324-4,859) at the current date to 341 (95% CI: 300-381) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 4,591 (95% CI: 4,324-4,859) at the current date to 15,425 (95% CI: 13,701-17,150) by 2021-02-15.

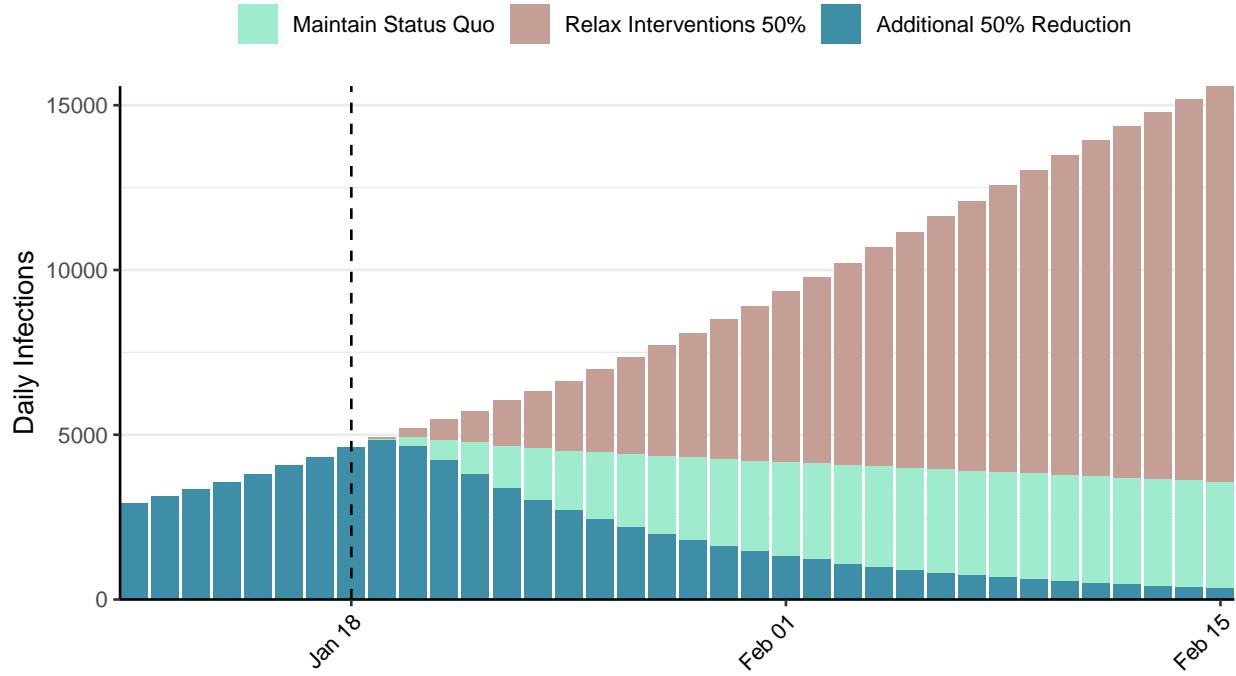


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Morocco, 2021-01-18

[Download the report for Morocco, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.87 (95% CI: 0.75-1.04)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Morocco is not shown in the following plot as only 0 deaths have been reported to date**

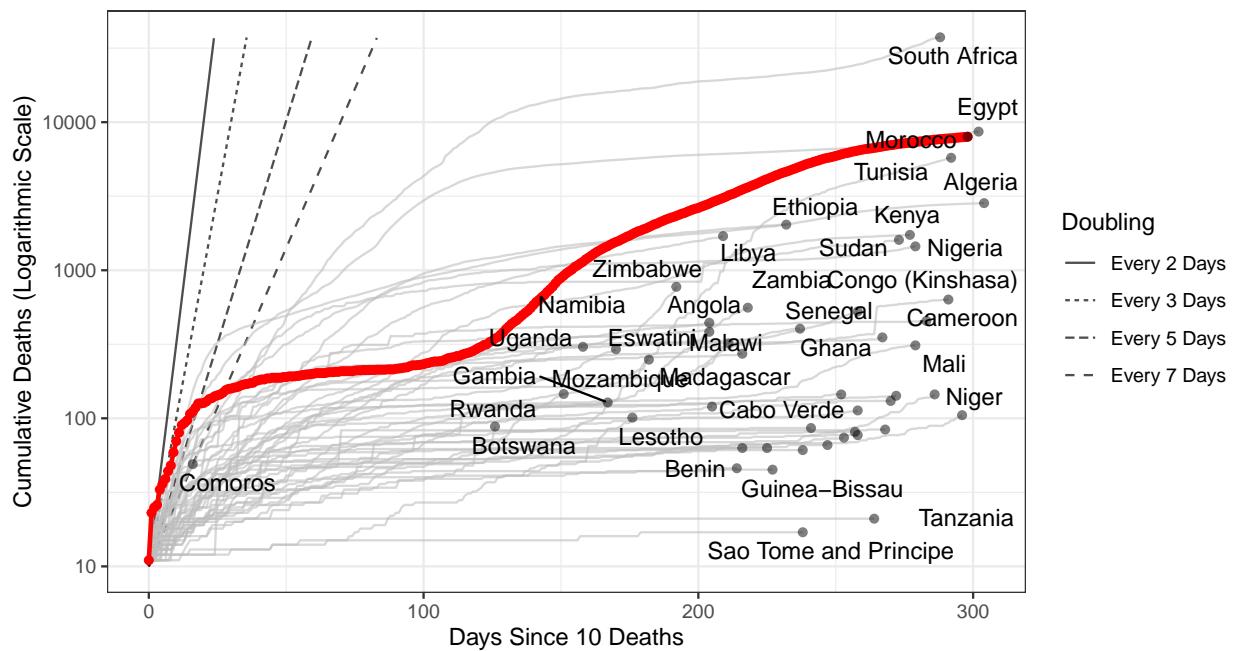


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 343,054 (95% CI: 319,129–366,978) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

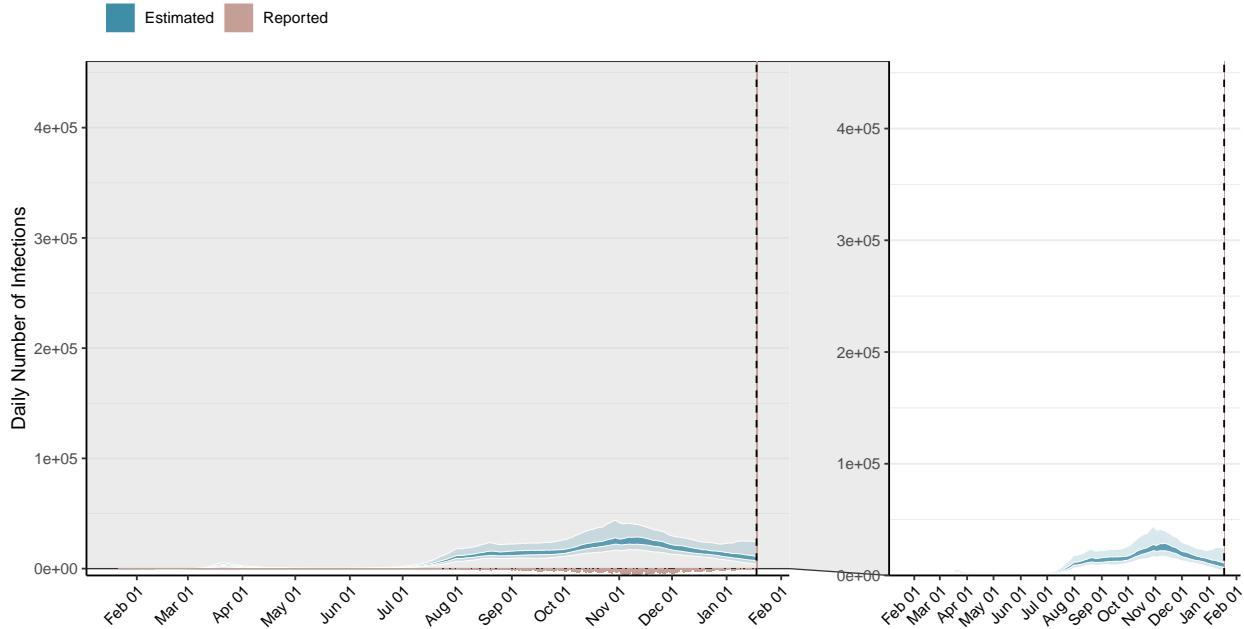


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

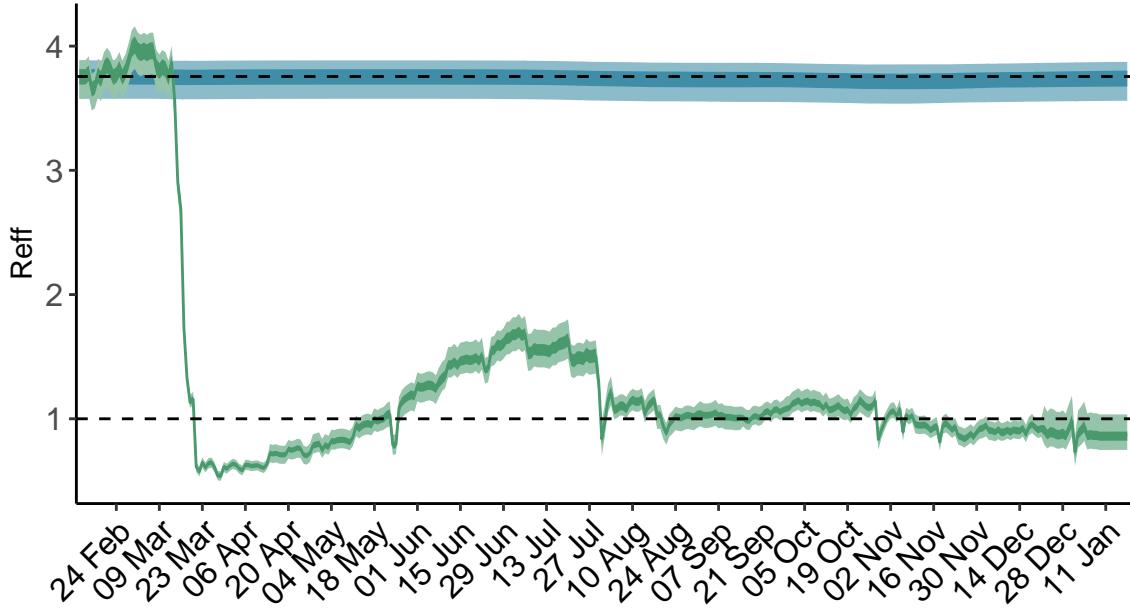


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Morocco is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

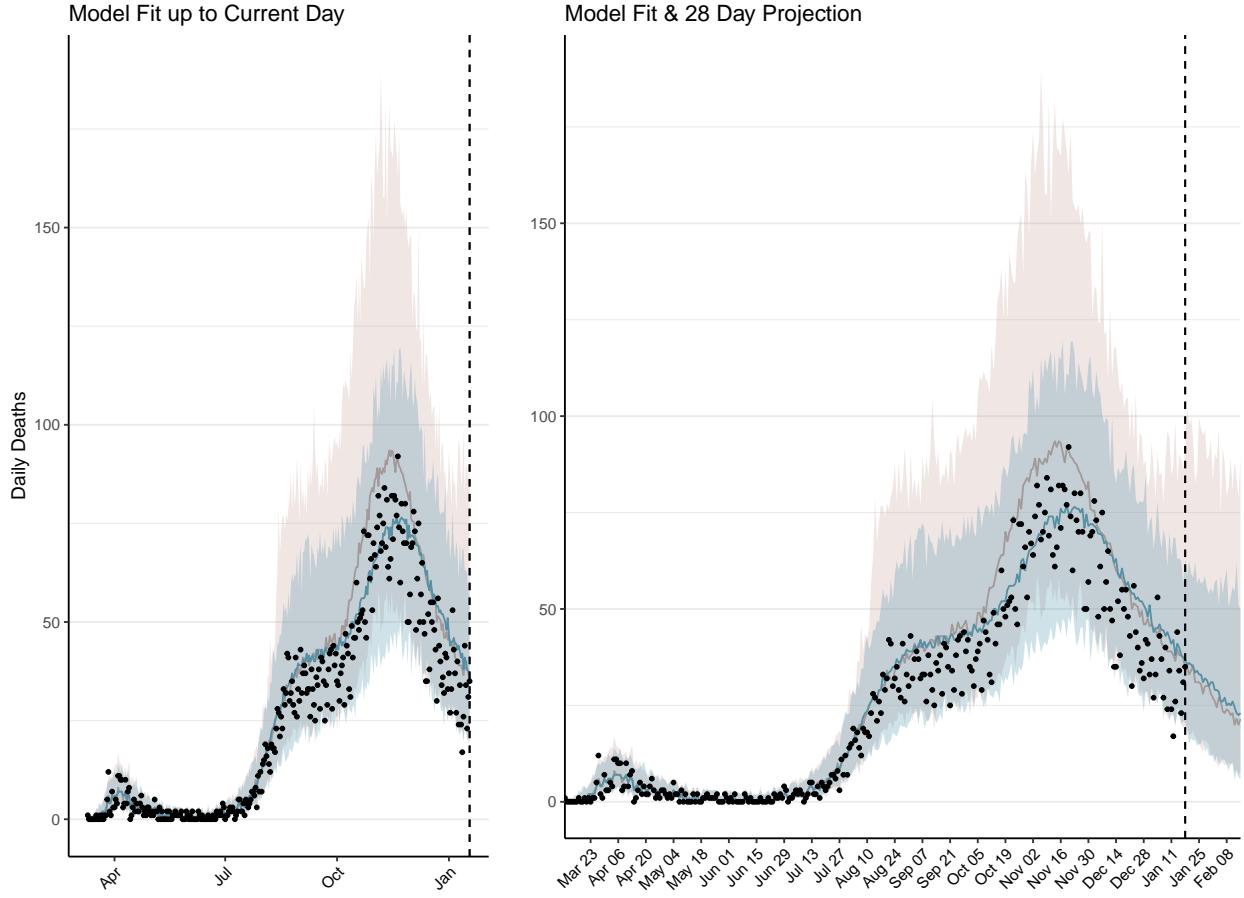


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1,423 (95% CI: 1,320-1,526) patients requiring treatment with high-pressure oxygen at the current date to 925 (95% CI: 798-1,052) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 531 (95% CI: 508-555) patients requiring treatment with mechanical ventilation at the current date to 357 (95% CI: 325-389) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

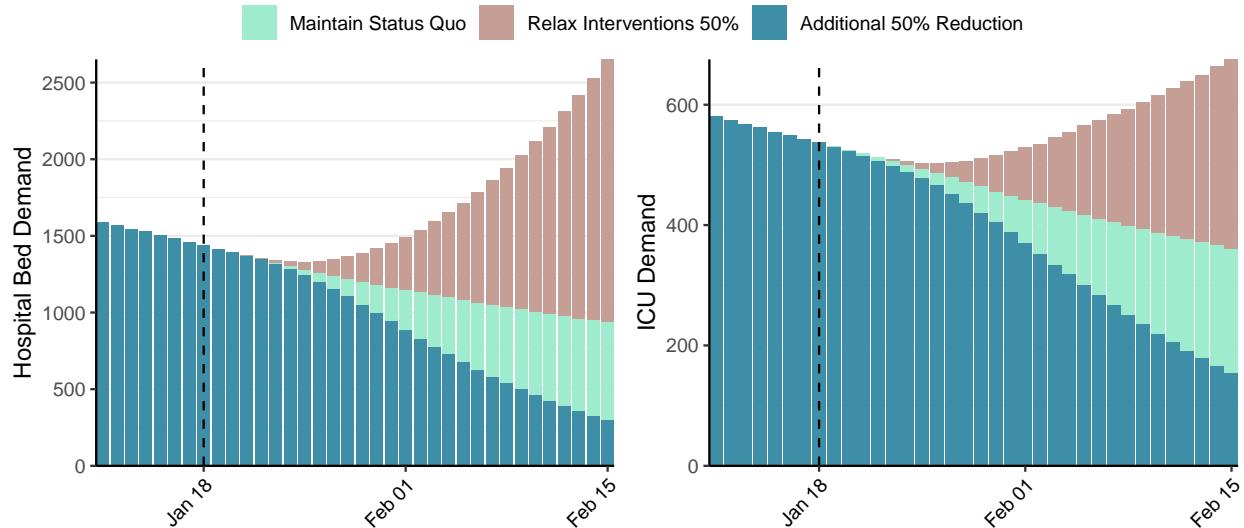


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 9,748 (95% CI: 8,816-10,680) at the current date to 586 (95% CI: 491-682) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 9,748 (95% CI: 8,816-10,680) at the current date to 35,400 (95% CI: 28,791-42,009) by 2021-02-15.

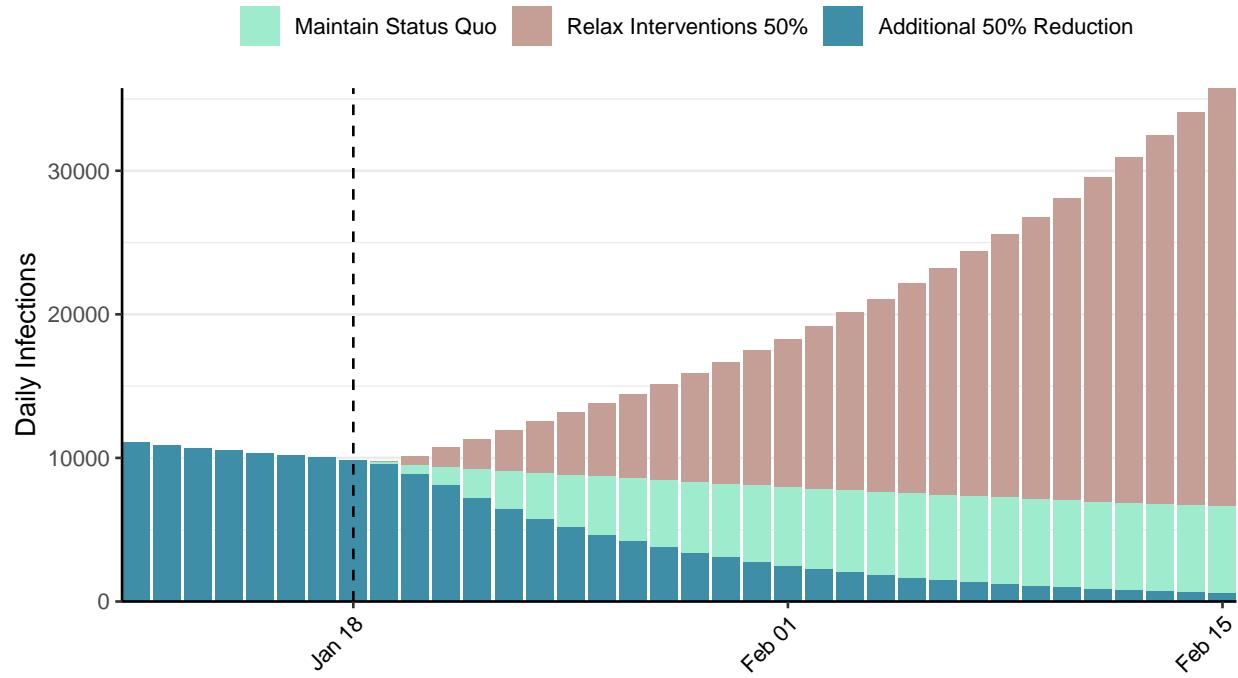


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Moldova, 2021-01-18

[Download the report for Moldova, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.95 (95% CI: 0.72-1.2)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Moldova is not shown in the following plot as only 0 deaths have been reported to date**

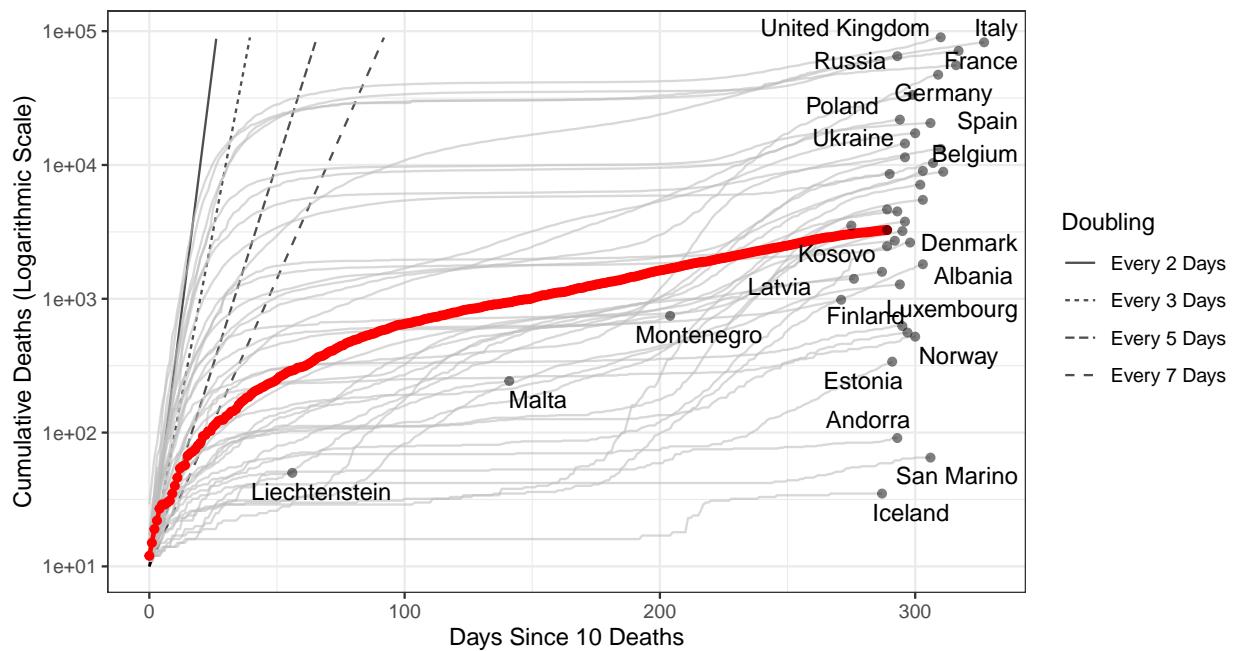


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 176,719 (95% CI: 167,003-186,435) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

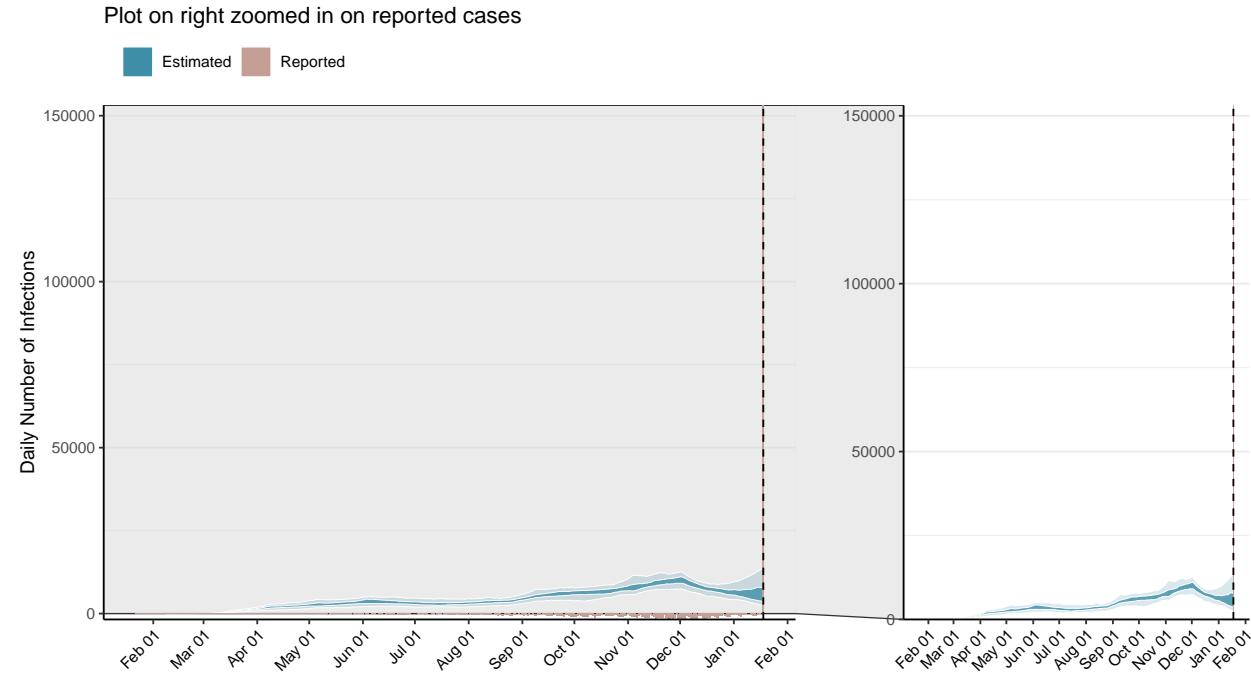


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

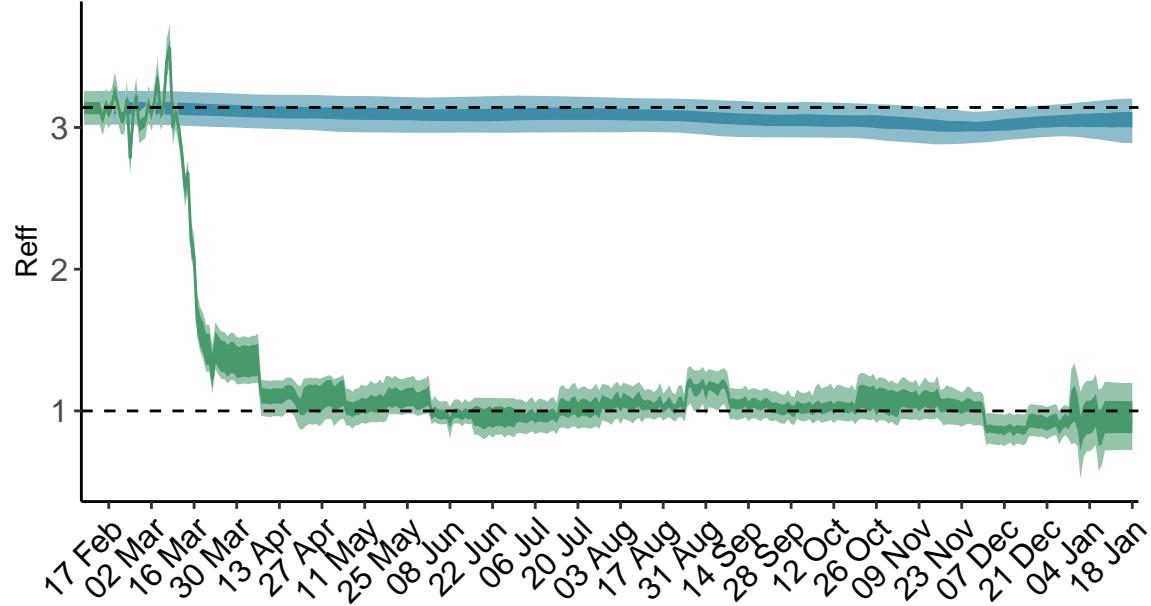


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

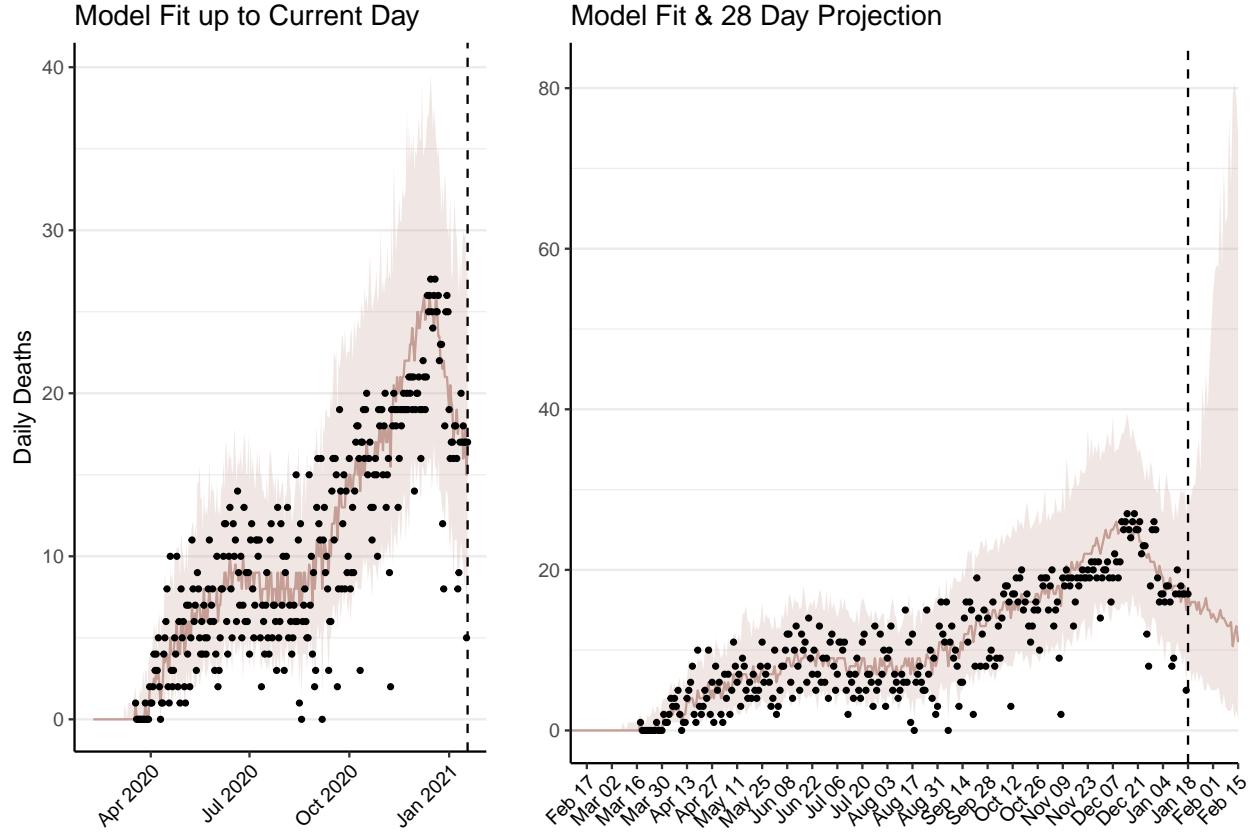


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 661 (95% CI: 619-702) patients requiring treatment with high-pressure oxygen at the current date to 700 (95% CI: 578-821) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 263 (95% CI: 248-278) patients requiring treatment with mechanical ventilation at the current date to 245 (95% CI: 212-278) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

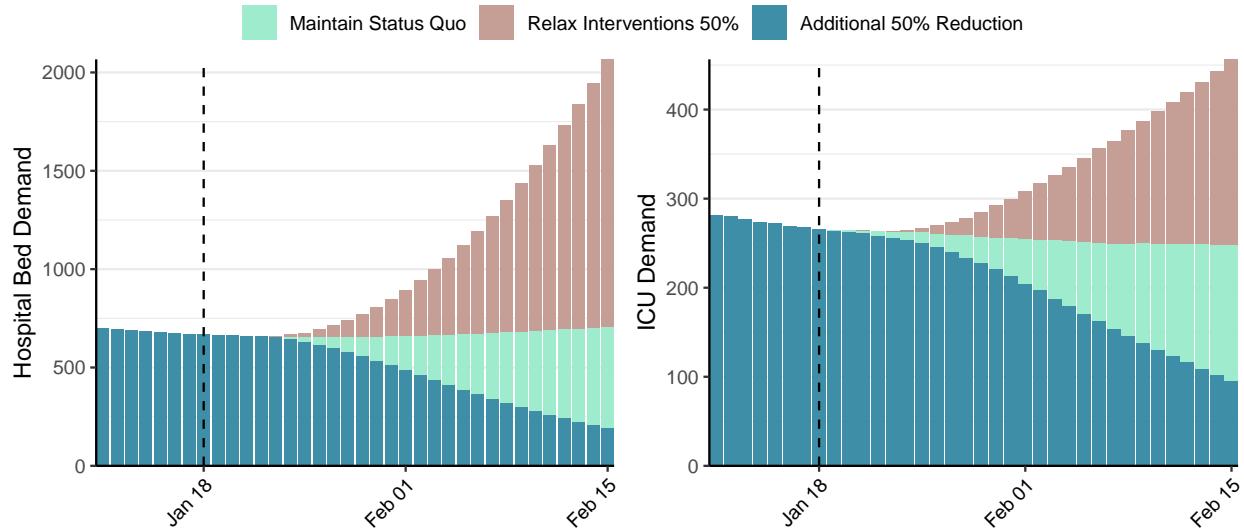


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 6,026 (95% CI: 5,382-6,669) at the current date to 607 (95% CI: 485-729) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 6,026 (95% CI: 5,382-6,669) at the current date to 31,922 (95% CI: 26,066-37,779) by 2021-02-15.

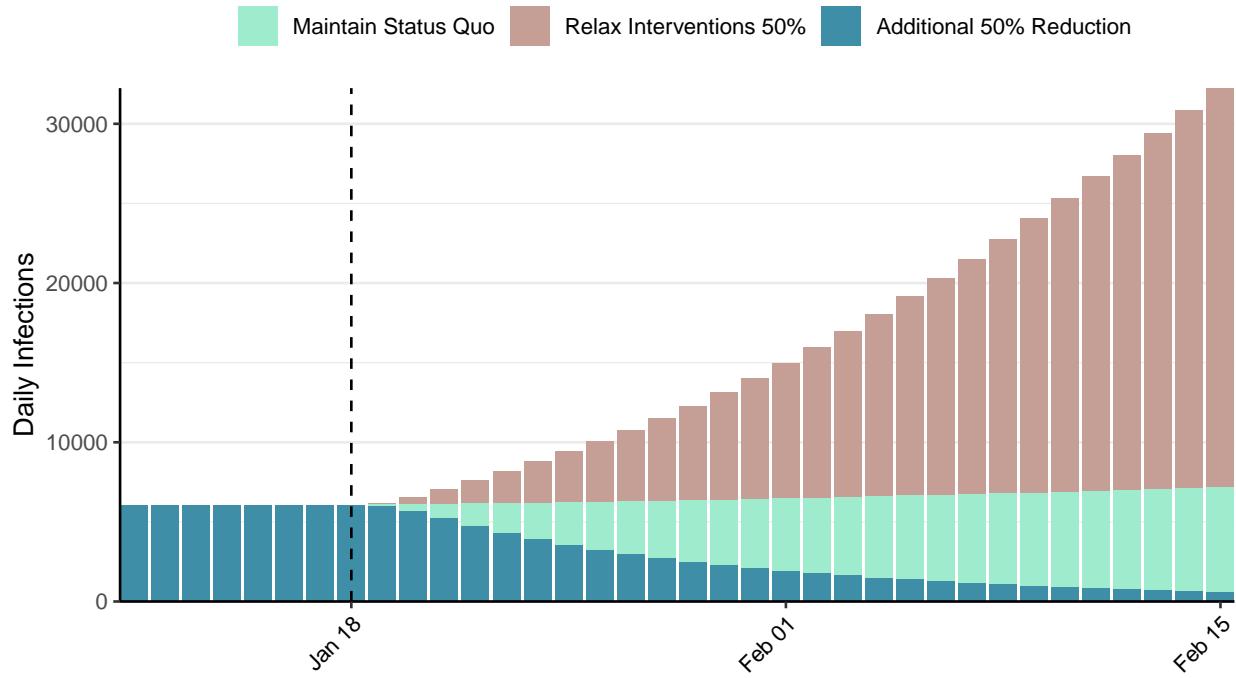


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Madagascar, 2021-01-18

[Download the report for Madagascar, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.77 (95% CI: 1.4-2.18)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Madagascar is not shown in the following plot as only 0 deaths have been reported to date**

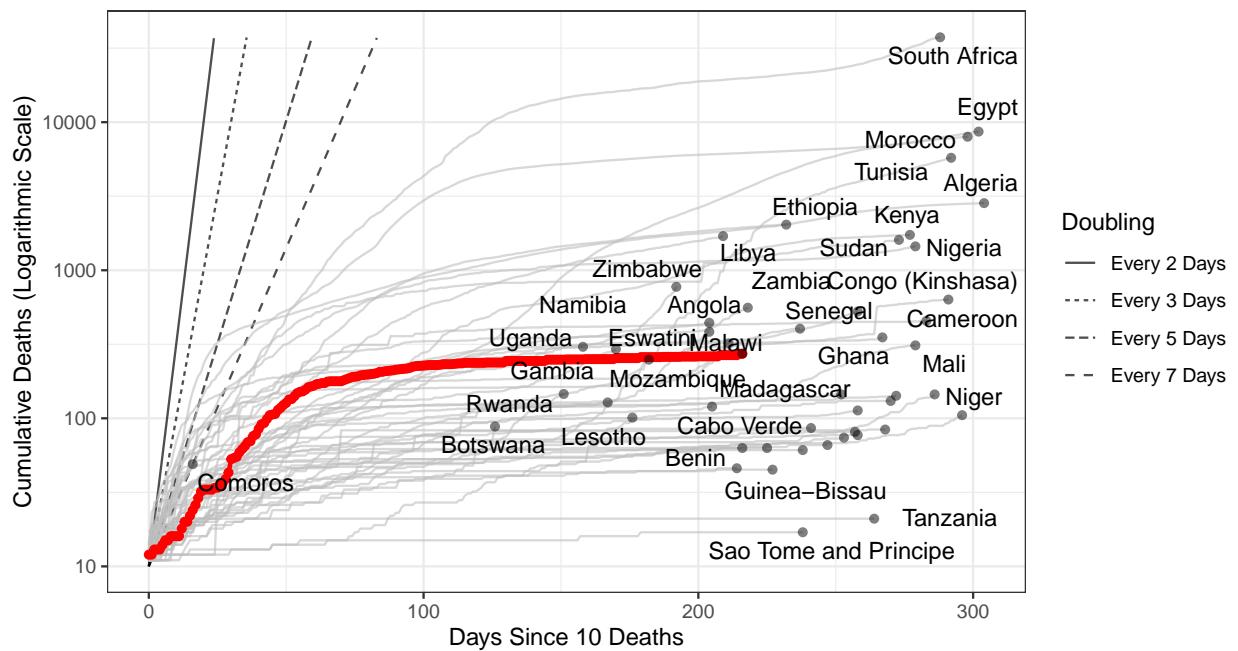


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 27,539 (95% CI: 24,154-30,924) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. Madagascar has revised their historic reported cases and thus have reported negative cases.**

Plot on right zoomed in on reported cases

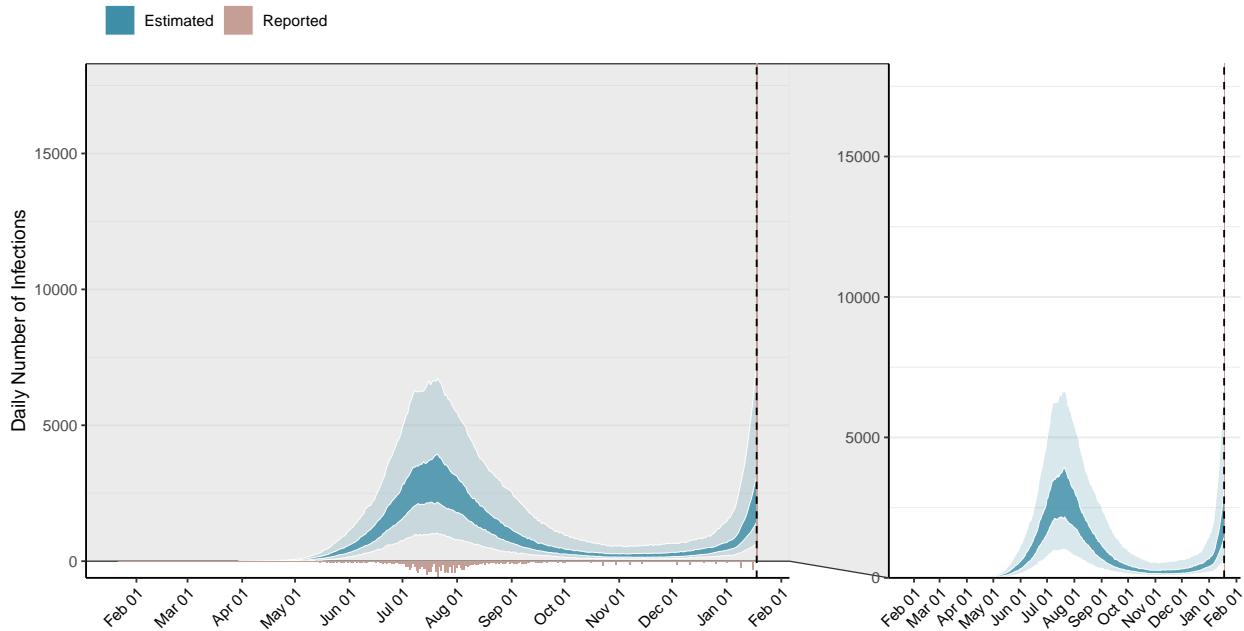


Figure 2: Daily number of infections estimated by fitting to the current total of deaths. Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

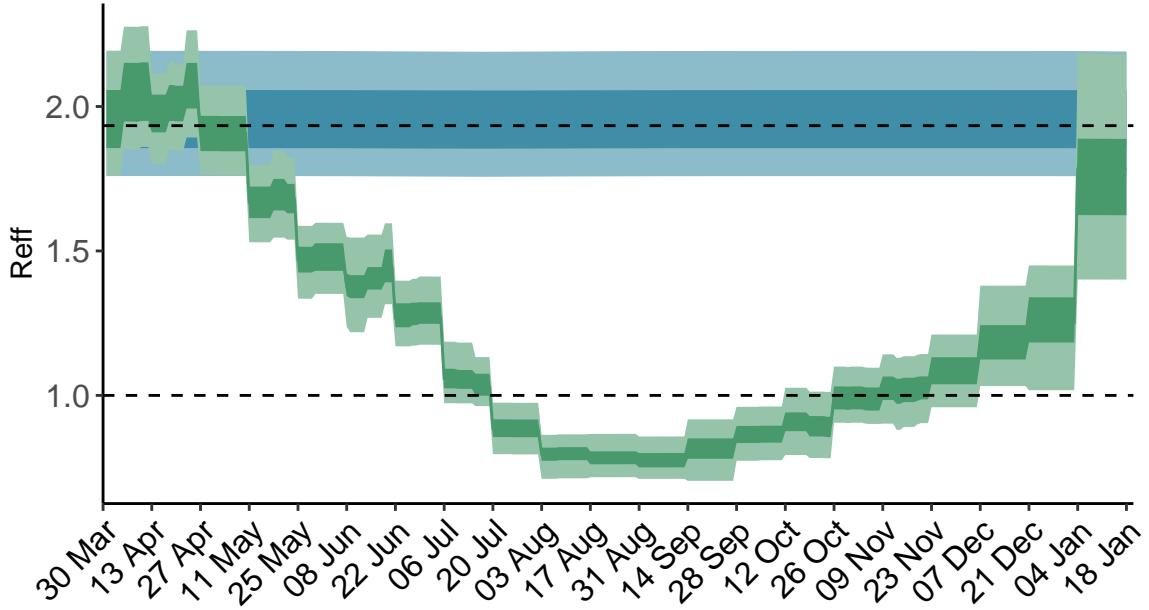


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Madagascar is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

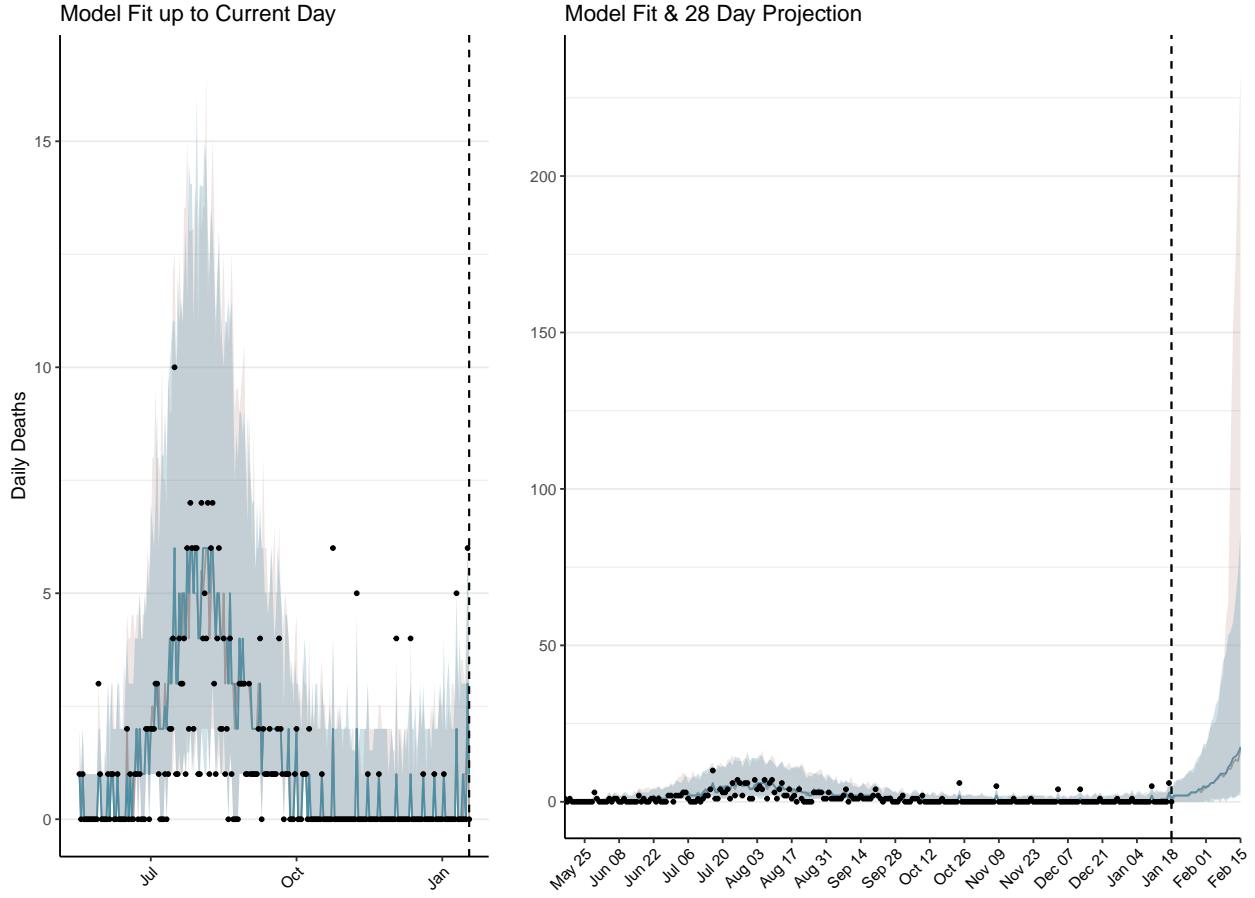


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 85 (95% CI: 75-96) patients requiring treatment with high-pressure oxygen at the current date to 1,417 (95% CI: 1,125-1,710) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 29 (95% CI: 26-33) patients requiring treatment with mechanical ventilation at the current date to 413 (95% CI: 351-476) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

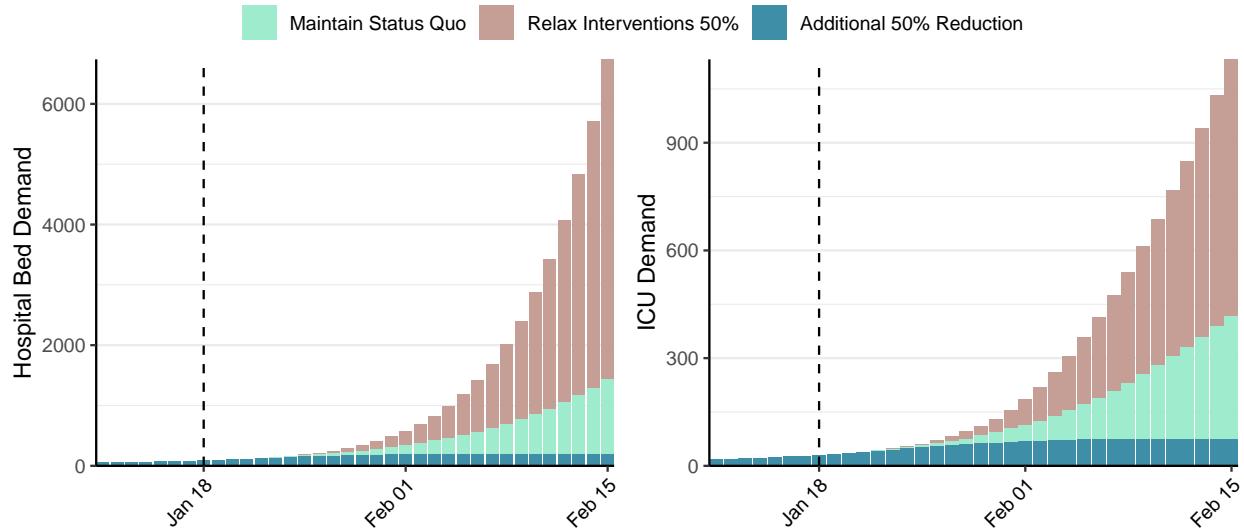


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 2,532 (95% CI: 2,167-2,897) at the current date to 2,165 (95% CI: 1,694-2,637) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,532 (95% CI: 2,167-2,897) at the current date to 321,401 (95% CI: 259,290-383,512) by 2021-02-15.

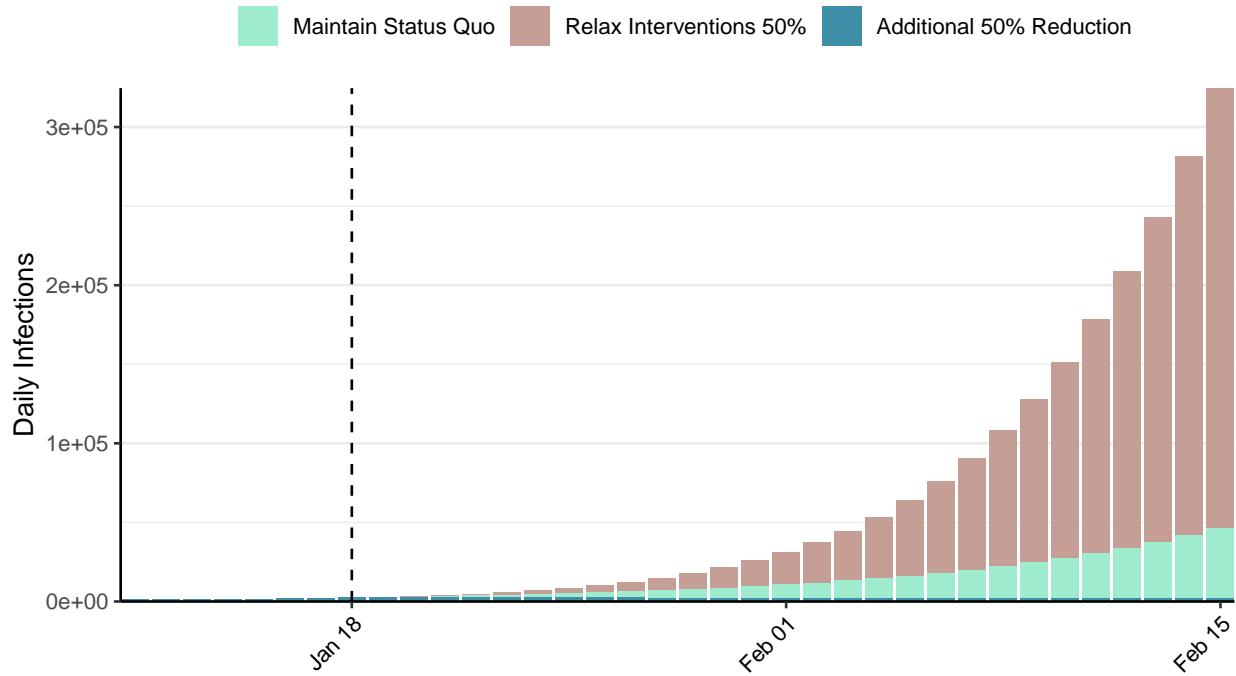


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Maldives, 2021-01-18

[Download the report for Maldives, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.04 (95% CI: 0.62-1.53)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Maldives is not shown in the following plot as only 0 deaths have been reported to date**

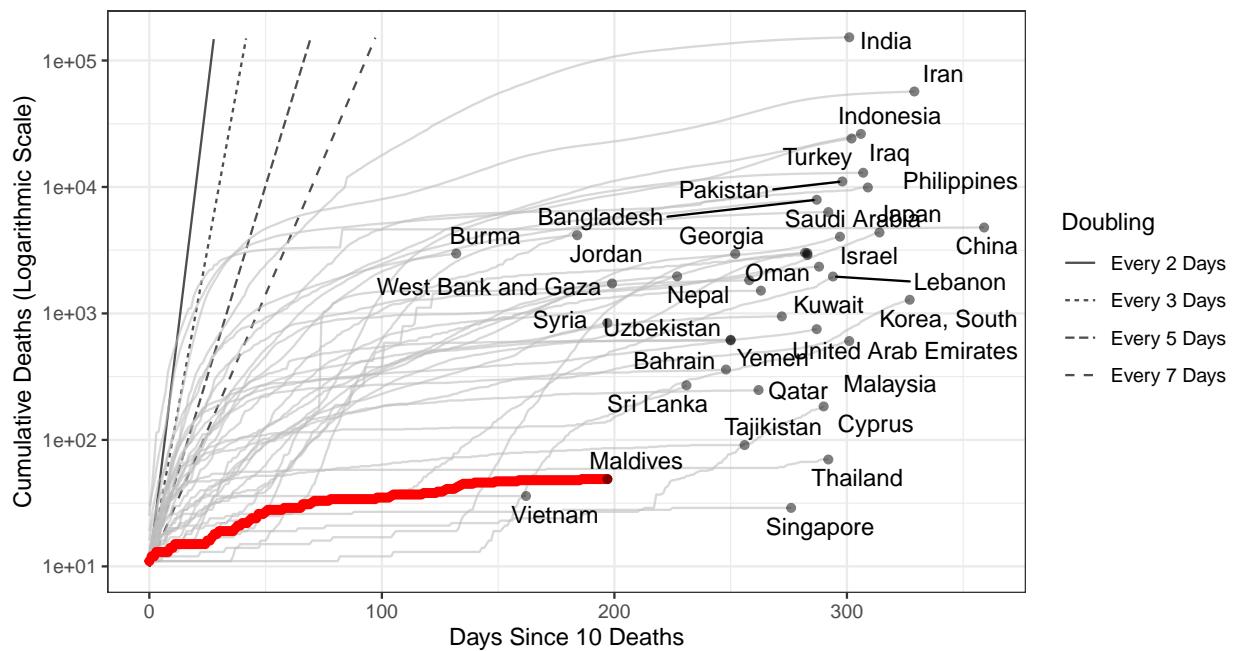


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 278 (95% CI: 217-339) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

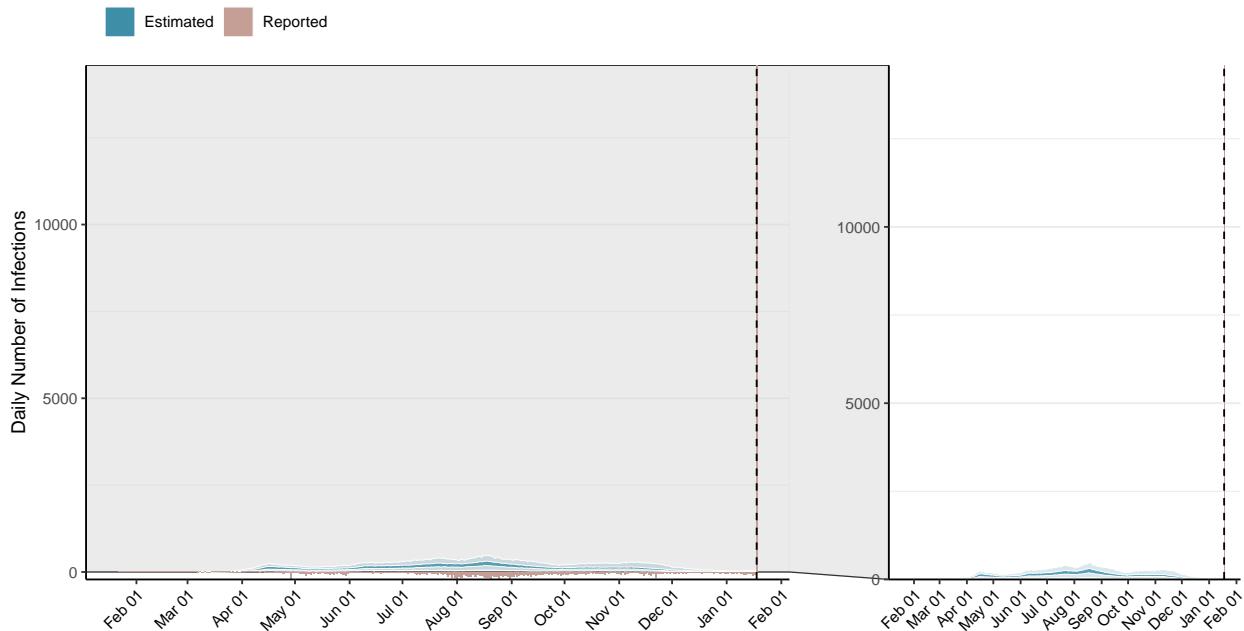


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

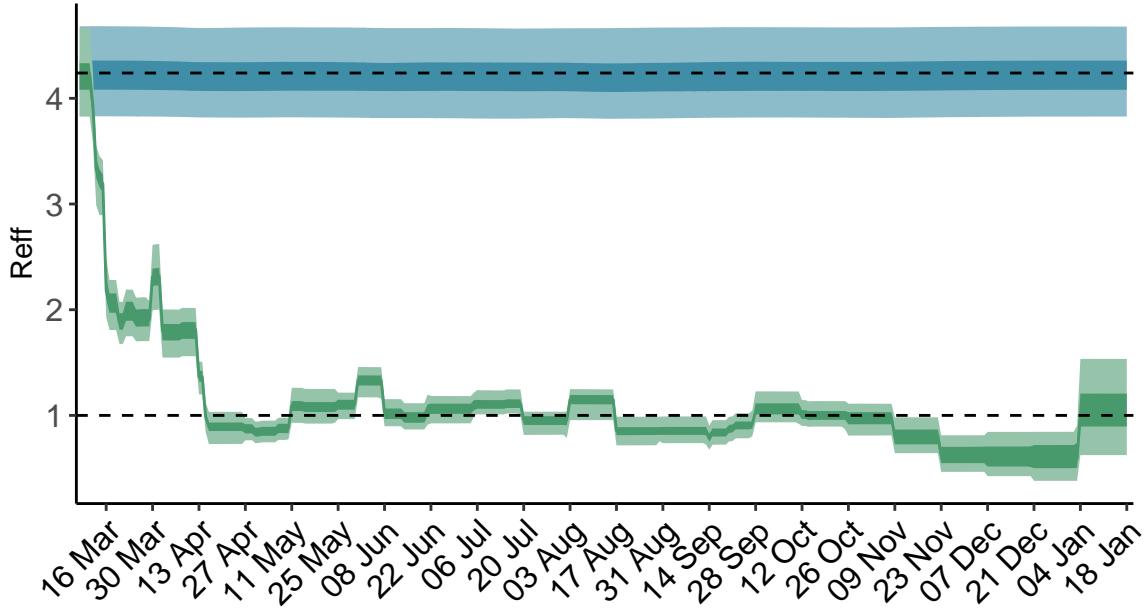


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Maldives is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

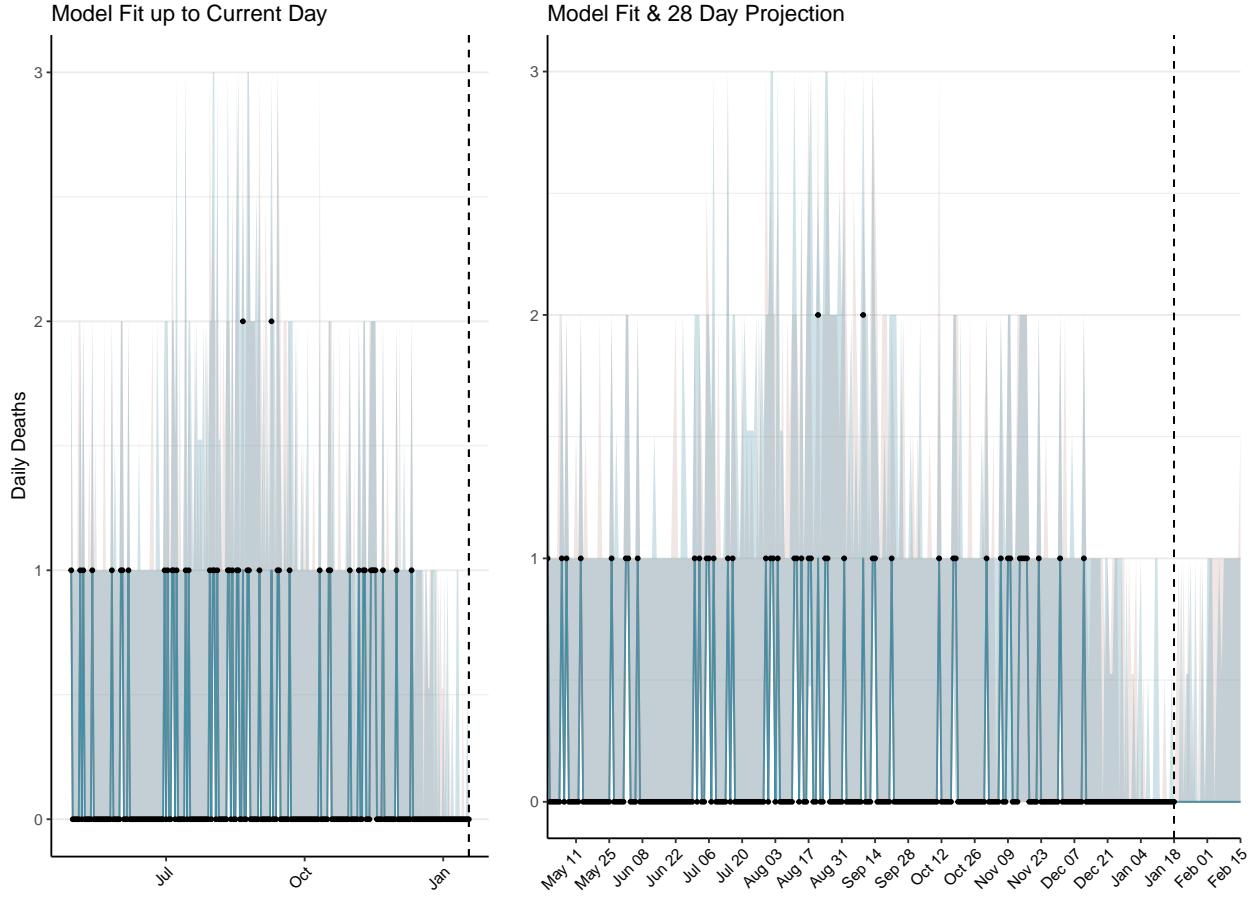


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1 (95% CI: 1-1) patients requiring treatment with high-pressure oxygen at the current date to 6 (95% CI: 3-8) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 0 (95% CI: 0-1) patients requiring treatment with mechanical ventilation at the current date to 2 (95% CI: 1-2) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

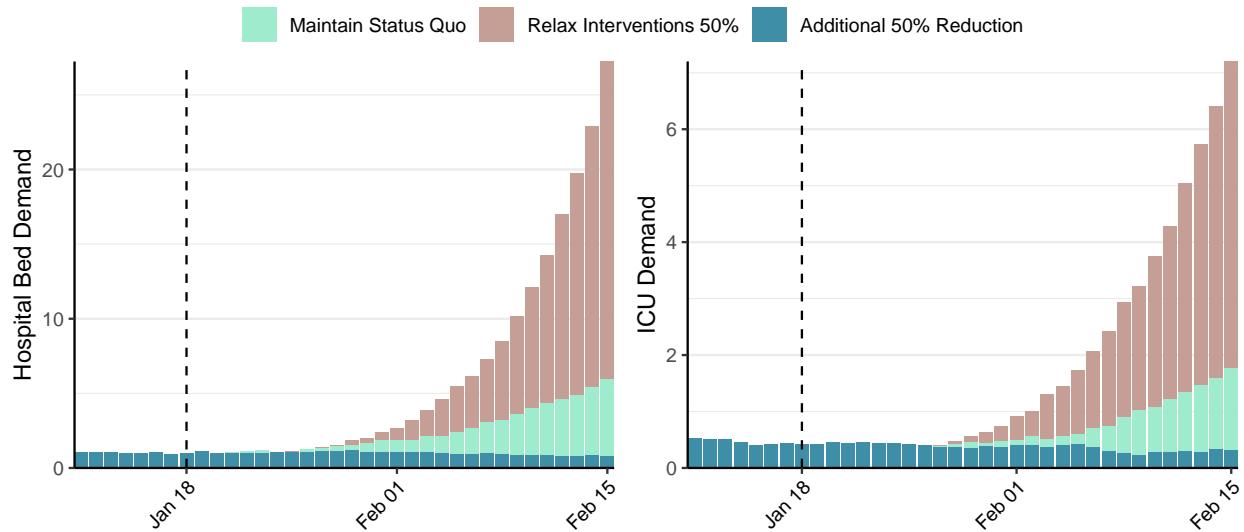


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 11 (95% CI: 8-14) at the current date to 6 (95% CI: 3-9) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 11 (95% CI: 8-14) at the current date to 994 (95% CI: 493-1,494) by 2021-02-15.

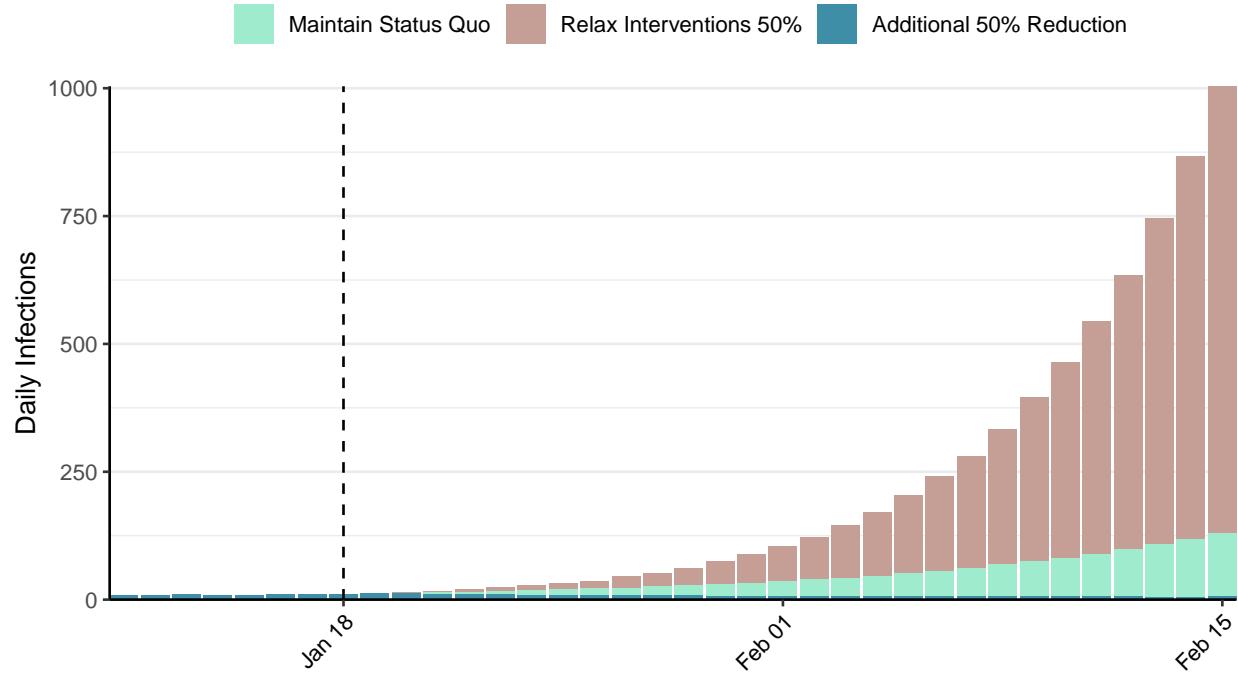


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](#) - <https://covidsim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Mexico, 2021-01-18

[Download the report for Mexico, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.97 (95% CI: 0.77-1.21)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Mexico is not shown in the following plot as only 0 deaths have been reported to date**

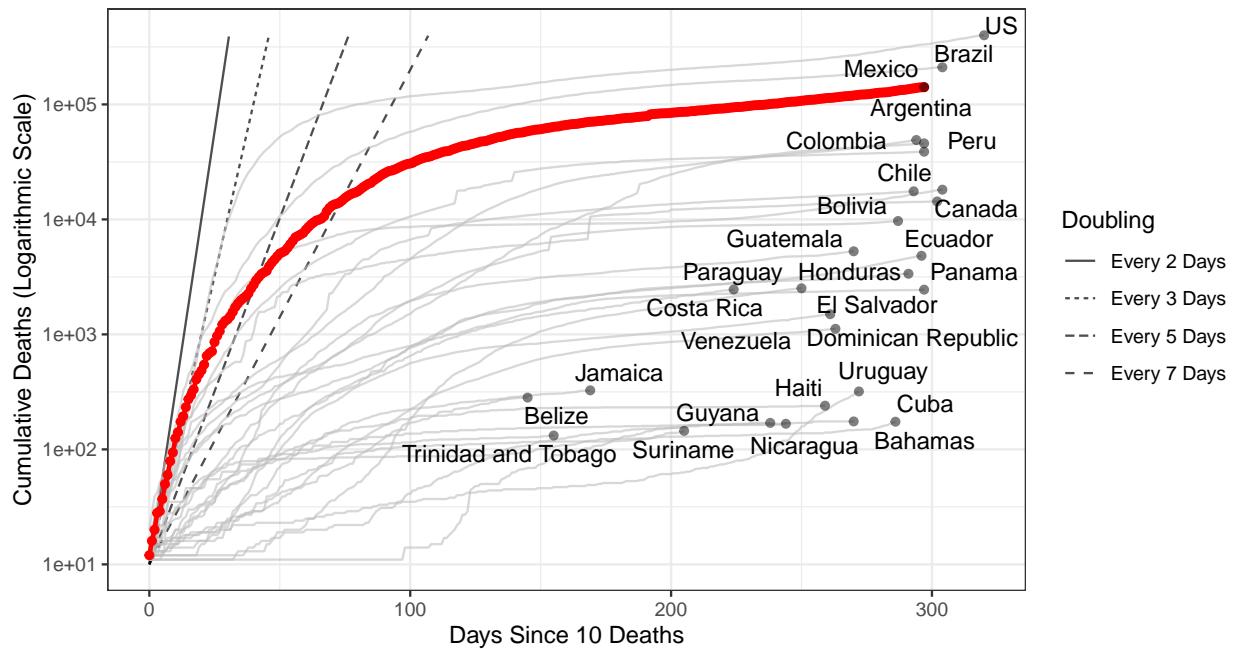


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 6,904,802 (95% CI: 6,654,721-7,154,882) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

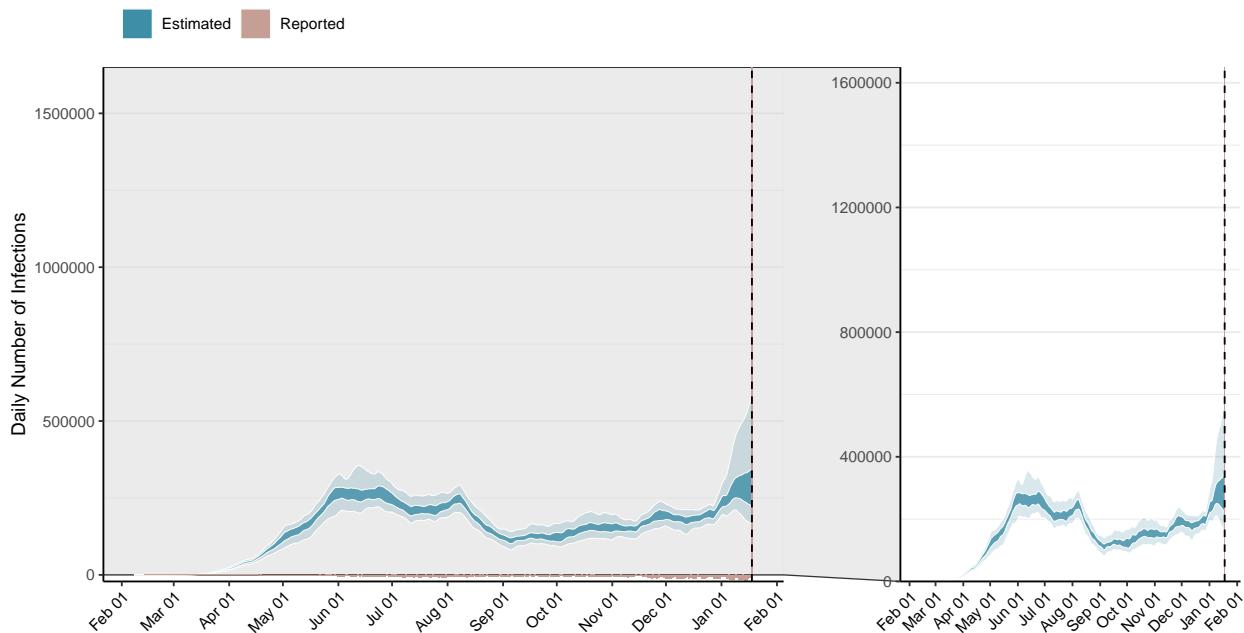


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

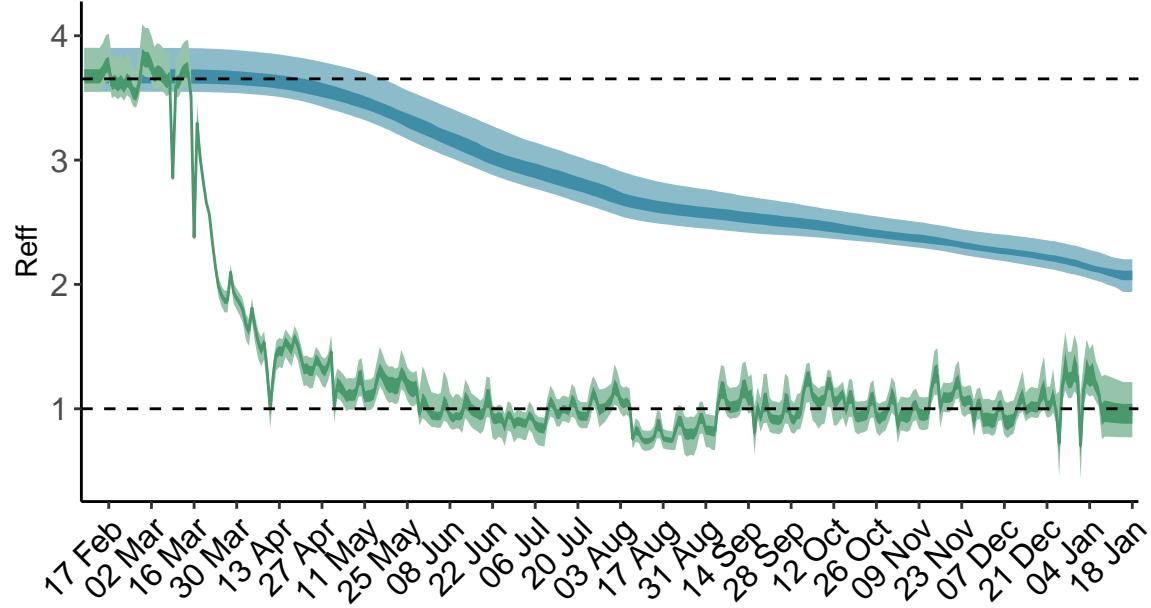


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Mexico is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

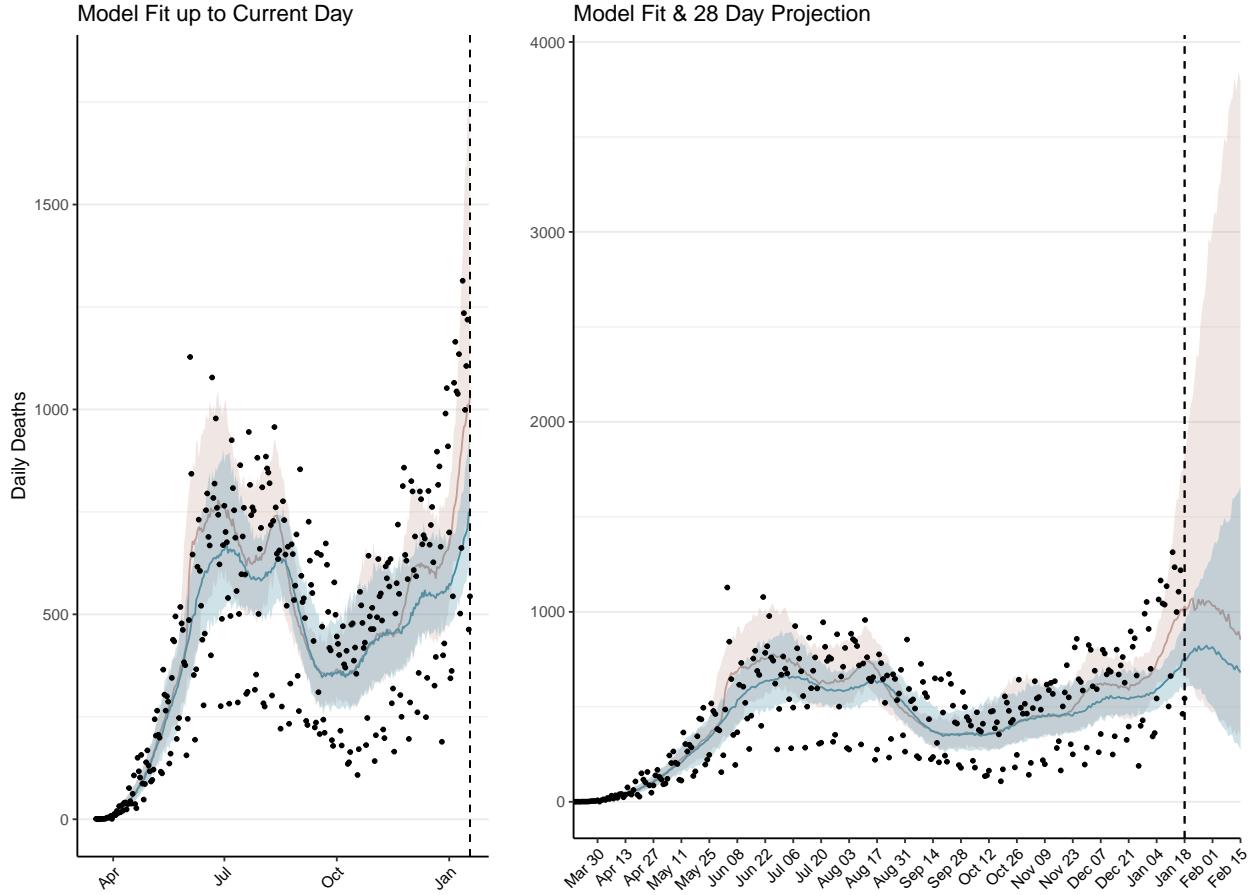


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 29,157 (95% CI: 27,986-30,329) patients requiring treatment with high-pressure oxygen at the current date to 32,768 (95% CI: 28,611-36,925) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 6,615 (95% CI: 6,470-6,761) patients requiring treatment with mechanical ventilation at the current date to 6,586 (95% CI: 6,295-6,876) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B.** These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.

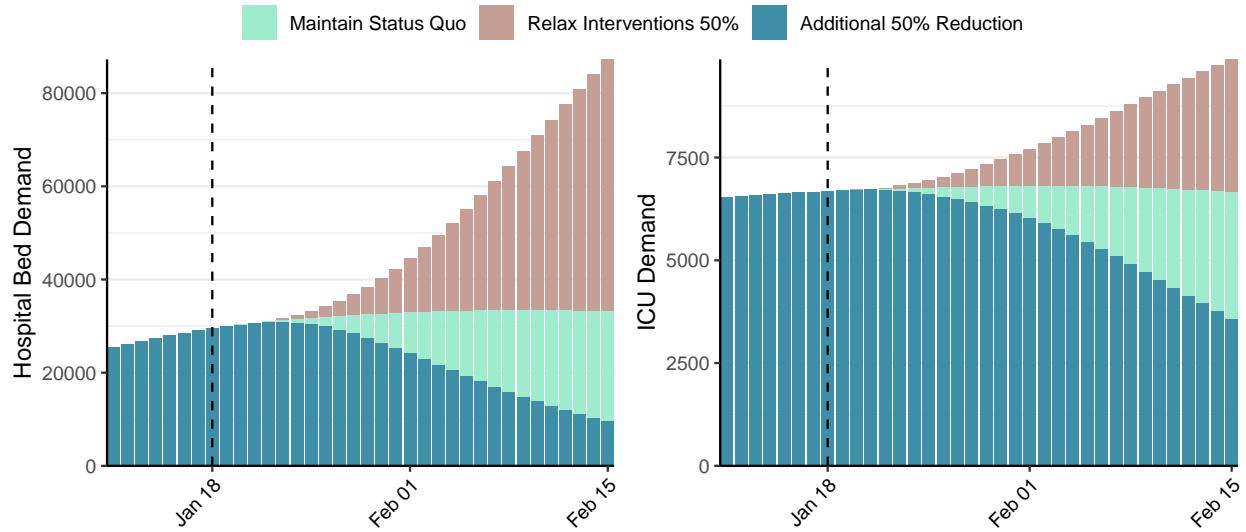


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 291,814 (95% CI: 271,129-312,499) at the current date to 26,856 (95% CI: 22,667-31,044) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 291,814 (95% CI: 271,129-312,499) at the current date to 942,777 (95% CI: 850,375-1,035,178) by 2021-02-15.

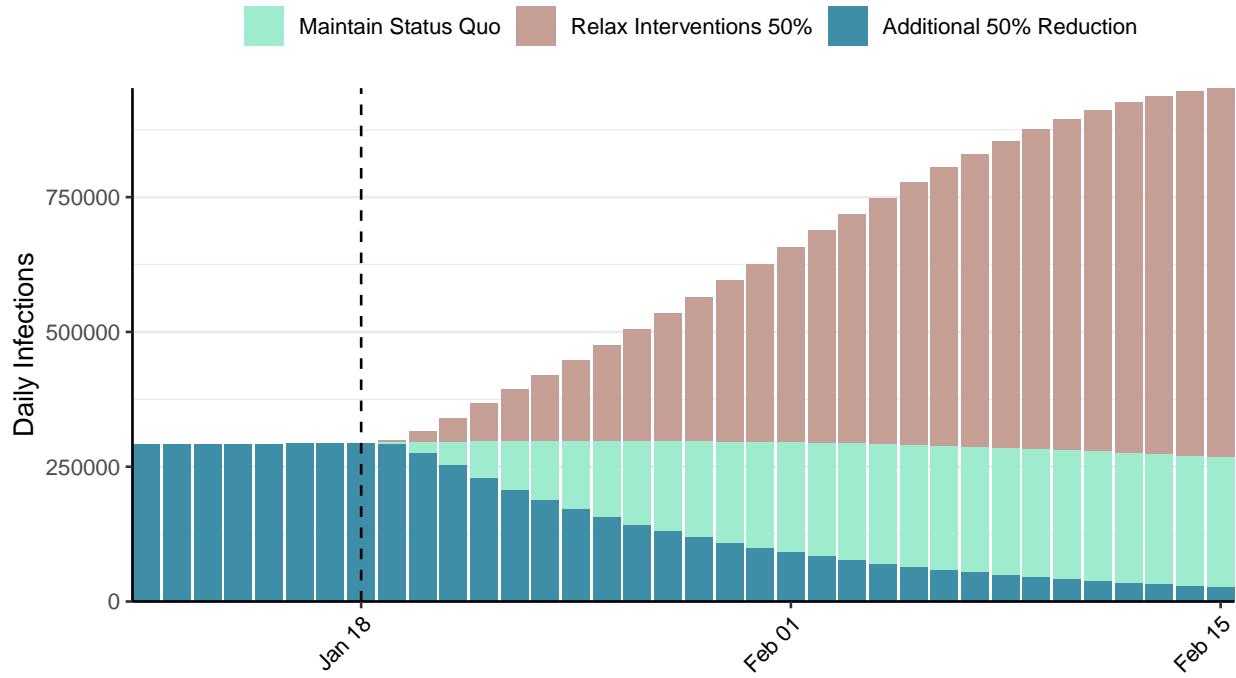


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: North Macedonia, 2021-01-18

[Download the report for North Macedonia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.9 (95% CI: 0.71-1.1)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. North Macedonia is not shown in the following plot as only 0 deaths have been reported to date**

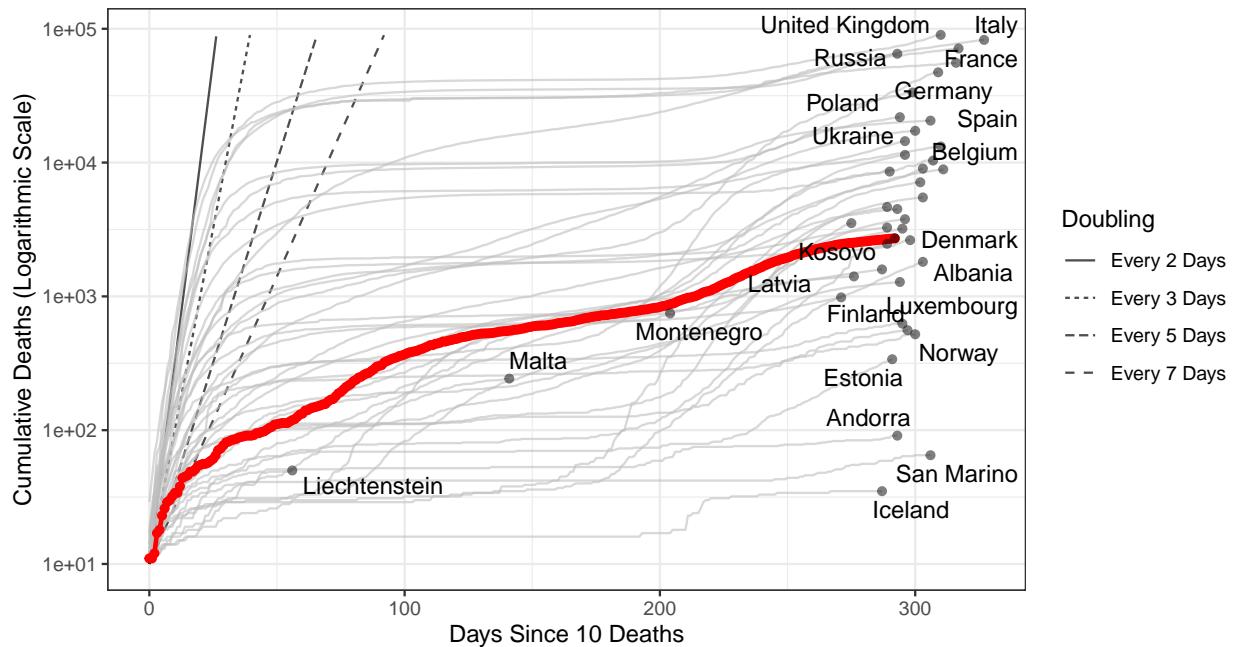


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 128,955 (95% CI: 123,414-134,496) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

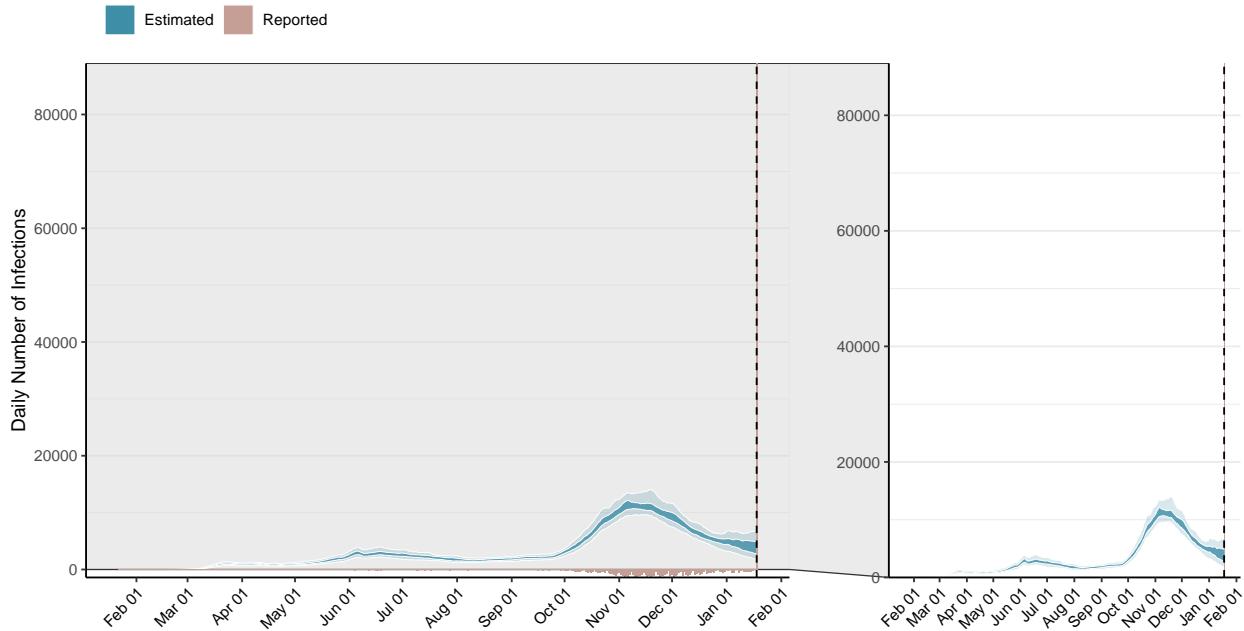


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

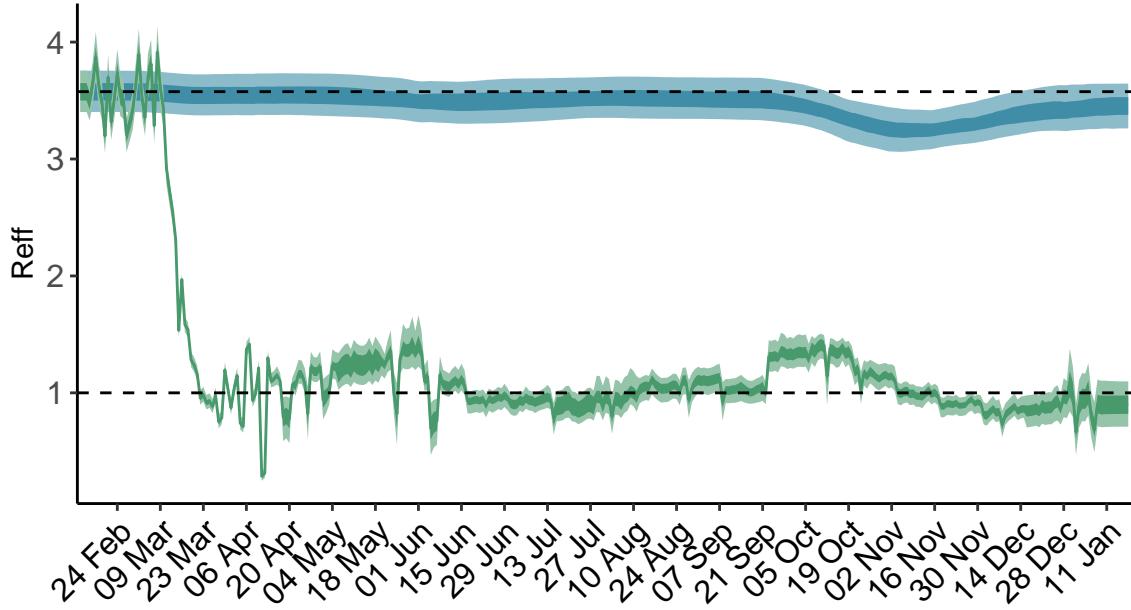


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. North Macedonia is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

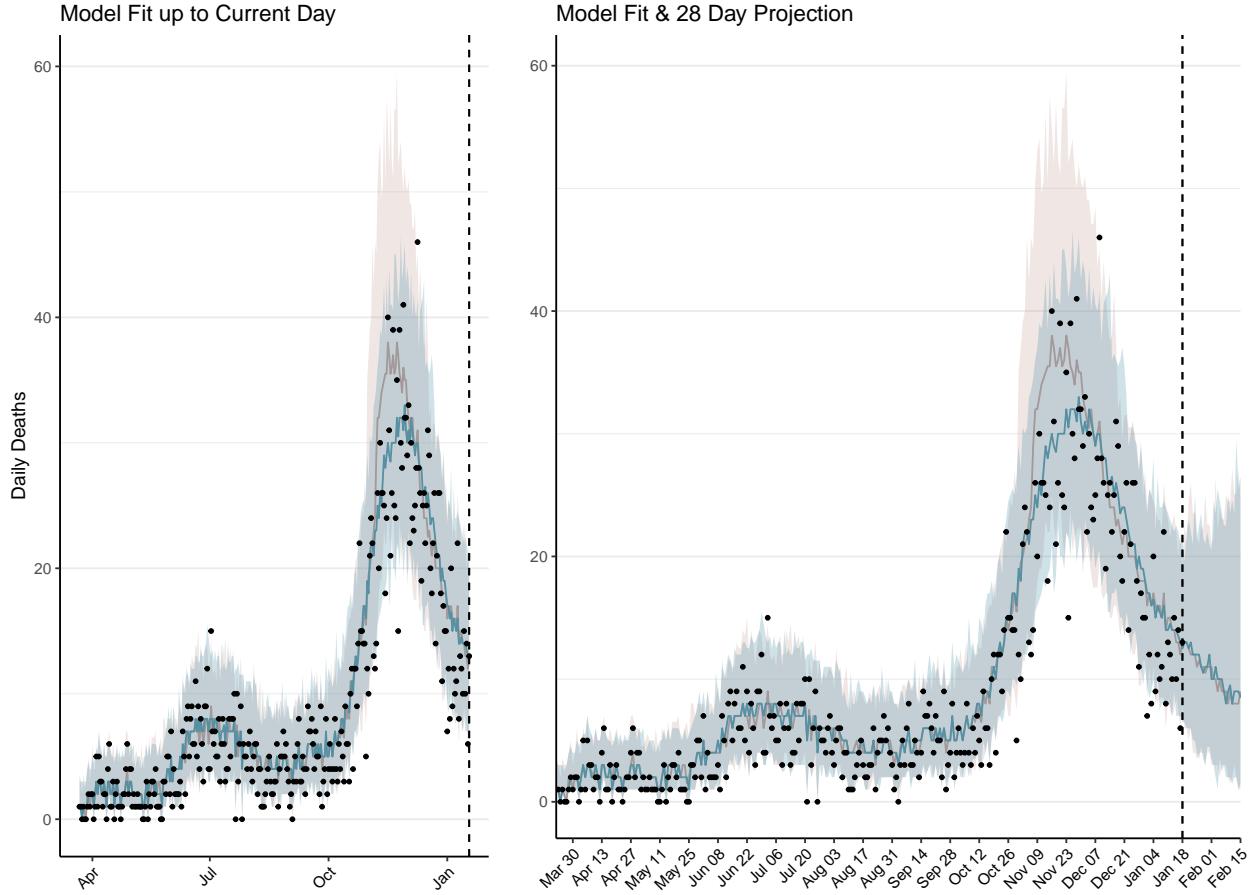


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 495 (95% CI: 471-520) patients requiring treatment with high-pressure oxygen at the current date to 382 (95% CI: 329-435) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 202 (95% CI: 193-211) patients requiring treatment with mechanical ventilation at the current date to 147 (95% CI: 130-164) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

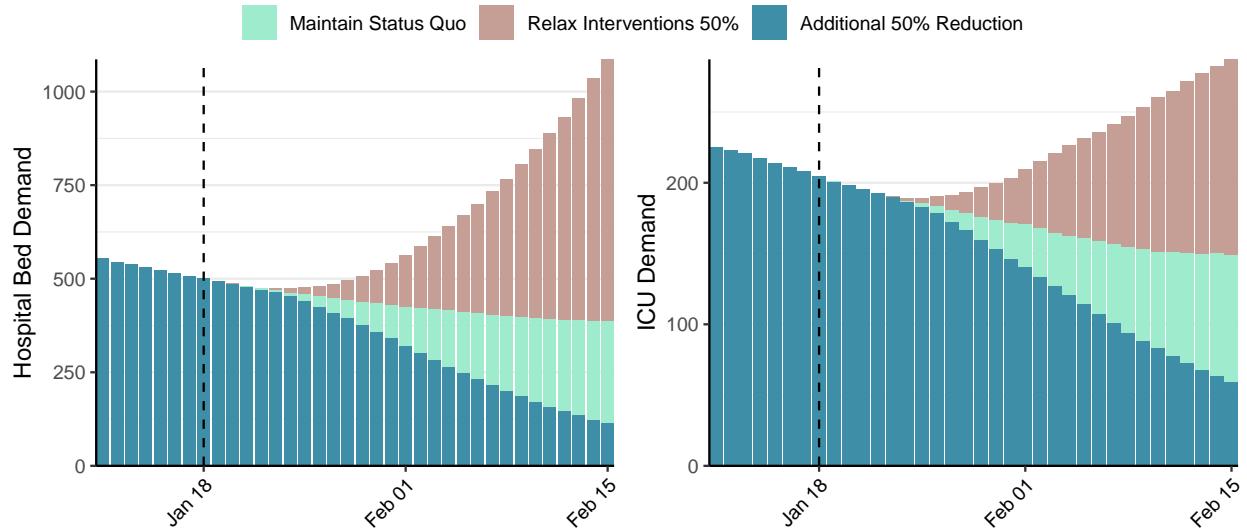


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 3,851 (95% CI: 3,541-4,160) at the current date to 293 (95% CI: 244-341) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,851 (95% CI: 3,541-4,160) at the current date to 14,804 (95% CI: 12,569-17,039) by 2021-02-15.

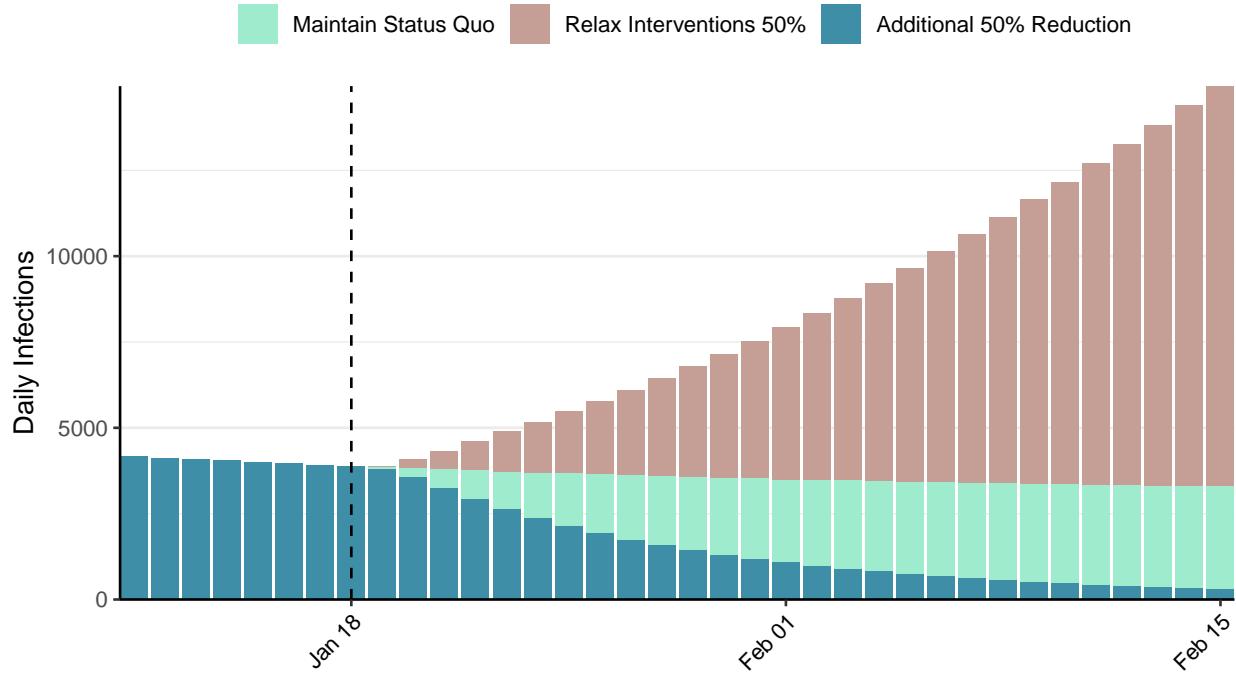


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Mali, 2021-01-18

[Download the report for Mali, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.67 (95% CI: 0.54-0.82)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Mali is not shown in the following plot as only 0 deaths have been reported to date**

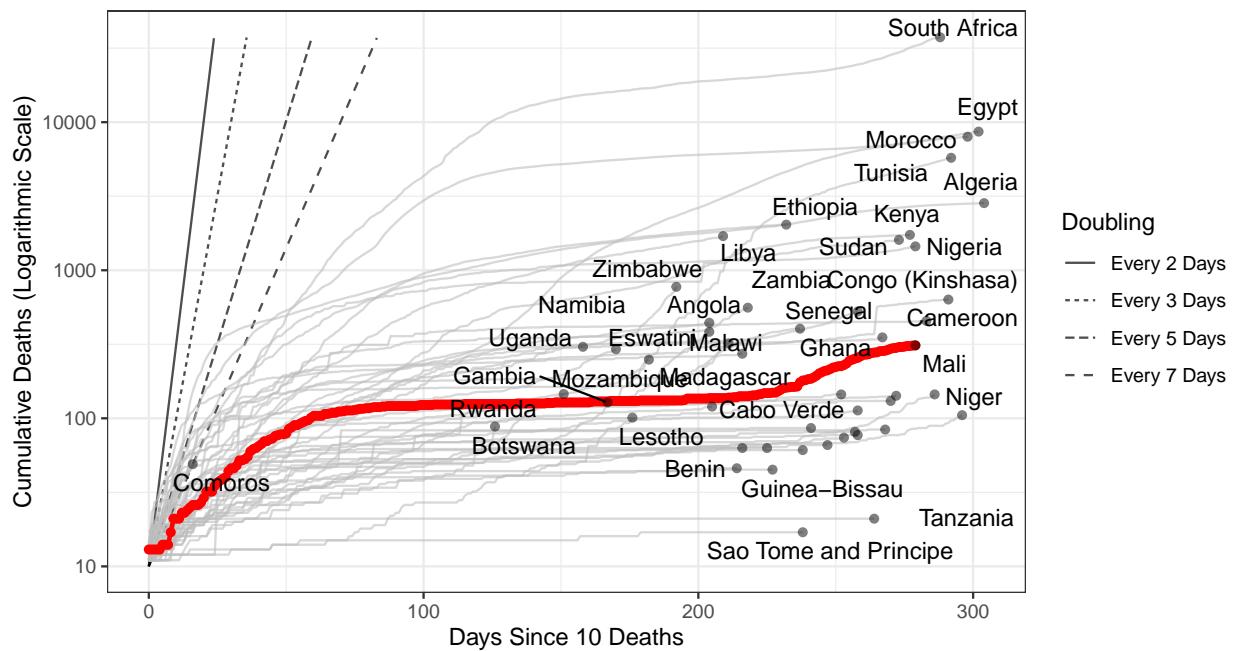


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 51,233 (95% CI: 47,812-54,653) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

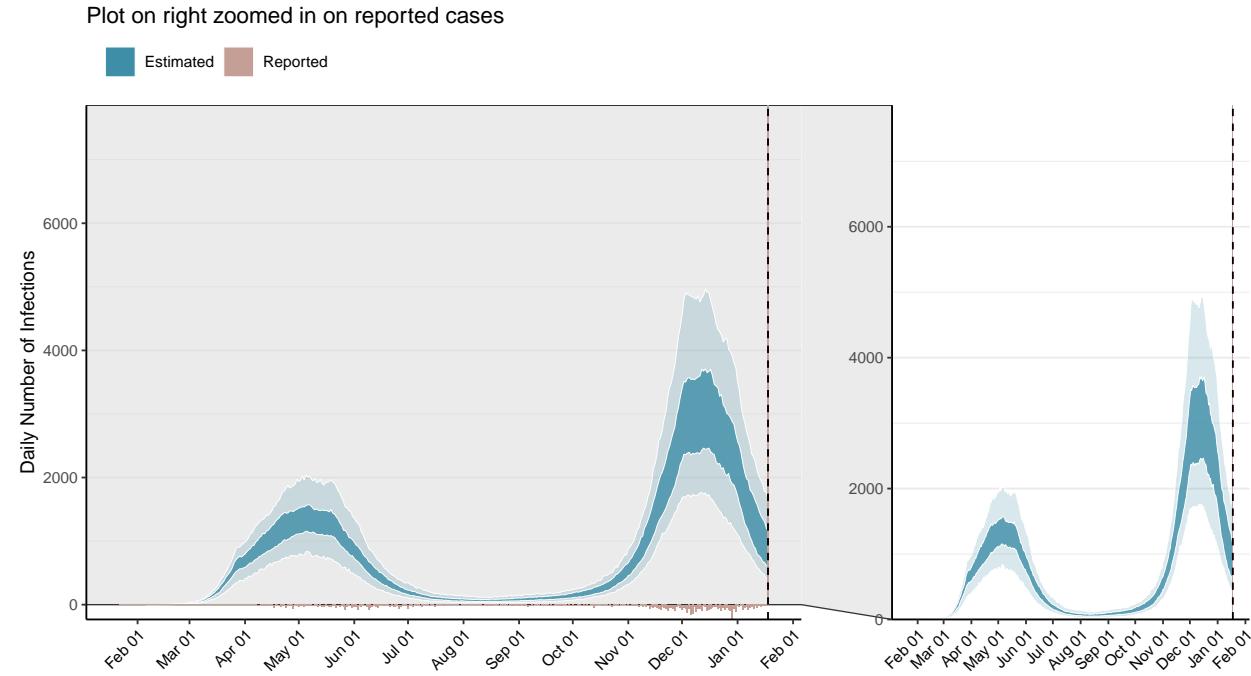


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

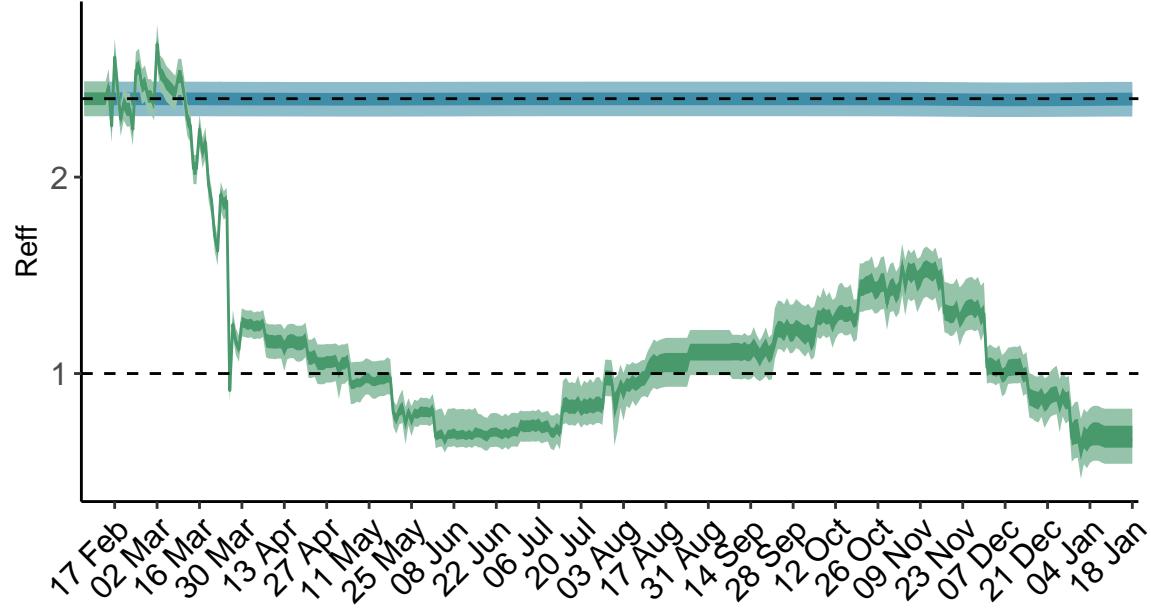


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

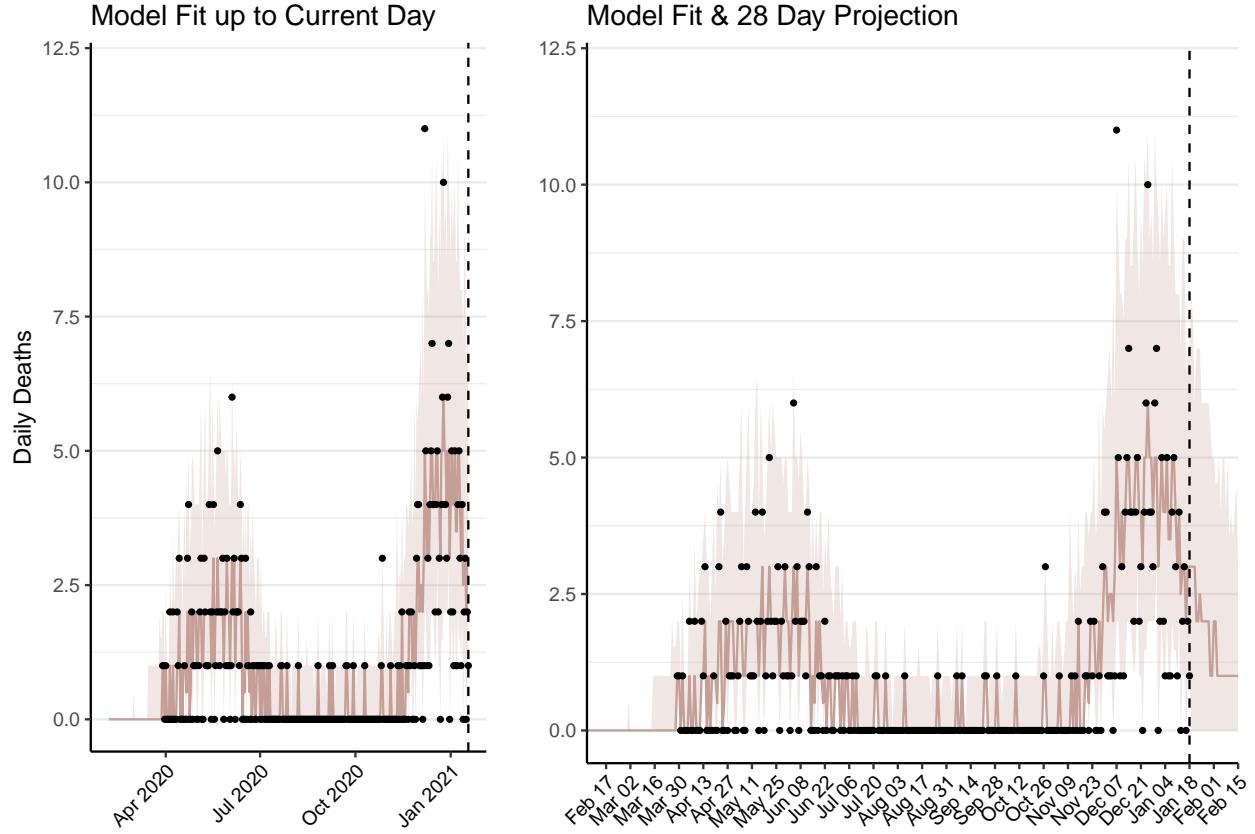


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 119 (95% CI: 110-127) patients requiring treatment with high-pressure oxygen at the current date to 31 (95% CI: 27-35) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 52 (95% CI: 48-56) patients requiring treatment with mechanical ventilation at the current date to 15 (95% CI: 13-17) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

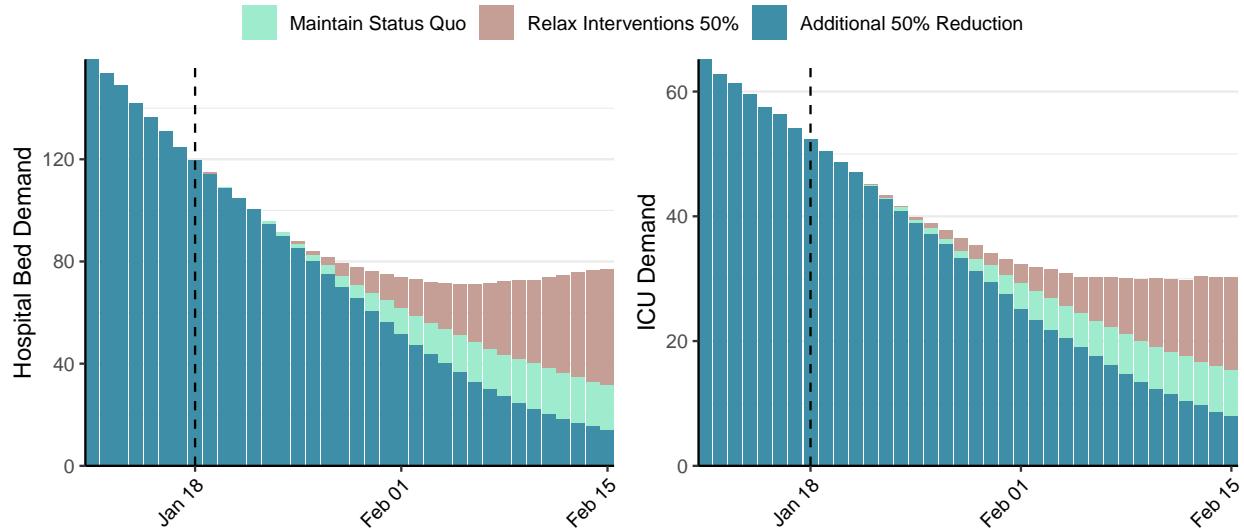


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 890 (95% CI: 811-968) at the current date to 25 (95% CI: 21-28) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 890 (95% CI: 811-968) at the current date to 1,150 (95% CI: 951-1,350) by 2021-02-15.

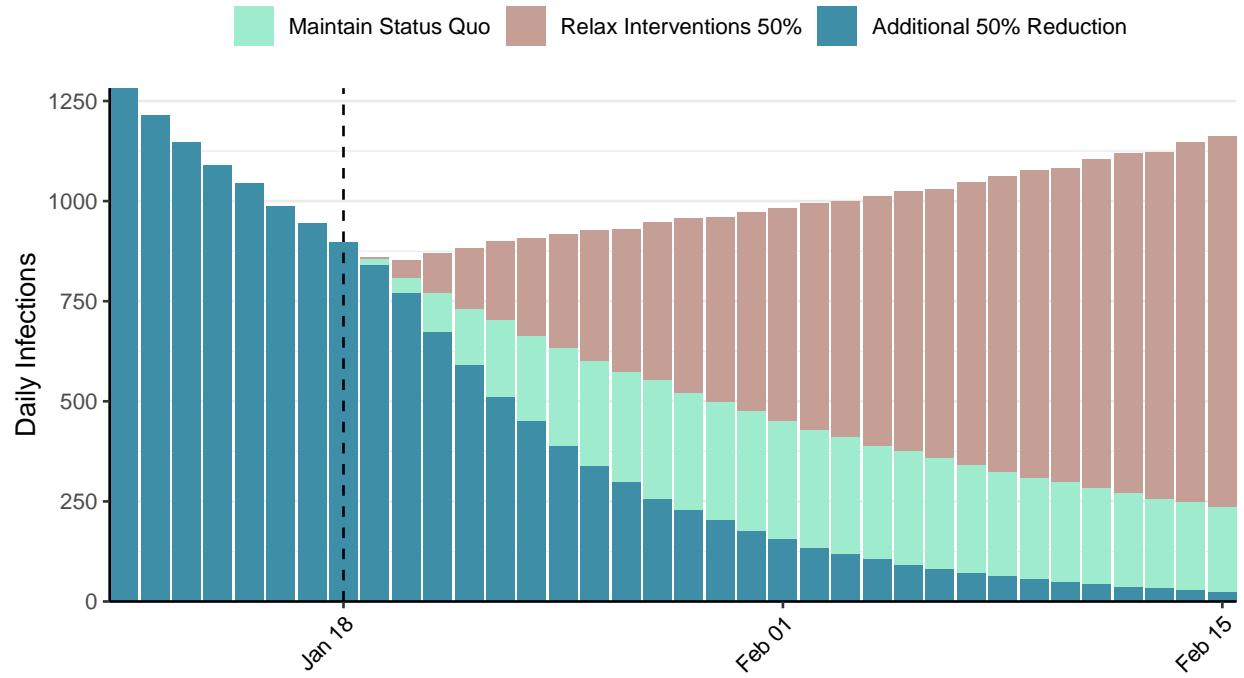


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Myanmar, 2021-01-18

[Download the report for Myanmar, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.01 (95% CI: 0.83-1.35)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Myanmar is not shown in the following plot as only 0 deaths have been reported to date**

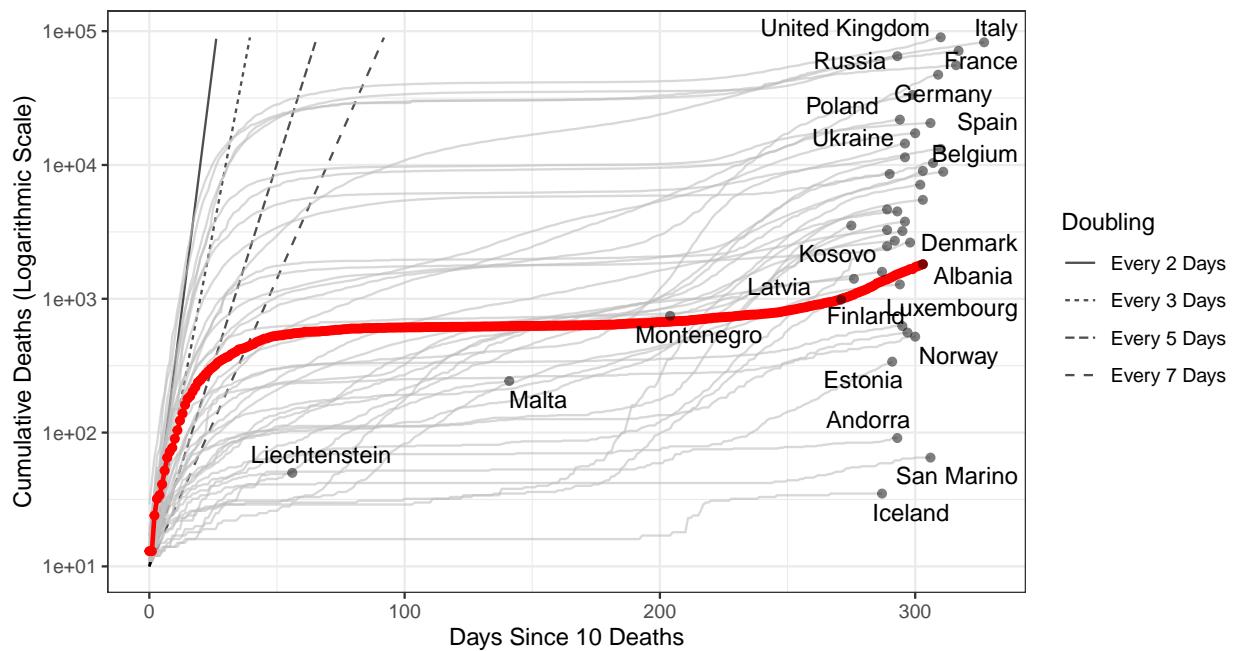


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 175,434 (95% CI: 166,654-184,214) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

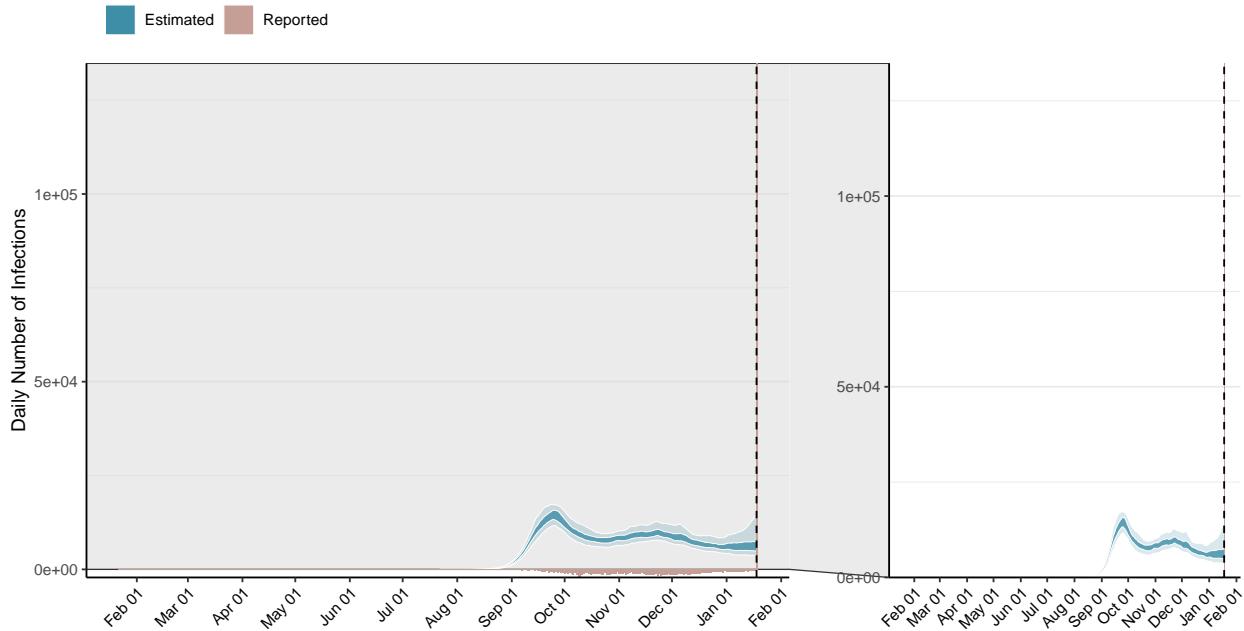


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

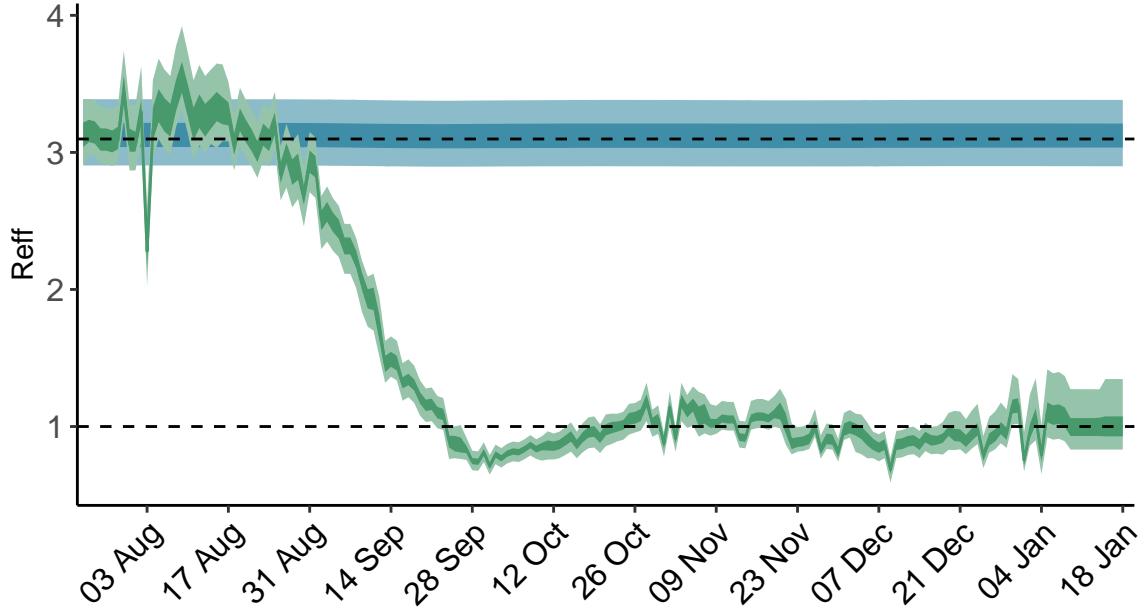


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

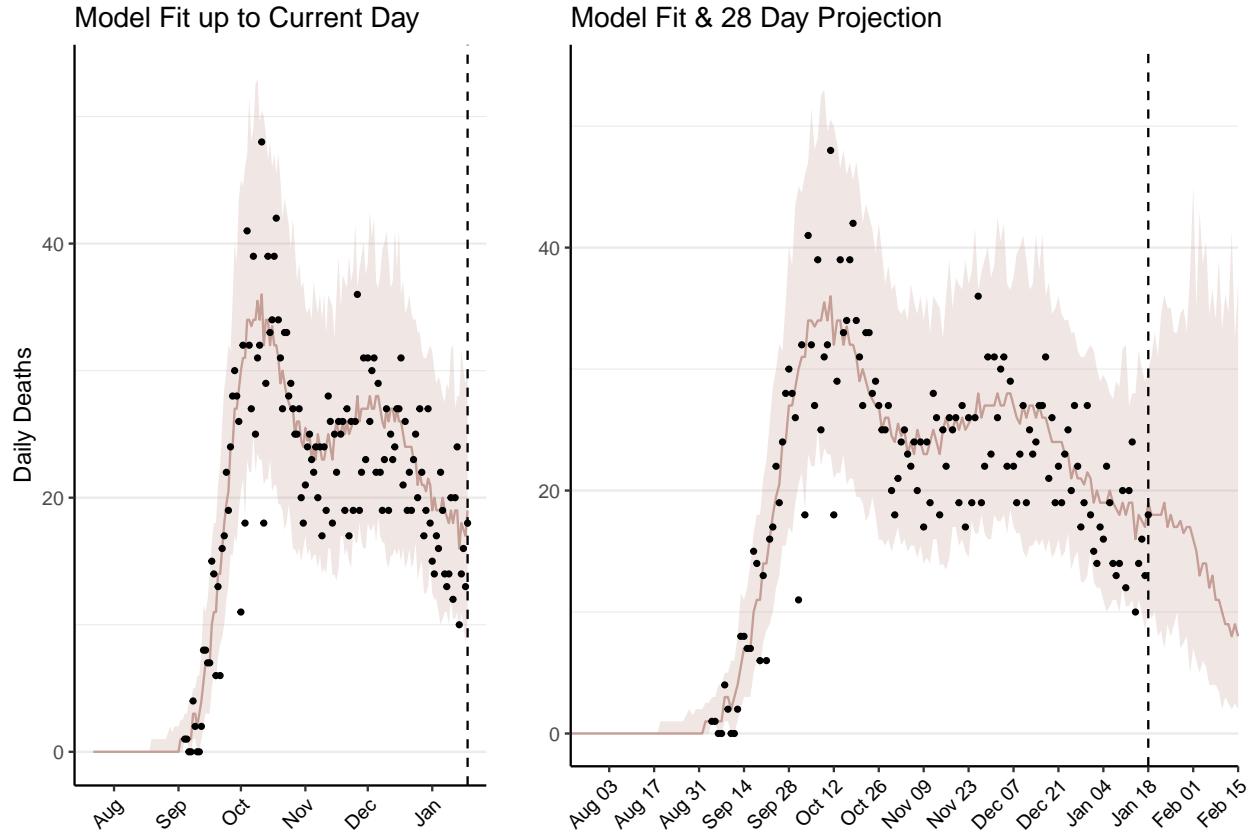


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 741 (95% CI: 702-781) patients requiring treatment with high-pressure oxygen at the current date to 333 (95% CI: 260-405) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 301 (95% CI: 286-315) patients requiring treatment with mechanical ventilation at the current date to 152 (95% CI: 125-180) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

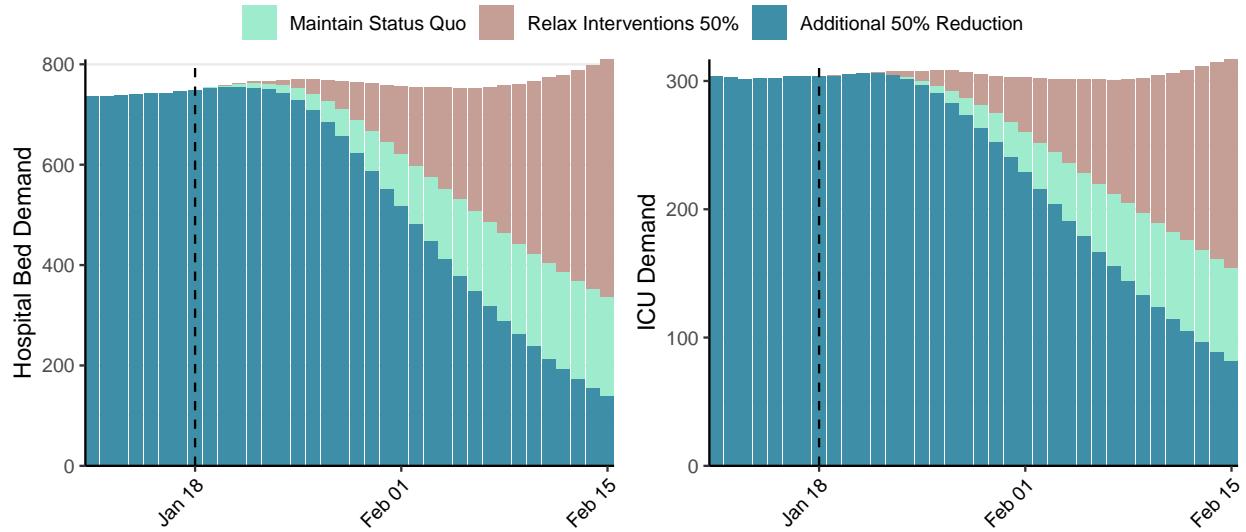


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 6,655 (95% CI: 6,097-7,213) at the current date to 174 (95% CI: 120-228) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 6,655 (95% CI: 6,097-7,213) at the current date to 8,715 (95% CI: 4,620-12,811) by 2021-02-15.

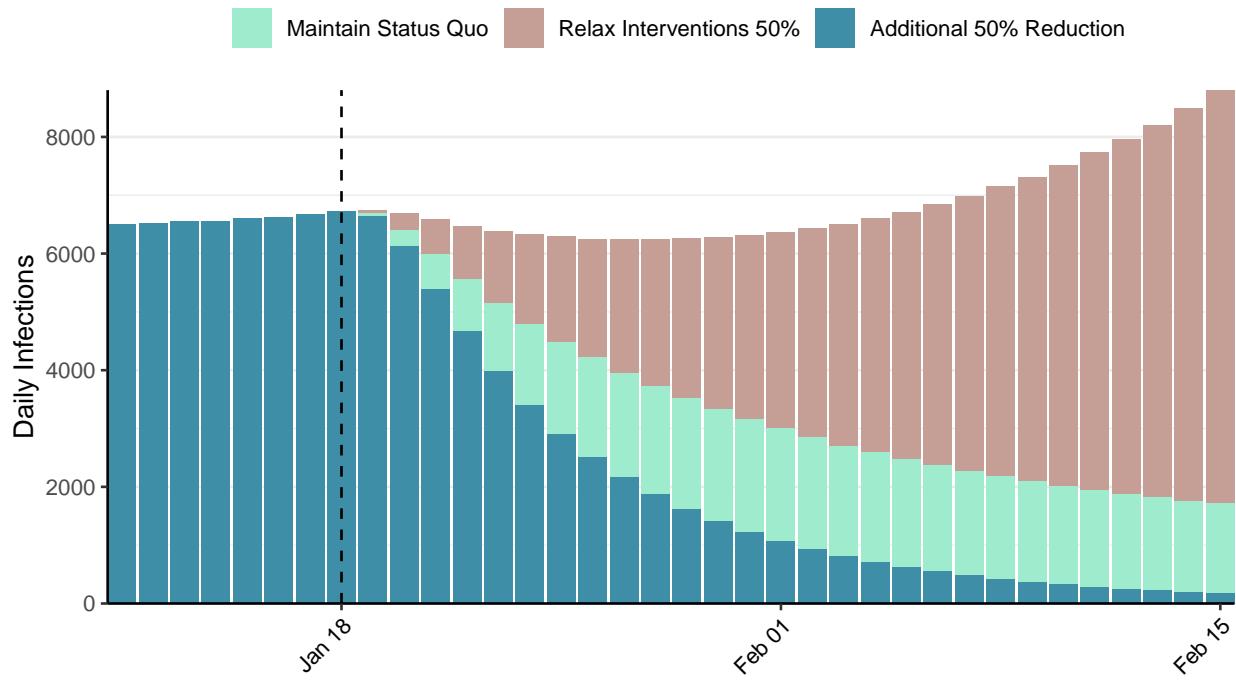


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Montenegro, 2021-01-18

[Download the report for Montenegro, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.07 (95% CI: 0.94-1.16)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Montenegro is not shown in the following plot as only 0 deaths have been reported to date**

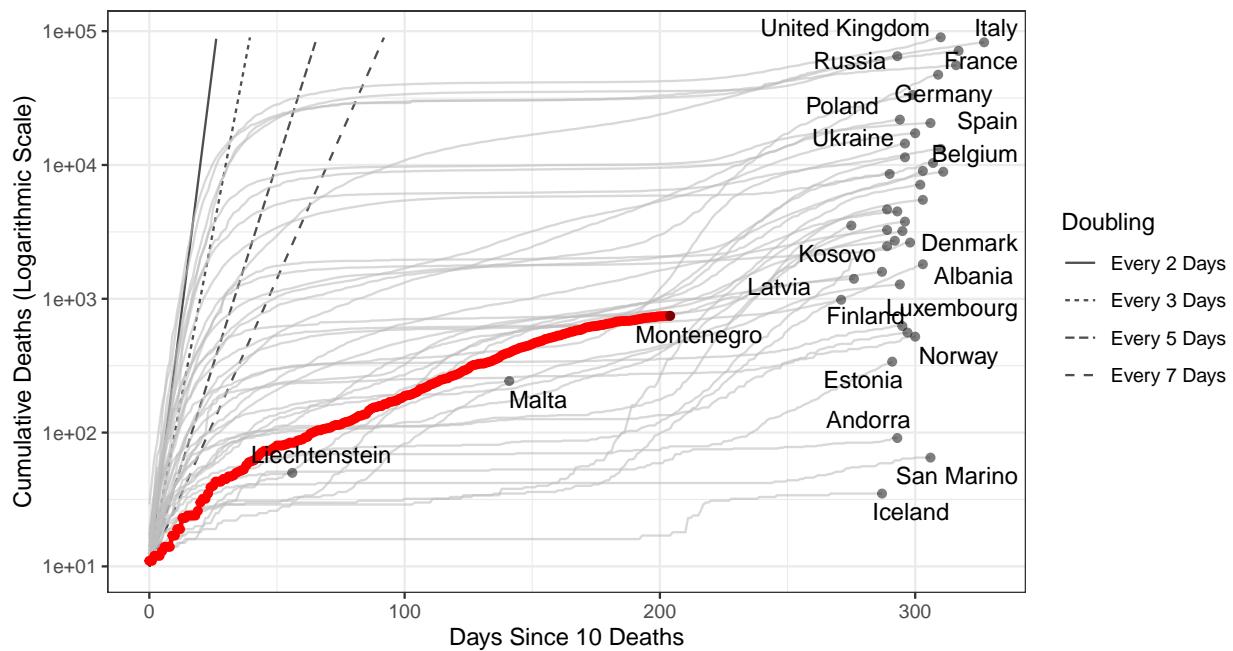


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 45,665 (95% CI: 43,819-47,510) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

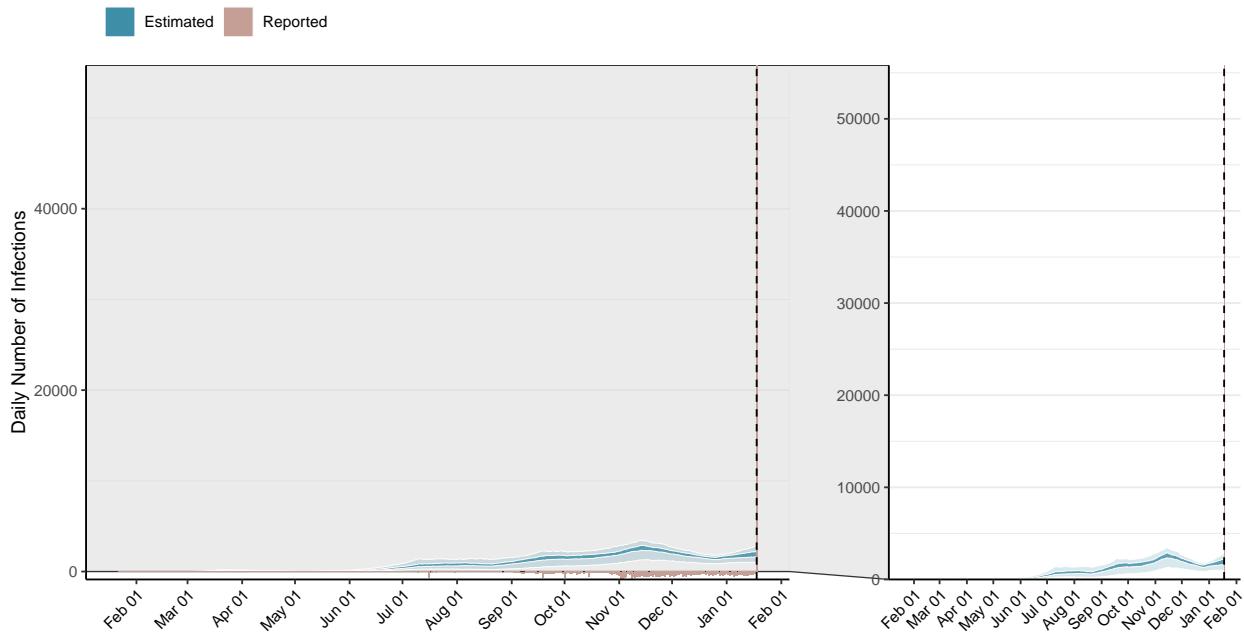


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

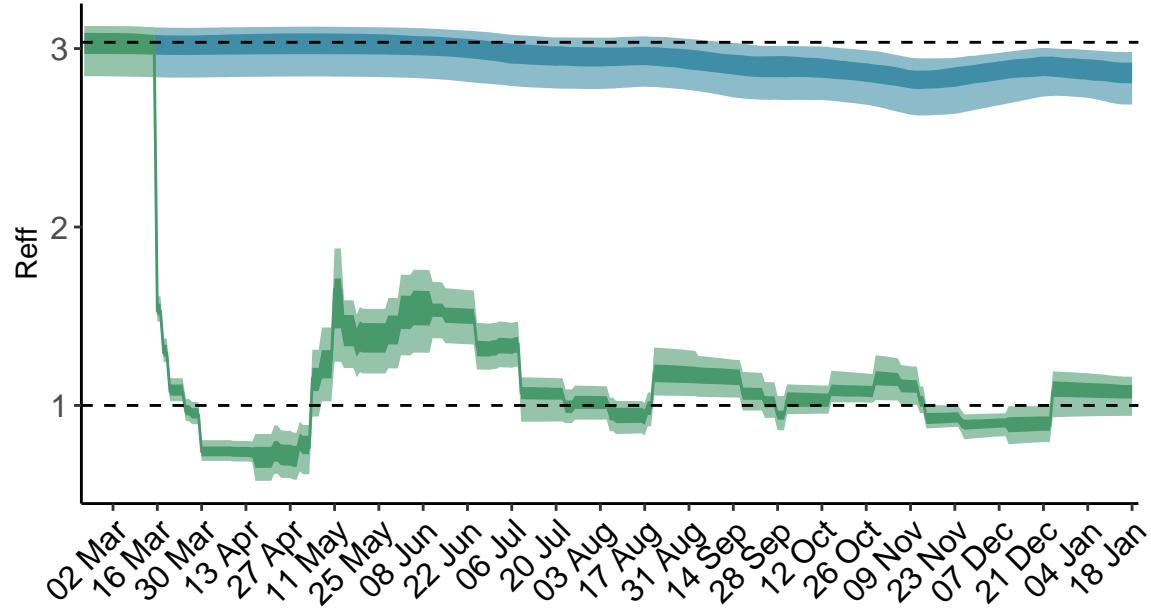


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Montenegro is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

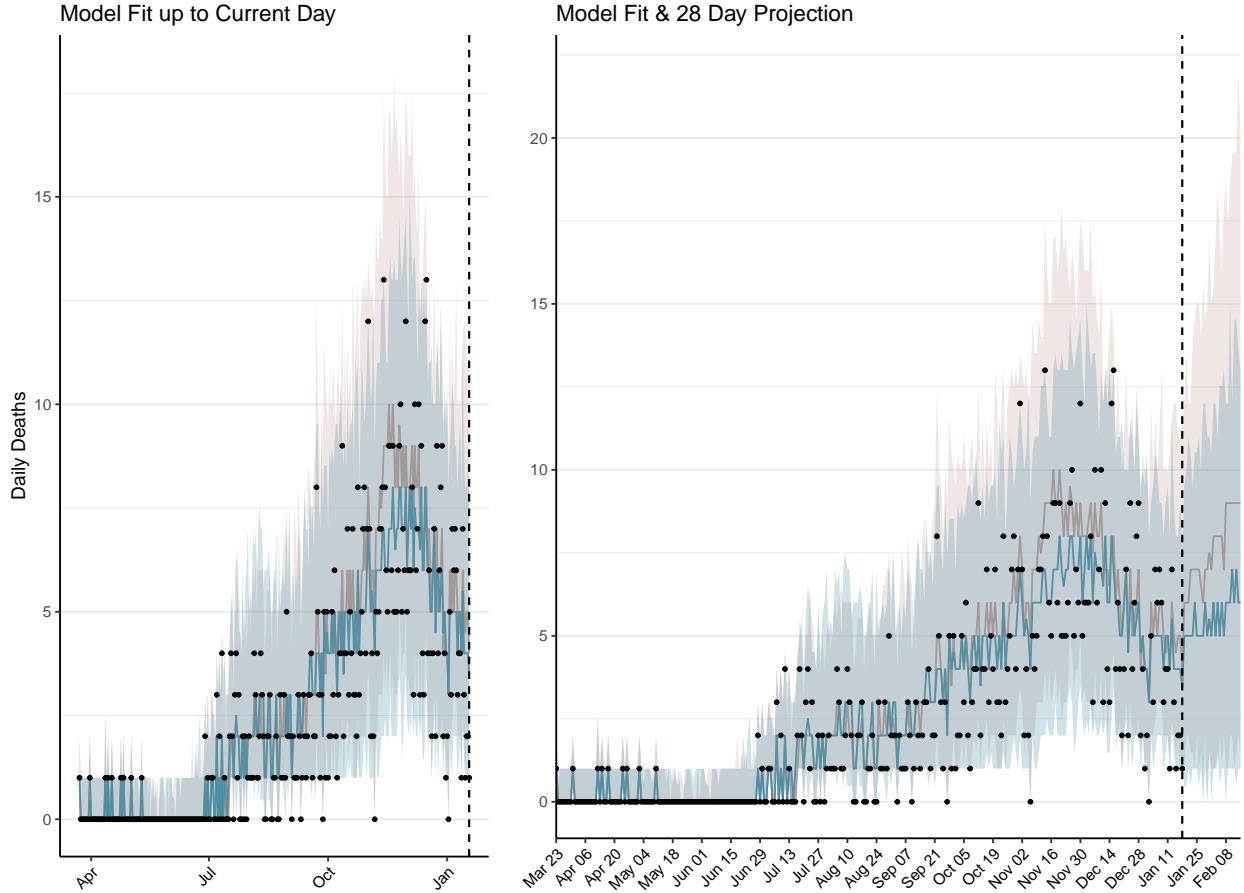


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 191 (95% CI: 182-199) patients requiring treatment with high-pressure oxygen at the current date to 265 (95% CI: 245-284) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 49 (95% CI: 48-50) patients requiring treatment with mechanical ventilation at the current date to 53 (95% CI: 51-55) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

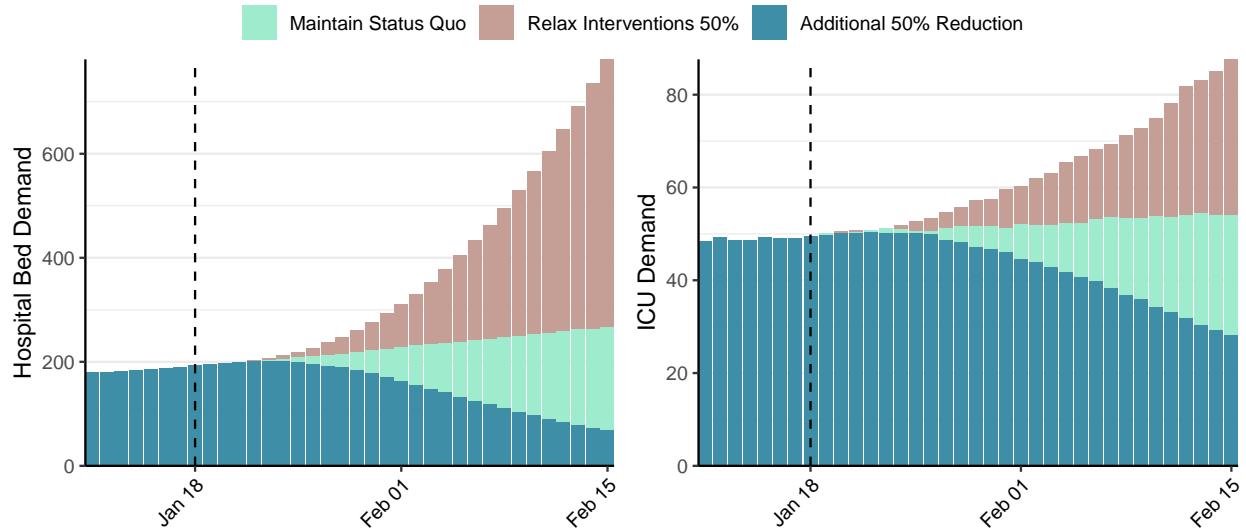


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 1,916 (95% CI: 1,815-2,018) at the current date to 234 (95% CI: 214-253) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,916 (95% CI: 1,815-2,018) at the current date to 10,865 (95% CI: 10,165-11,565) by 2021-02-15.

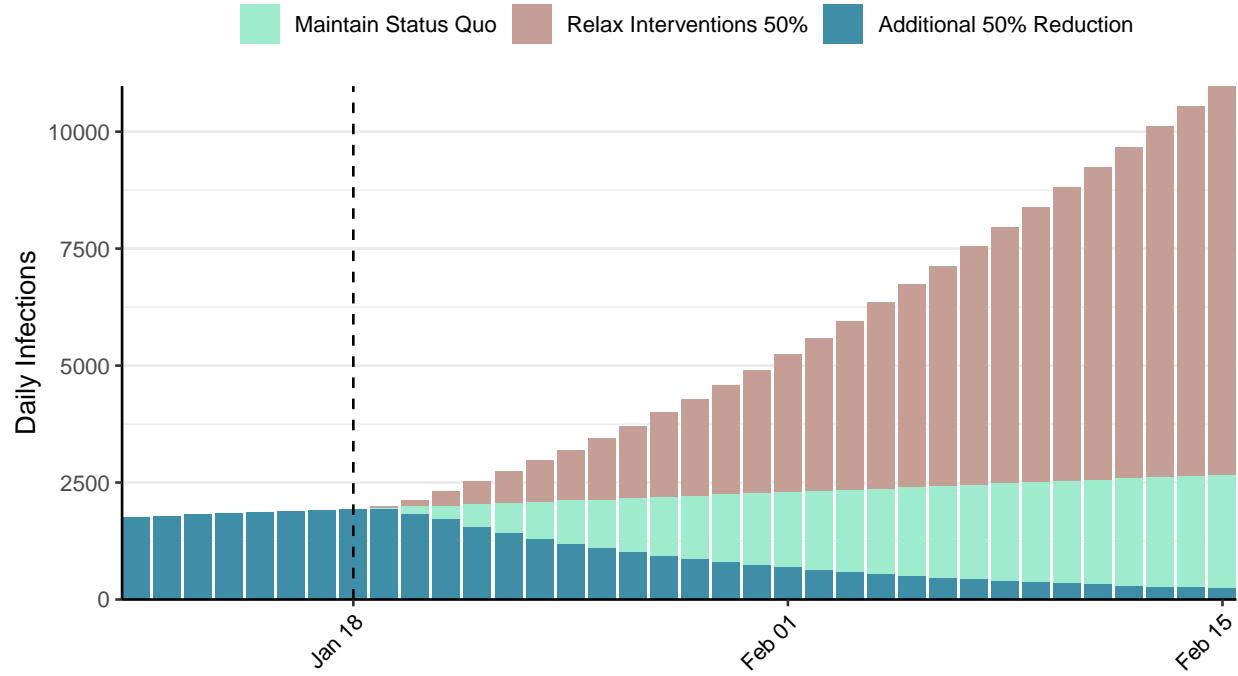


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Mongolia, 2021-01-18

[Download the report for Mongolia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.67 (95% CI: 1.25-2.09)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Mongolia is not shown in the following plot as only 0 deaths have been reported to date**

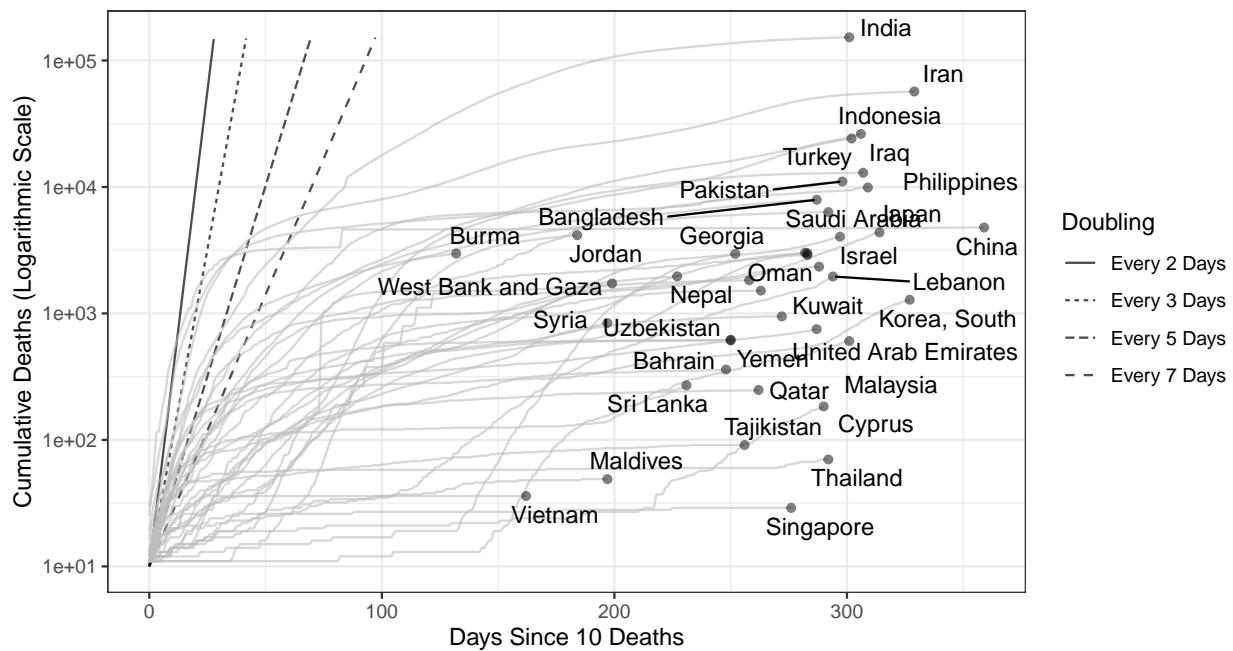


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 2,873 (95% CI: 2,452-3,293) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

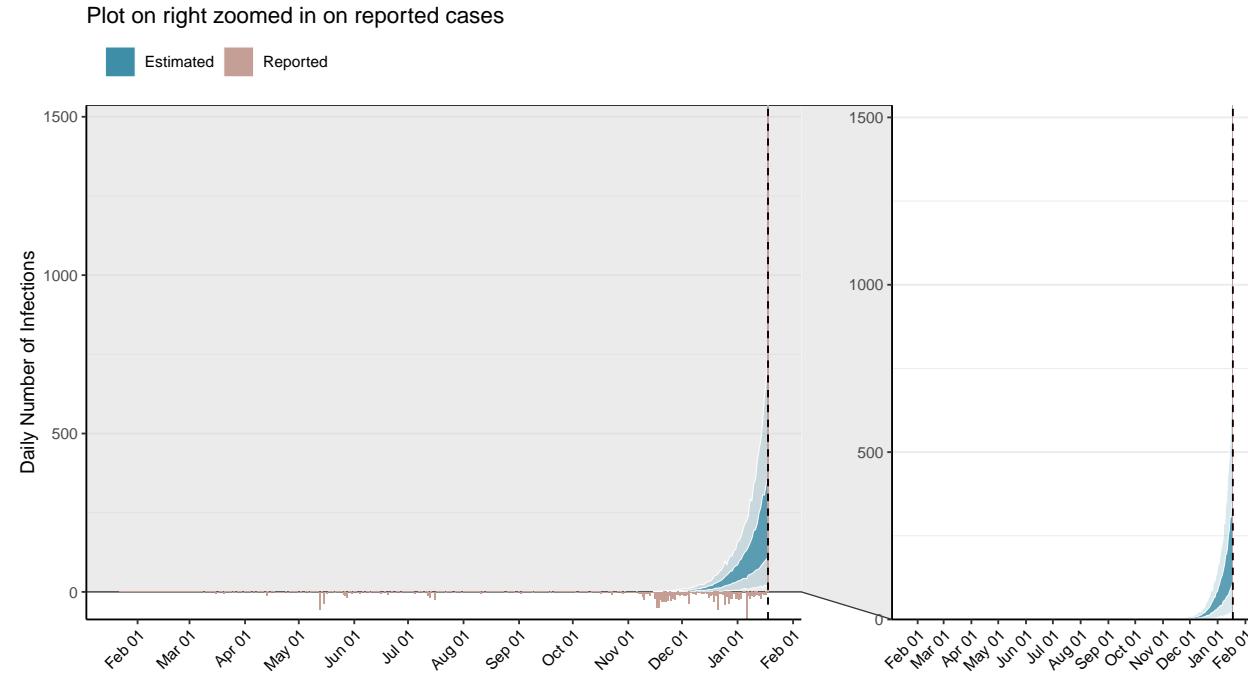


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

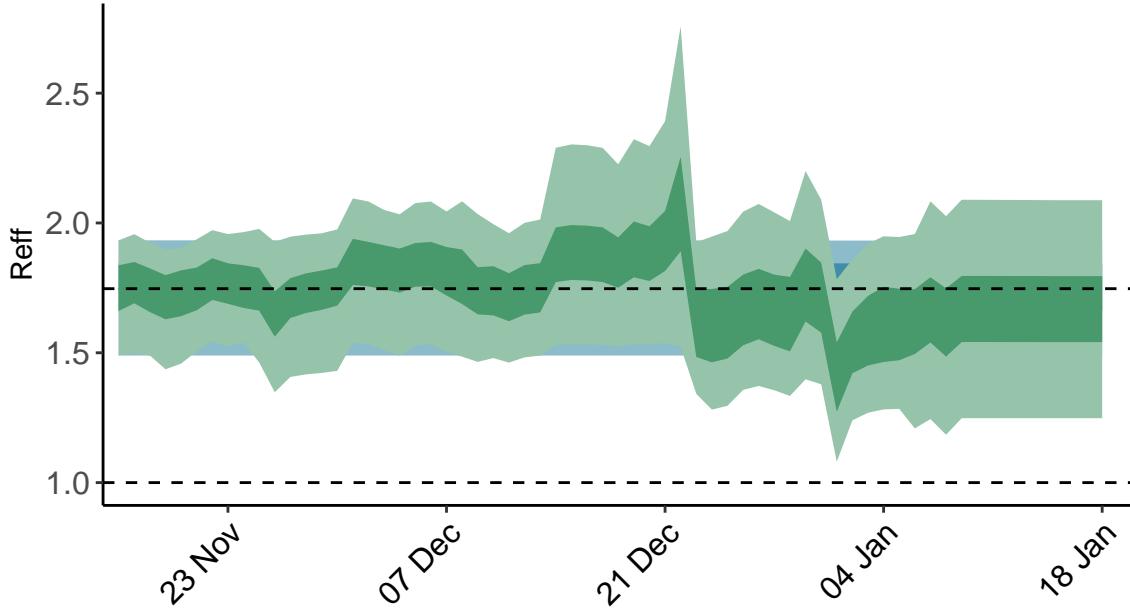


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Mongolia is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

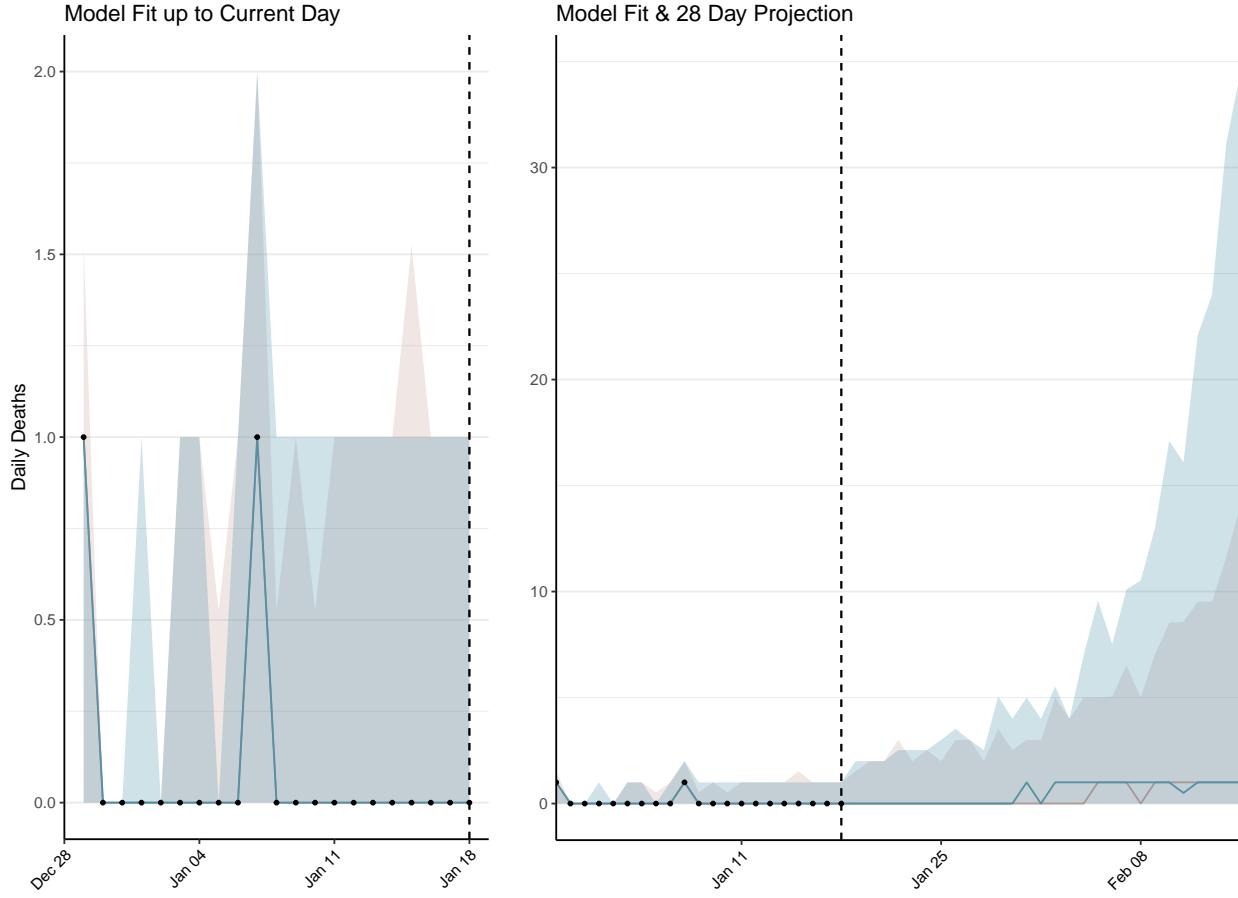


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 13 (95% CI: 11-15) patients requiring treatment with high-pressure oxygen at the current date to 113 (95% CI: 75-151) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 4 (95% CI: 4-5) patients requiring treatment with mechanical ventilation at the current date to 38 (95% CI: 26-51) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

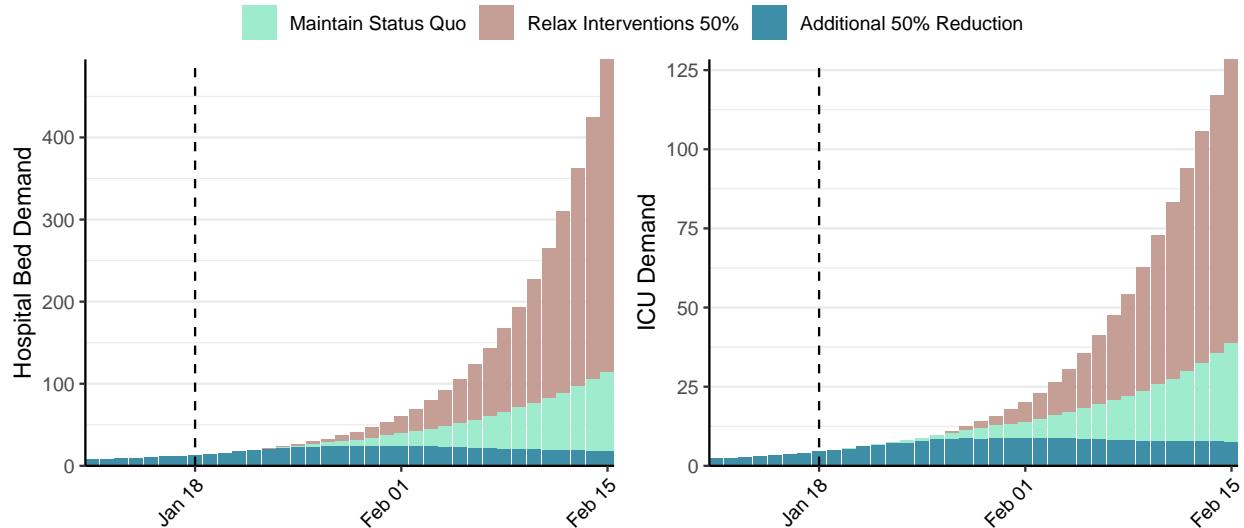


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 266 (95% CI: 221-310) at the current date to 114 (95% CI: 71-157) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 266 (95% CI: 221-310) at the current date to 15,478 (95% CI: 9,345-21,611) by 2021-02-15.

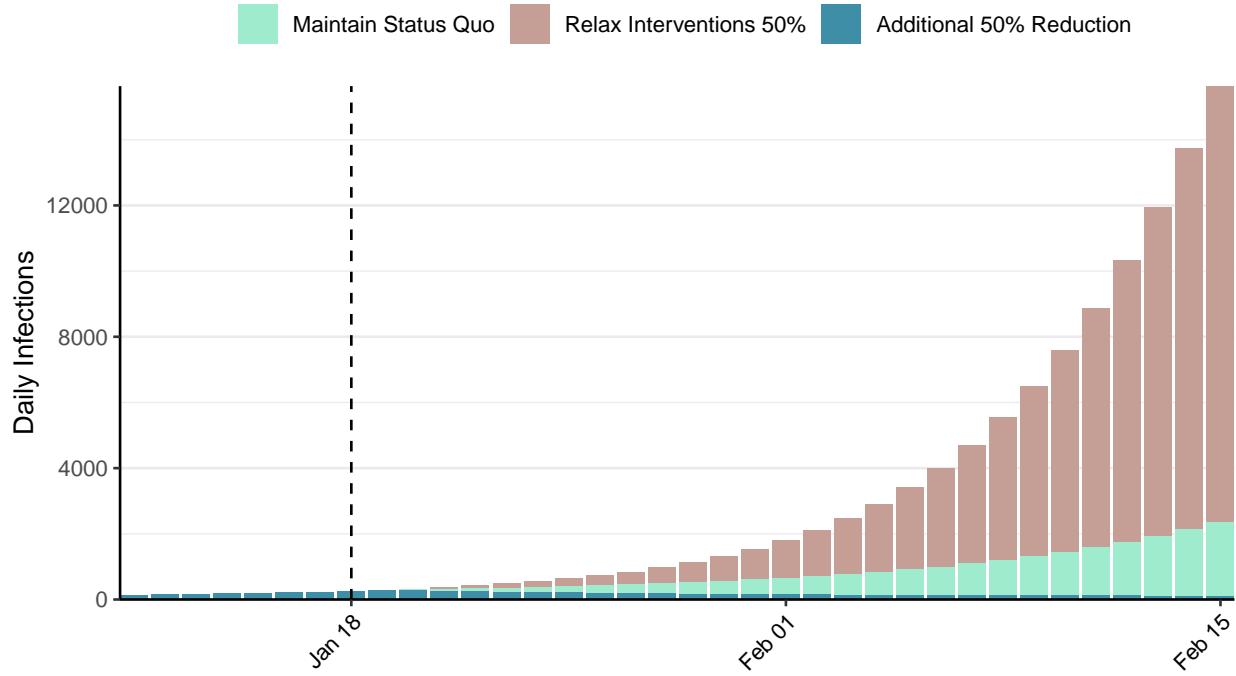


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Mozambique, 2021-01-18

[Download the report for Mozambique, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.15 (95% CI: 0.94-1.39)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Mozambique is not shown in the following plot as only 0 deaths have been reported to date**

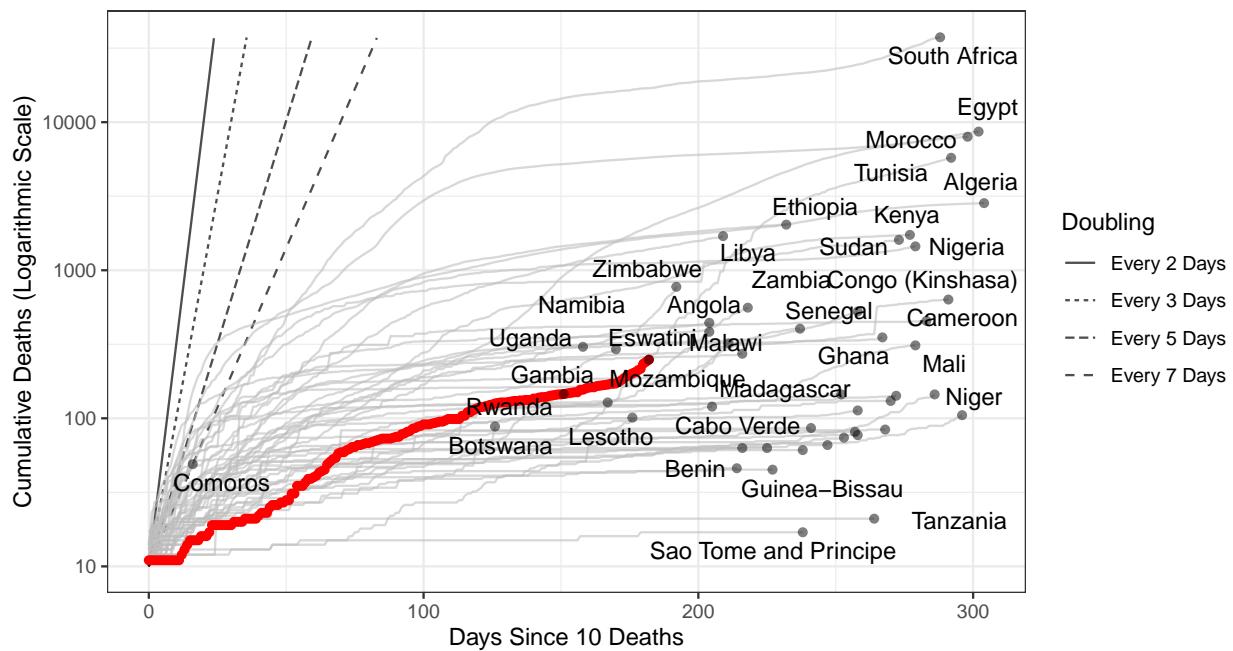


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 532,168 (95% CI: 435,320-629,017) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

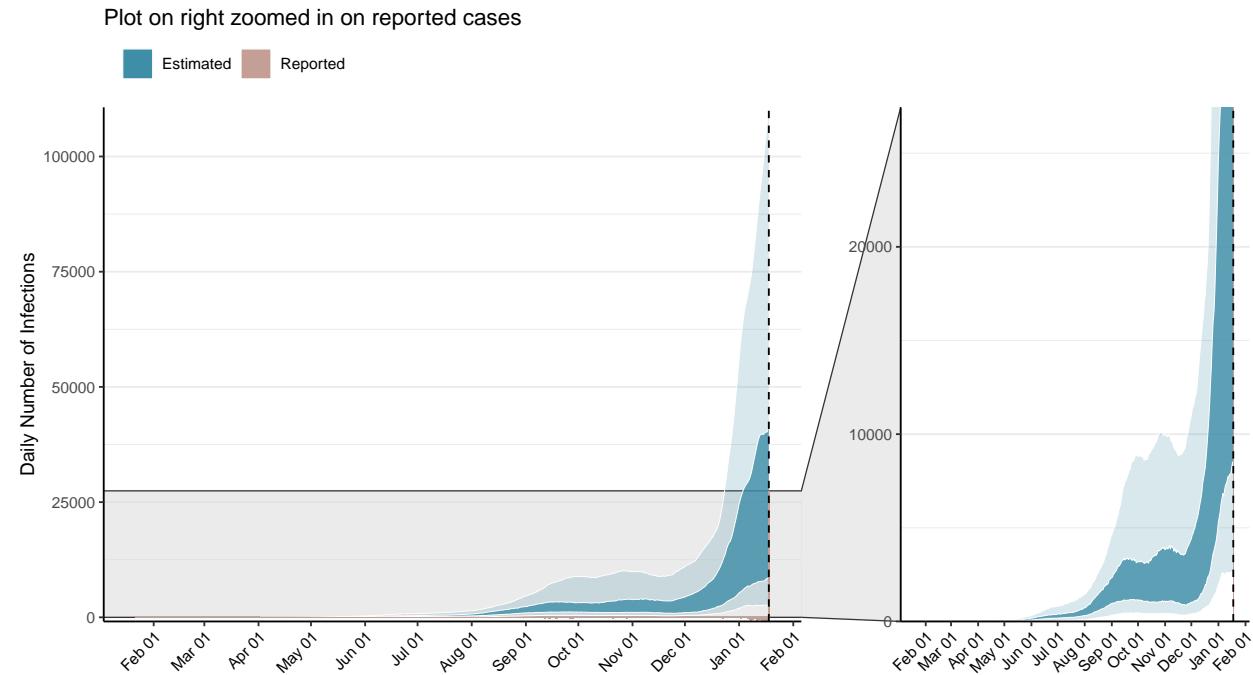


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

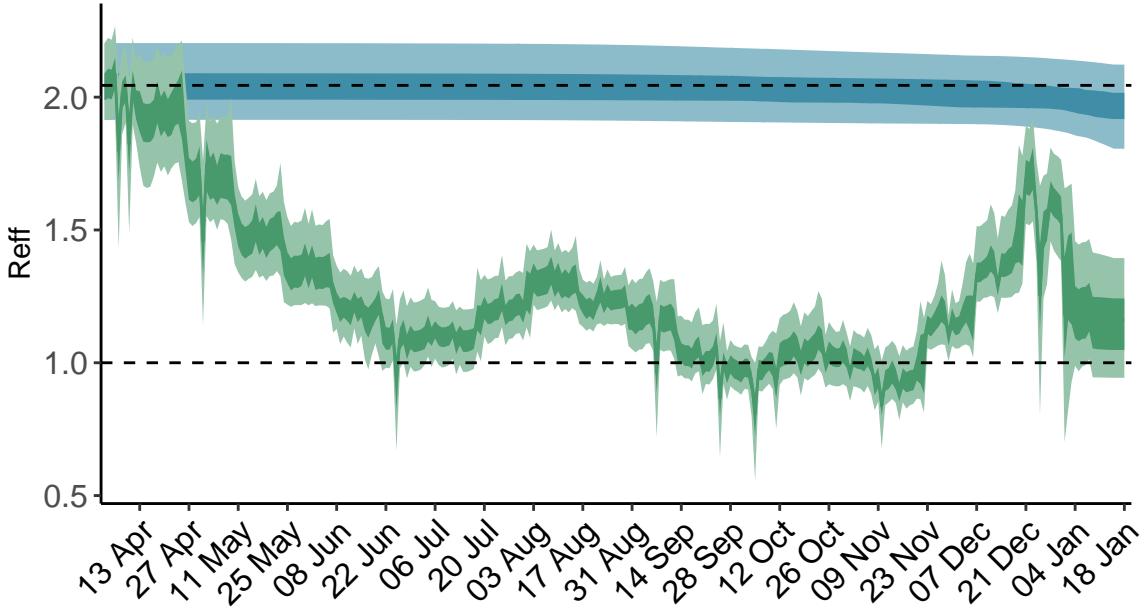


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Mozambique is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

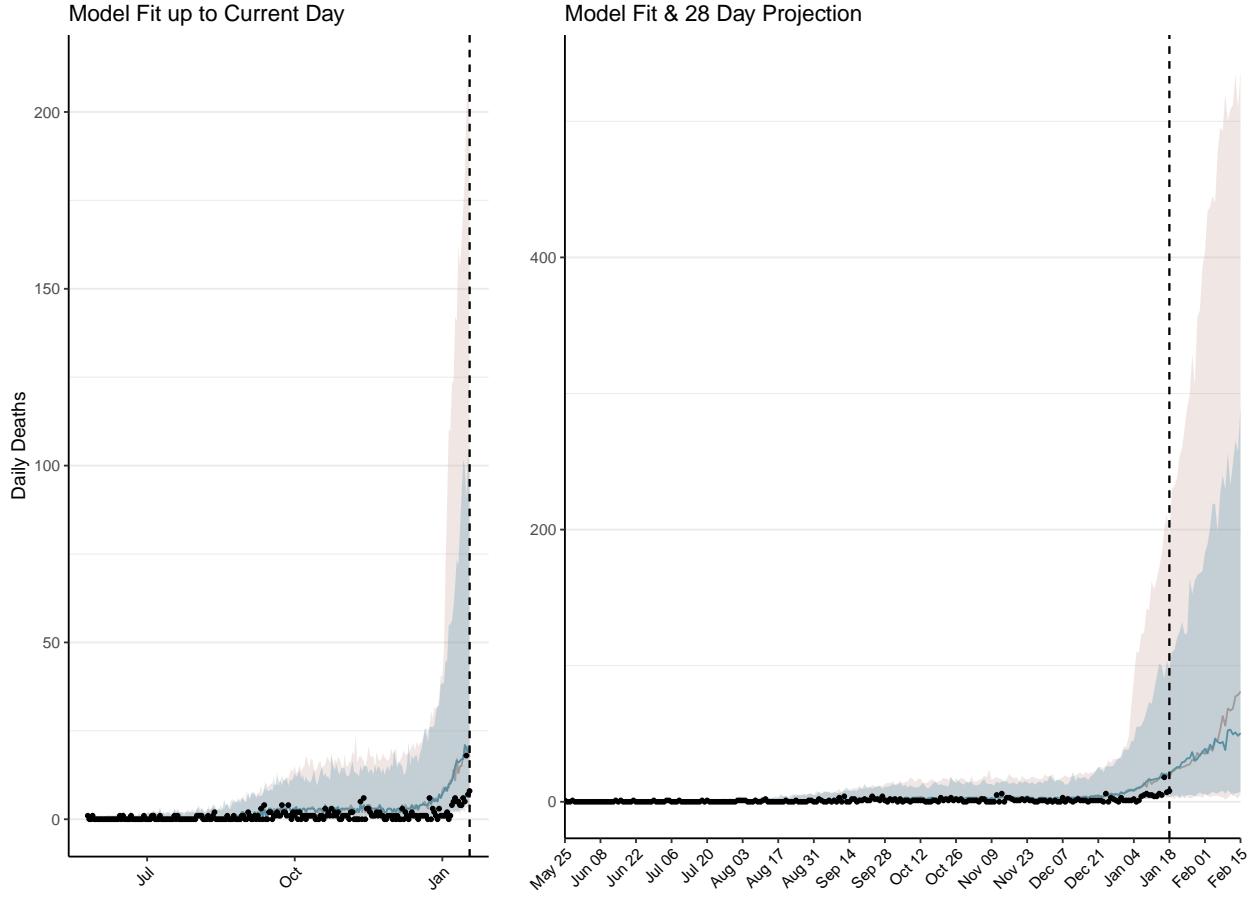


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1,584 (95% CI: 1,299-1,869) patients requiring treatment with high-pressure oxygen at the current date to 3,544 (95% CI: 2,818-4,270) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 434 (95% CI: 378-489) patients requiring treatment with mechanical ventilation at the current date to 663 (95% CI: 594-733) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

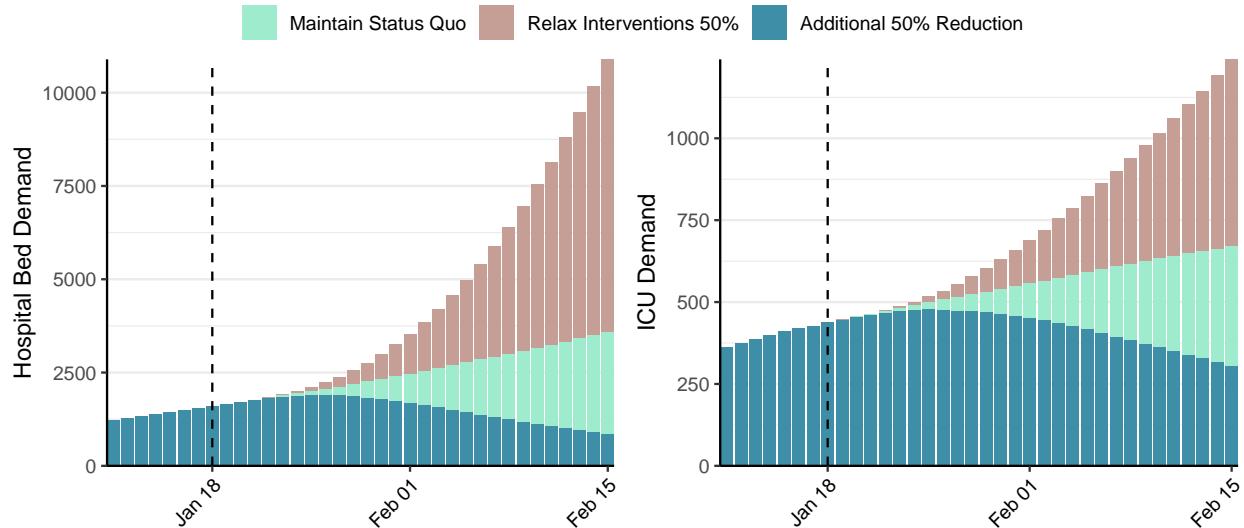


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 29,322 (95% CI: 23,609-35,035) at the current date to 4,968 (95% CI: 3,813-6,123) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 29,322 (95% CI: 23,609-35,035) at the current date to 277,378 (95% CI: 236,109-318,648) by 2021-02-15.

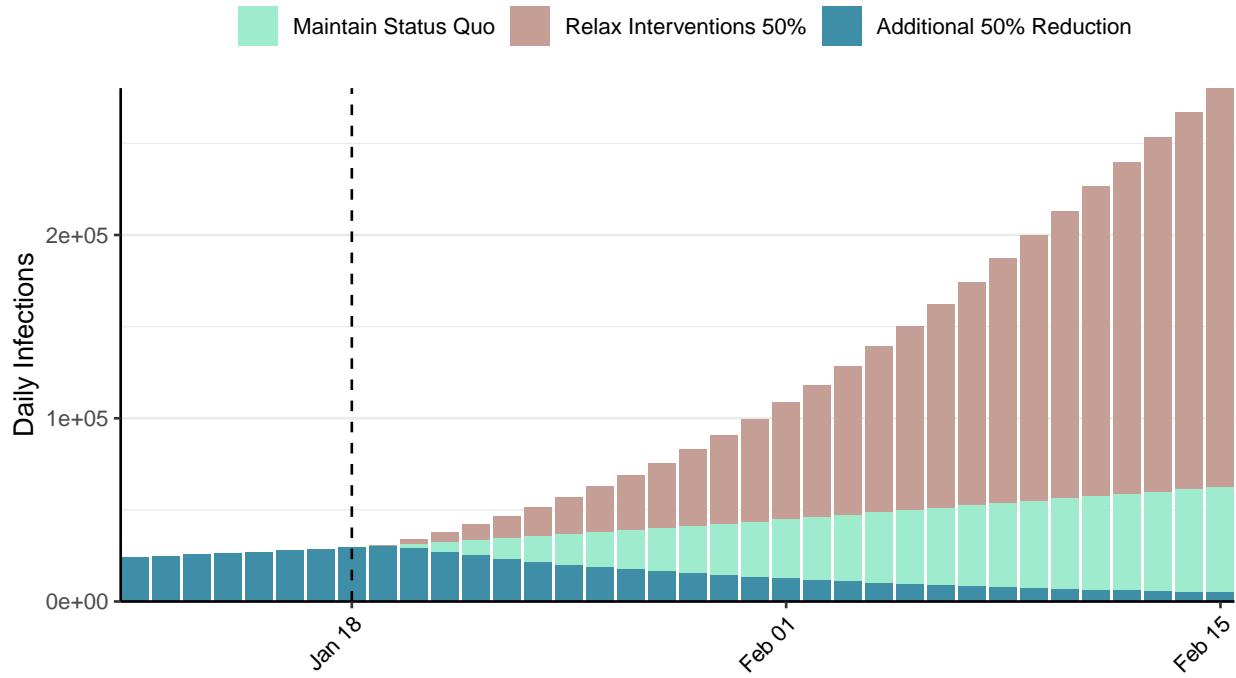


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Mauritania, 2021-01-18

[Download the report for Mauritania, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.72 (95% CI: 0.62-0.84)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Mauritania is not shown in the following plot as only 0 deaths have been reported to date**

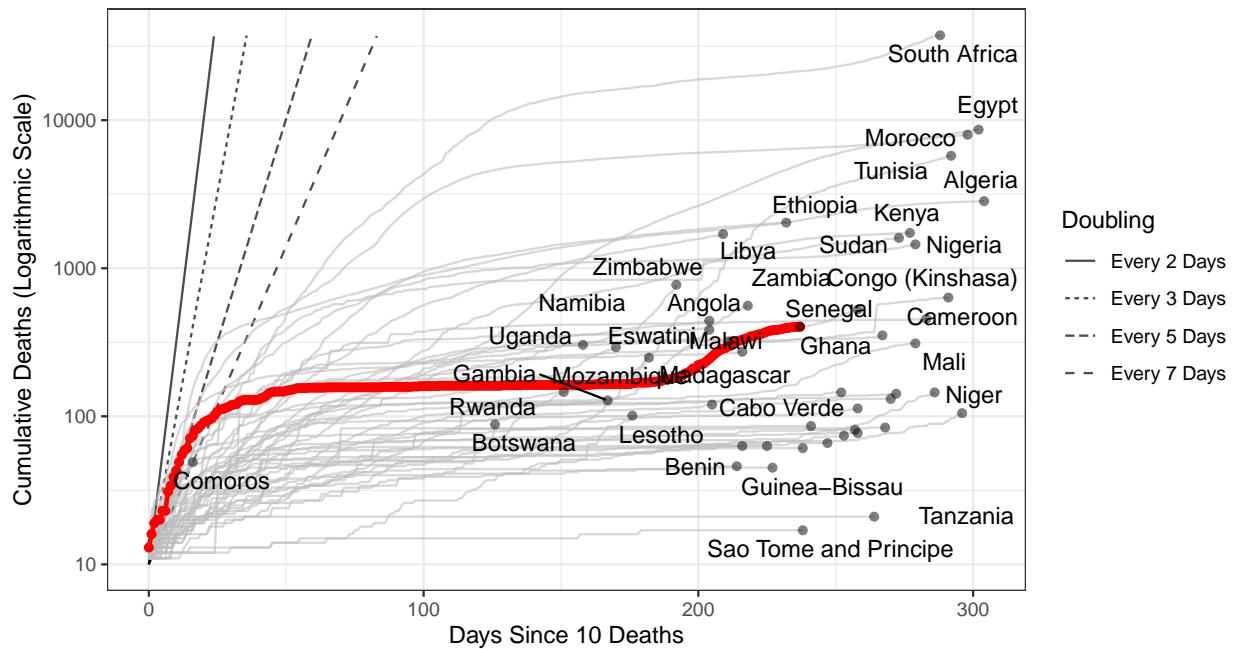


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 52,085 (95% CI: 48,751-55,419) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

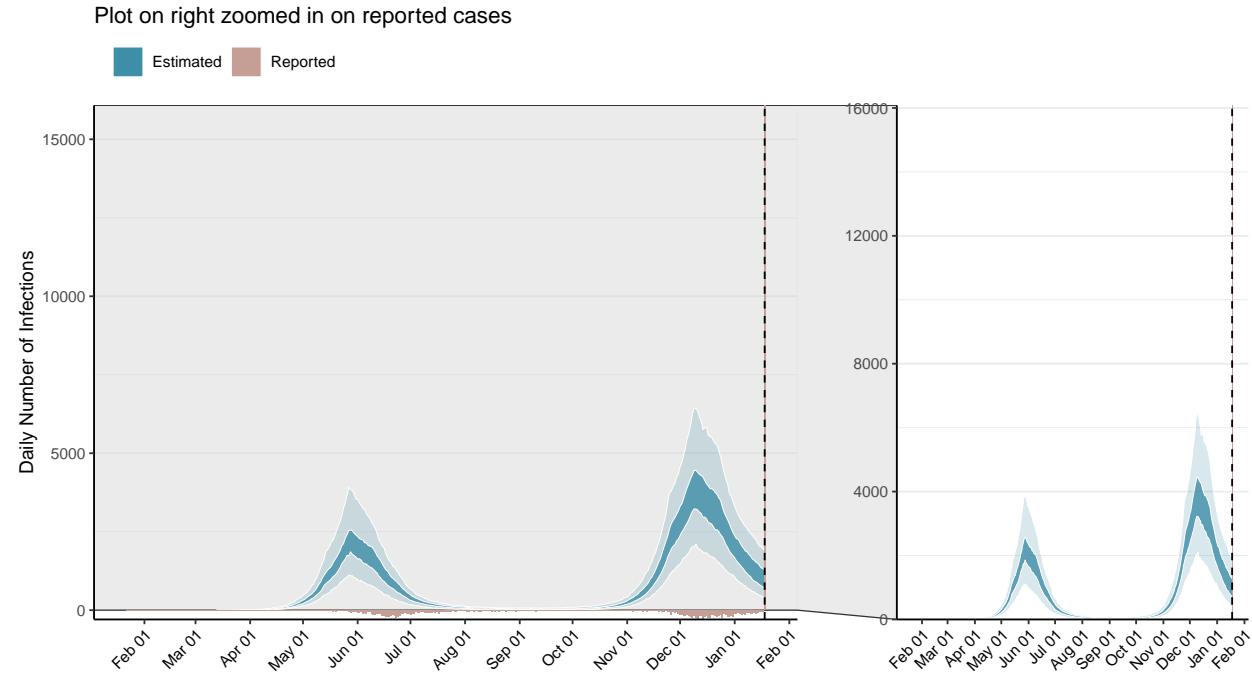


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

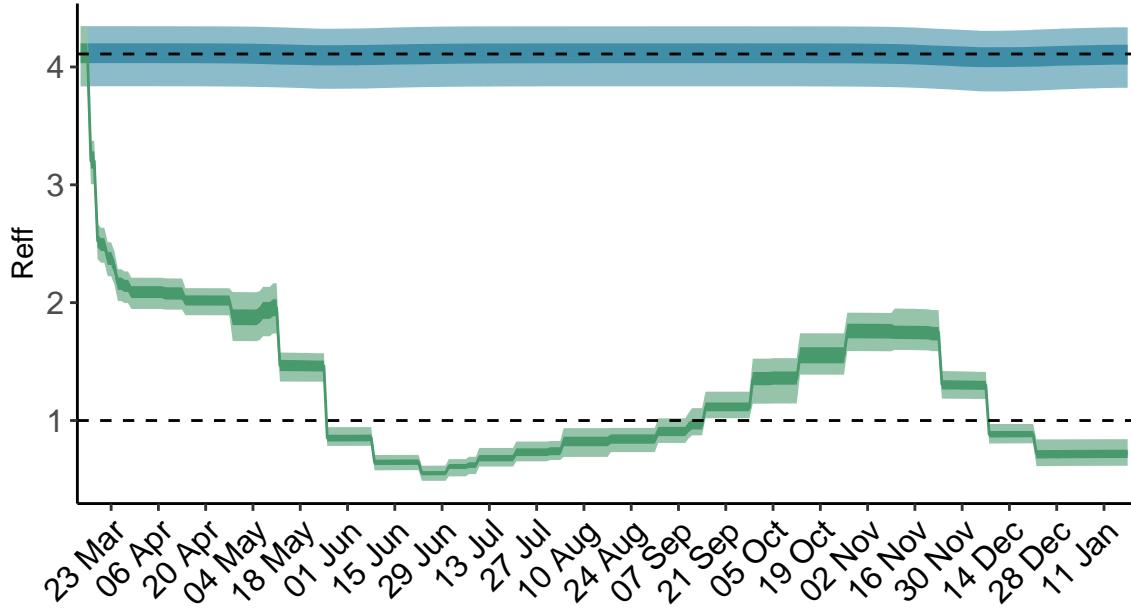


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Mauritania is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

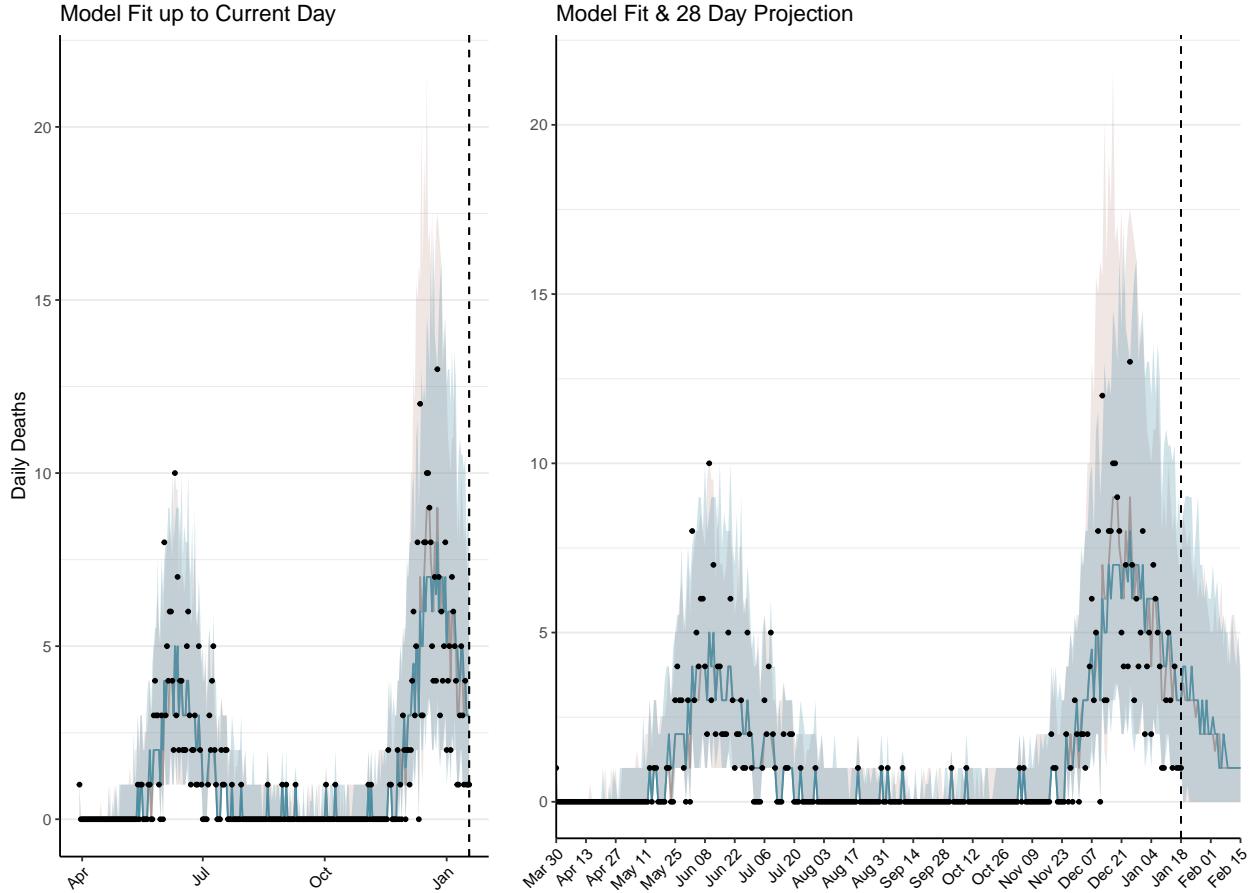


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 134 (95% CI: 125-143) patients requiring treatment with high-pressure oxygen at the current date to 43 (95% CI: 39-48) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 53 (95% CI: 50-56) patients requiring treatment with mechanical ventilation at the current date to 19 (95% CI: 17-21) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

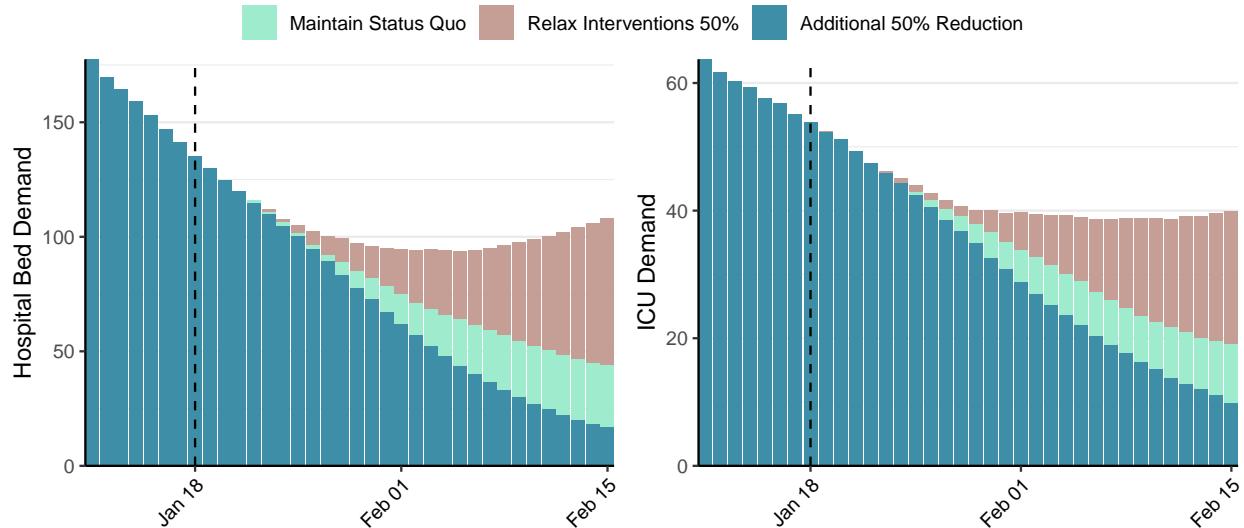


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 978 (95% CI: 895-1,061) at the current date to 33 (95% CI: 29-38) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 978 (95% CI: 895-1,061) at the current date to 1,588 (95% CI: 1,354-1,823) by 2021-02-15.

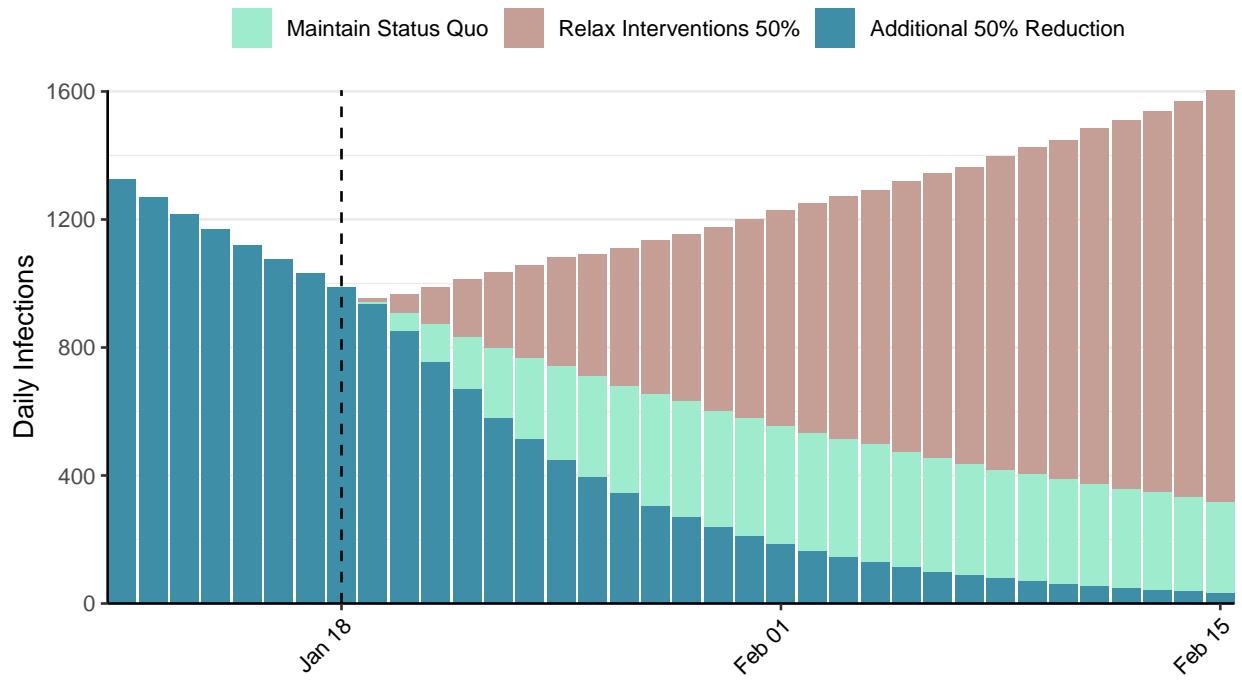


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Mauritius, 2021-01-18

[Download the report for Mauritius, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.63 (95% CI: 0.19-1.3)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Mauritius is not shown in the following plot as only 0 deaths have been reported to date**

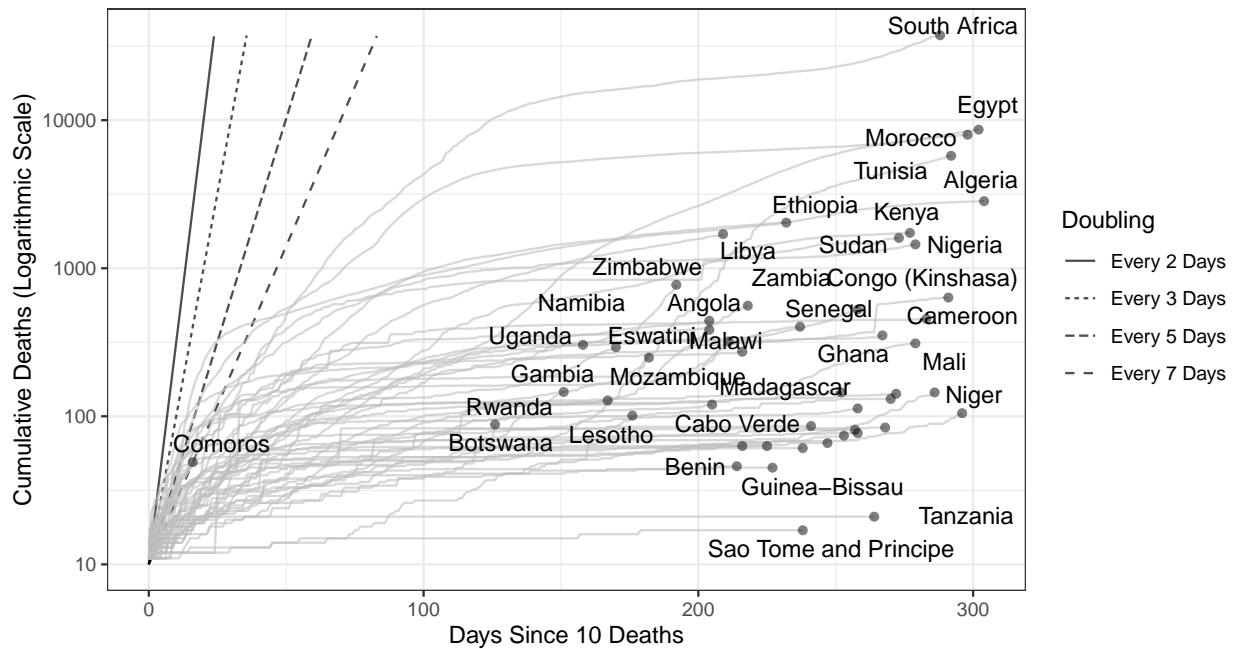


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 0 (95% CI: NaN-NaN) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. Mauritius has revised their historic reported cases and thus have reported negative cases.**

Plot on right zoomed in on reported cases

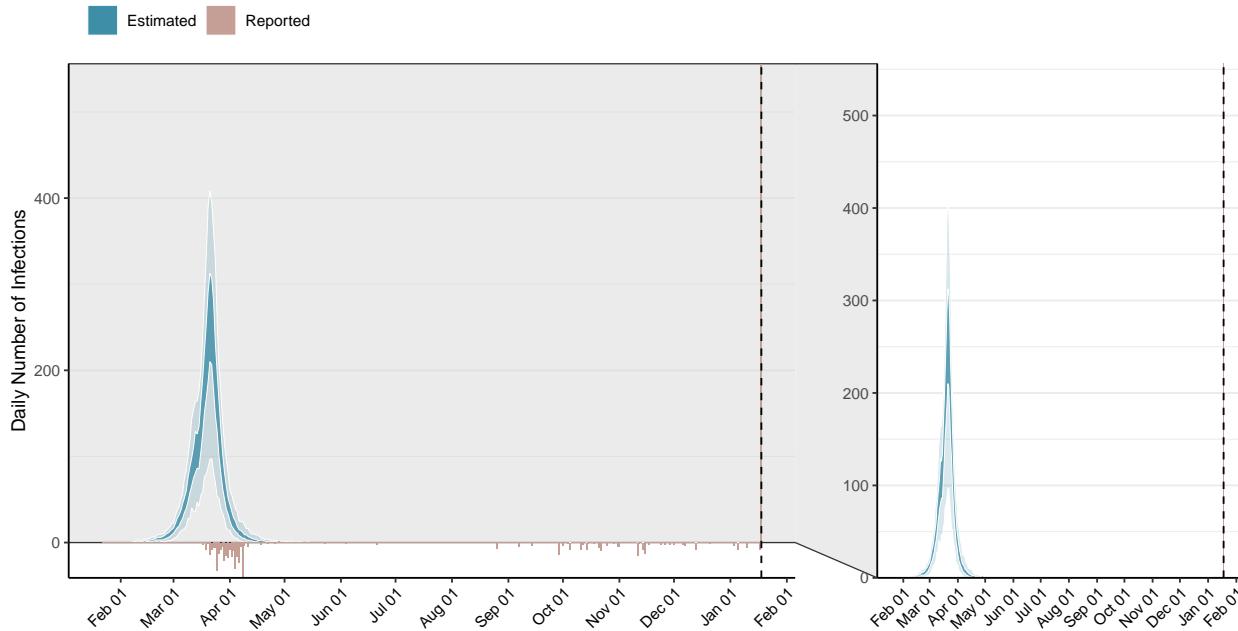


Figure 2: Daily number of infections estimated by fitting to the current total of deaths. Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

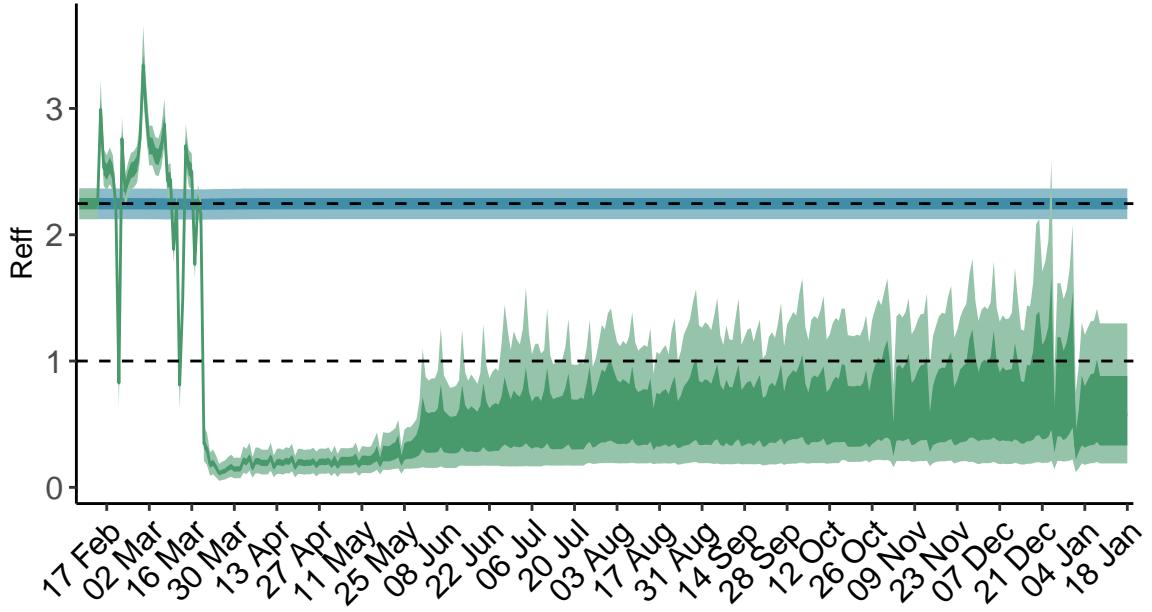


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

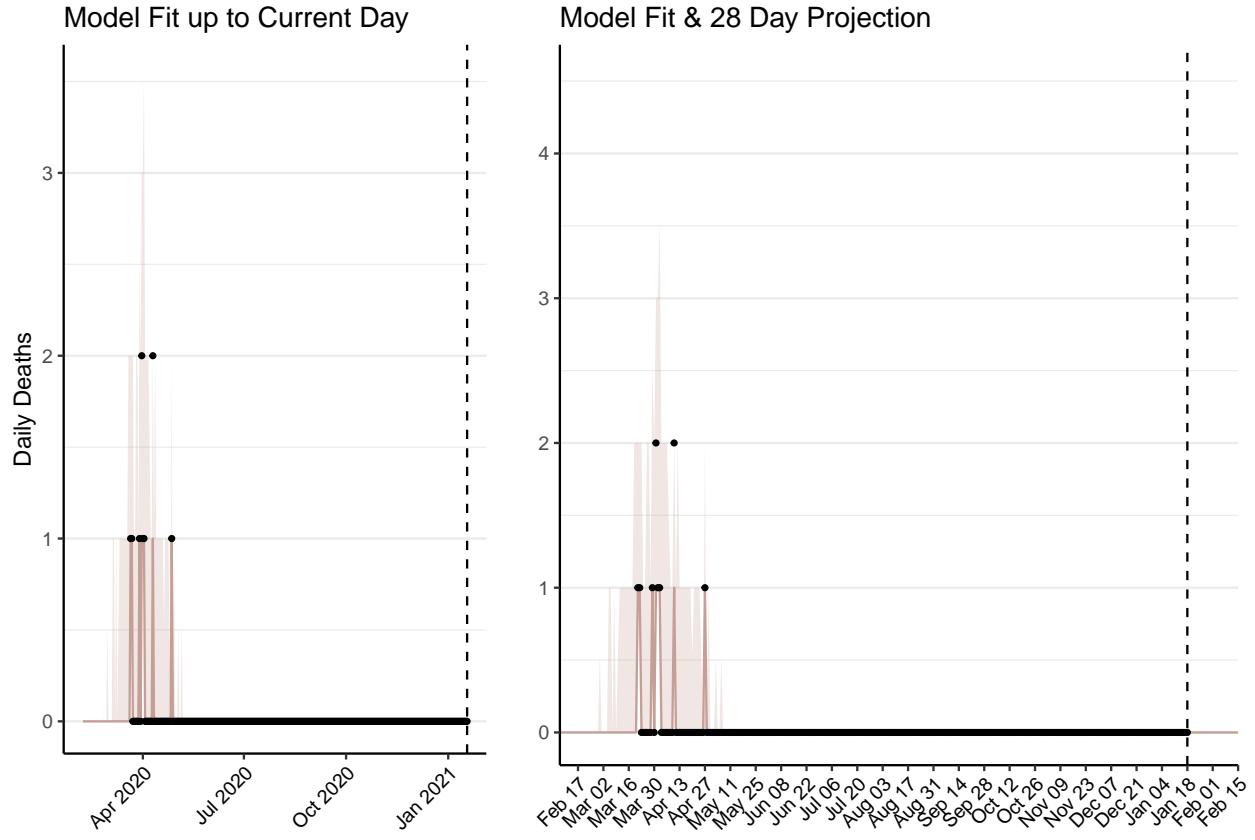


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 0 (95% CI: NaN-NaN) patients requiring treatment with high-pressure oxygen at the current date to 0 (95% CI: NaN-NaN) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 0 (95% CI: NaN-NaN) patients requiring treatment with mechanical ventilation at the current date to 0 (95% CI: NaN-NaN) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

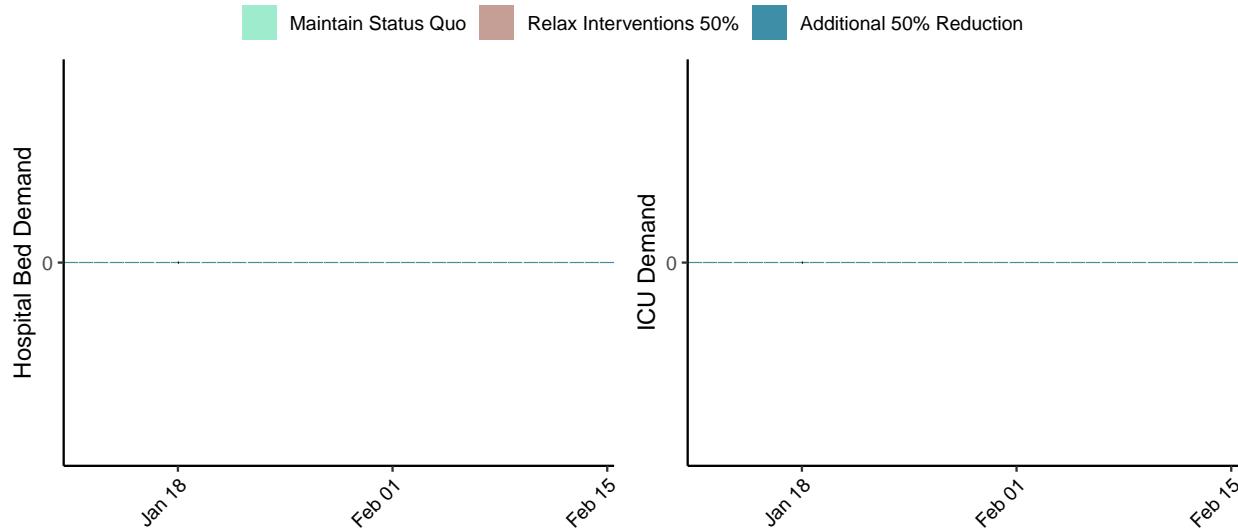


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 0 (95% CI: NaN-NaN) at the current date to 0 (95% CI: NaN-NaN) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 0 (95% CI: NaN-NaN) at the current date to 0 (95% CI: NaN-NaN) by 2021-02-15.

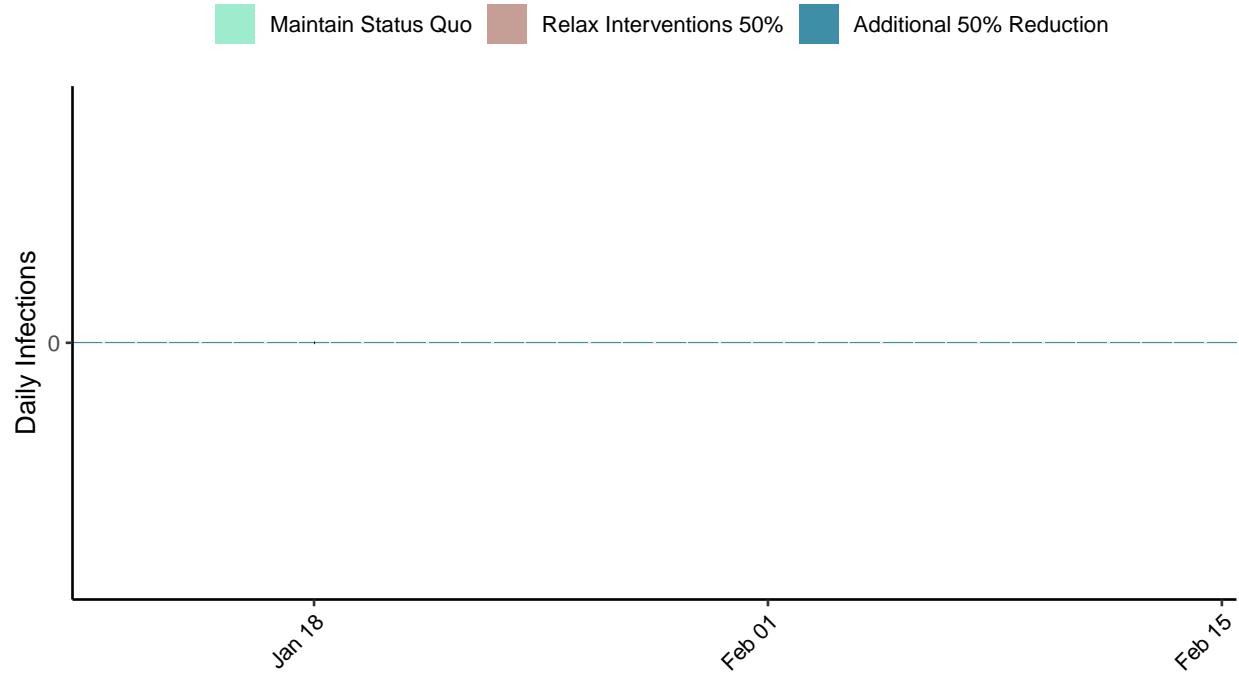


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Malawi, 2021-01-18

[Download the report for Malawi, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	2.13 (95% CI: 1.93-2.33)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Malawi is not shown in the following plot as only 0 deaths have been reported to date**

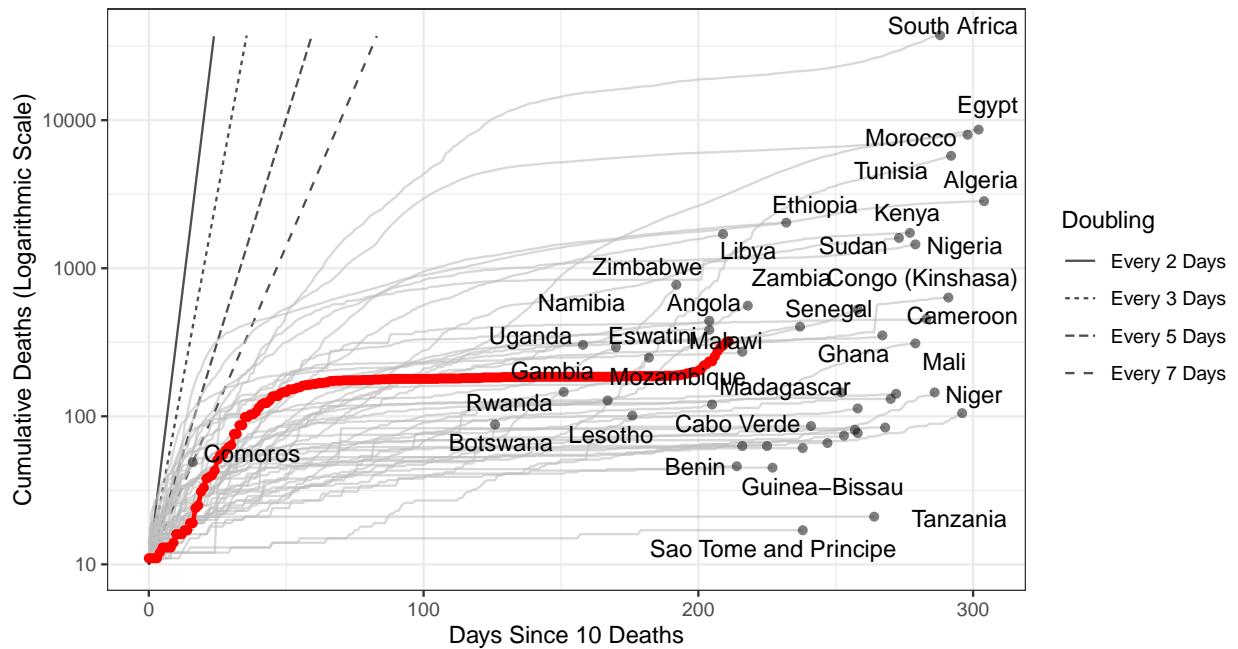


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 419,554 (95% CI: 386,985-452,122) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

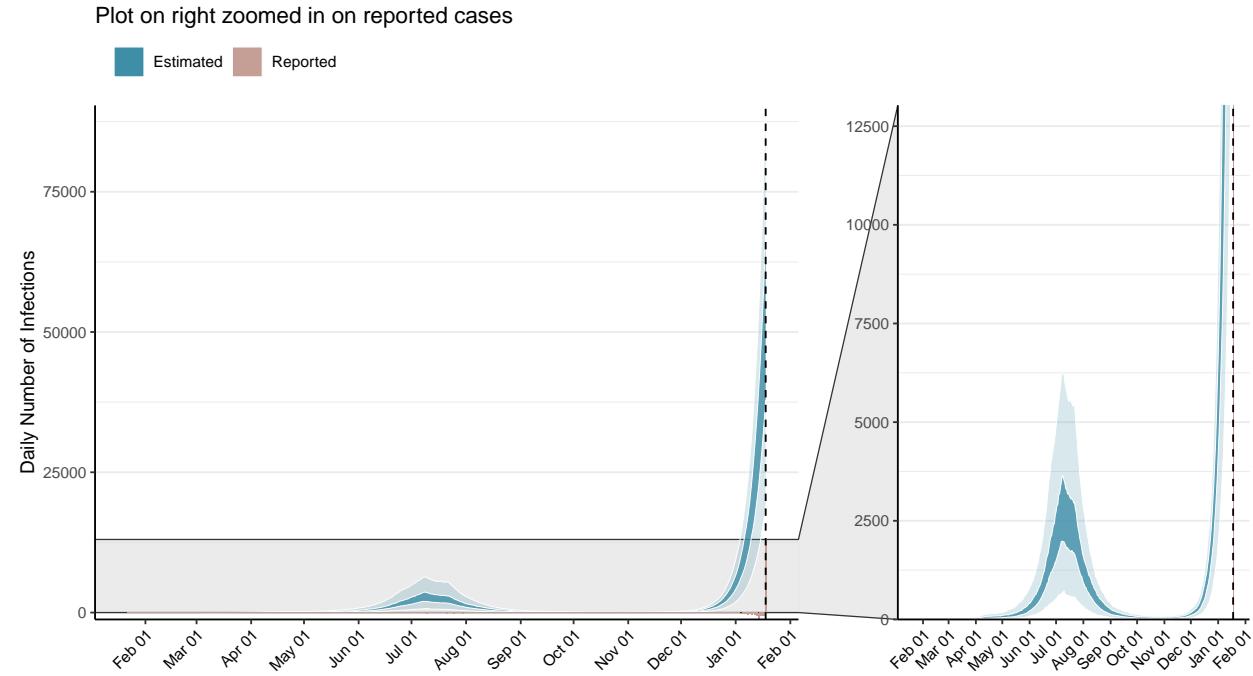


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

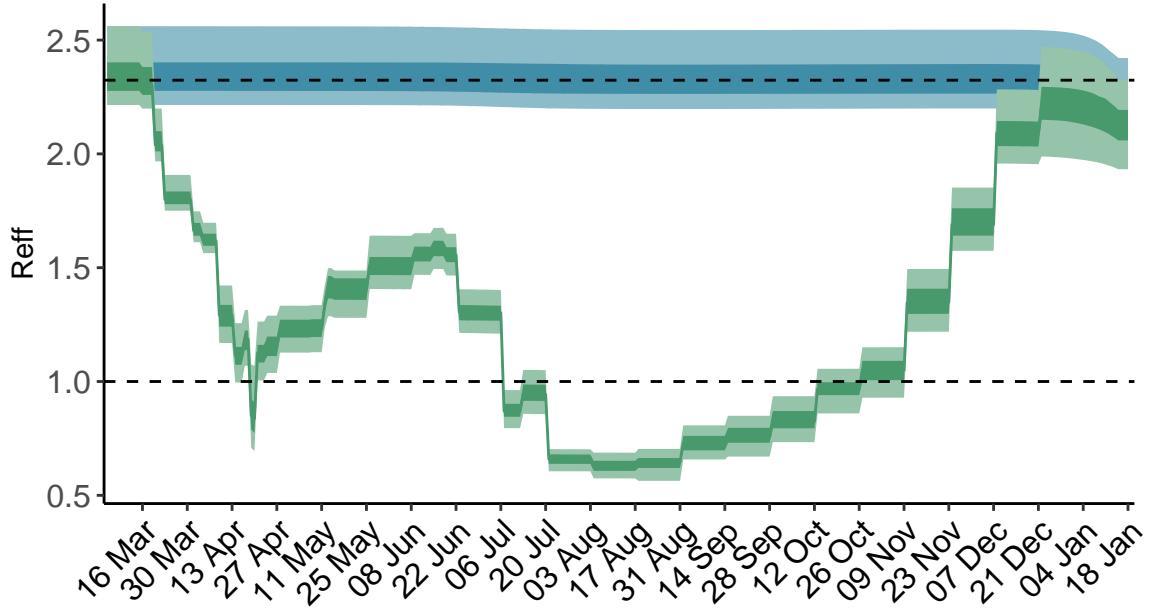


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Malawi is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

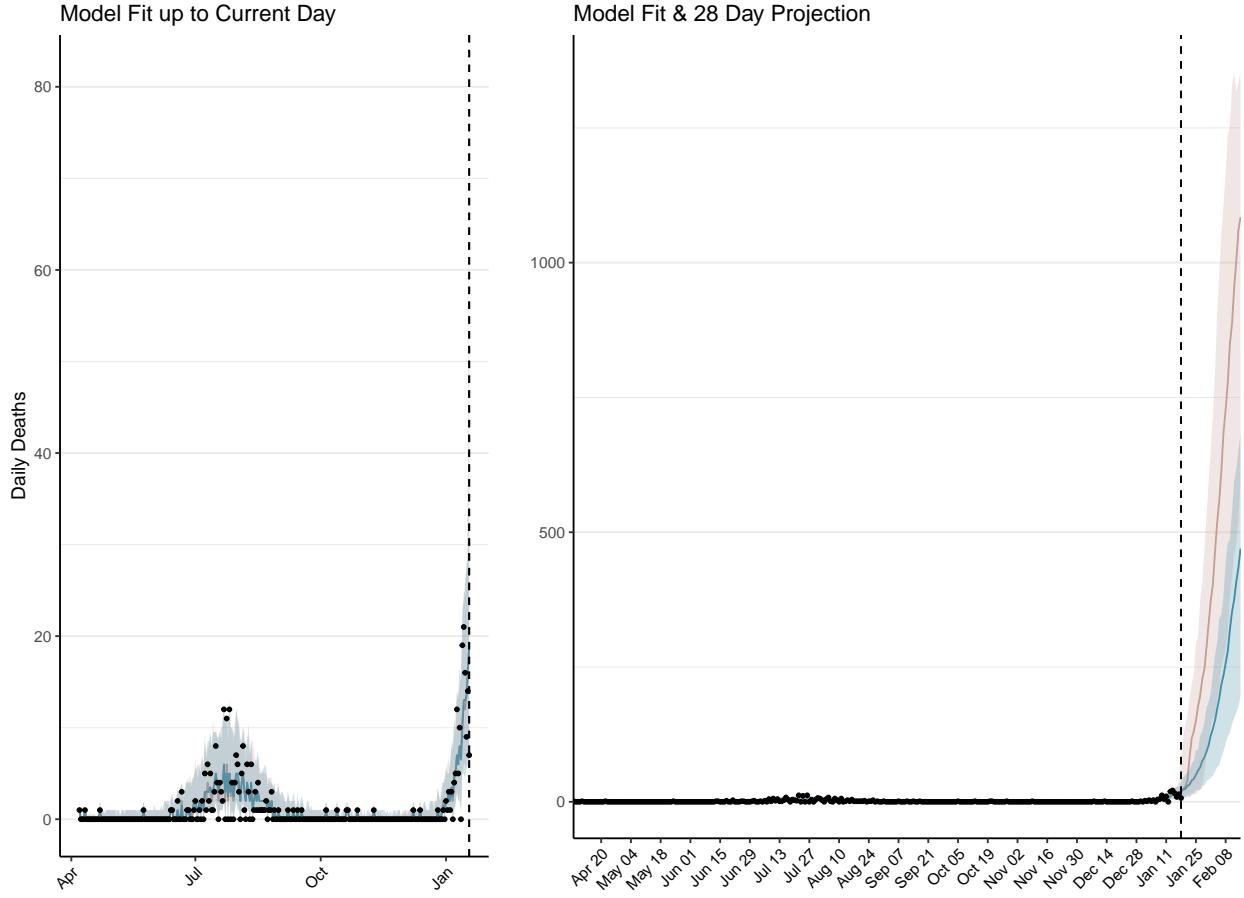


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1,254 (95% CI: 1,159-1,350) patients requiring treatment with high-pressure oxygen at the current date to 23,178 (95% CI: 21,945-24,410) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 401 (95% CI: 372-429) patients requiring treatment with mechanical ventilation at the current date to 1,780 (95% CI: 1,716-1,844) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

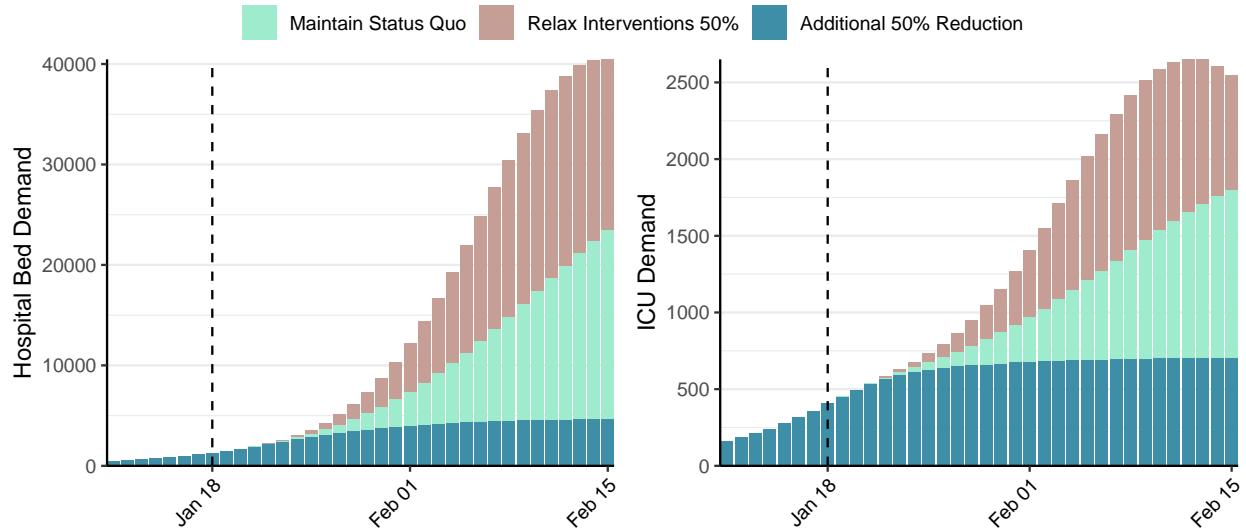


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 53,736 (95% CI: 49,298-58,173) at the current date to 62,612 (95% CI: 57,511-67,713) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 53,736 (95% CI: 49,298-58,173) at the current date to 509,698 (95% CI: 477,595-541,801) by 2021-02-15.

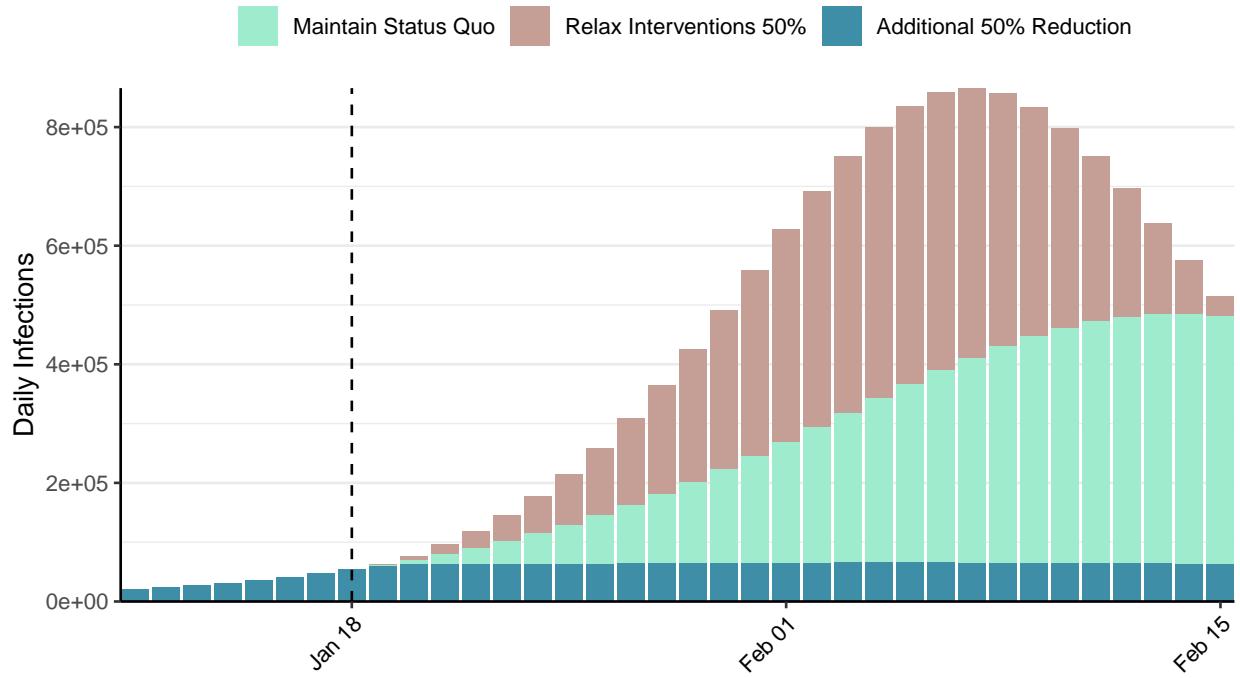


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Malaysia, 2021-01-18

[Download the report for Malaysia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.59 (95% CI: 1.38-1.86)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Malaysia is not shown in the following plot as only 0 deaths have been reported to date**

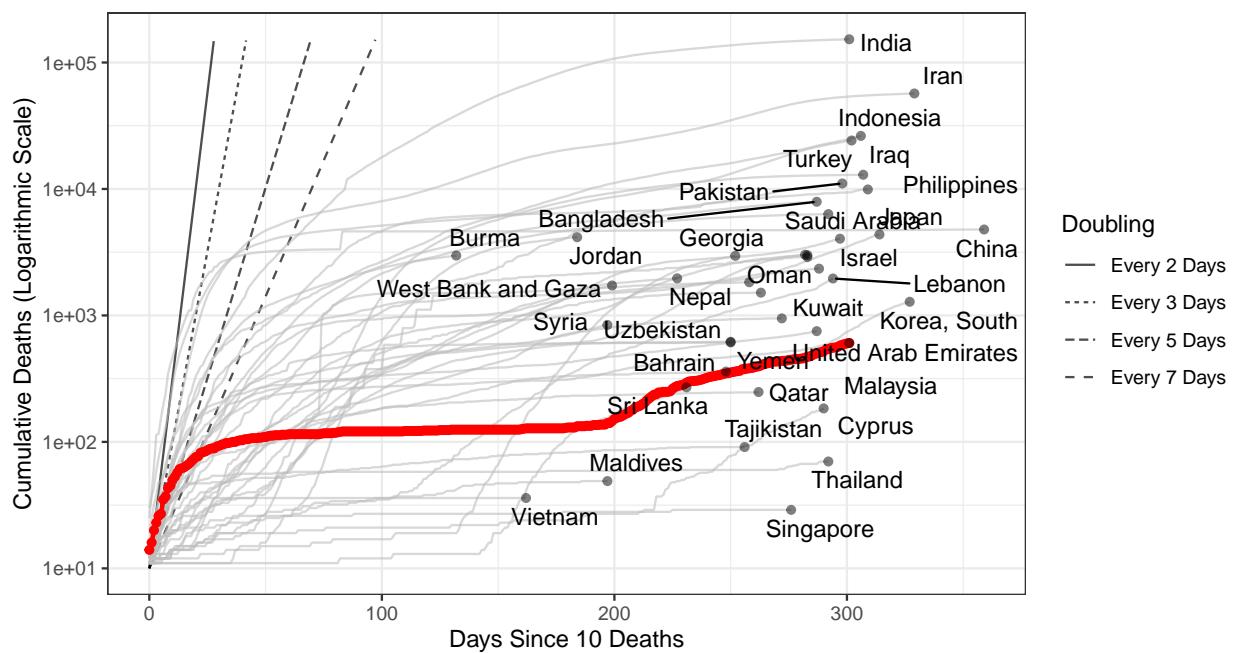


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 190,089 (95% CI: 178,338-201,841) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

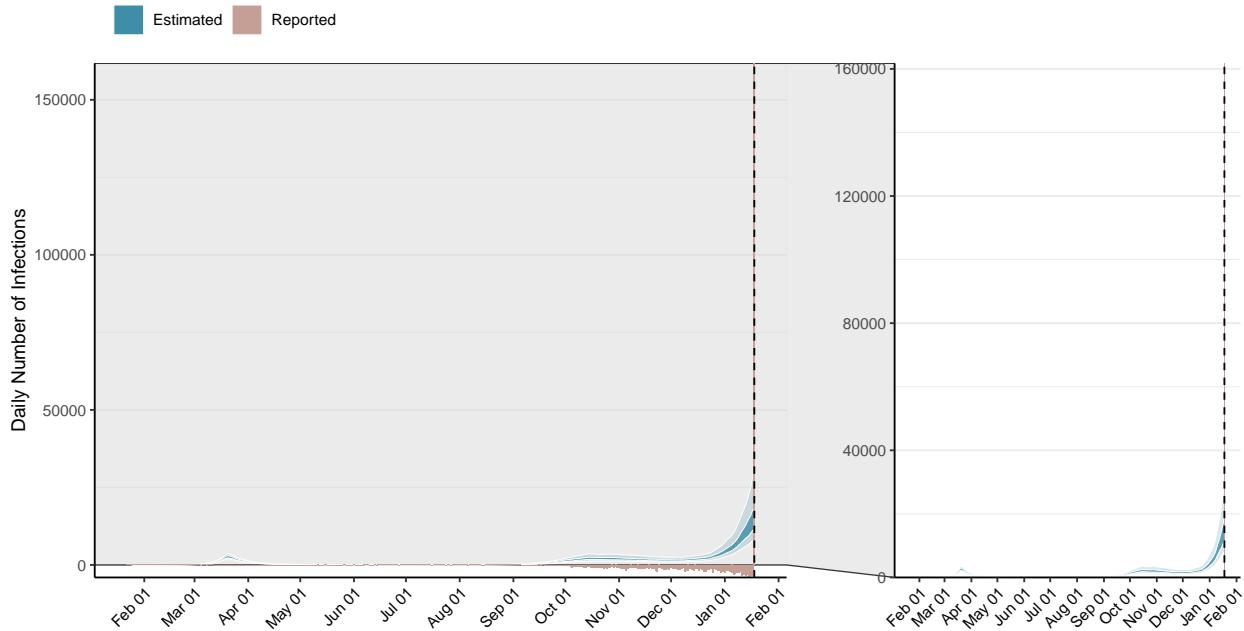


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

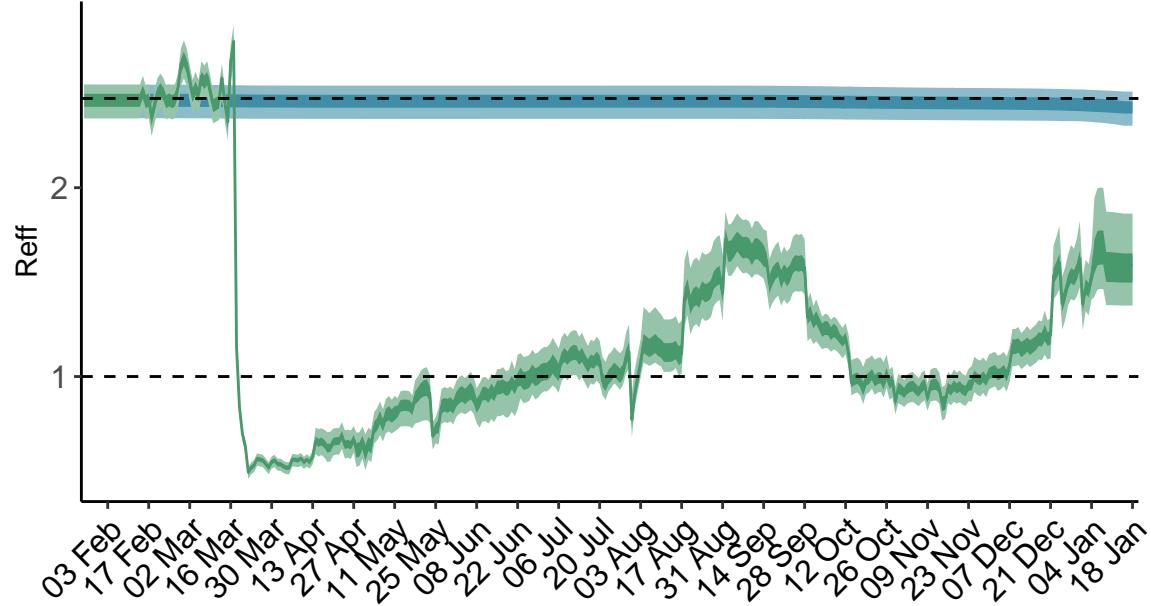


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Malaysia is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

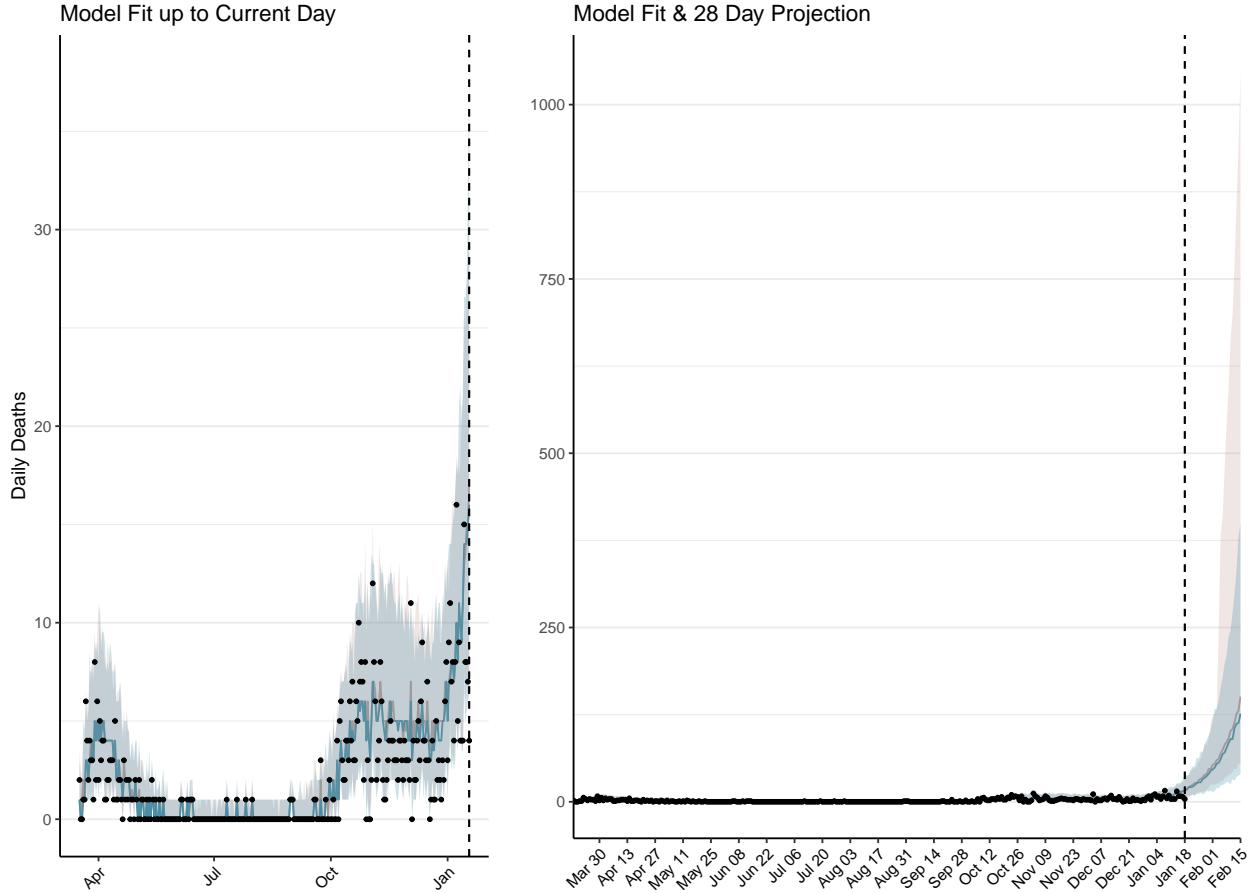


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 907 (95% CI: 851-963) patients requiring treatment with high-pressure oxygen at the current date to 7,983 (95% CI: 7,005-8,962) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 317 (95% CI: 298-337) patients requiring treatment with mechanical ventilation at the current date to 2,143 (95% CI: 2,000-2,285) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

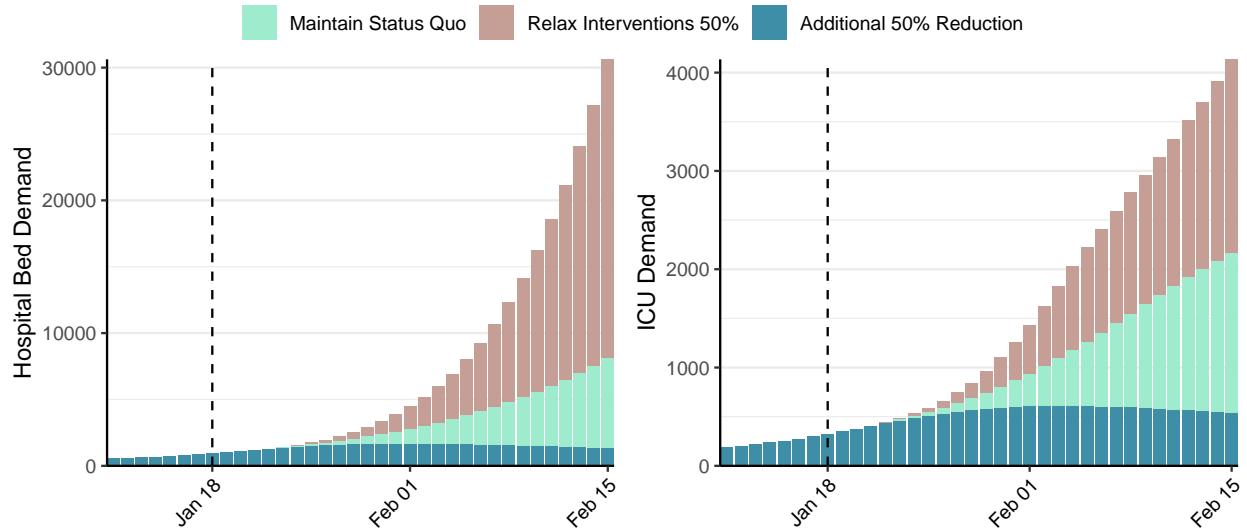


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 15,951 (95% CI: 14,741-17,162) at the current date to 7,906 (95% CI: 6,800-9,012) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 15,951 (95% CI: 14,741-17,162) at the current date to 645,592 (95% CI: 589,241-701,944) by 2021-02-15.

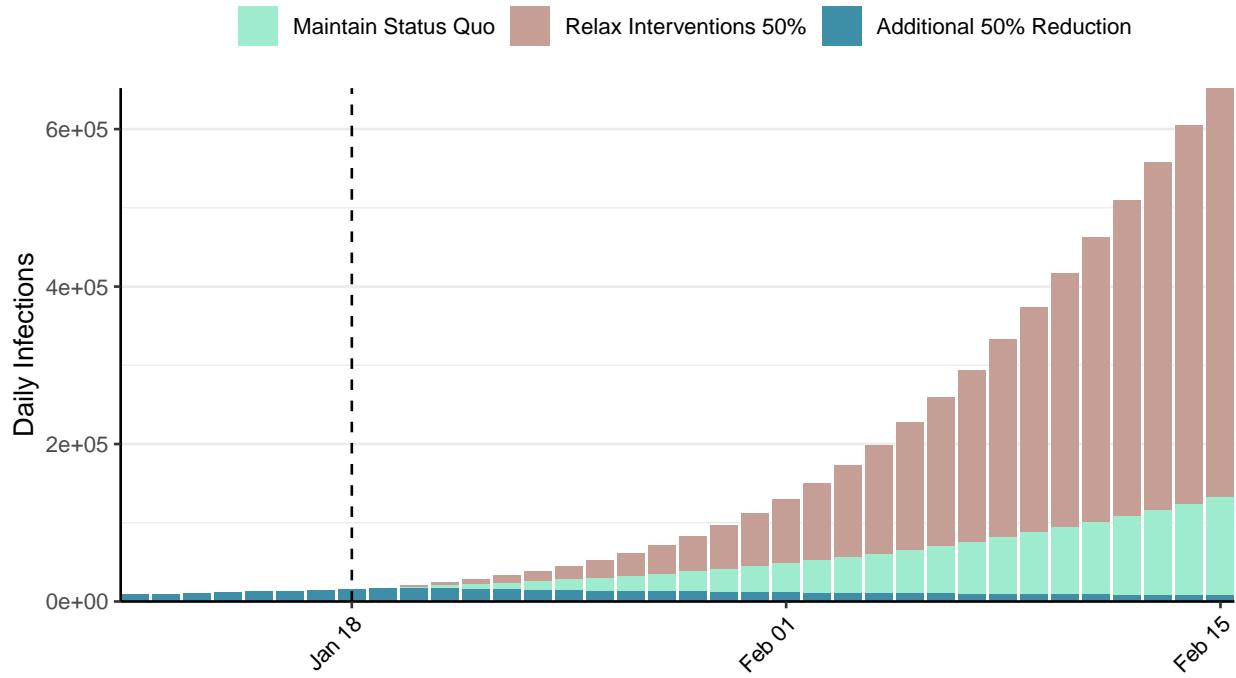


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Namibia, 2021-01-18

[Download the report for Namibia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.98 (95% CI: 0.8-1.18)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Namibia is not shown in the following plot as only 0 deaths have been reported to date**

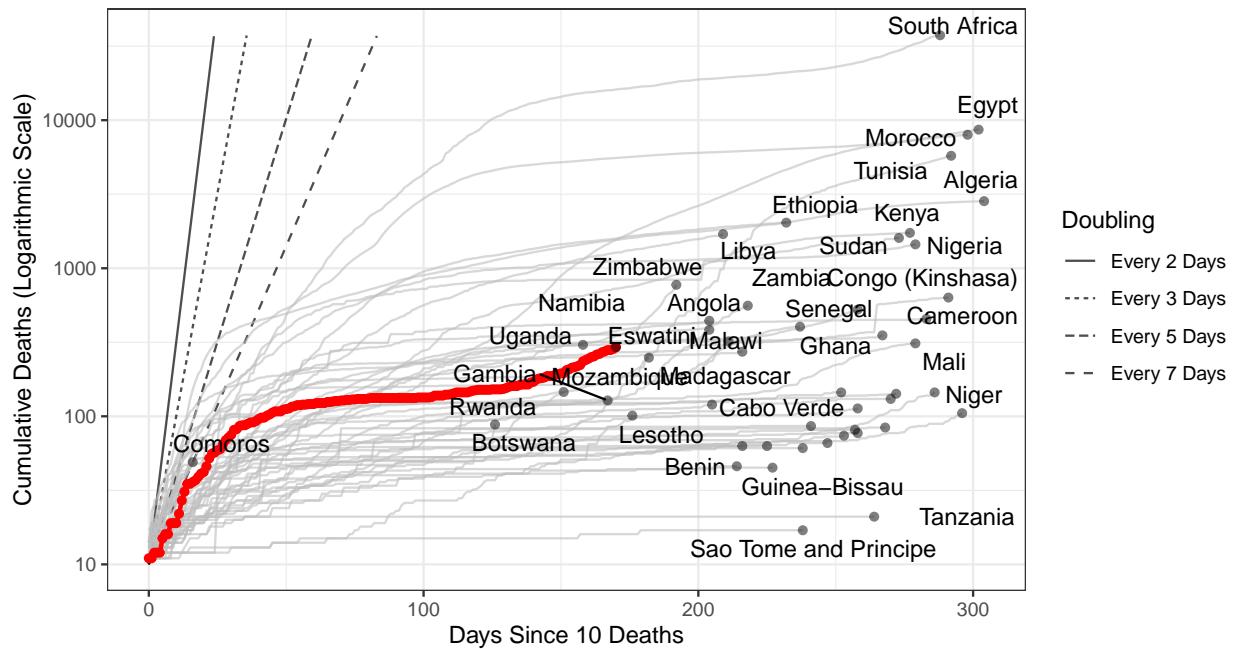


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 109,762 (95% CI: 88,893-130,631) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

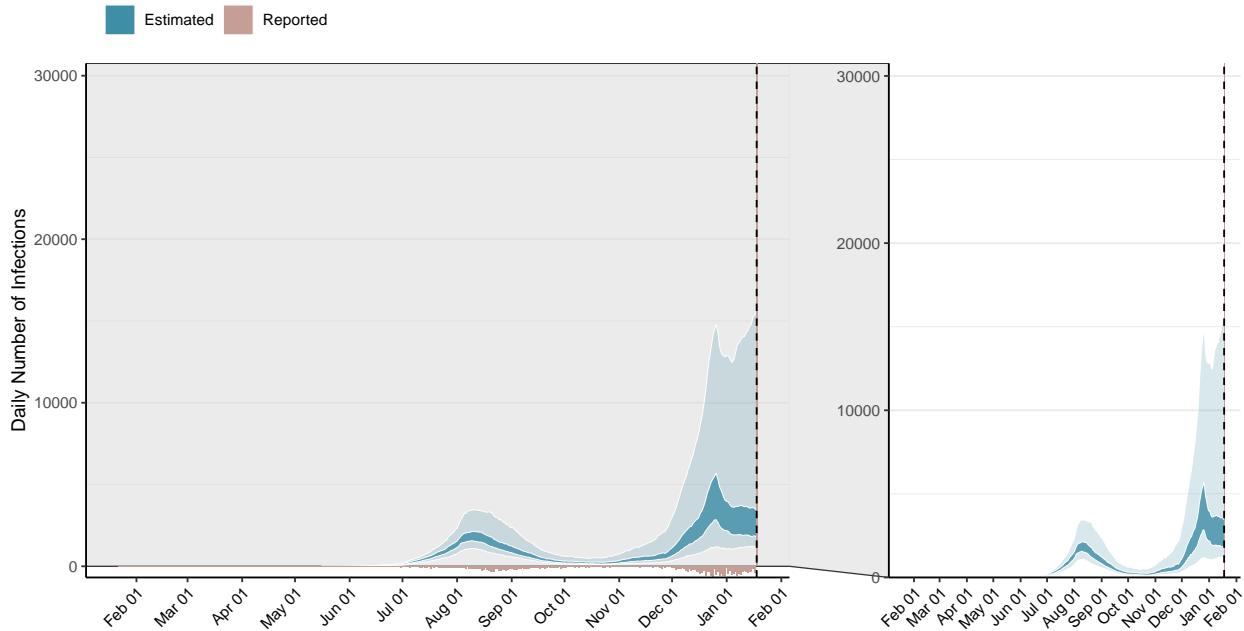


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

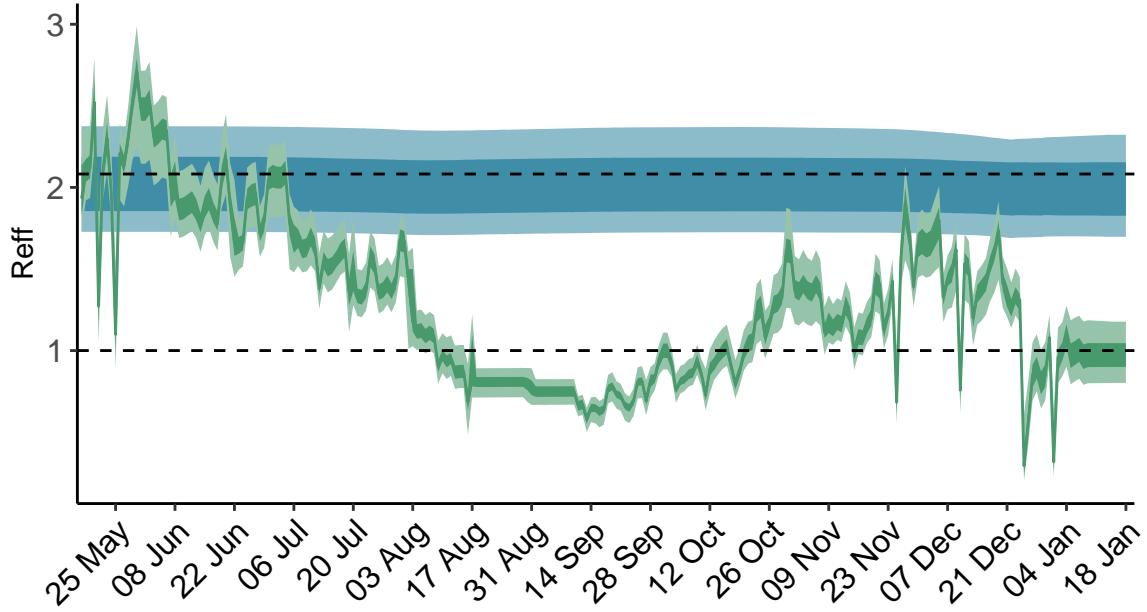


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

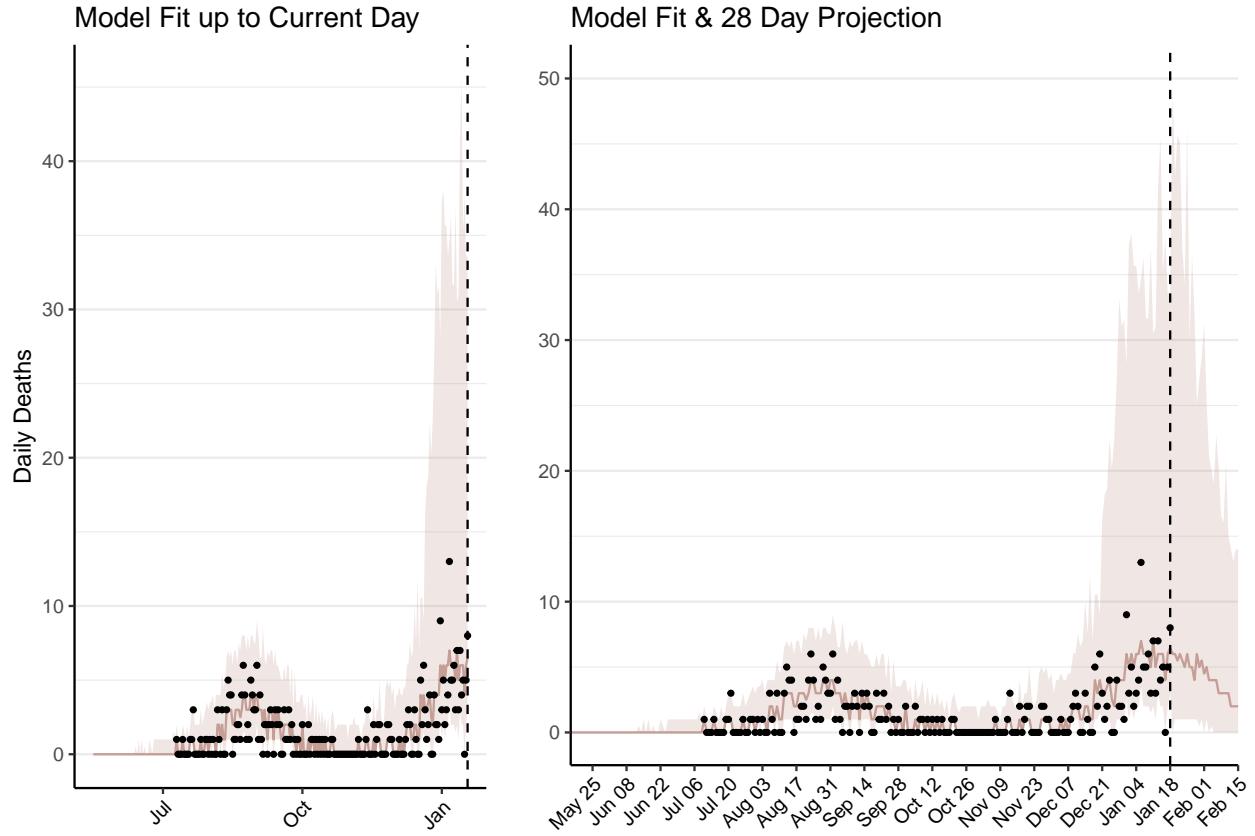


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 312 (95% CI: 252-373) patients requiring treatment with high-pressure oxygen at the current date to 108 (95% CI: 84-132) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 102 (95% CI: 91-113) patients requiring treatment with mechanical ventilation at the current date to 46 (95% CI: 38-54) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

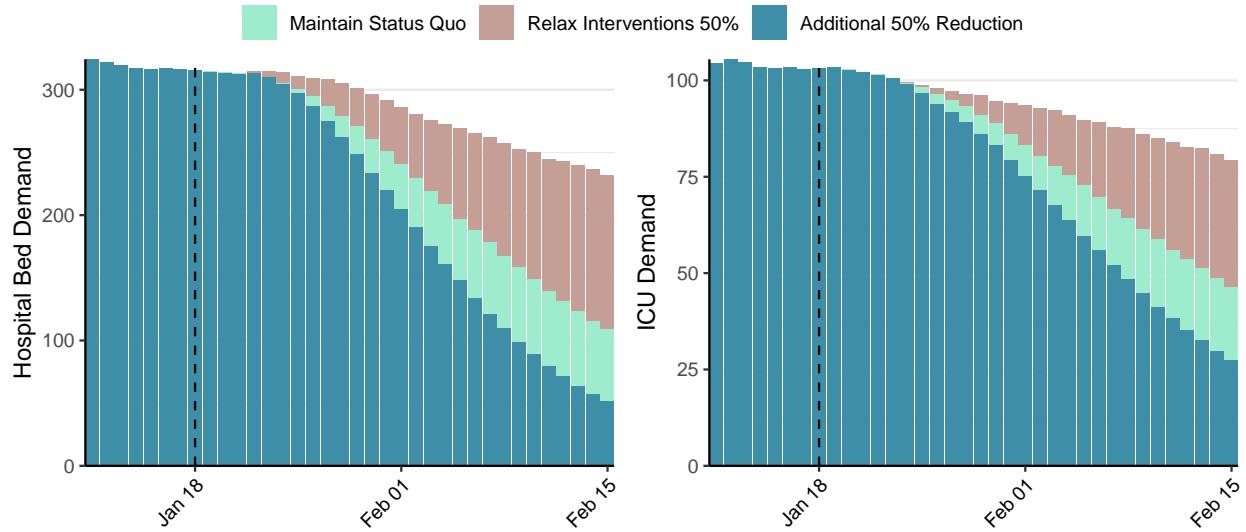


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 3,685 (95% CI: 2,835-4,536) at the current date to 68 (95% CI: 51-86) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,685 (95% CI: 2,835-4,536) at the current date to 2,353 (95% CI: 1,721-2,985) by 2021-02-15.

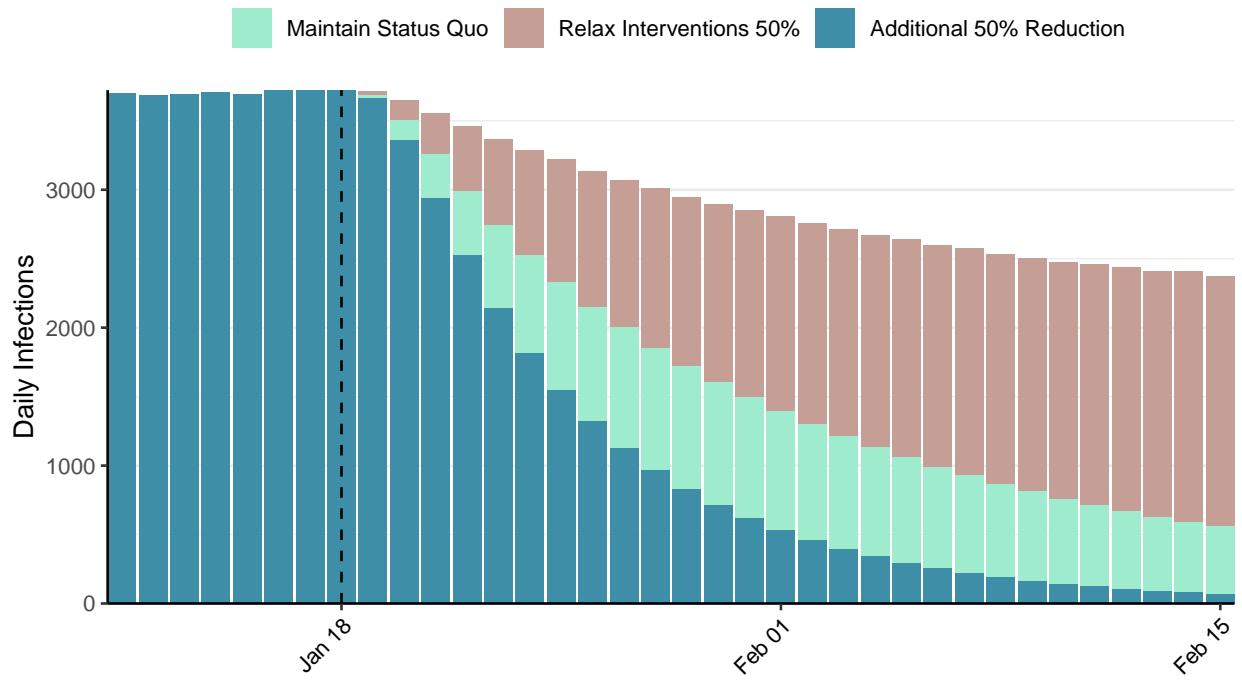


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Niger, 2021-01-18

[Download the report for Niger, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.95 (95% CI: 0.81-1.12)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Niger is not shown in the following plot as only 0 deaths have been reported to date**

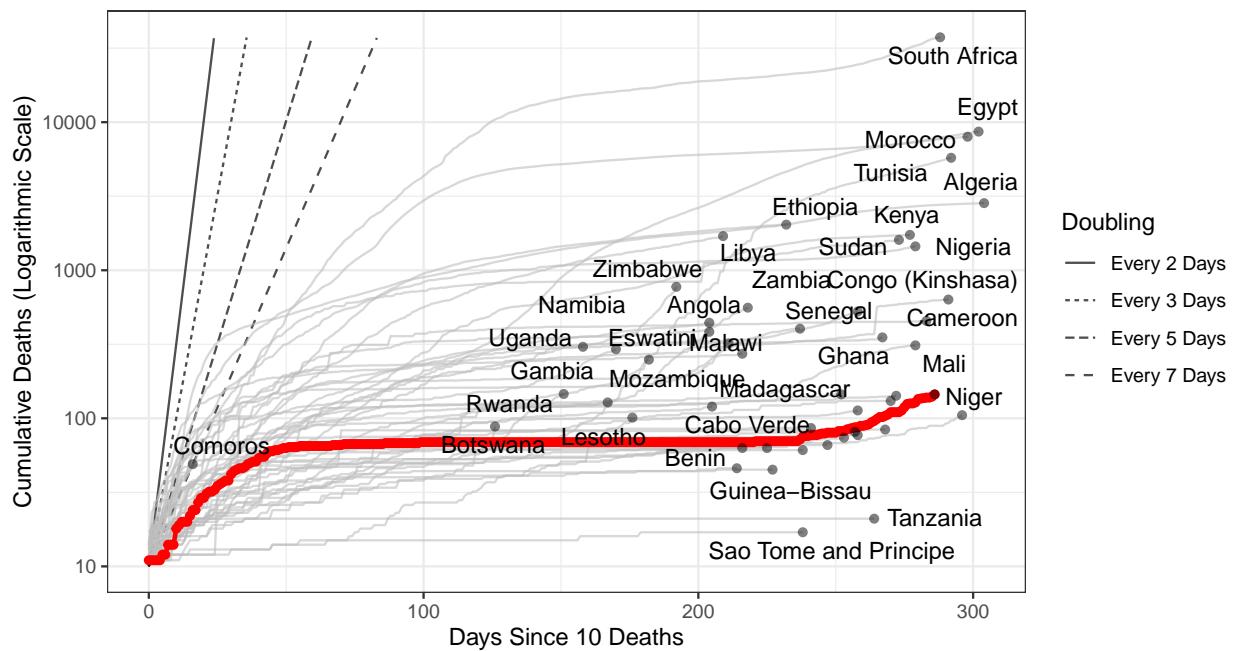


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 43,681 (95% CI: 40,295-47,067) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. Niger has revised their historic reported cases and thus have reported negative cases.**

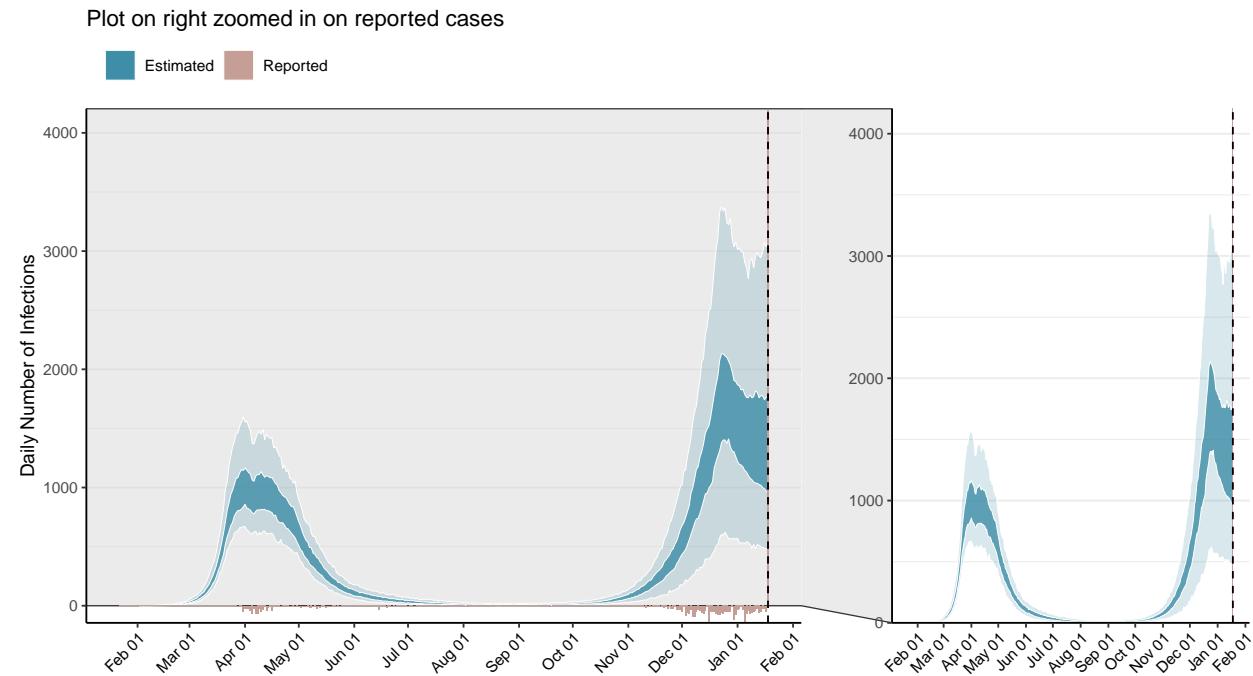


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

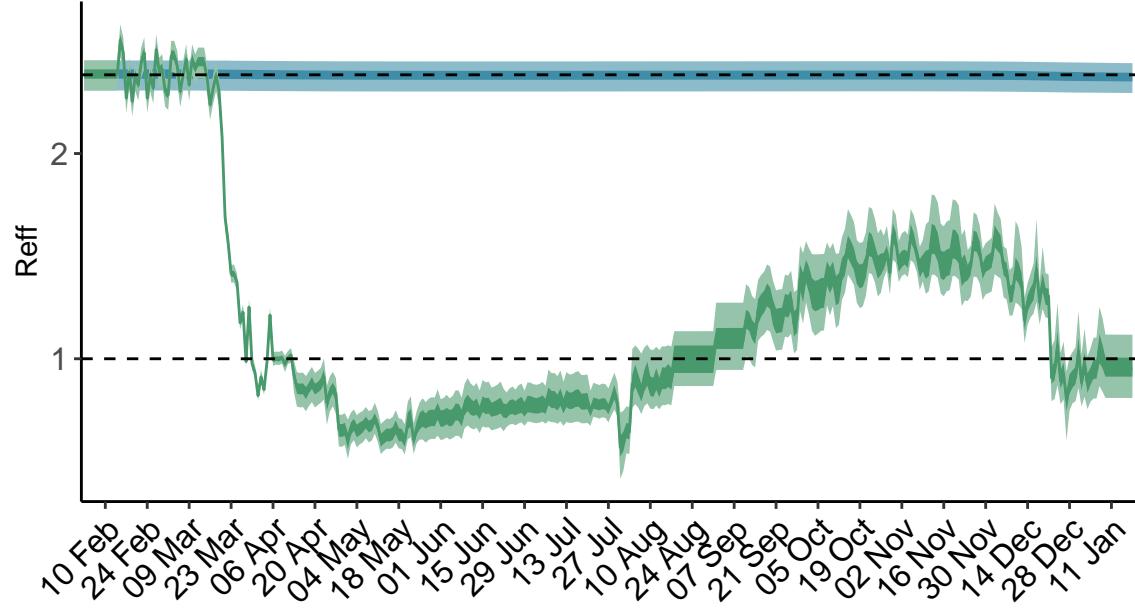


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

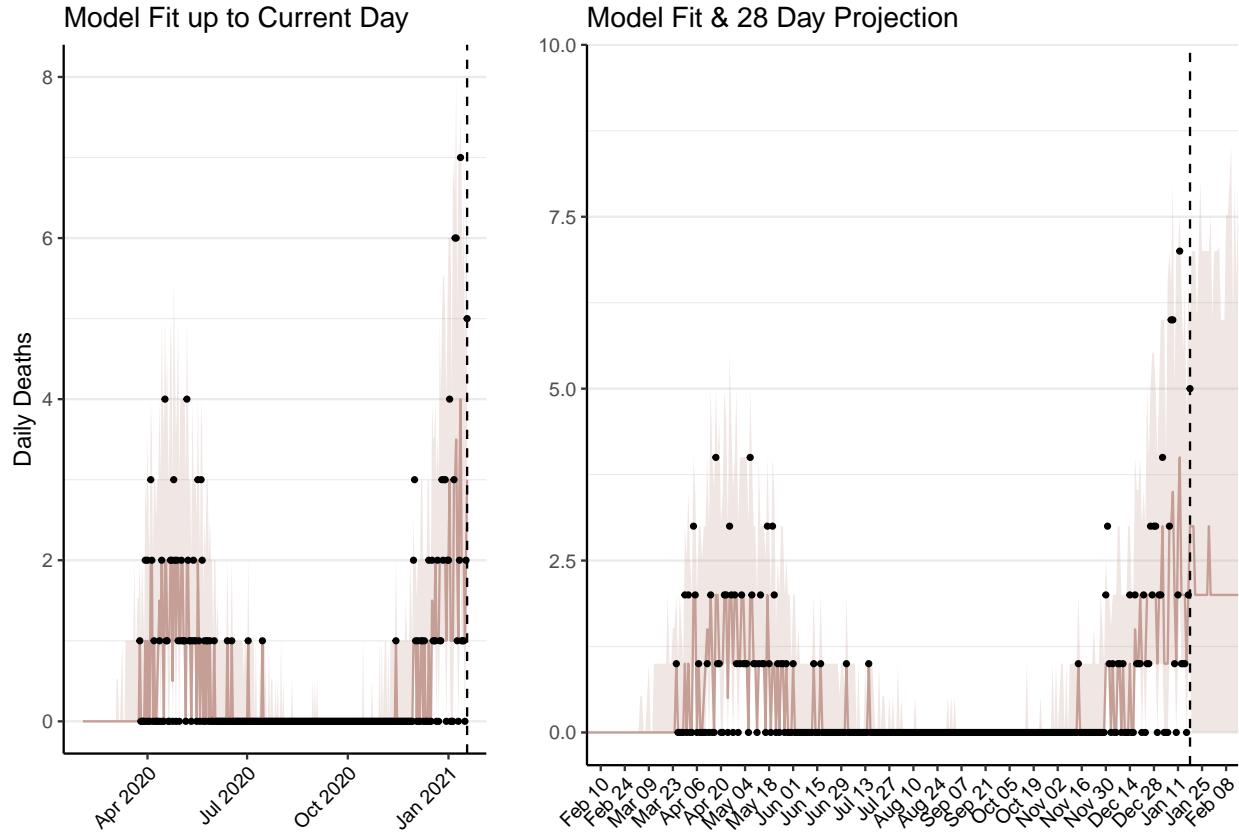


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 110 (95% CI: 101-119) patients requiring treatment with high-pressure oxygen at the current date to 103 (95% CI: 90-116) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 44 (95% CI: 41-48) patients requiring treatment with mechanical ventilation at the current date to 41 (95% CI: 36-45) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

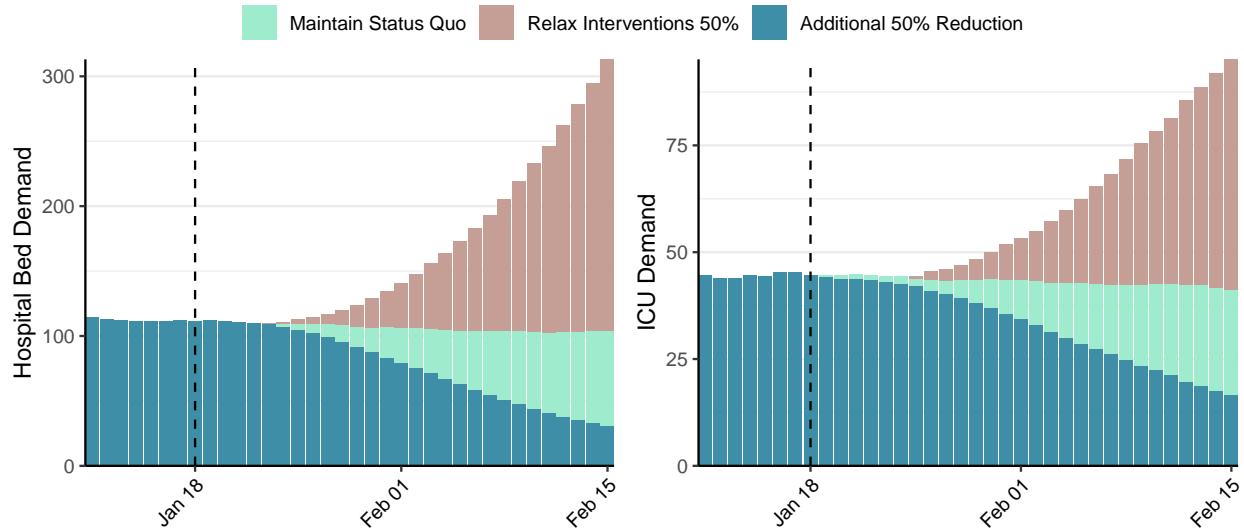


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 1,448 (95% CI: 1,314-1,581) at the current date to 113 (95% CI: 98-128) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,448 (95% CI: 1,314-1,581) at the current date to 7,966 (95% CI: 6,780-9,152) by 2021-02-15.

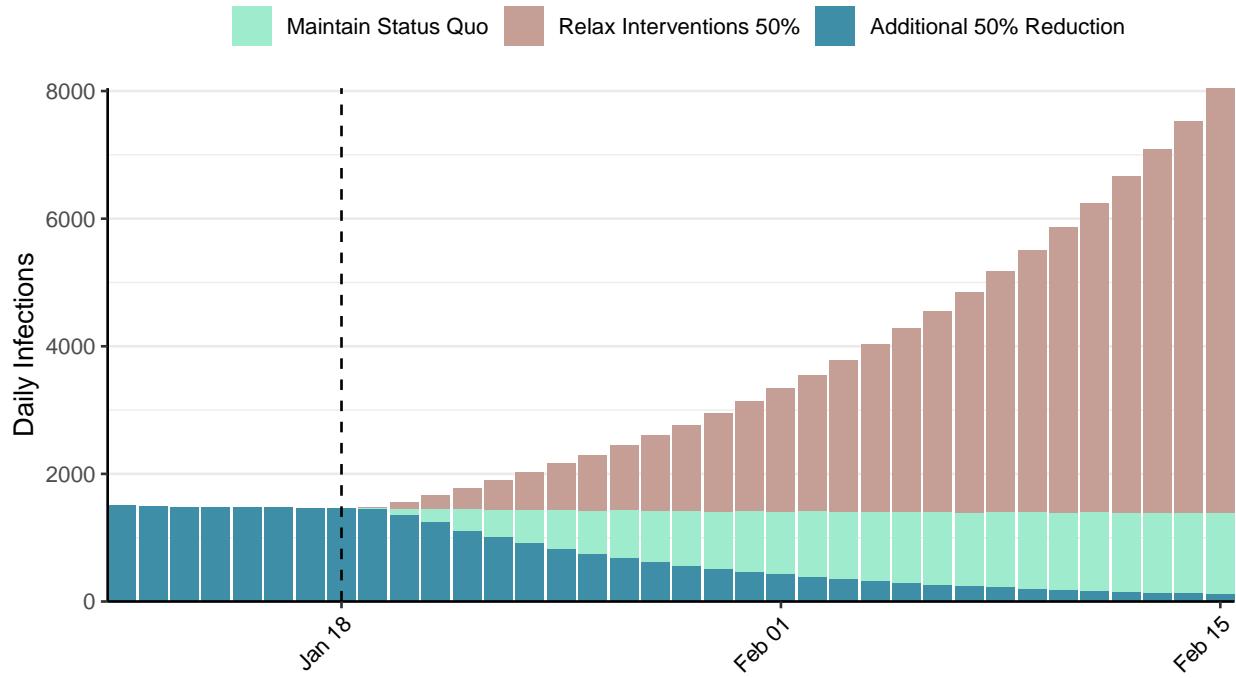


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Nigeria, 2021-01-18

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Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.02 (95% CI: 0.79-1.27)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Nigeria is not shown in the following plot as only 0 deaths have been reported to date**

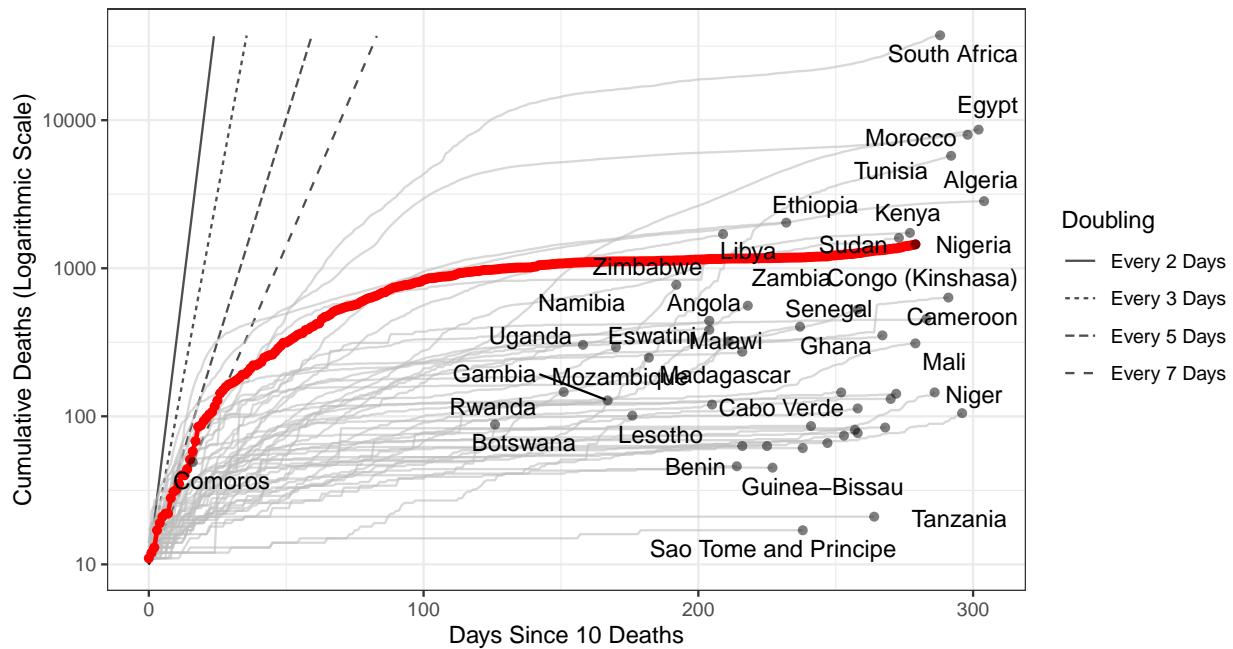


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 309,623 (95% CI: 290,654–328,592) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

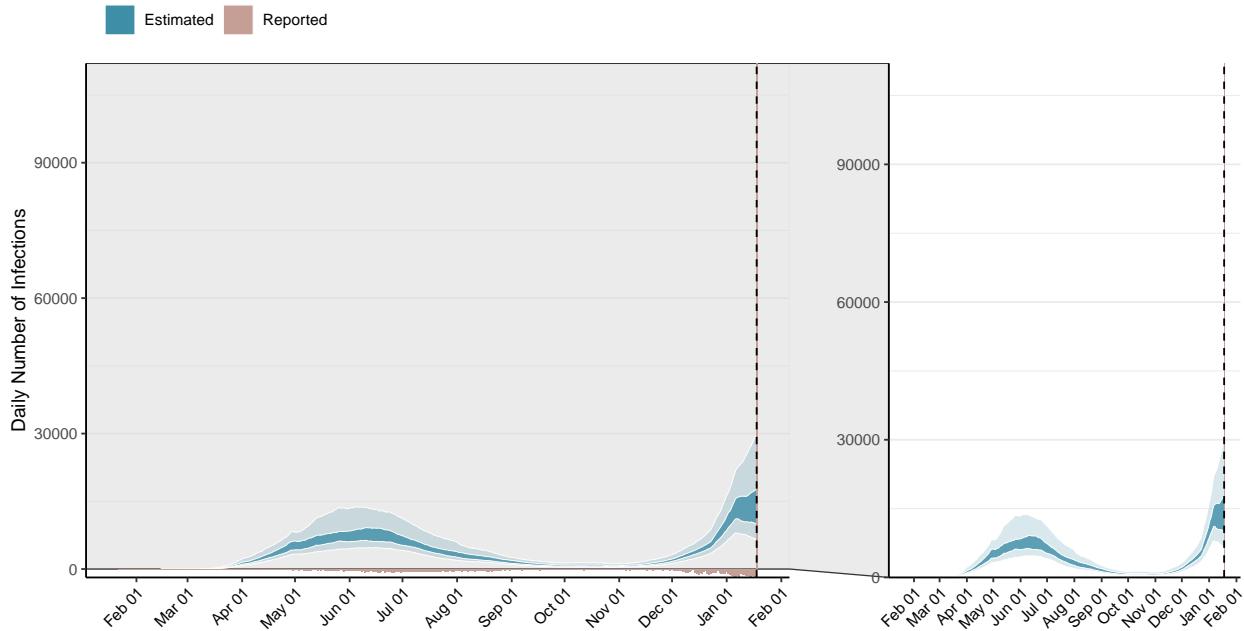


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

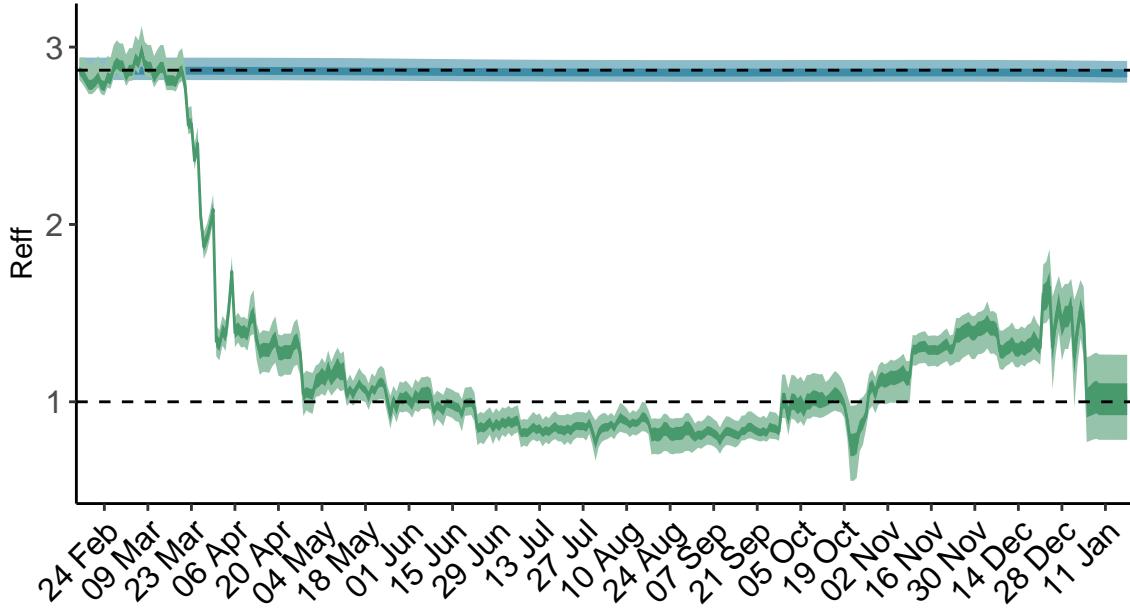


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

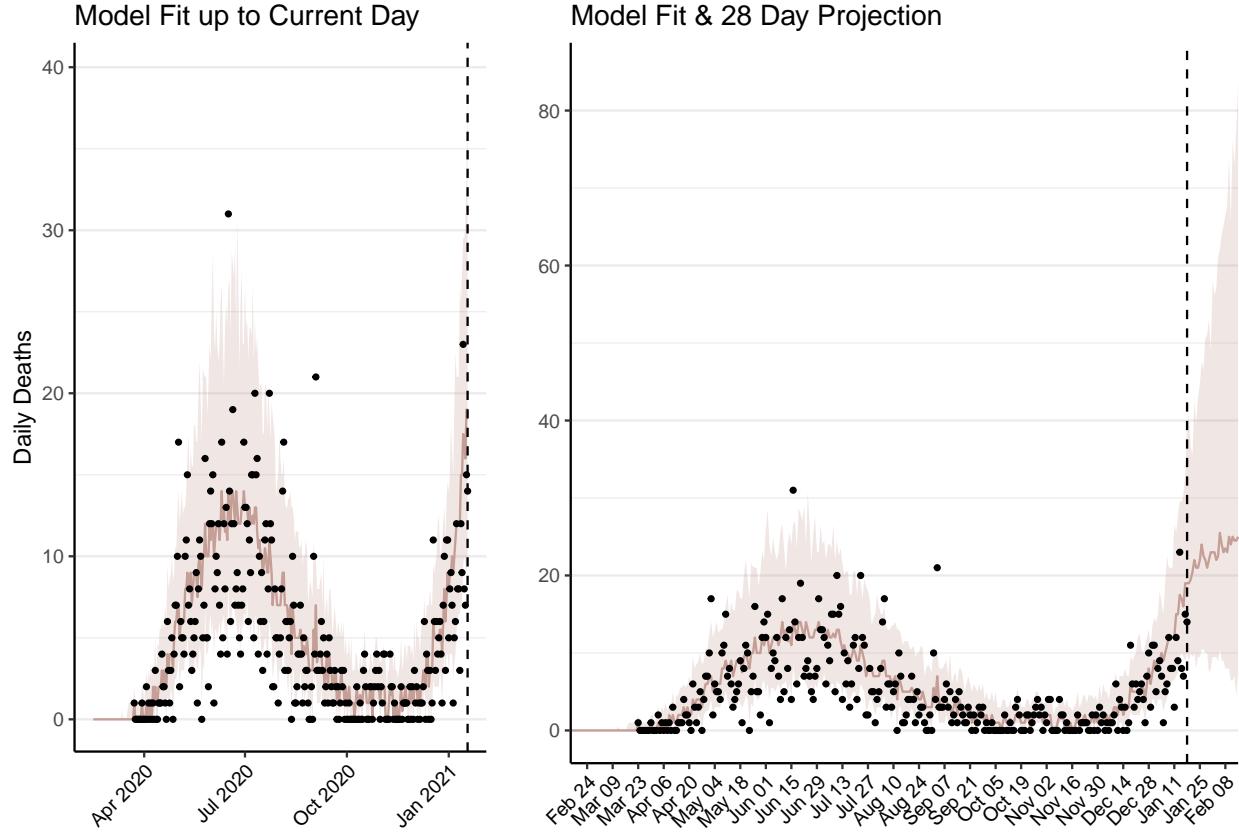


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 934 (95% CI: 875-993) patients requiring treatment with high-pressure oxygen at the current date to 1,329 (95% CI: 1,137-1,521) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 348 (95% CI: 326-369) patients requiring treatment with mechanical ventilation at the current date to 524 (95% CI: 453-596) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

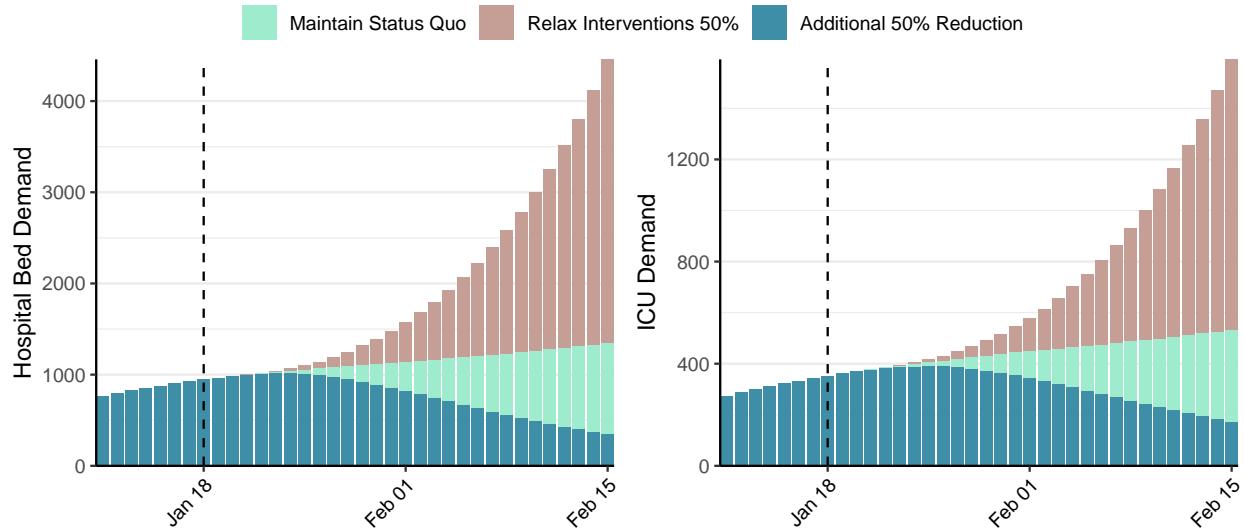


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 14,391 (95% CI: 13,117-15,665) at the current date to 1,554 (95% CI: 1,303-1,805) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 14,391 (95% CI: 13,117-15,665) at the current date to 124,842 (95% CI: 100,755-148,929) by 2021-02-15.

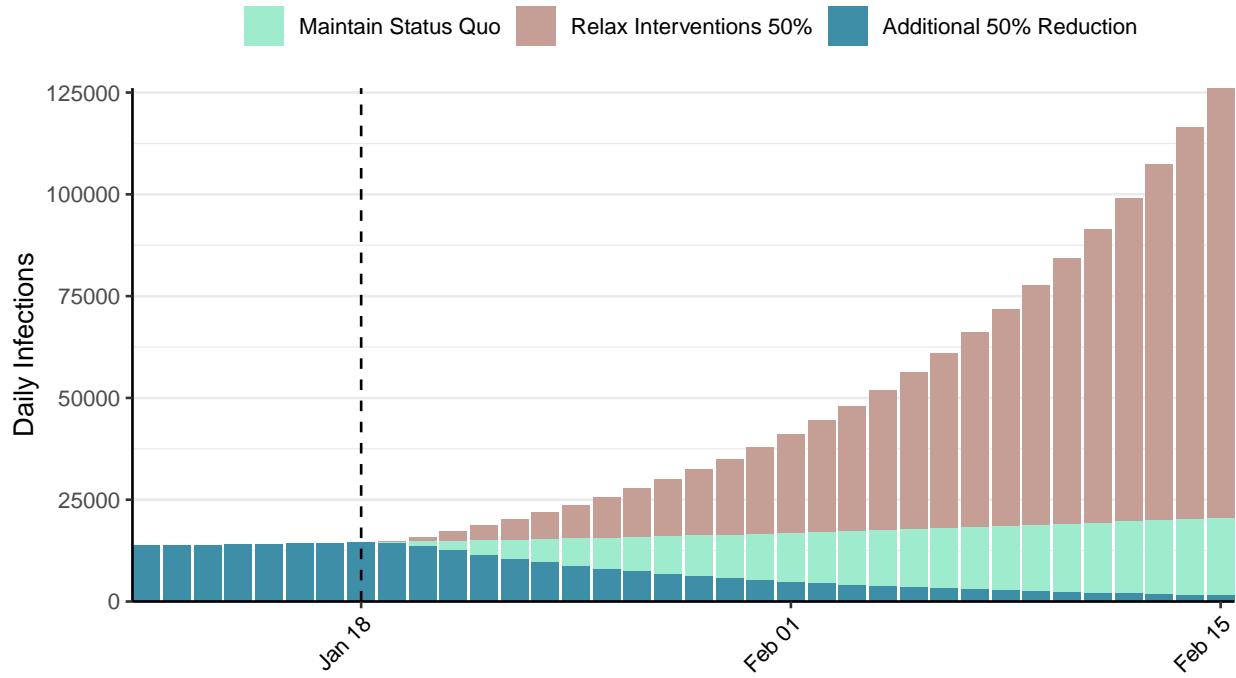


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Nicaragua, 2021-01-18

[Download the report for Nicaragua, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.78 (95% CI: 0.6-1)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Nicaragua is not shown in the following plot as only 0 deaths have been reported to date**

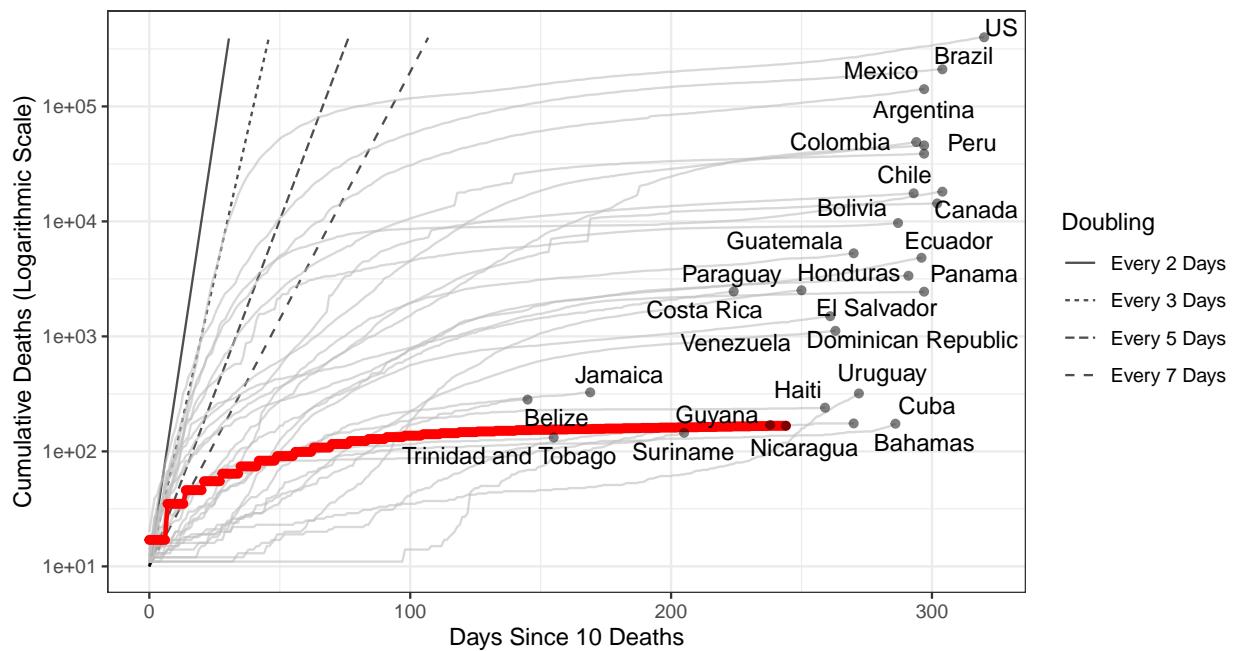


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 2,541 (95% CI: 2,201-2,880) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

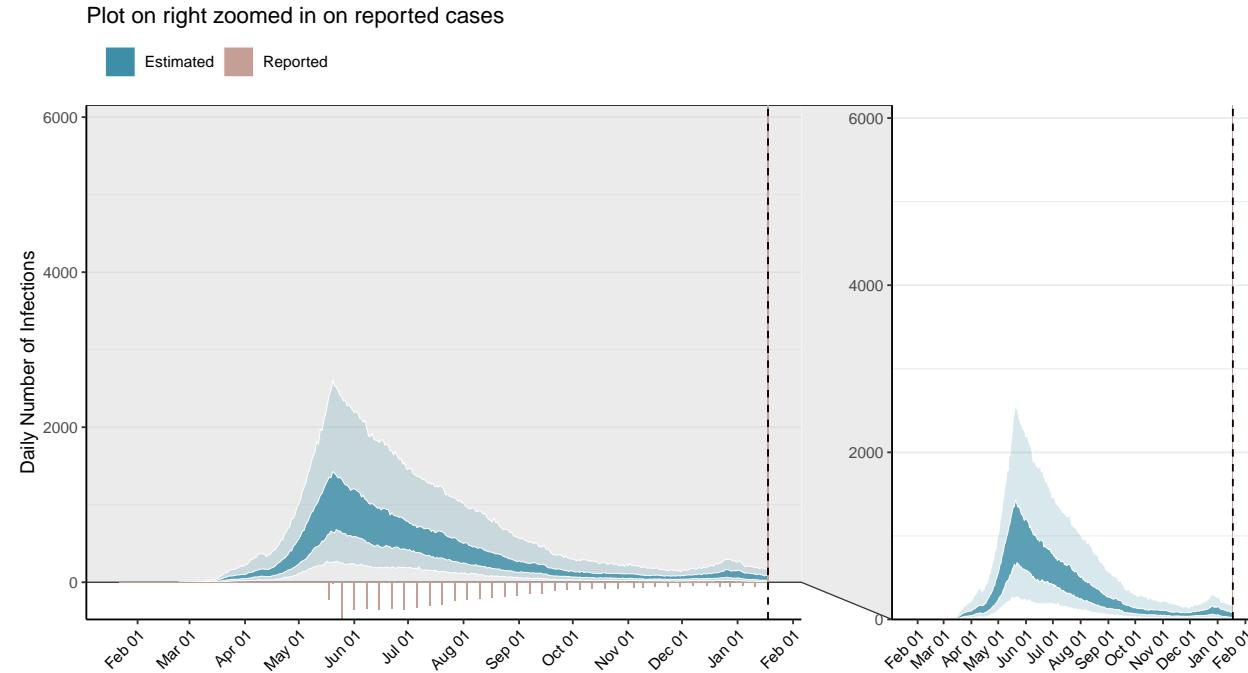


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

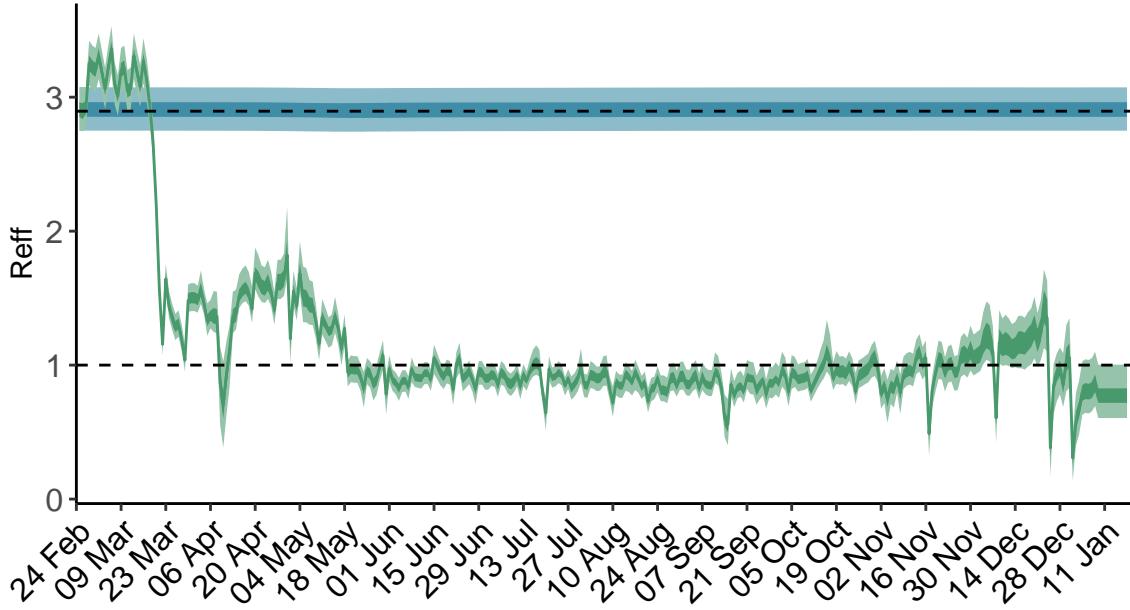


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

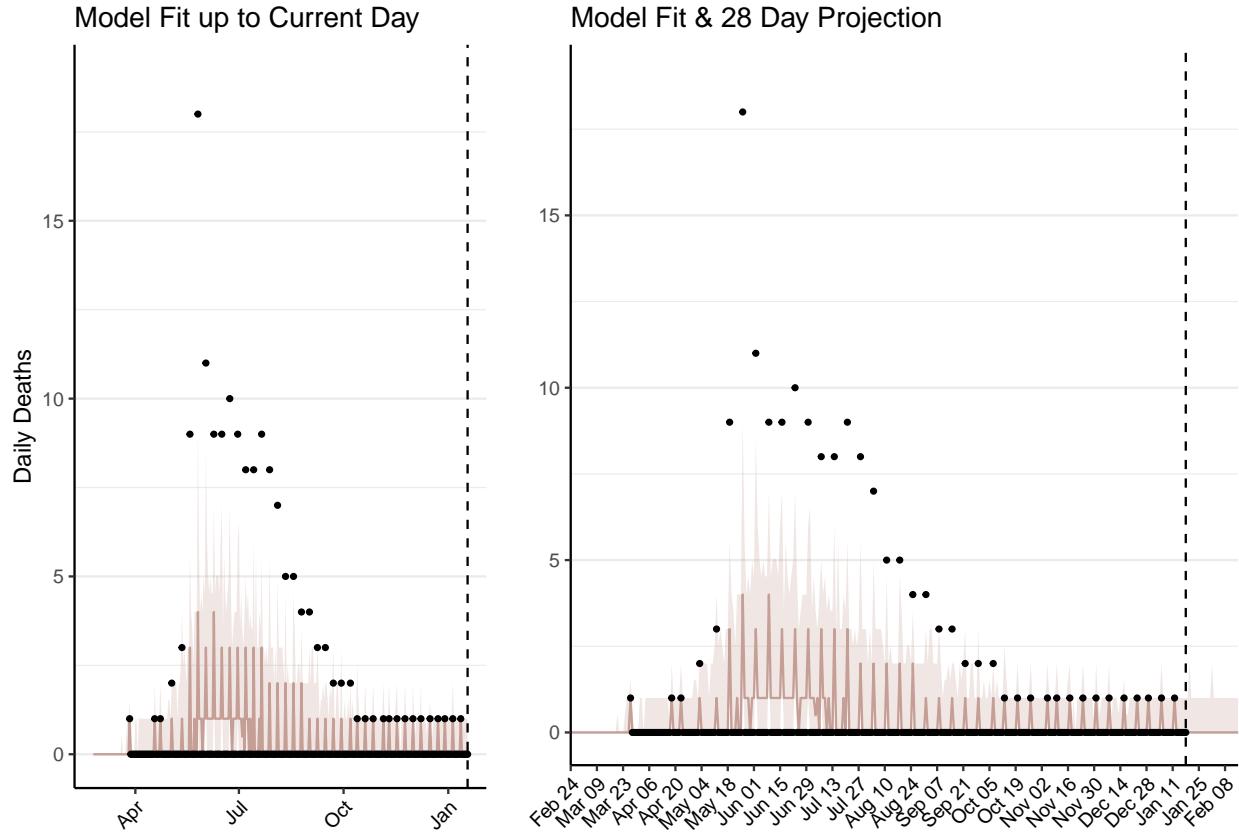


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 7 (95% CI: 6-8) patients requiring treatment with high-pressure oxygen at the current date to 3 (95% CI: 2-4) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 2 (95% CI: 2-3) patients requiring treatment with mechanical ventilation at the current date to 1 (95% CI: 1-1) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

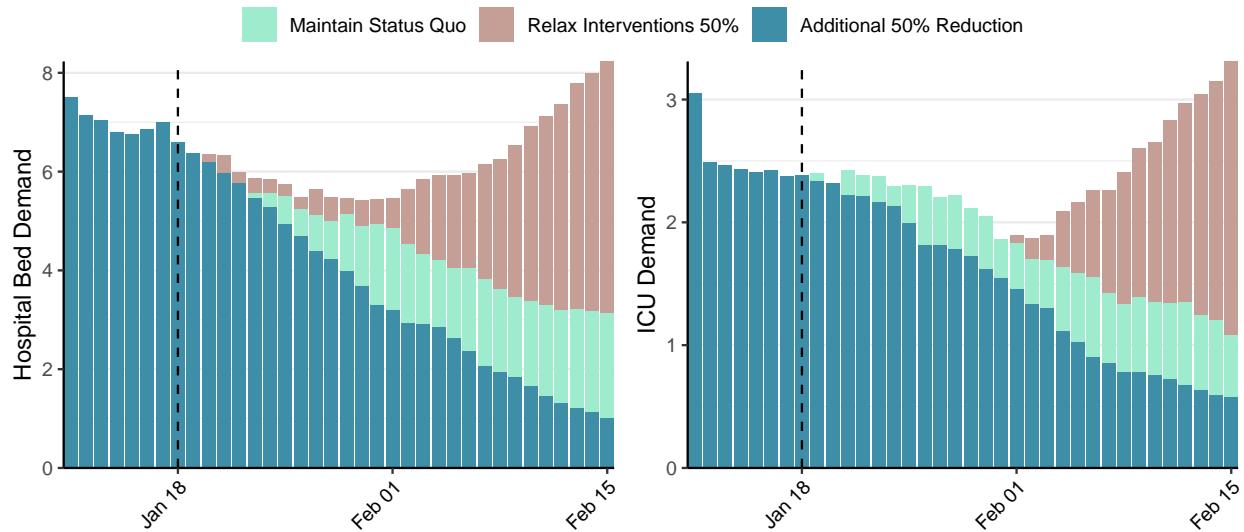


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 63 (95% CI: 52-73) at the current date to 3 (95% CI: 2-4) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 63 (95% CI: 52-73) at the current date to 170 (95% CI: 122-218) by 2021-02-15.

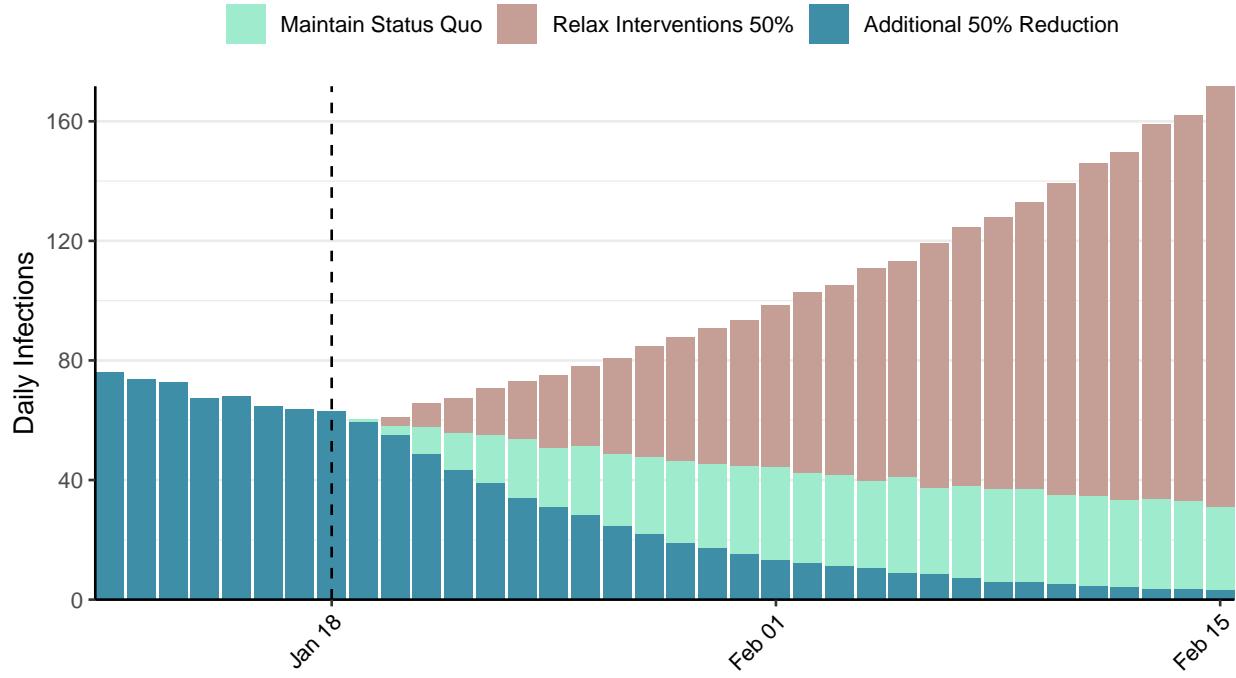


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](#) - <https://covidsim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Nepal, 2021-01-18

[Download the report for Nepal, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.85 (95% CI: 0.72-1.01)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Nepal is not shown in the following plot as only 0 deaths have been reported to date**

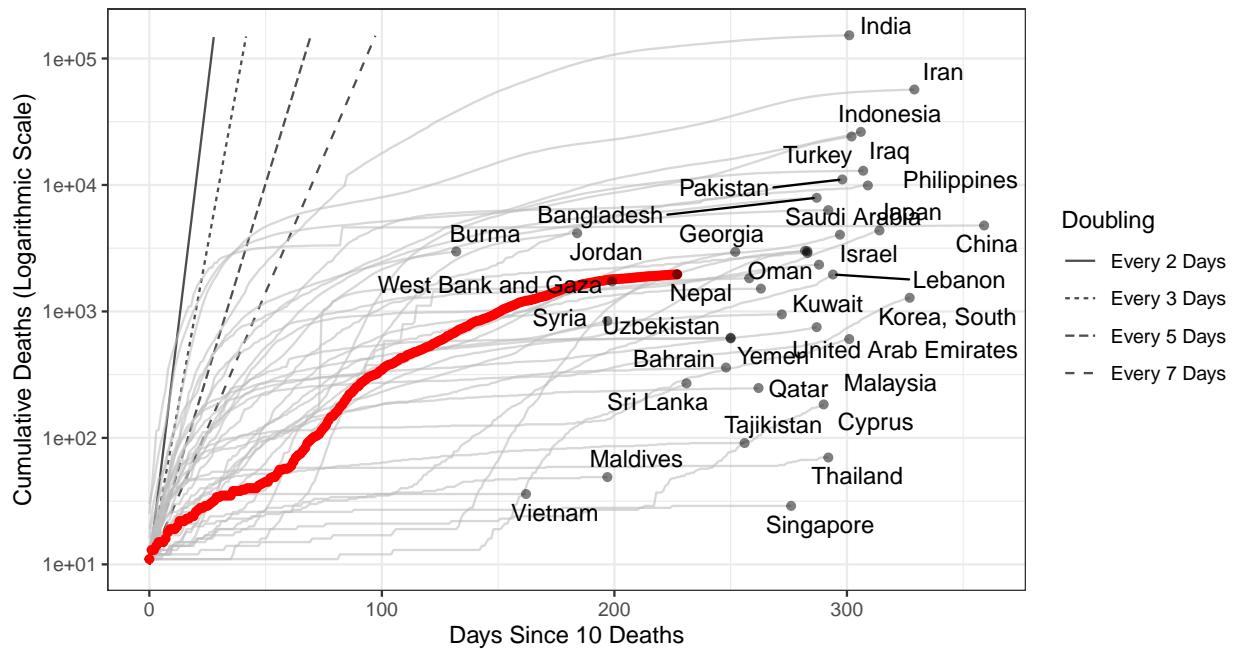


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 92,560 (95% CI: 86,071-99,049) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. Nepal has revised their historic reported cases and thus have reported negative cases.**

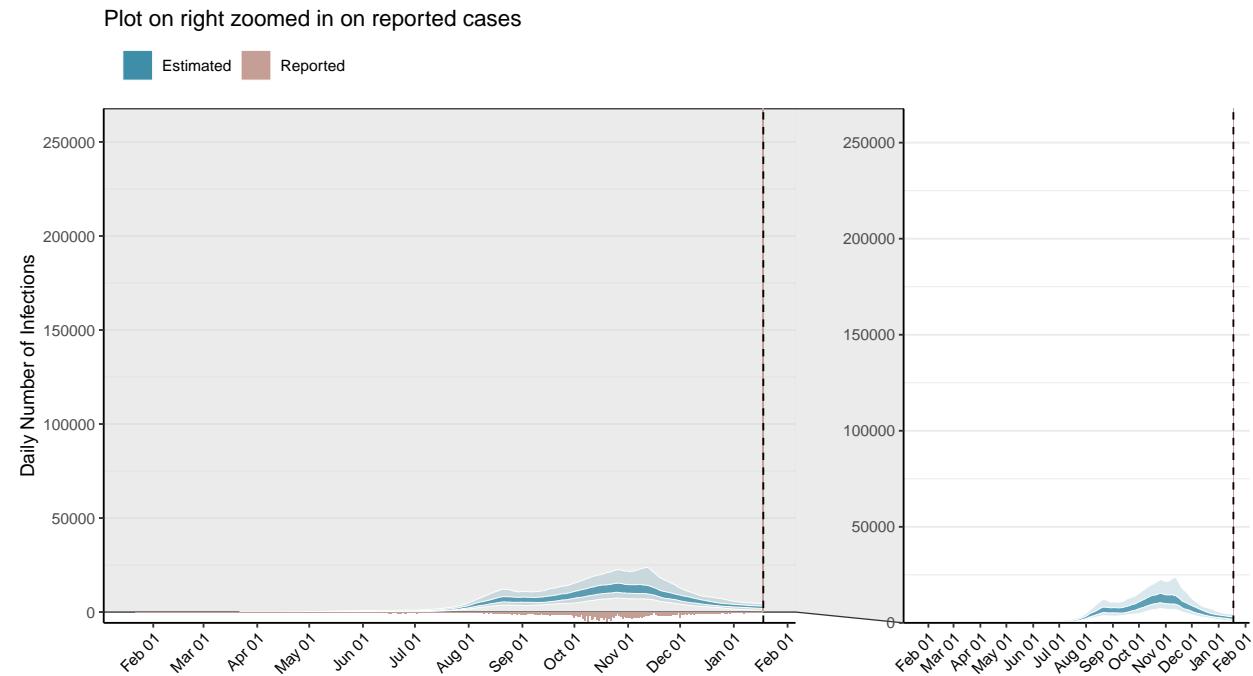


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

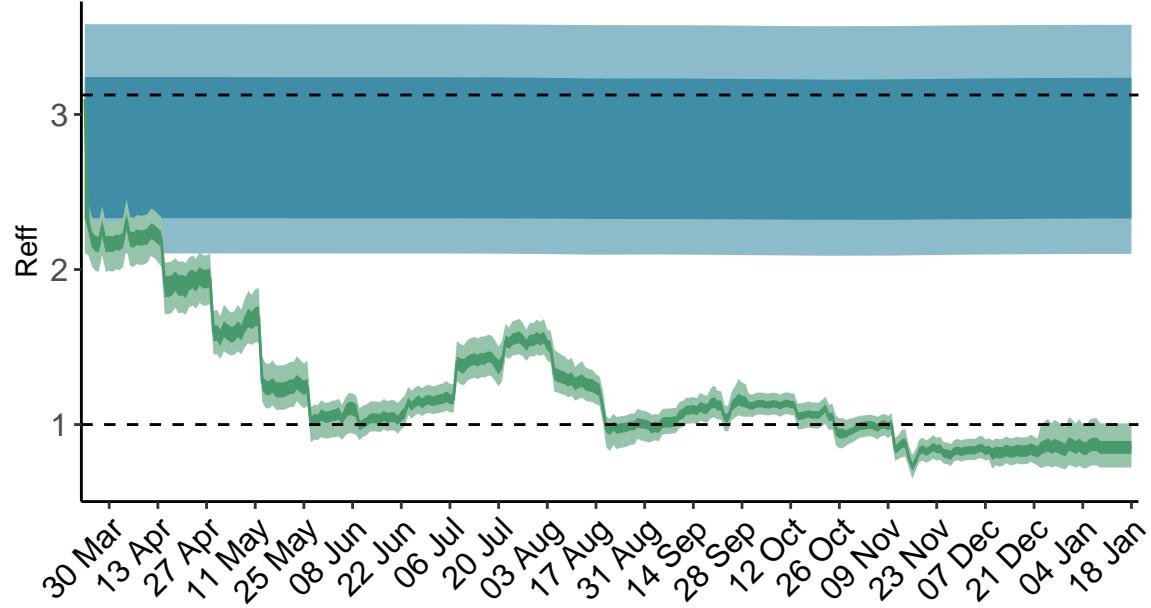


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

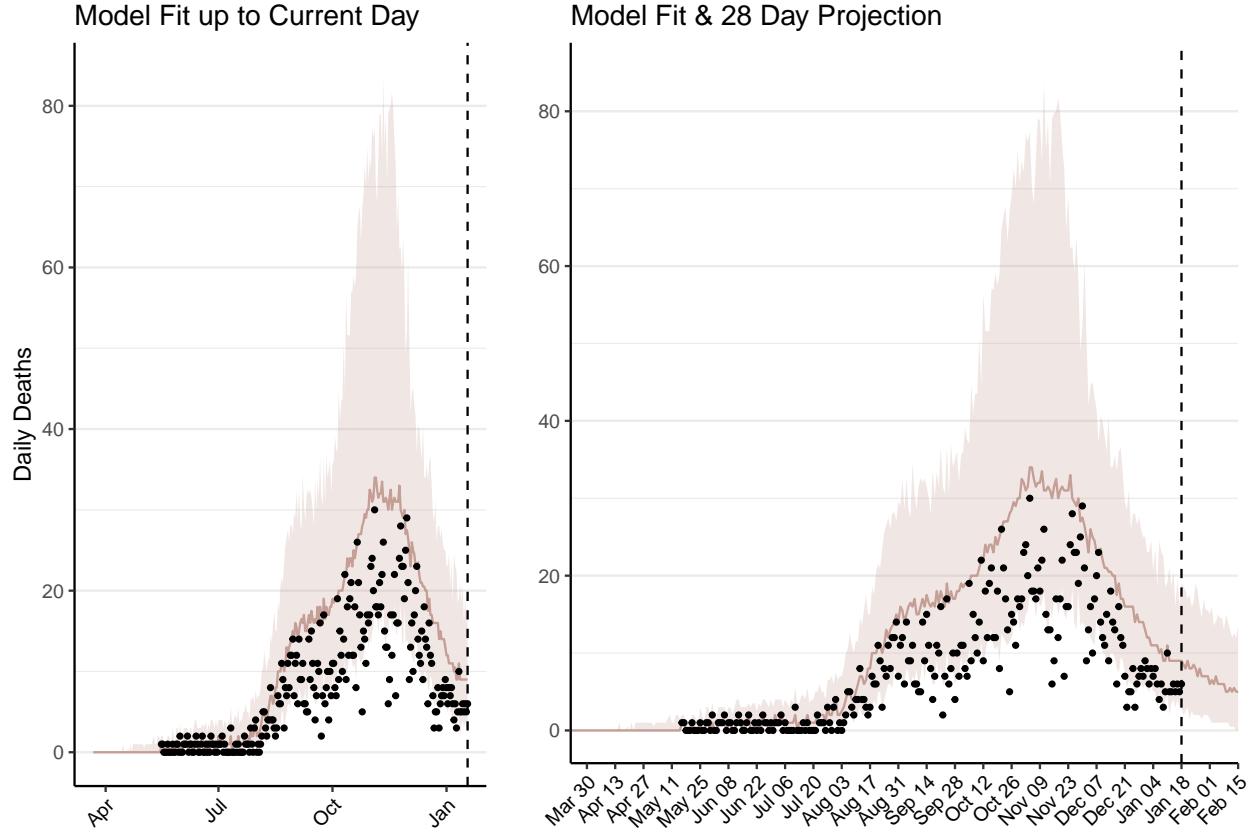


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 331 (95% CI: 307-356) patients requiring treatment with high-pressure oxygen at the current date to 197 (95% CI: 170-224) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 140 (95% CI: 130-149) patients requiring treatment with mechanical ventilation at the current date to 84 (95% CI: 73-95) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

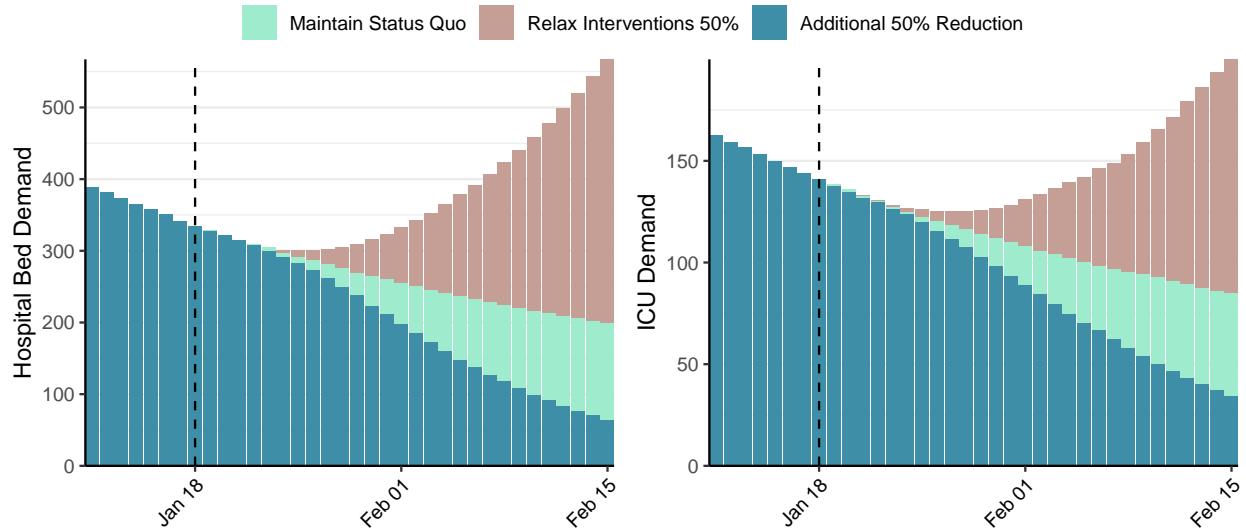


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 2,510 (95% CI: 2,271-2,748) at the current date to 143 (95% CI: 121-165) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,510 (95% CI: 2,271-2,748) at the current date to 8,551 (95% CI: 6,976-10,125) by 2021-02-15.

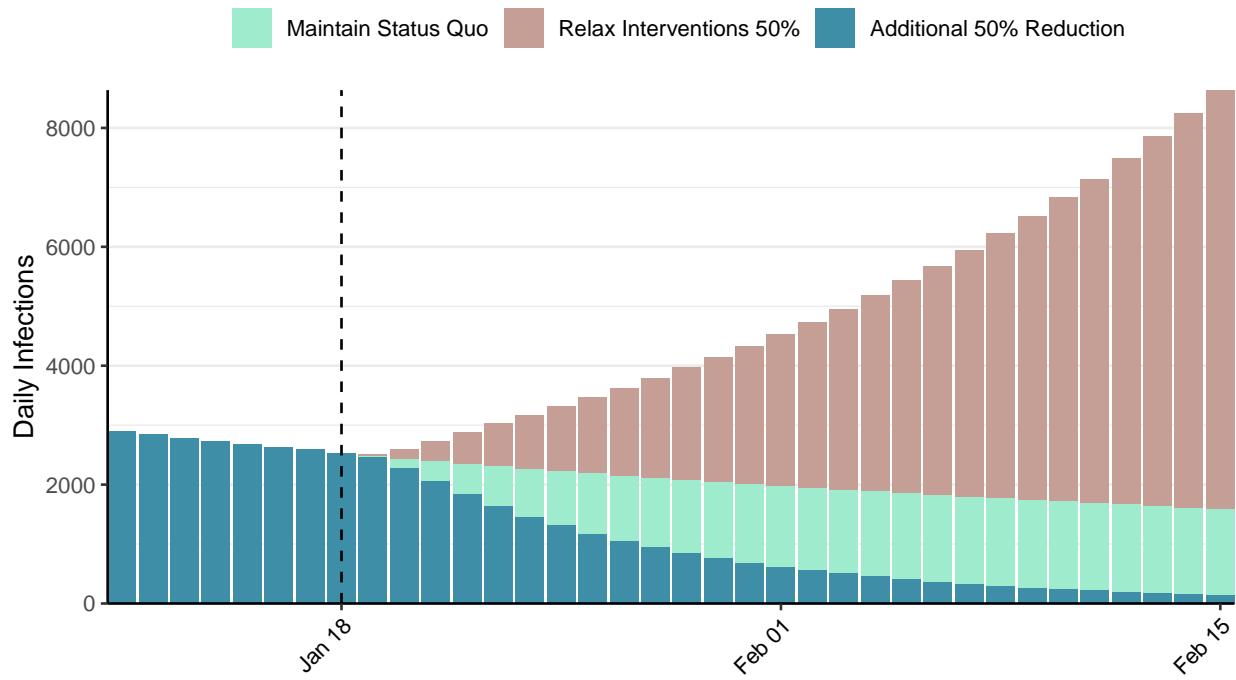


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Pakistan, 2021-01-18

[Download the report for Pakistan, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.05 (95% CI: 0.88-1.2)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Pakistan is not shown in the following plot as only 0 deaths have been reported to date**

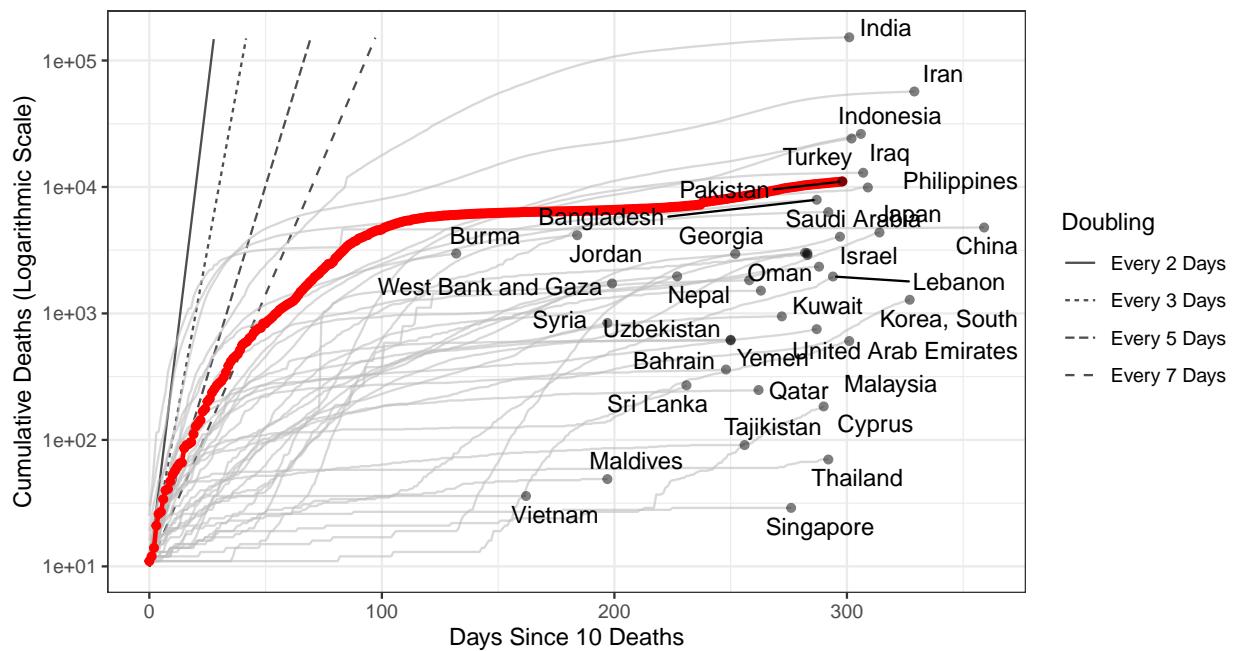


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 886,051 (95% CI: 838,510-933,592) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

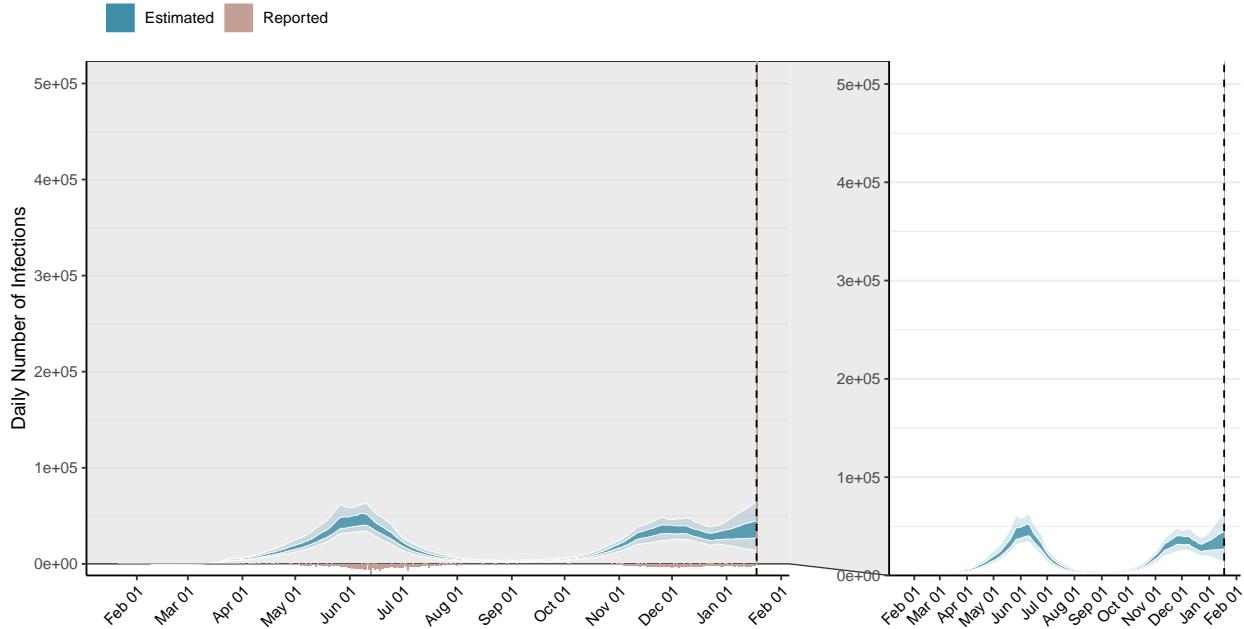


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

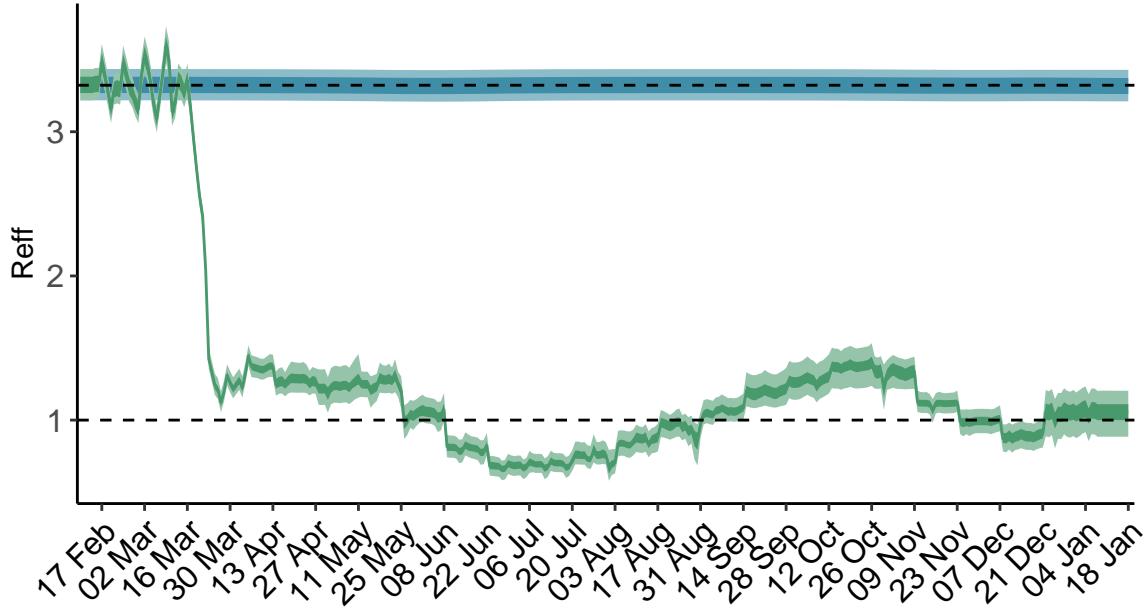


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Pakistan is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

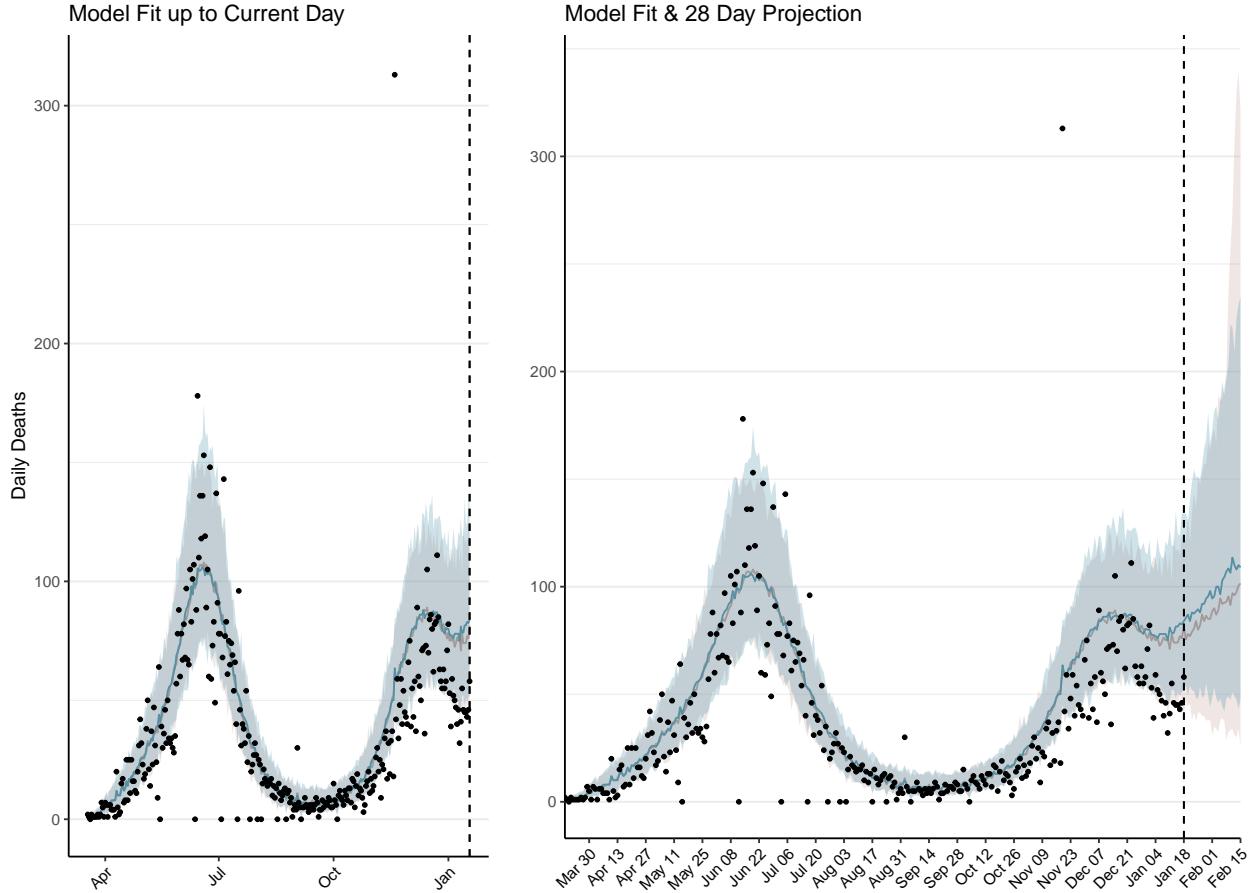


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 3,181 (95% CI: 3,000-3,362) patients requiring treatment with high-pressure oxygen at the current date to 4,374 (95% CI: 3,901-4,846) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 1,212 (95% CI: 1,146-1,277) patients requiring treatment with mechanical ventilation at the current date to 1,613 (95% CI: 1,461-1,765) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

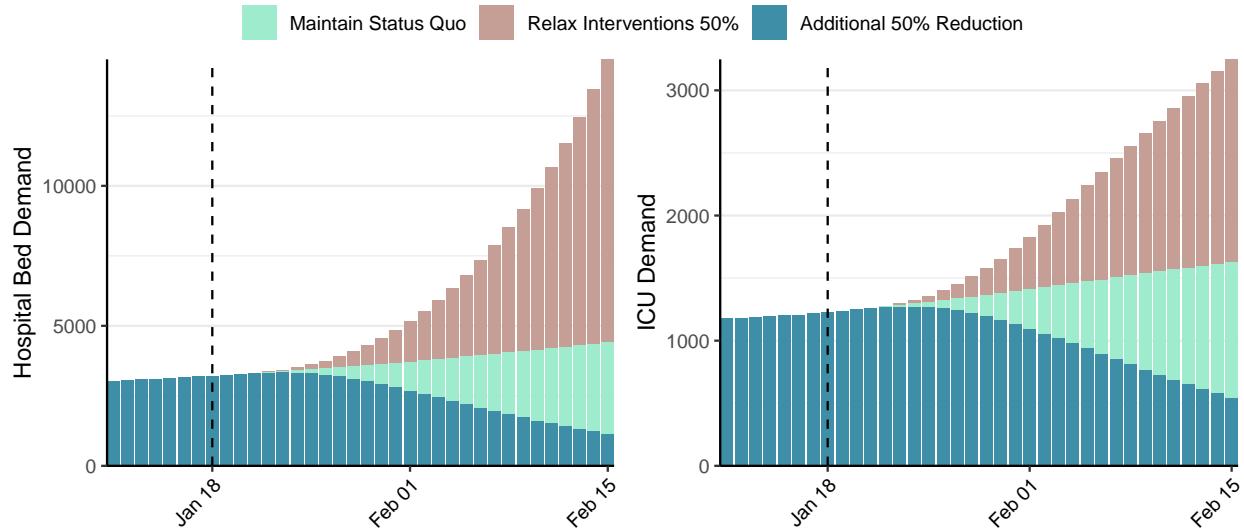


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 36,292 (95% CI: 33,577-39,006) at the current date to 4,027 (95% CI: 3,550-4,503) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 36,292 (95% CI: 33,577-39,006) at the current date to 312,950 (95% CI: 270,644-355,256) by 2021-02-15.

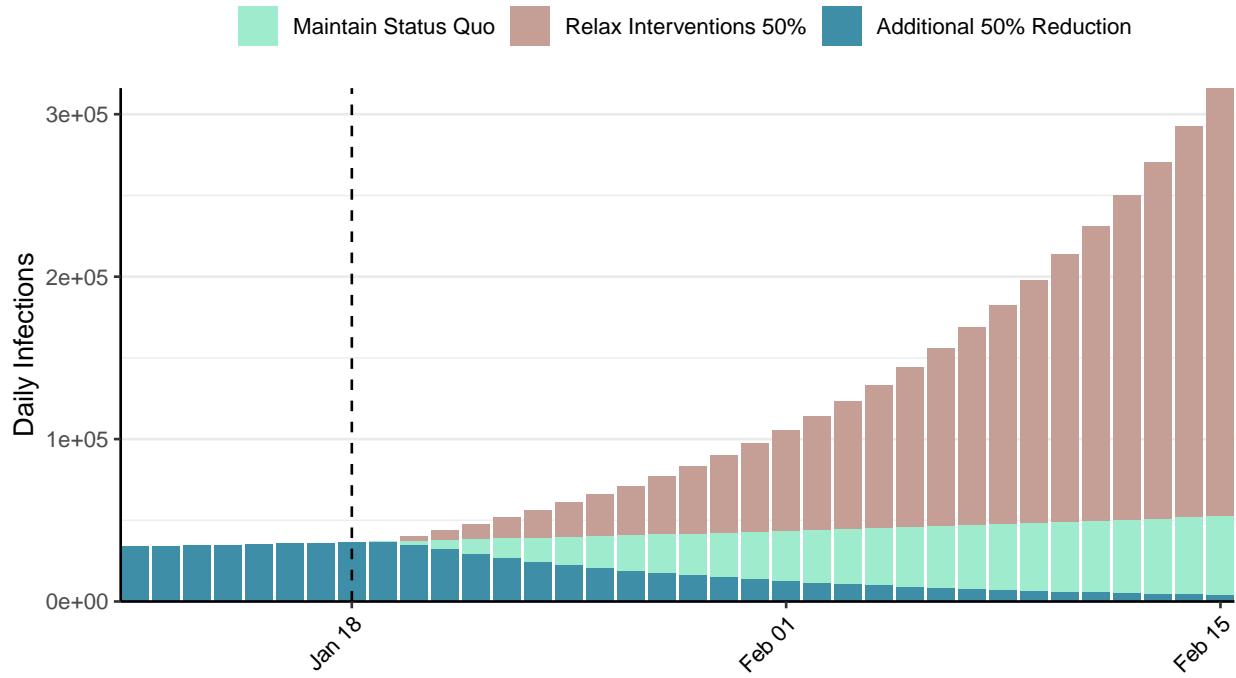


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Panama, 2021-01-18

[Download the report for Panama, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.87 (95% CI: 0.78-0.98)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Panama is not shown in the following plot as only 0 deaths have been reported to date**

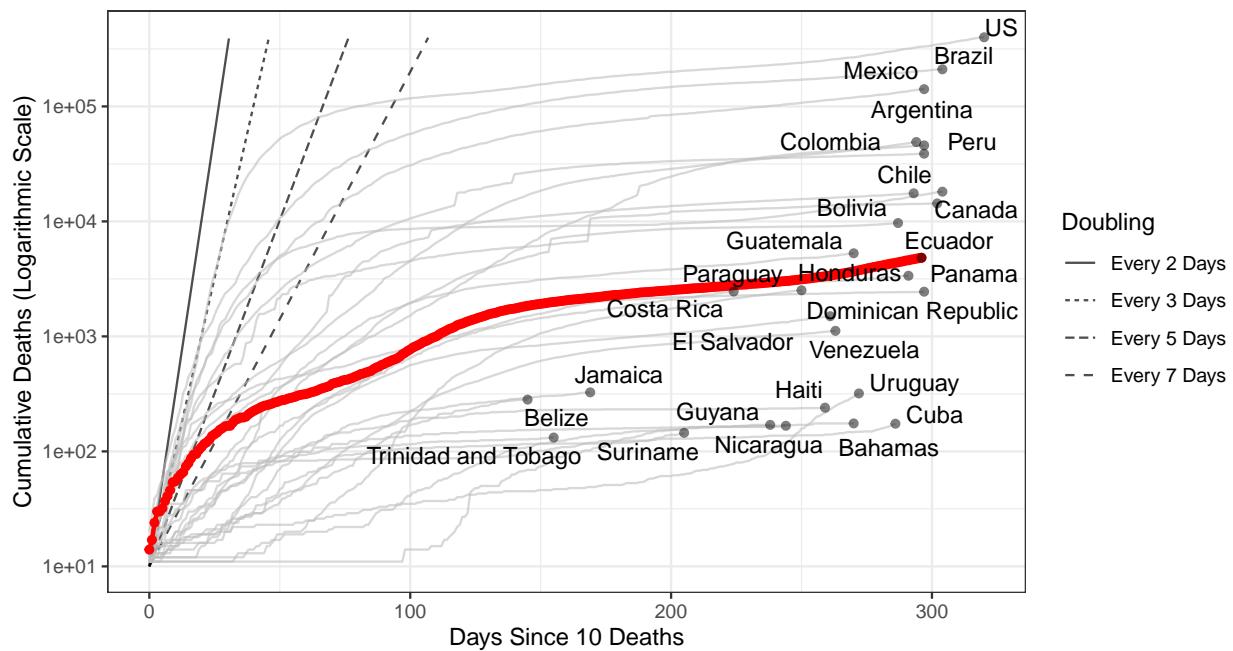


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 351,630 (95% CI: 341,565-361,695) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

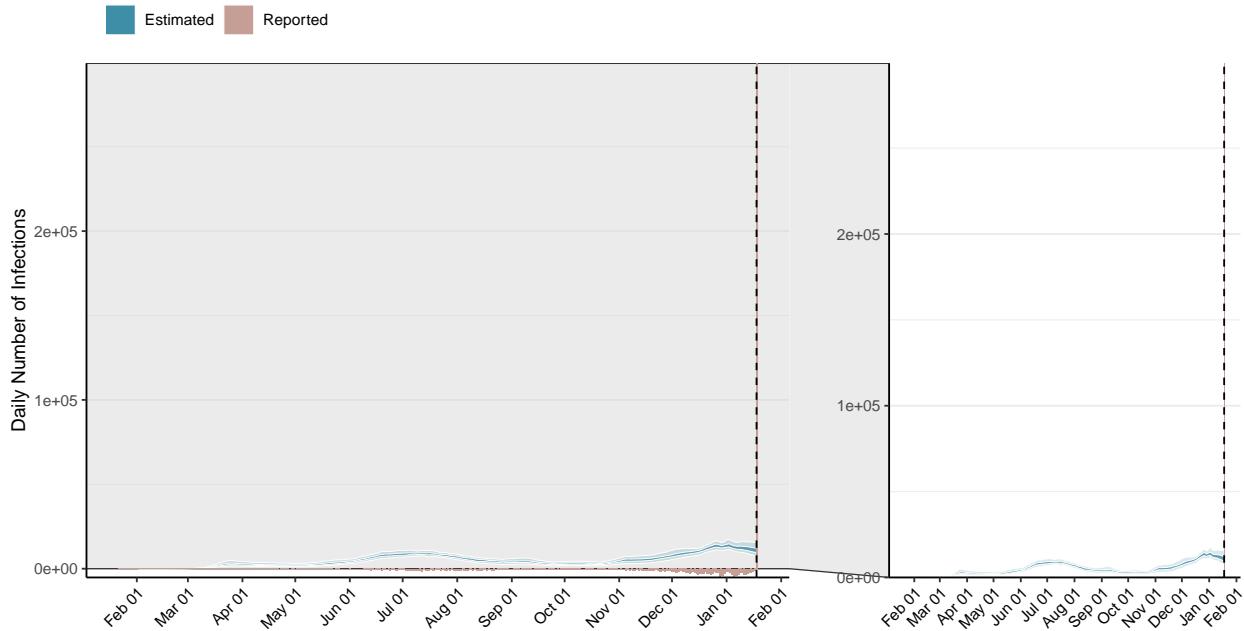


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

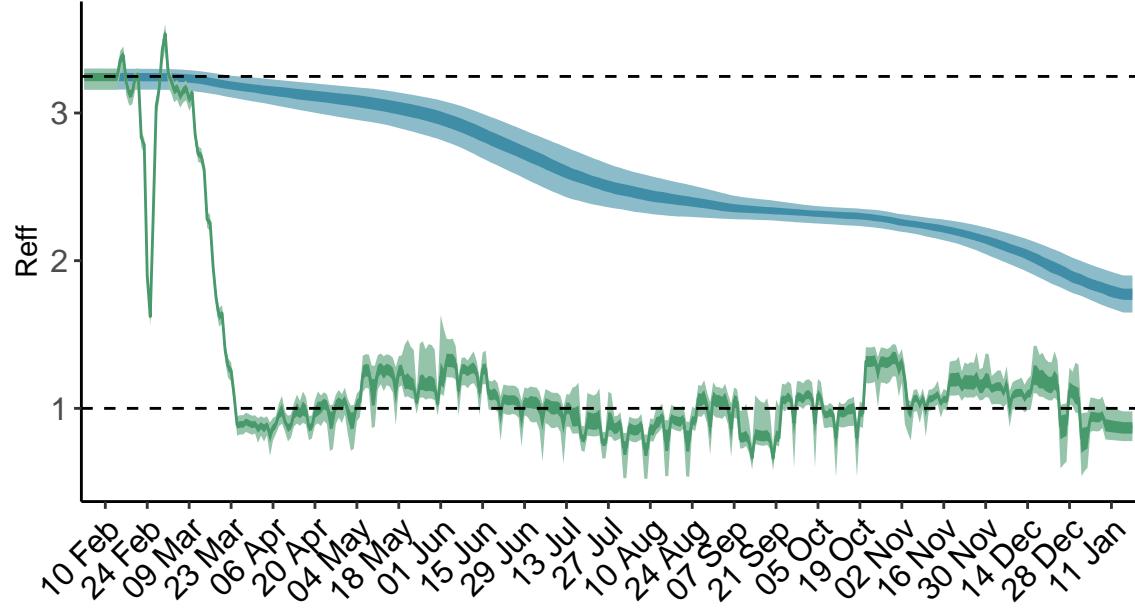


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Panama is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

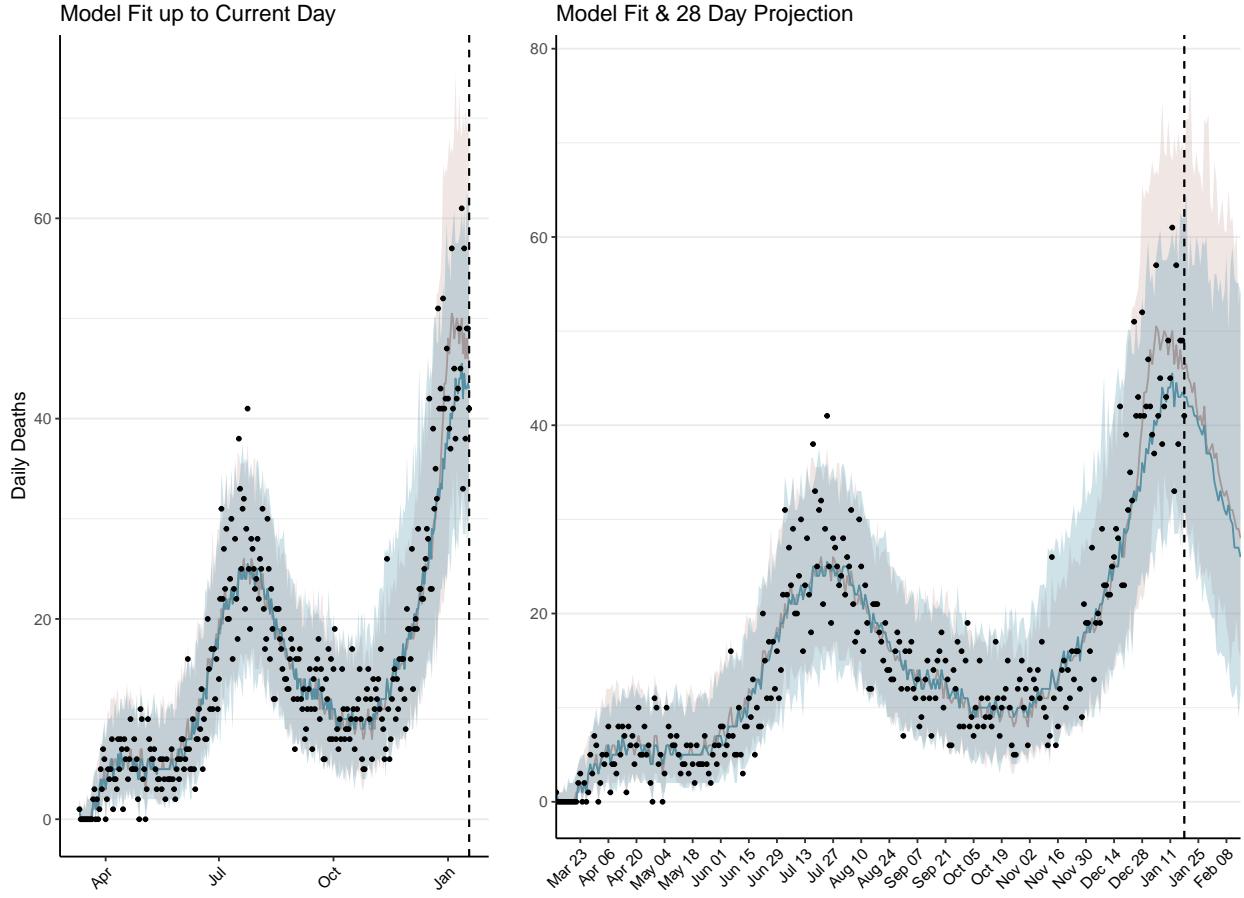


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1,467 (95% CI: 1,422-1,512) patients requiring treatment with high-pressure oxygen at the current date to 958 (95% CI: 898-1,017) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 403 (95% CI: 395-411) patients requiring treatment with mechanical ventilation at the current date to 328 (95% CI: 314-342) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

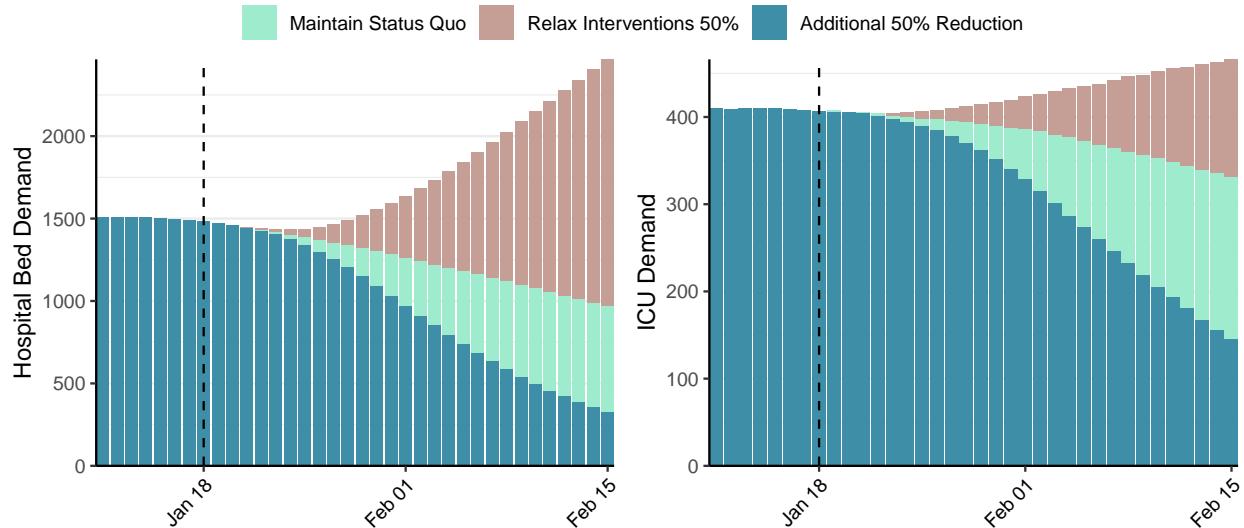


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 10,911 (95% CI: 10,443-11,378) at the current date to 611 (95% CI: 564-657) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 10,911 (95% CI: 10,443-11,378) at the current date to 23,386 (95% CI: 21,919-24,853) by 2021-02-15.

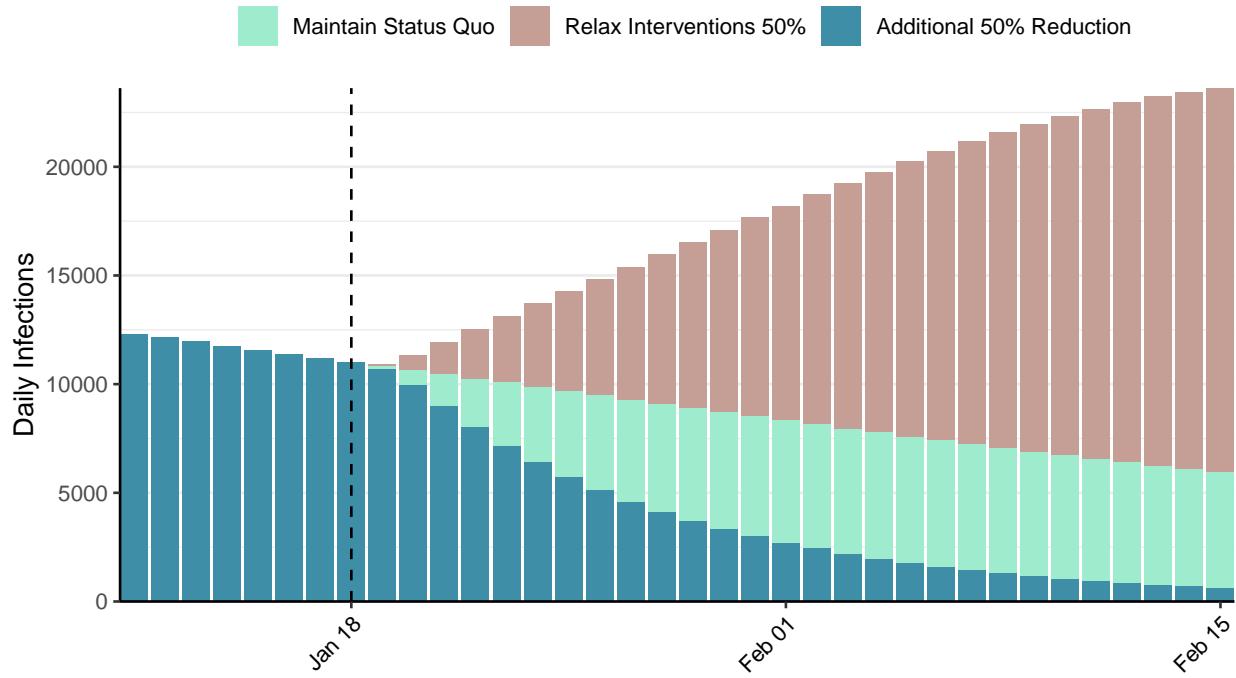


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Peru, 2021-01-18

[Download the report for Peru, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.1 (95% CI: 0.79-1.31)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Peru is not shown in the following plot as only 0 deaths have been reported to date**

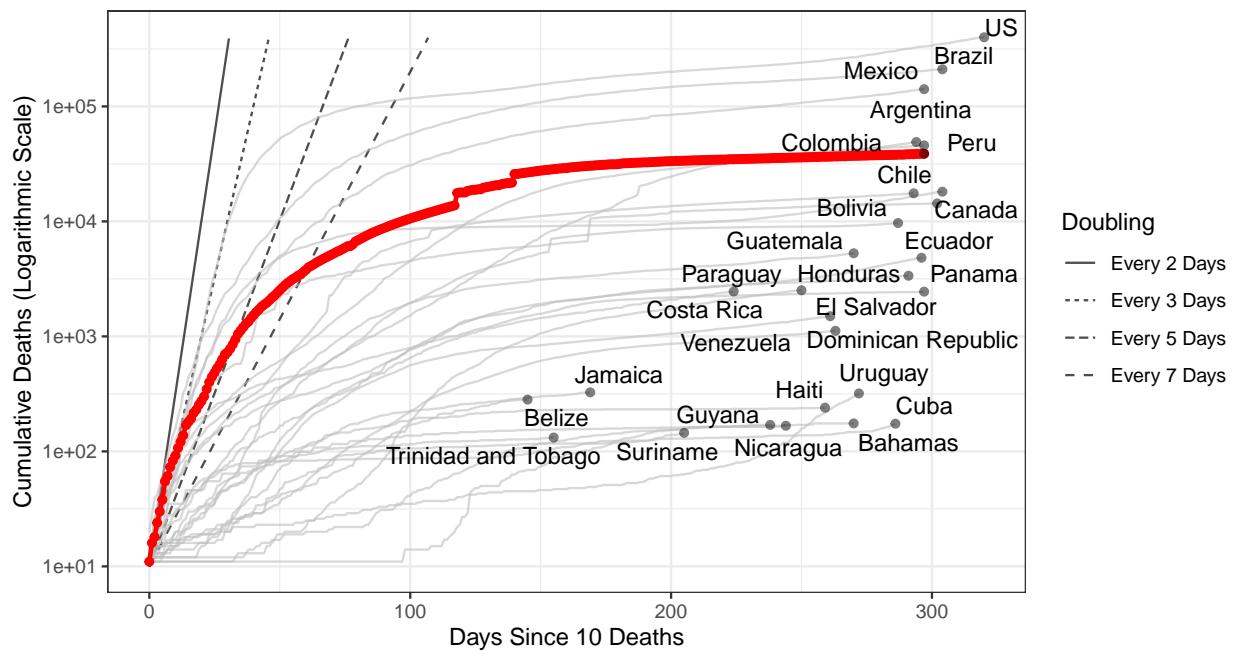


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 920,047 (95% CI: 875,025–965,068) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

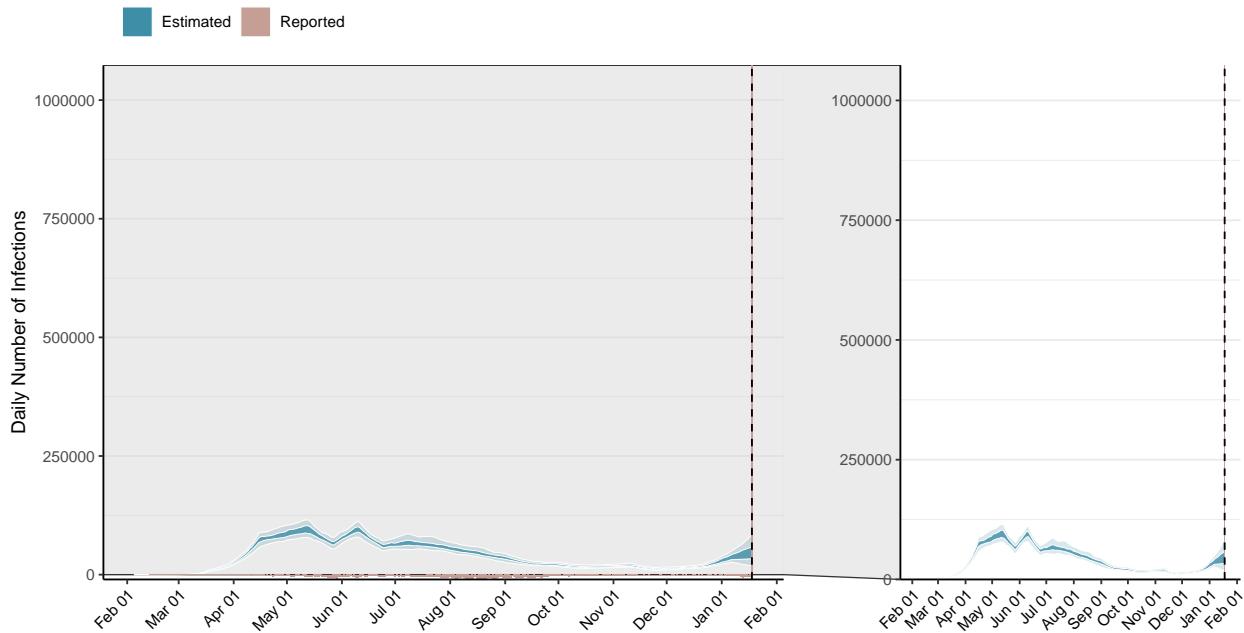


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

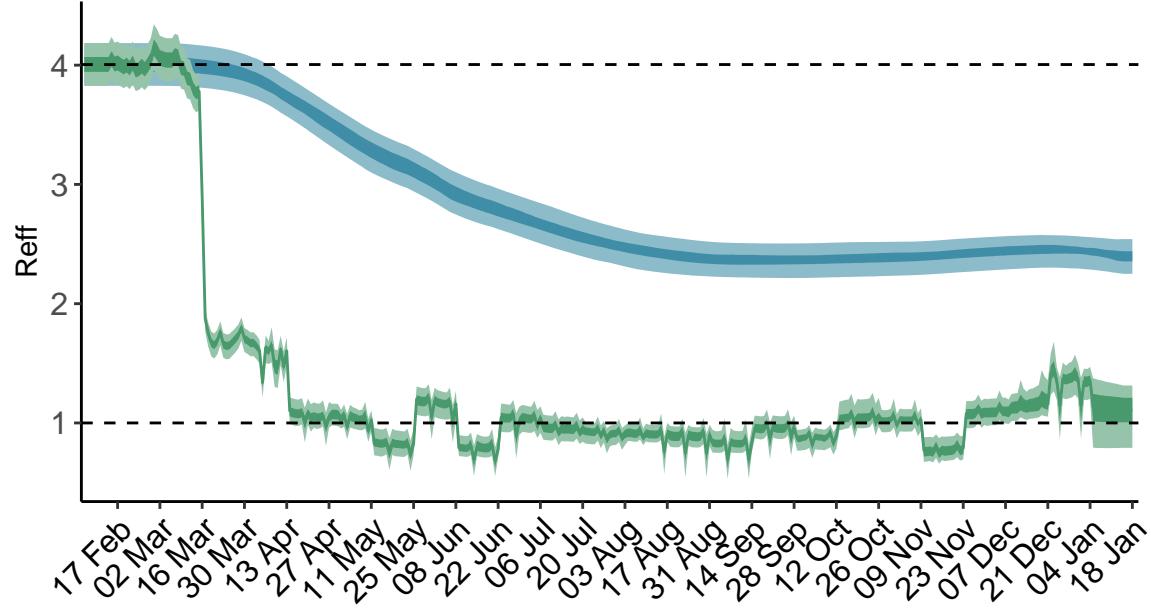


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Peru is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

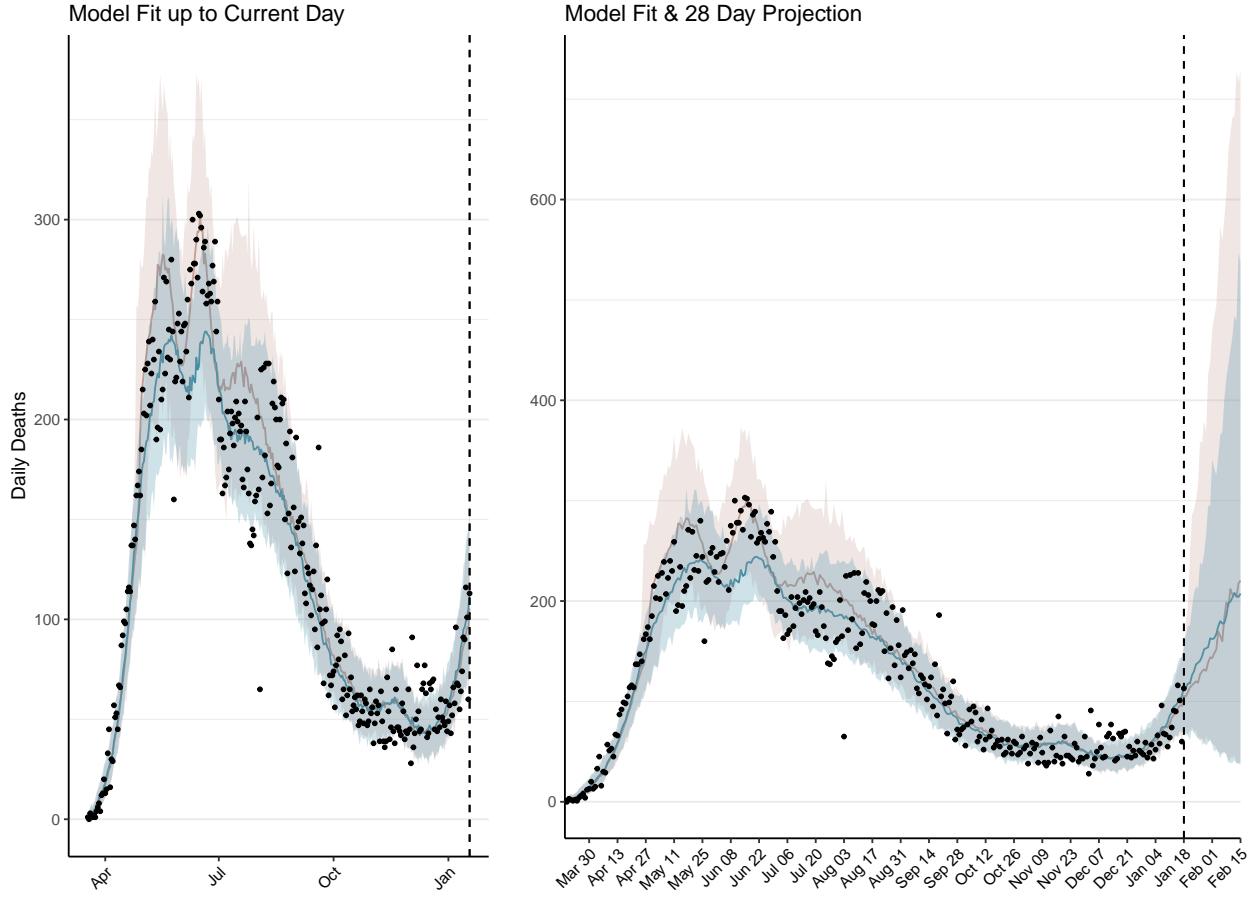


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 4,189 (95% CI: 3,976-4,403) patients requiring treatment with high-pressure oxygen at the current date to 7,716 (95% CI: 6,749-8,683) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 1,417 (95% CI: 1,349-1,485) patients requiring treatment with mechanical ventilation at the current date to 1,877 (95% CI: 1,745-2,010) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

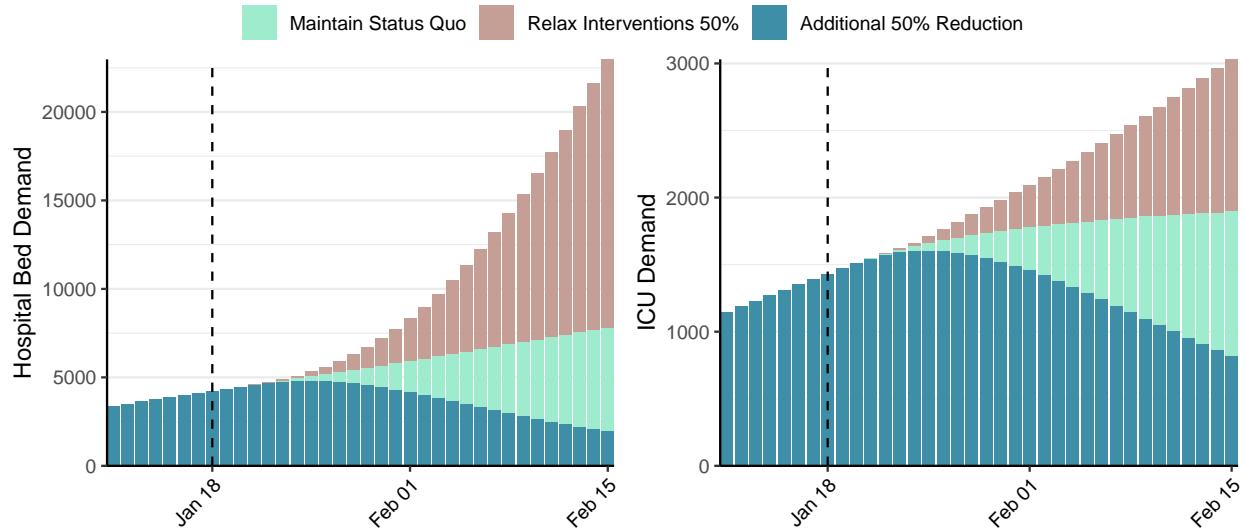


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 46,482 (95% CI: 42,724-50,241) at the current date to 6,641 (95% CI: 5,693-7,589) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 46,482 (95% CI: 42,724-50,241) at the current date to 295,043 (95% CI: 264,140-325,946) by 2021-02-15.

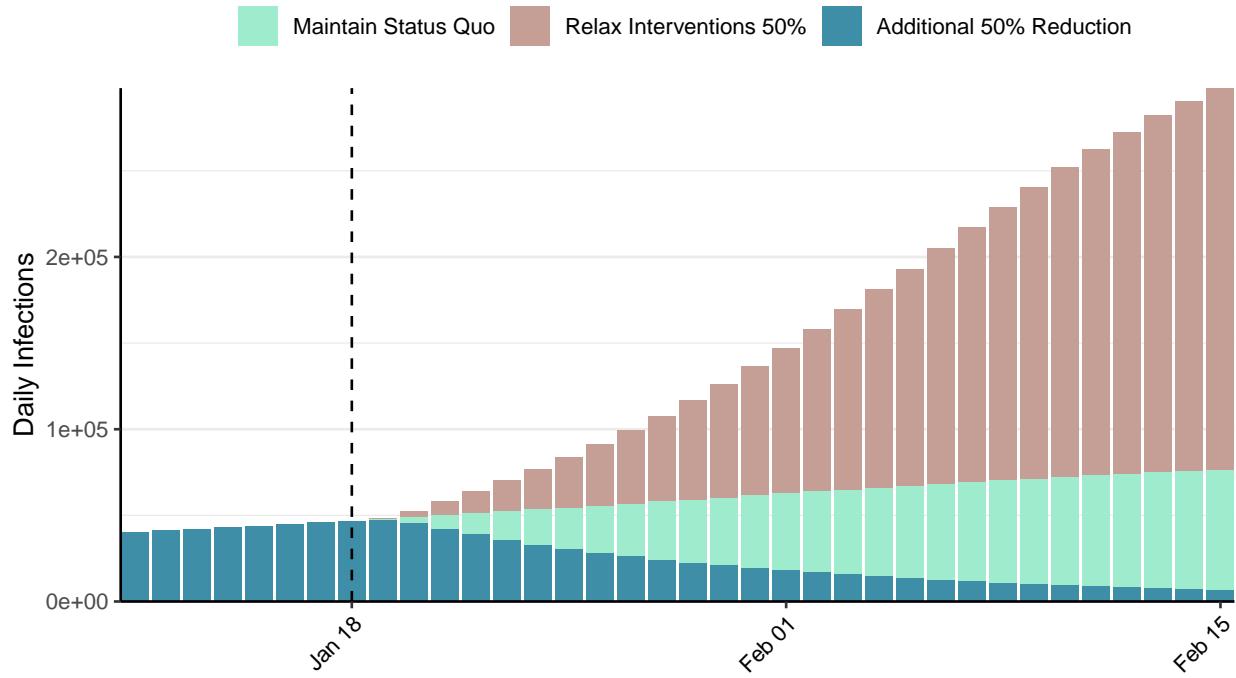


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Philippines, 2021-01-18

[Download the report for Philippines, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.2 (95% CI: 1.06-1.32)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Philippines is not shown in the following plot as only 0 deaths have been reported to date**

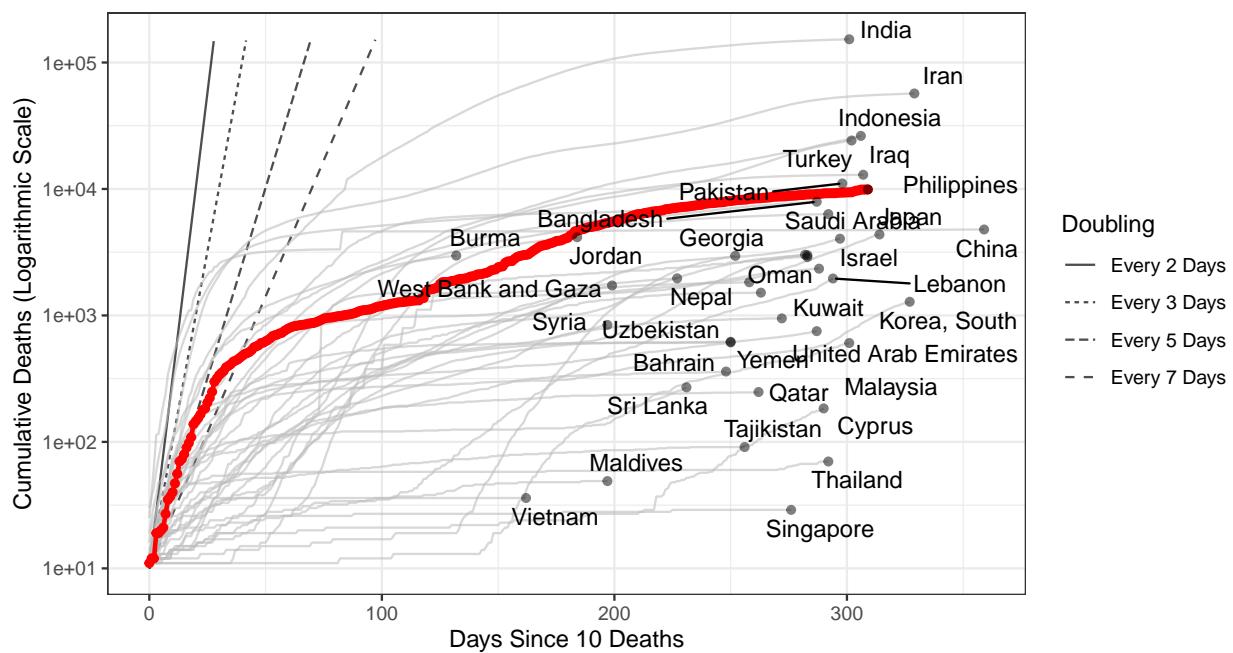


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 545,304 (95% CI: 524,359–566,248) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

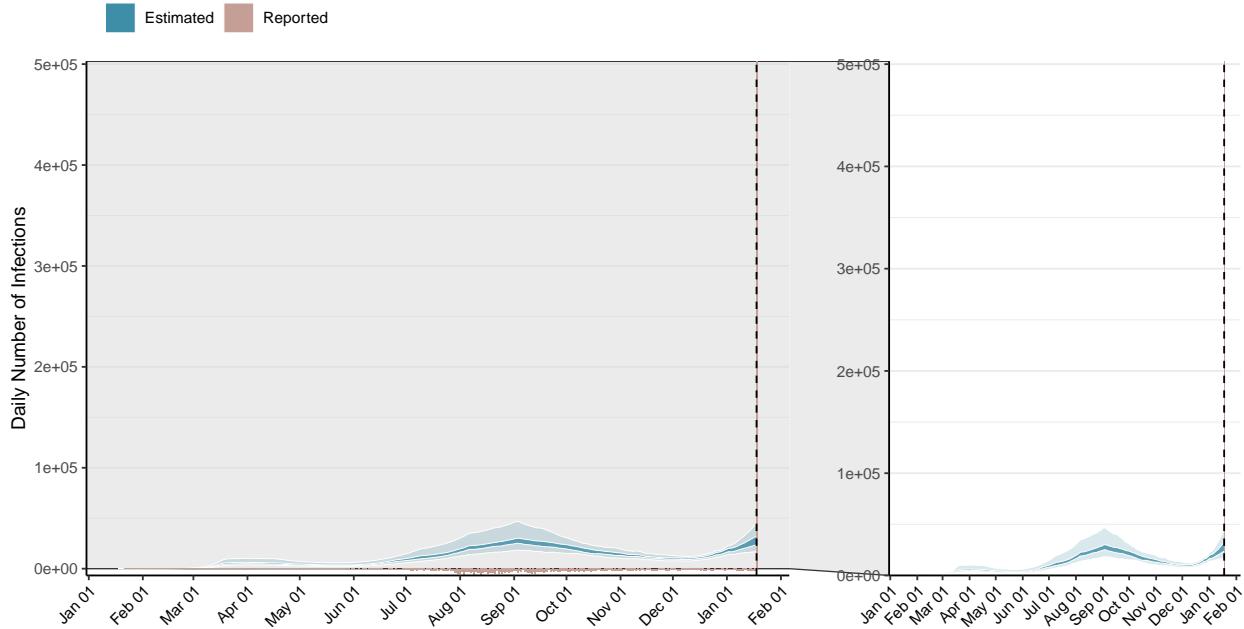


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

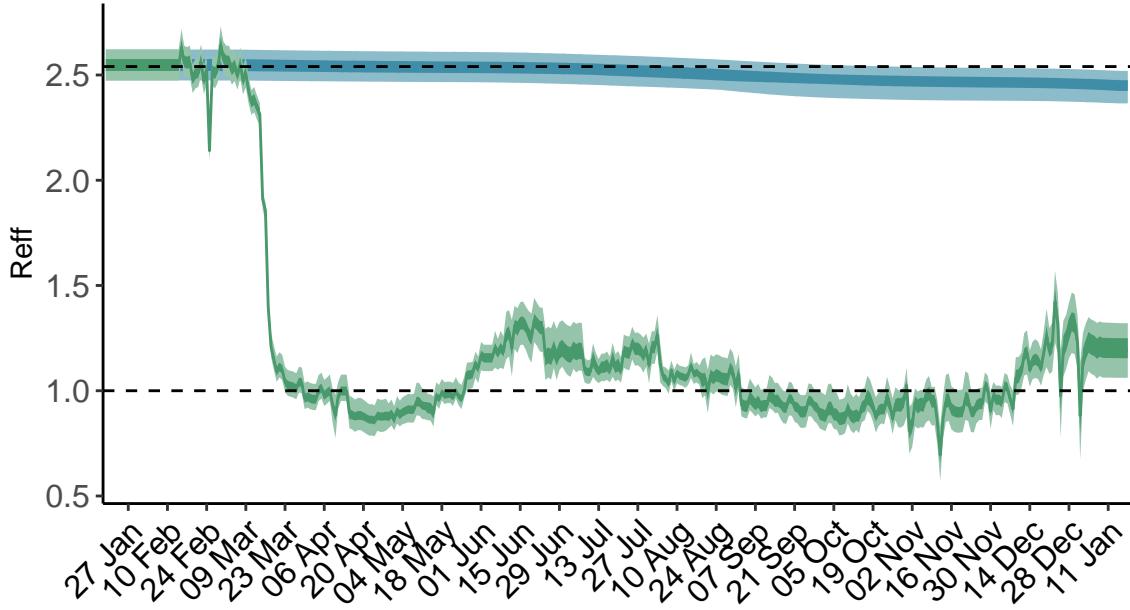


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Philippines is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

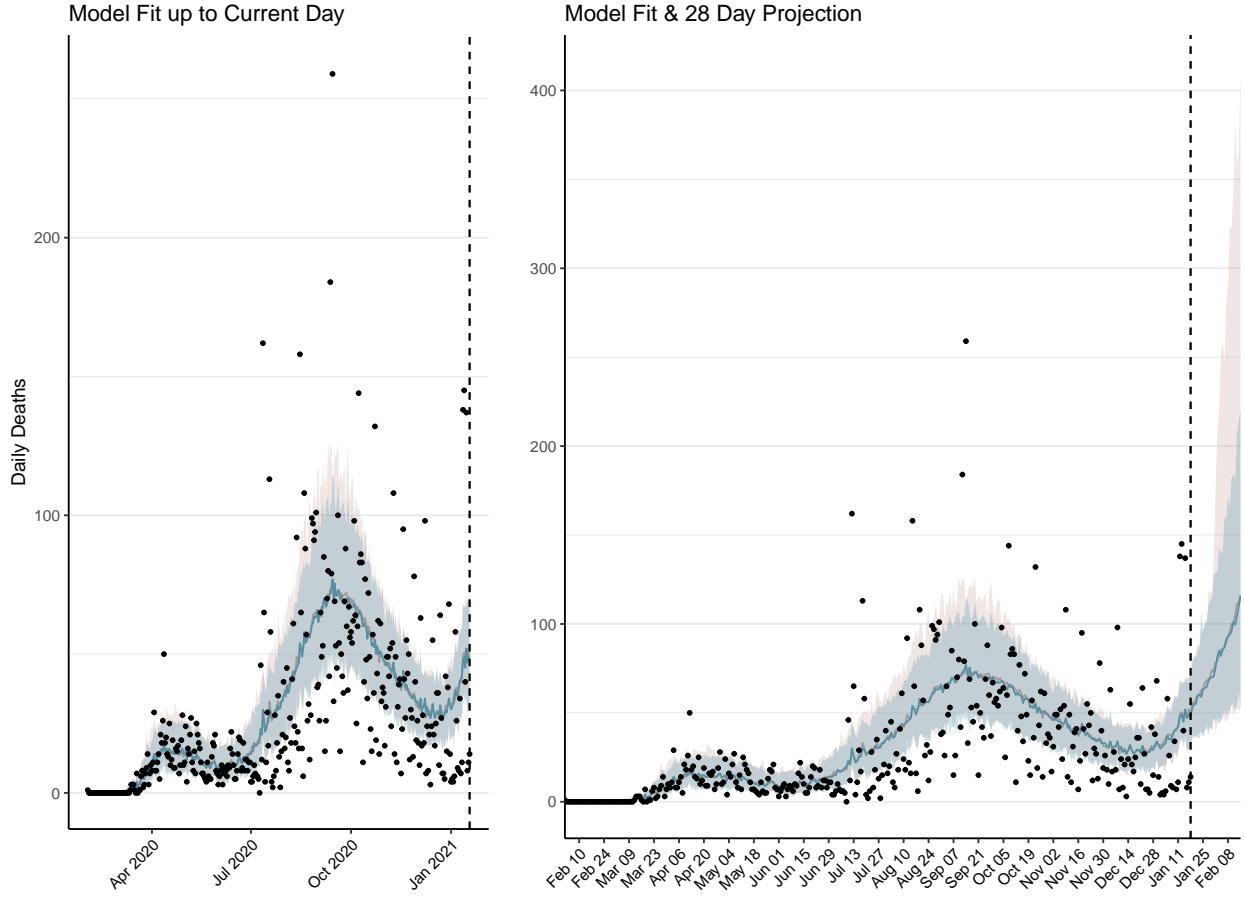


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 2,307 (95% CI: 2,213-2,401) patients requiring treatment with high-pressure oxygen at the current date to 5,332 (95% CI: 4,894-5,770) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 857 (95% CI: 823-891) patients requiring treatment with mechanical ventilation at the current date to 1,748 (95% CI: 1,655-1,842) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

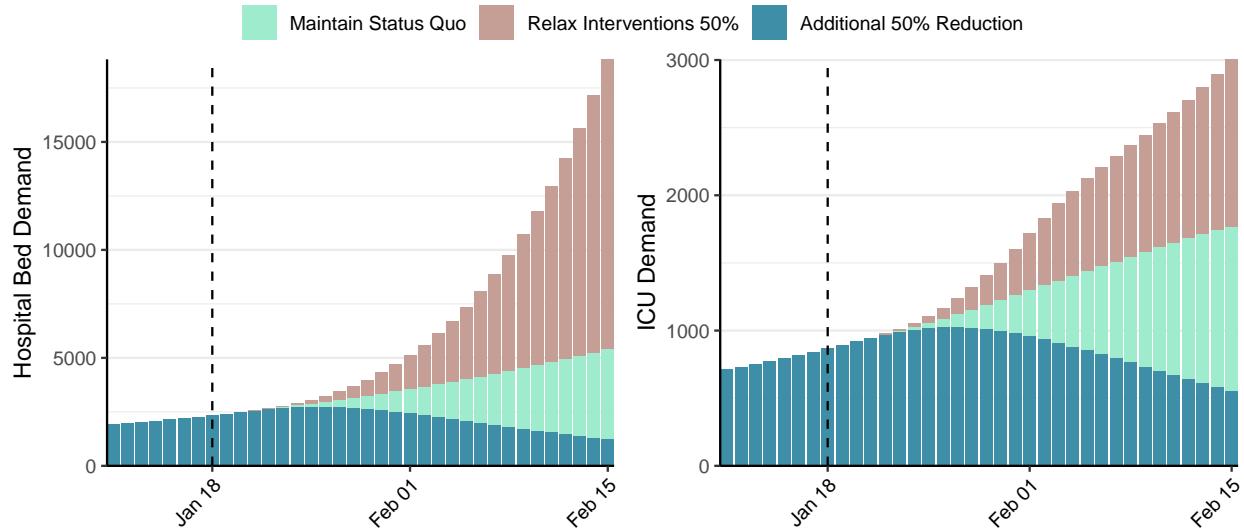


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 28,212 (95% CI: 26,690-29,734) at the current date to 4,676 (95% CI: 4,251-5,102) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 28,212 (95% CI: 26,690-29,734) at the current date to 399,914 (95% CI: 360,745-439,083) by 2021-02-15.

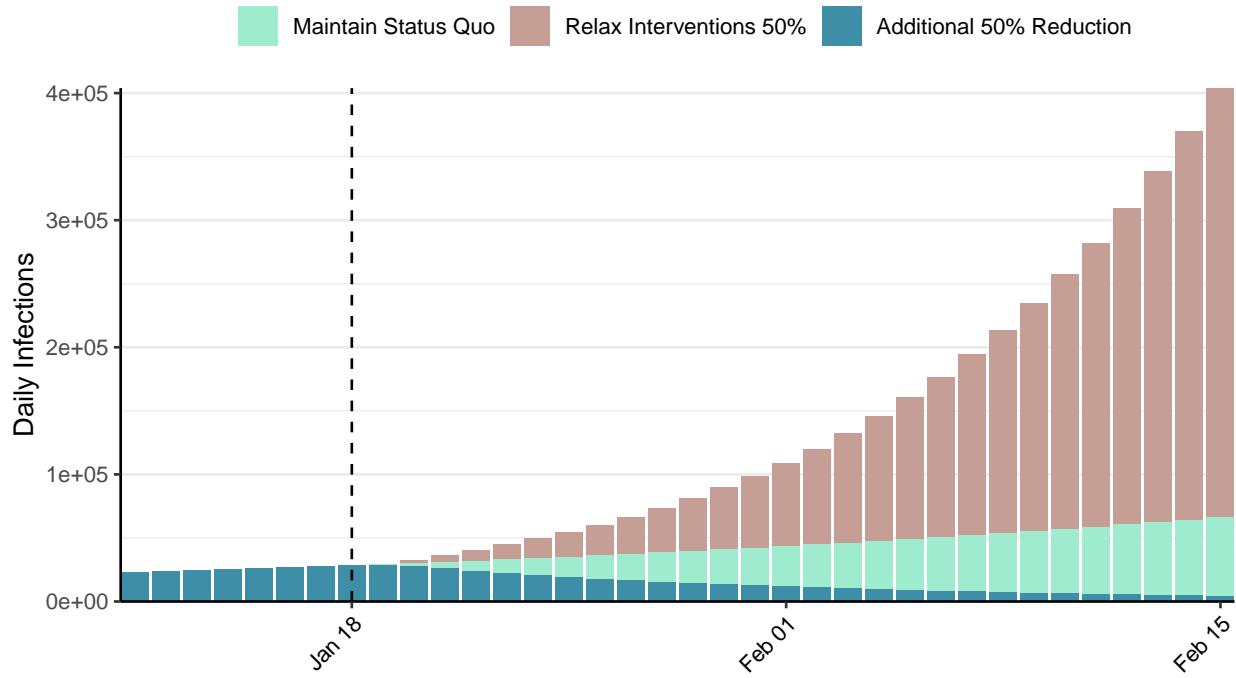


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Papua New Guinea, 2021-01-18

[Download the report for Papua New Guinea, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.95 (95% CI: 0.65-1.33)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B.** Papua New Guinea is not shown in the following plot as only 0 deaths have been reported to date

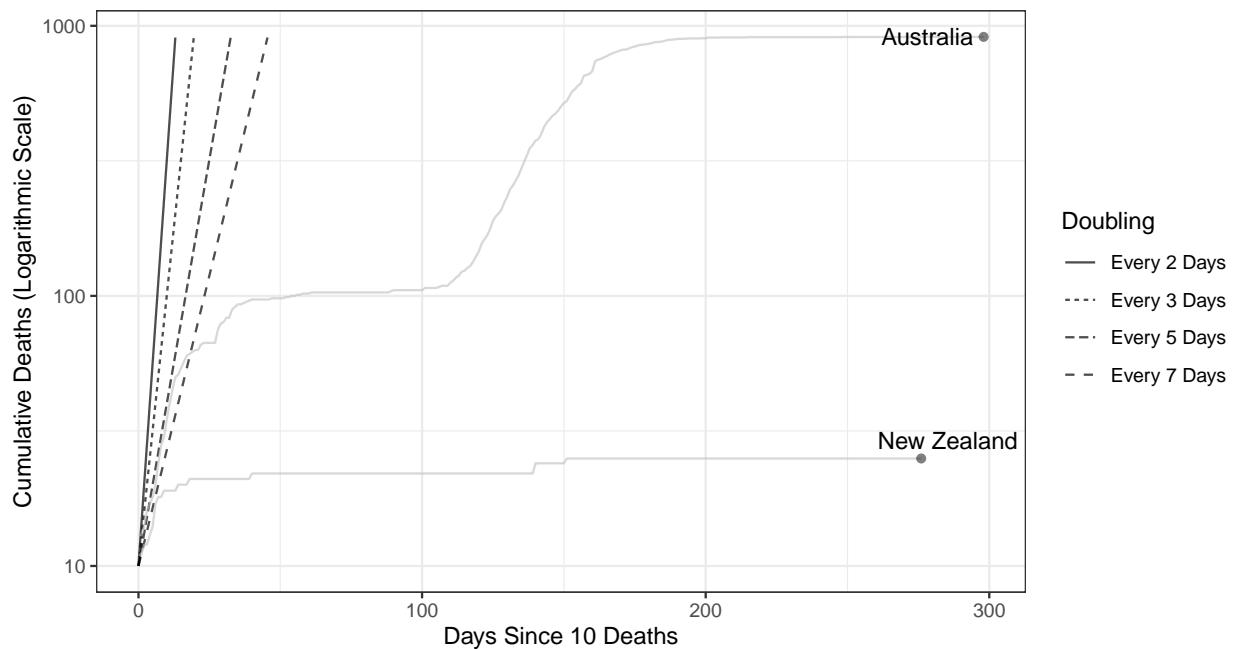


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 514 (95% CI: 362-665) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. Papua New Guinea has revised their historic reported cases and thus have reported negative cases.**

Plot on right zoomed in on reported cases

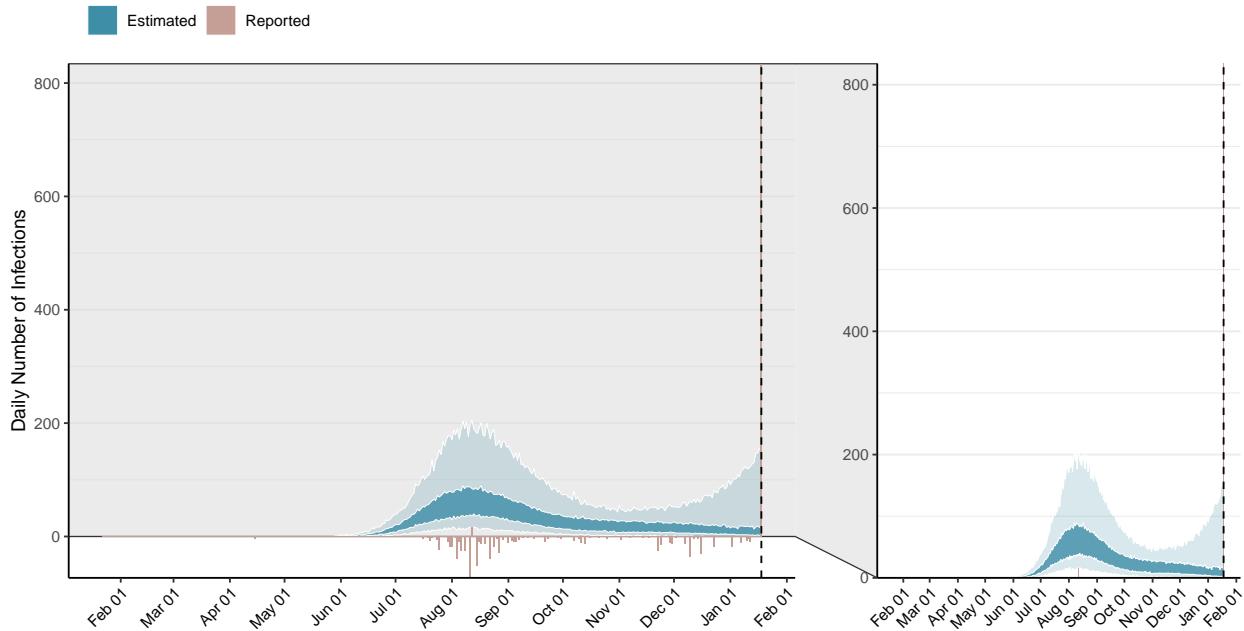


Figure 2: Daily number of infections estimated by fitting to the current total of deaths. Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

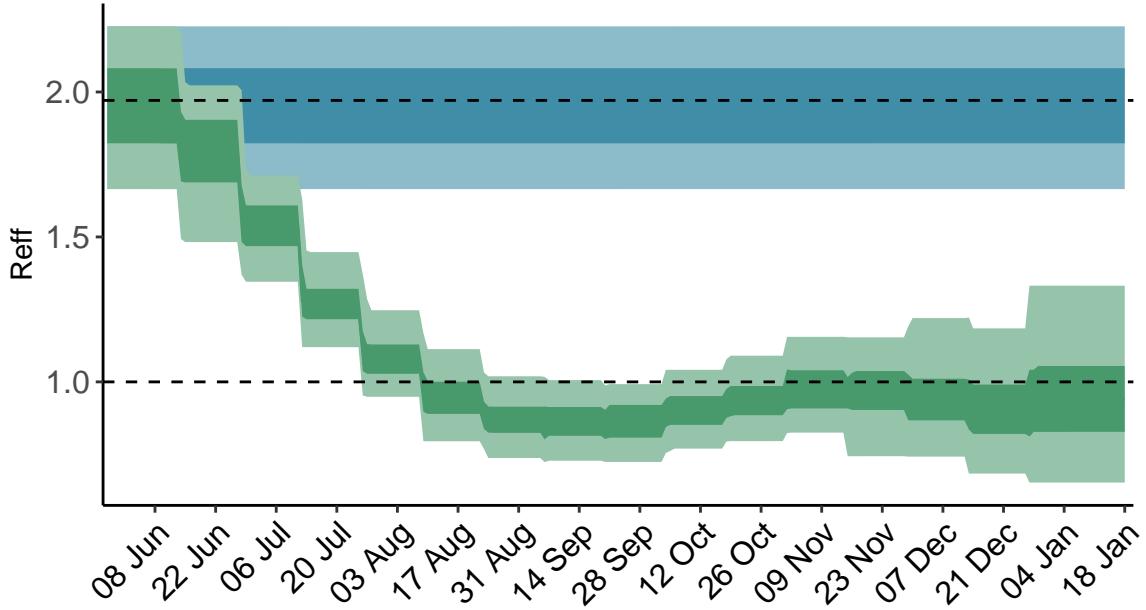


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

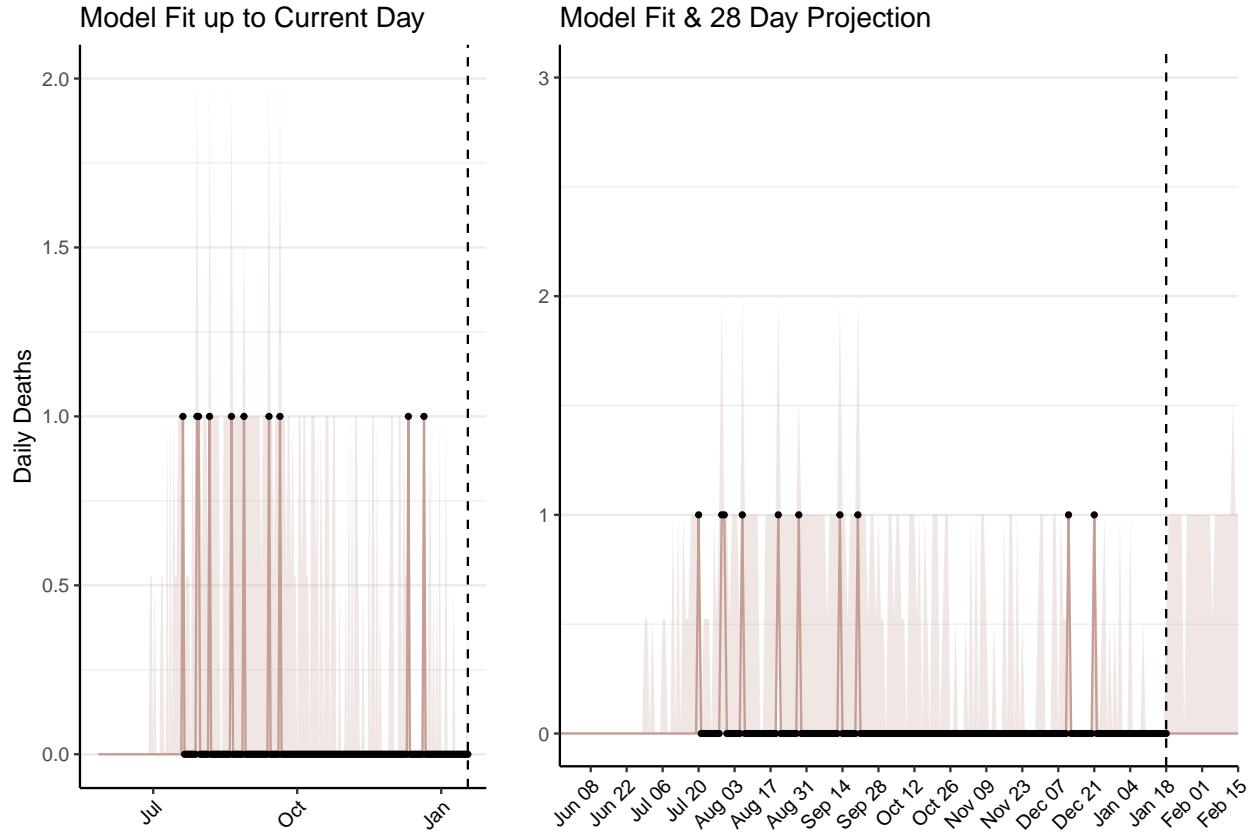


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 2 (95% CI: 1-3) patients requiring treatment with high-pressure oxygen at the current date to 3 (95% CI: 2-5) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 1 (95% CI: 1-1) patients requiring treatment with mechanical ventilation at the current date to 1 (95% CI: 1-2) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

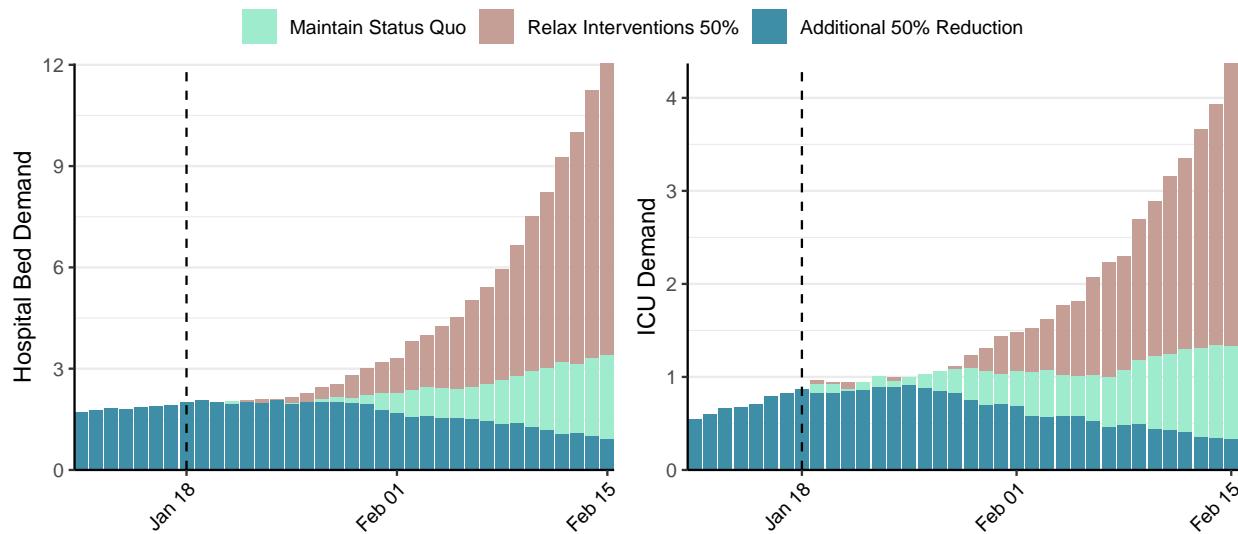


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 22 (95% CI: 13-30) at the current date to 3 (95% CI: 1-5) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 22 (95% CI: 13-30) at the current date to 300 (95% CI: 117-483) by 2021-02-15.

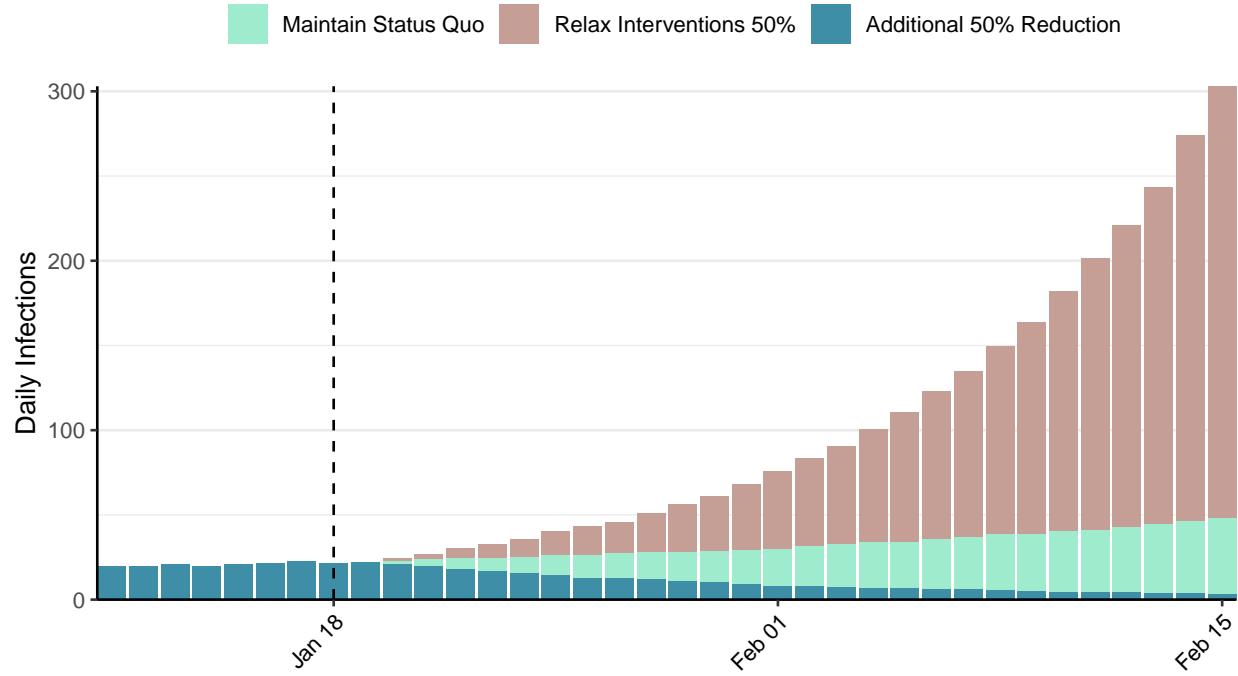


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](#) - <https://covidsim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Paraguay, 2021-01-18

[Download the report for Paraguay, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.93 (95% CI: 0.83-1.03)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Paraguay is not shown in the following plot as only 0 deaths have been reported to date**

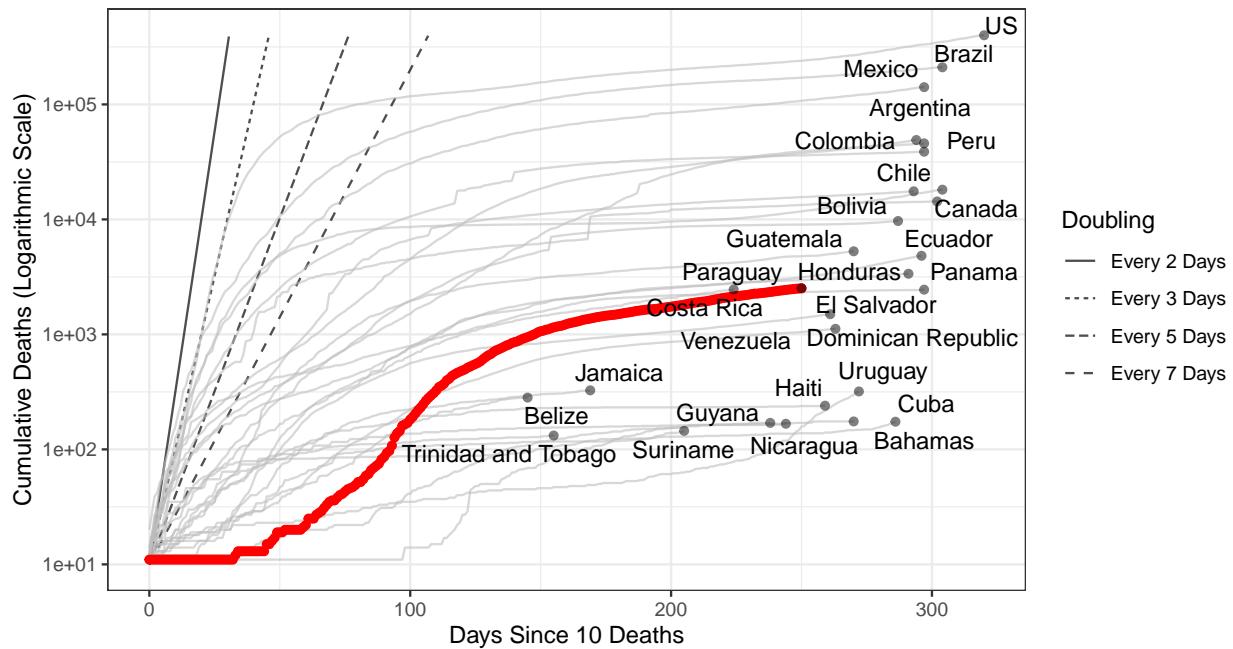


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 150,769 (95% CI: 140,313-161,225) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

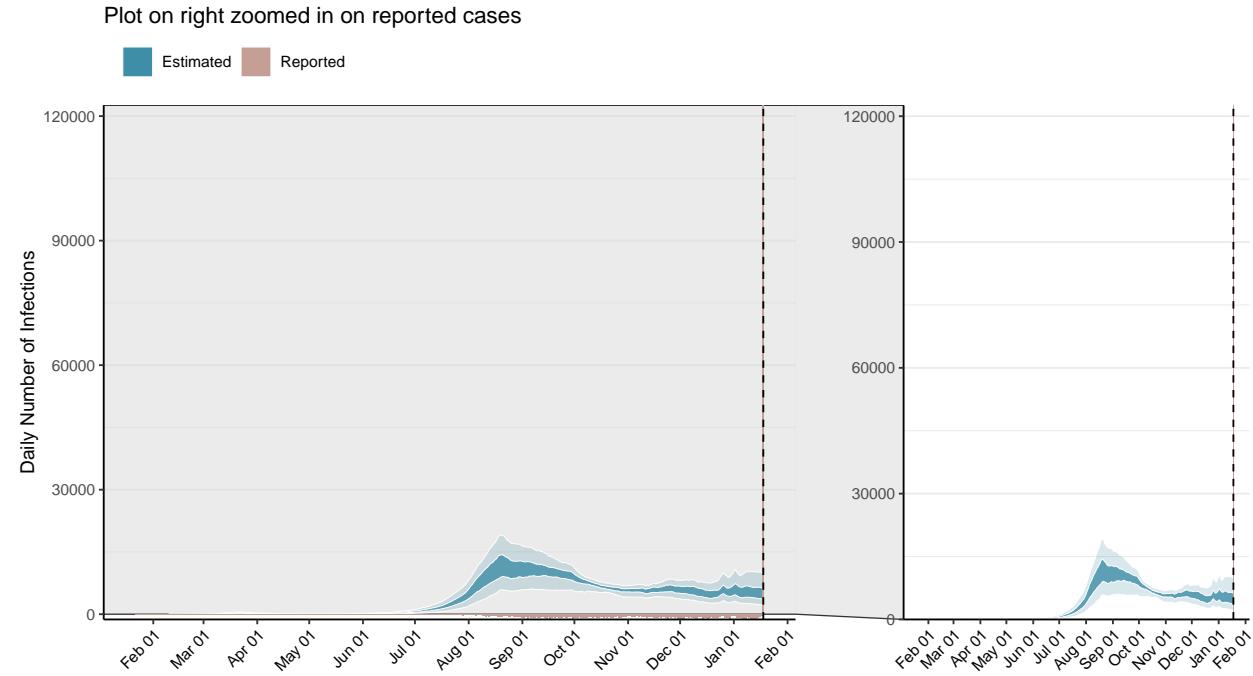


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

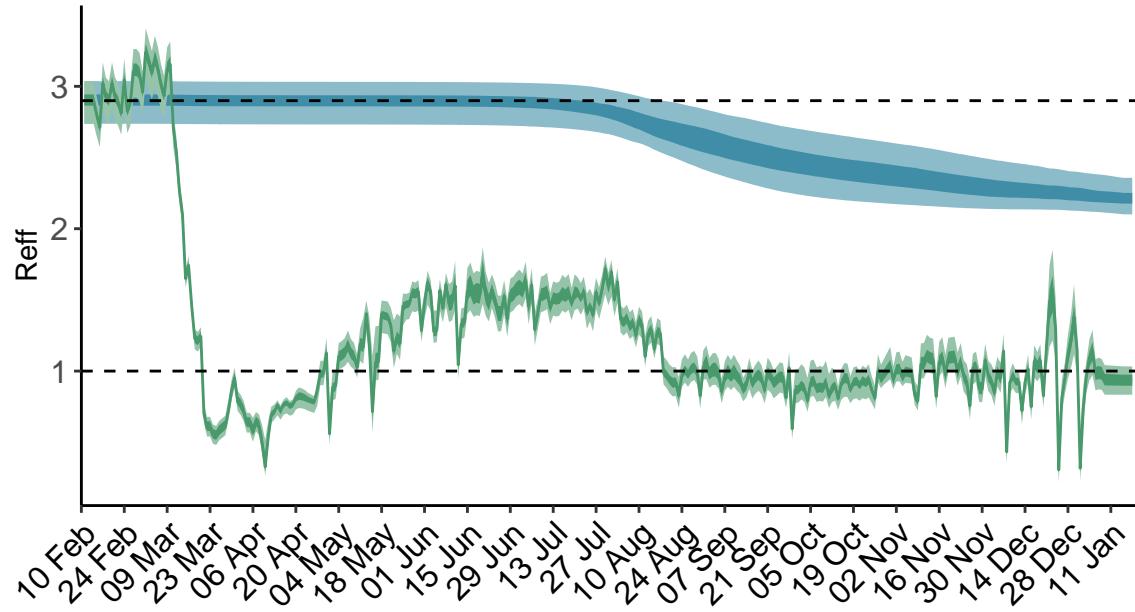


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

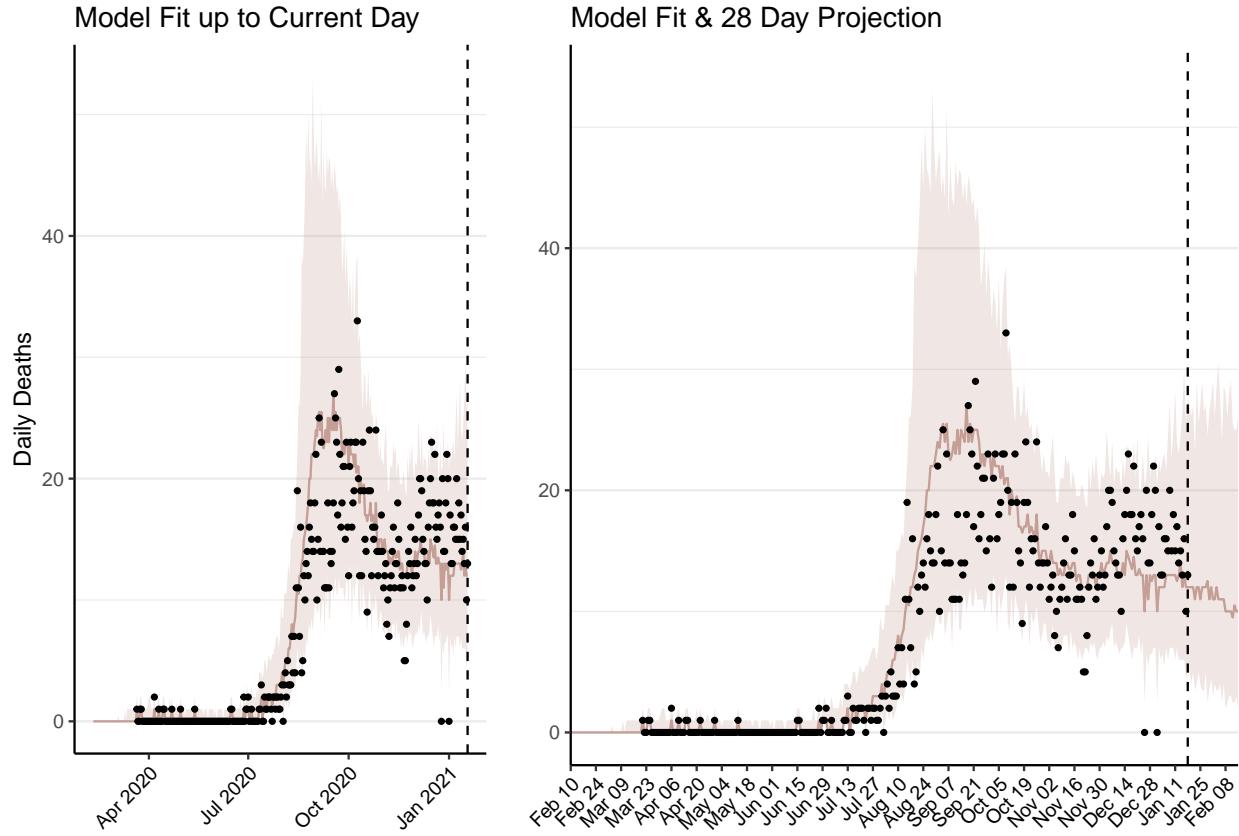


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 485 (95% CI: 451-520) patients requiring treatment with high-pressure oxygen at the current date to 409 (95% CI: 368-449) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 175 (95% CI: 164-186) patients requiring treatment with mechanical ventilation at the current date to 148 (95% CI: 134-161) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

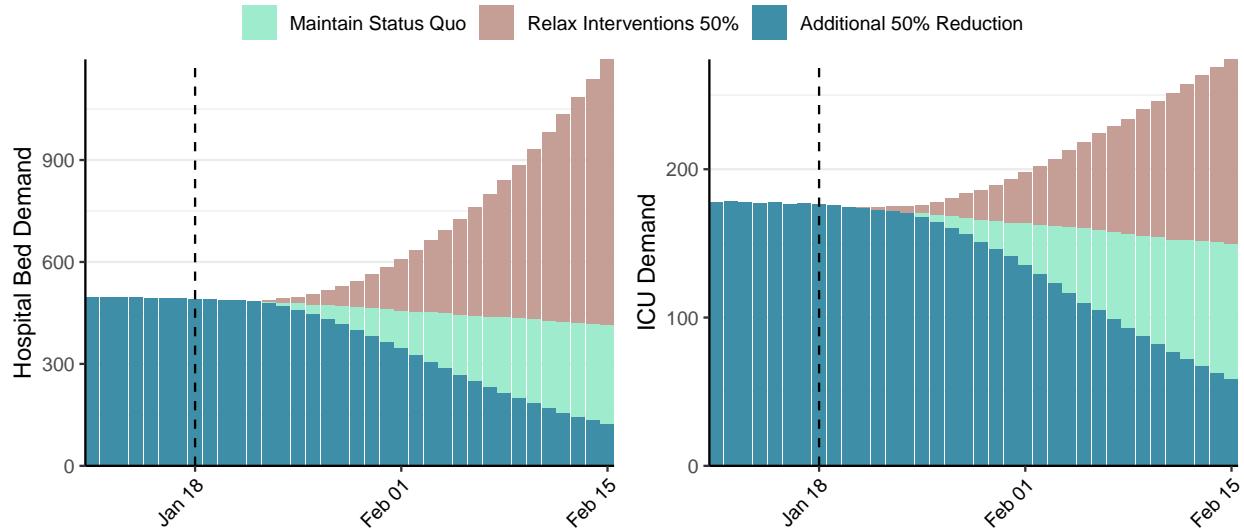


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 5,141 (95% CI: 4,709-5,572) at the current date to 367 (95% CI: 327-407) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 5,141 (95% CI: 4,709-5,572) at the current date to 20,721 (95% CI: 18,554-22,889) by 2021-02-15.

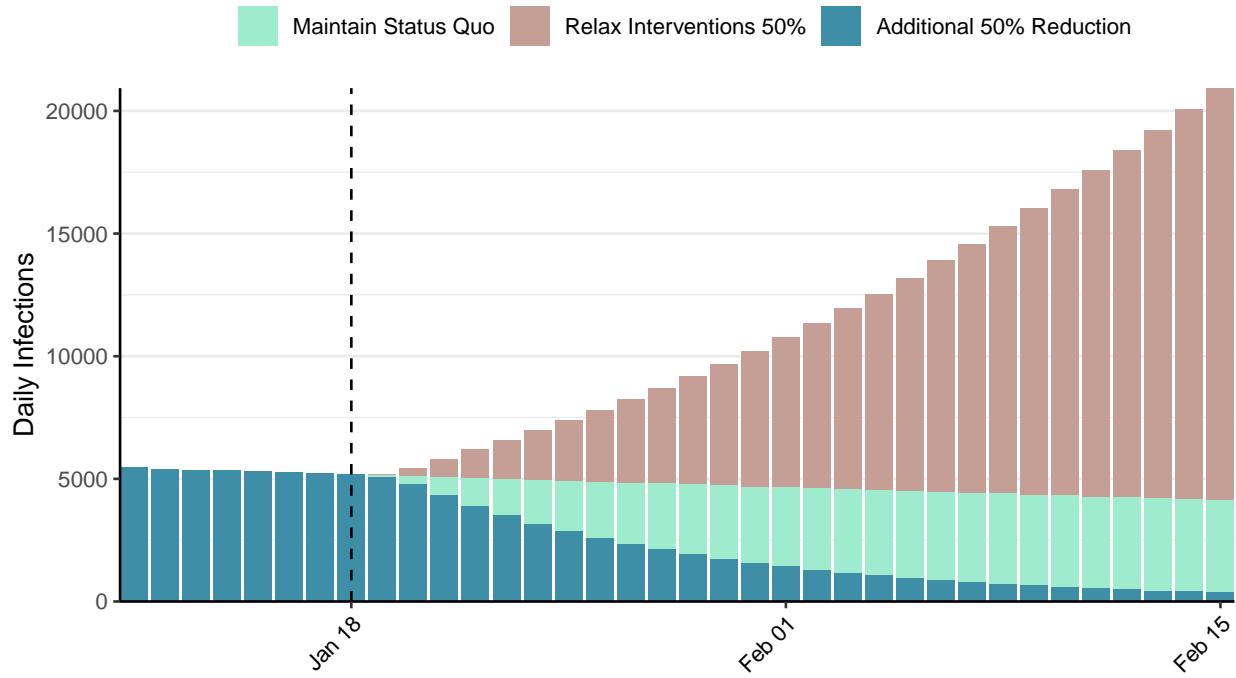


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: State of Palestine, 2021-01-18

[Download the report for State of Palestine, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.84 (95% CI: 0.7-1.01)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. State of Palestine is not shown in the following plot as only 0 deaths have been reported to date**

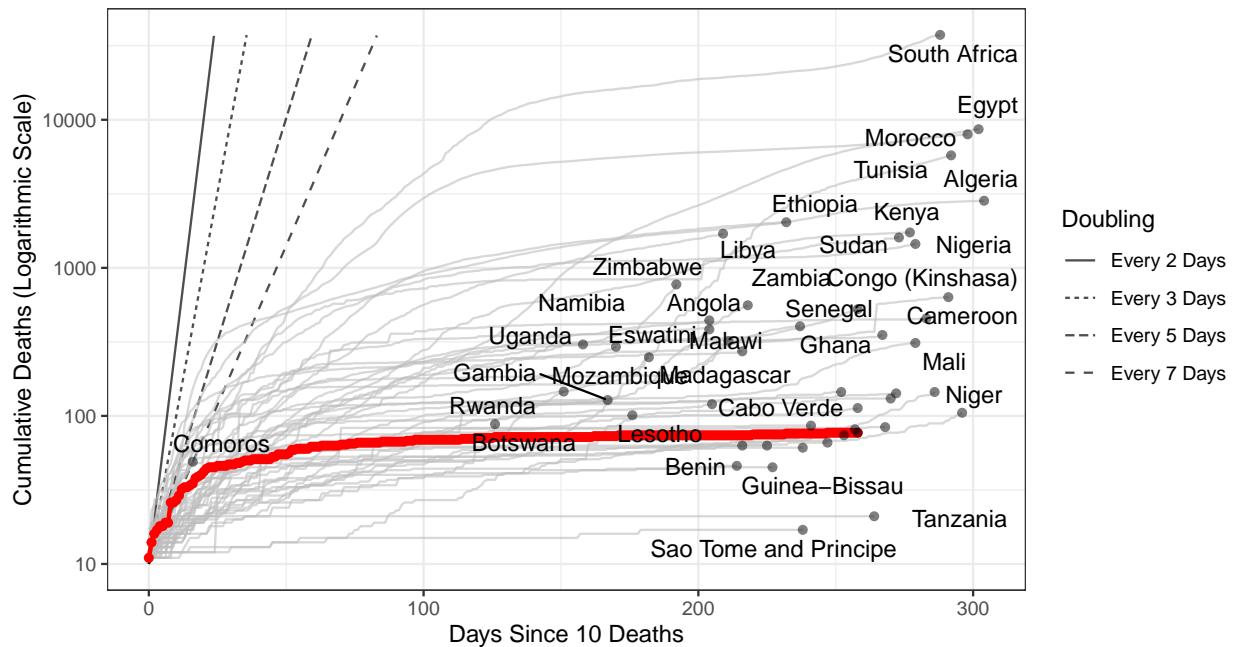


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 182,265 (95% CI: 175,680-188,849) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

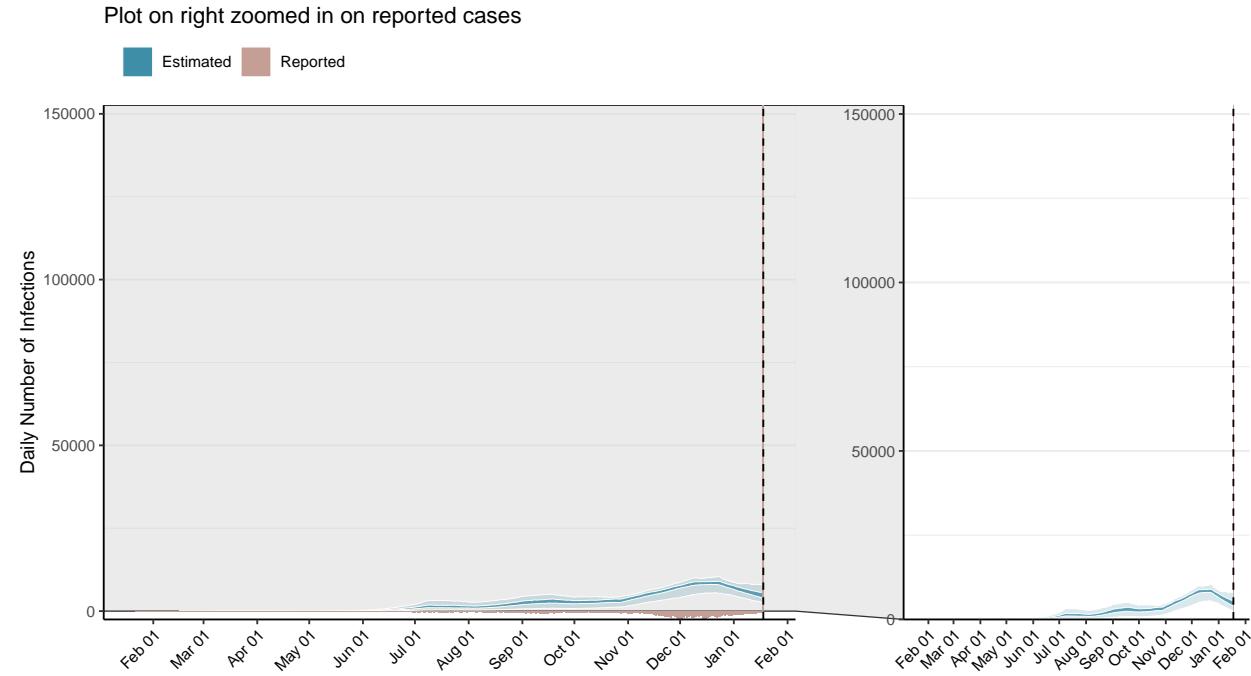


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

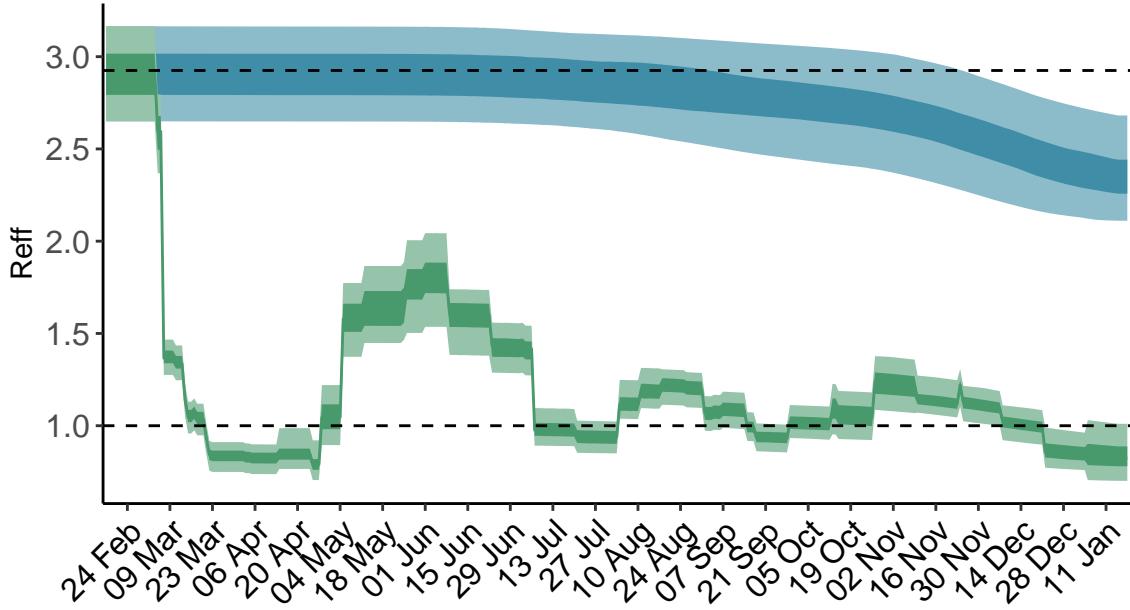


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. State of Palestine is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

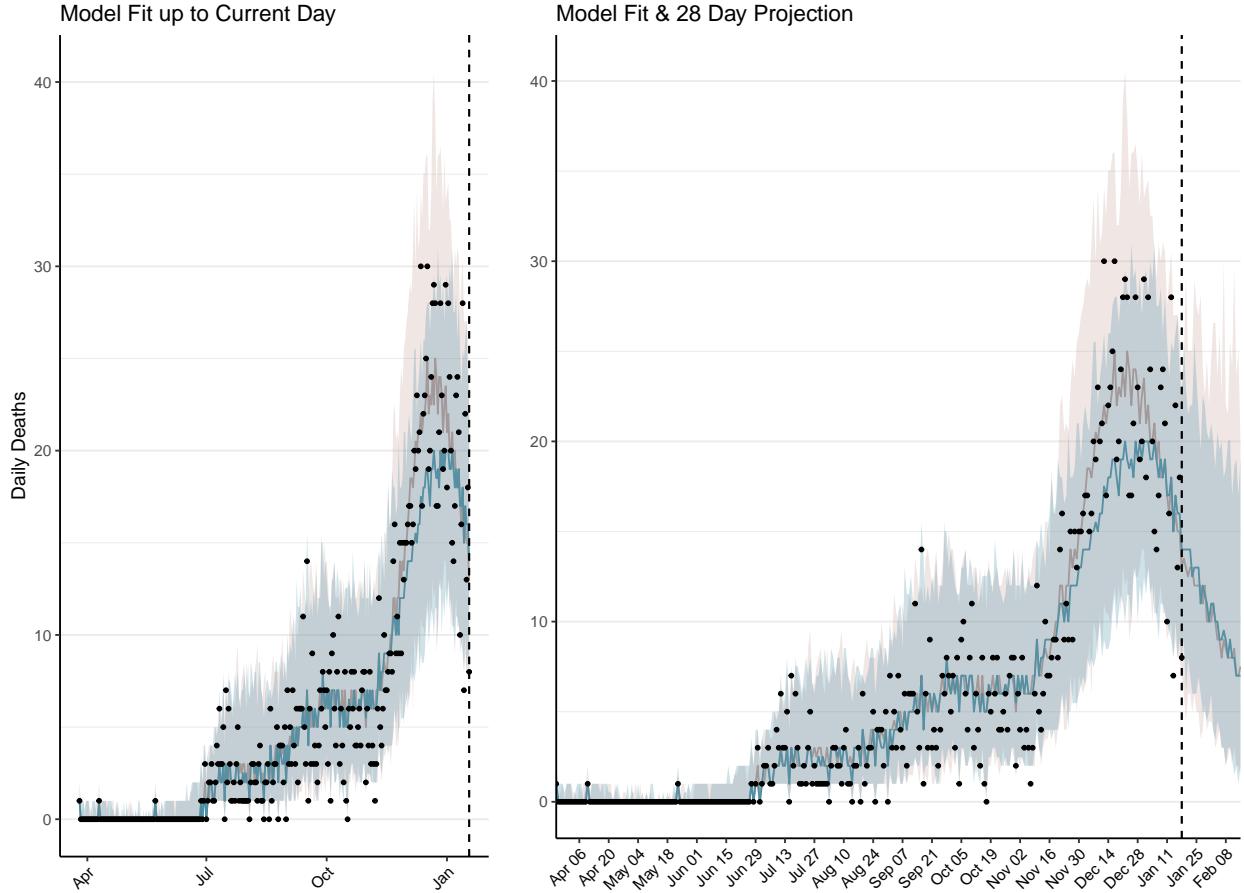


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 575 (95% CI: 551-598) patients requiring treatment with high-pressure oxygen at the current date to 318 (95% CI: 282-354) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 178 (95% CI: 173-182) patients requiring treatment with mechanical ventilation at the current date to 121 (95% CI: 112-129) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

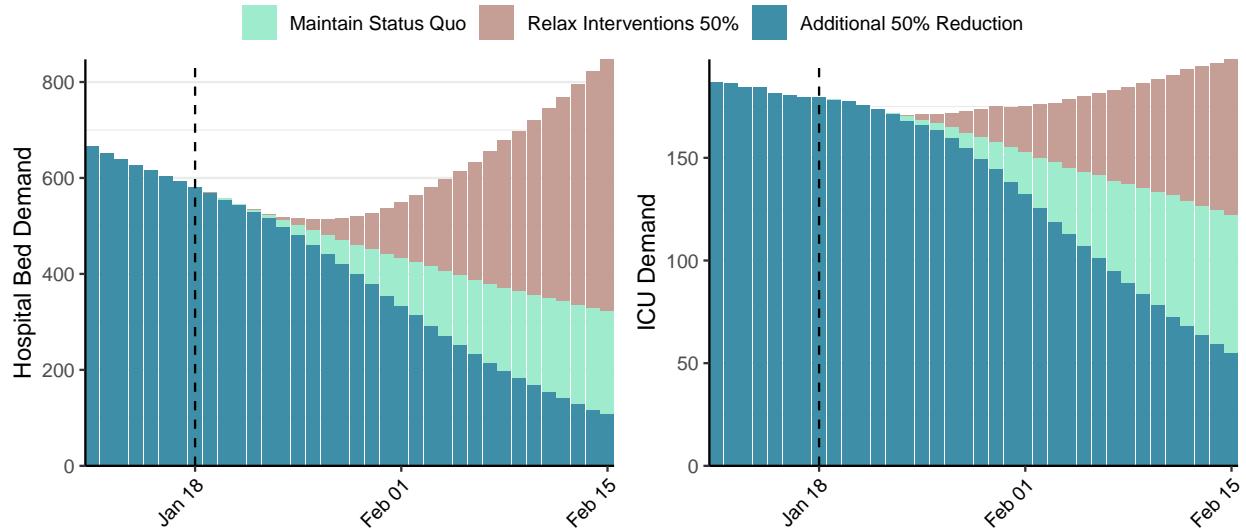


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 4,799 (95% CI: 4,493-5,106) at the current date to 258 (95% CI: 221-296) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 4,799 (95% CI: 4,493-5,106) at the current date to 12,798 (95% CI: 10,945-14,652) by 2021-02-15.

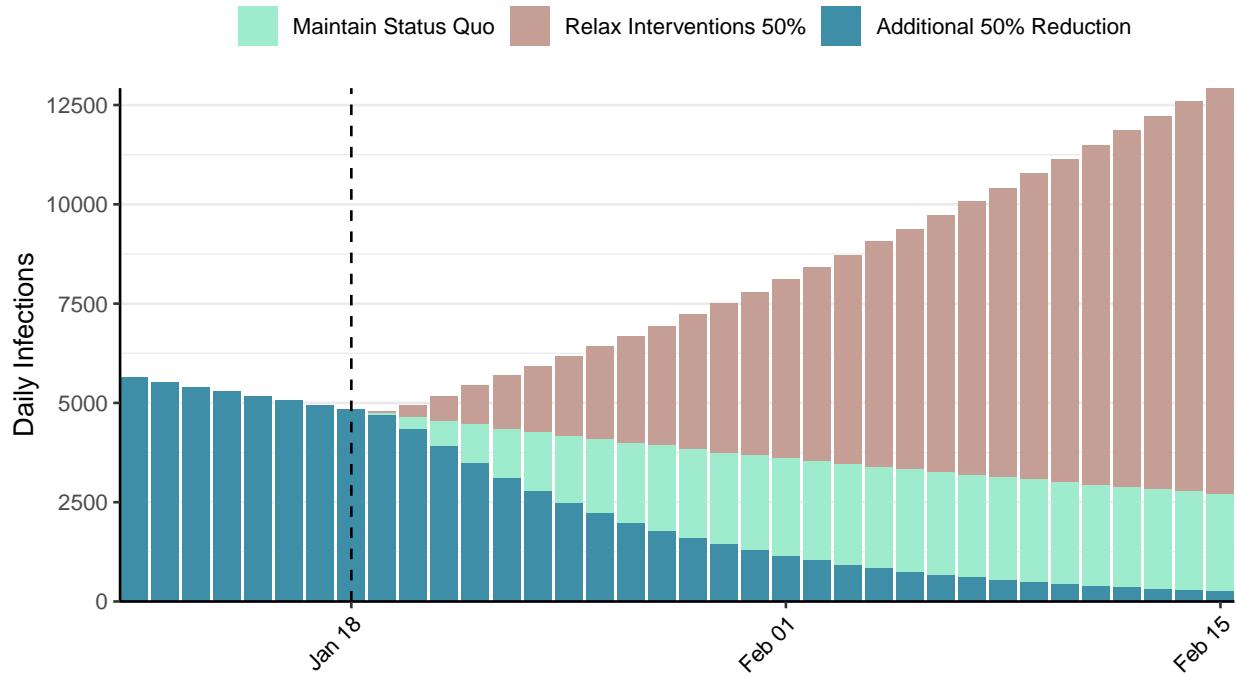


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Romania, 2021-01-18

[Download the report for Romania, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.9 (95% CI: 0.78-1.03)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Romania is not shown in the following plot as only 0 deaths have been reported to date**

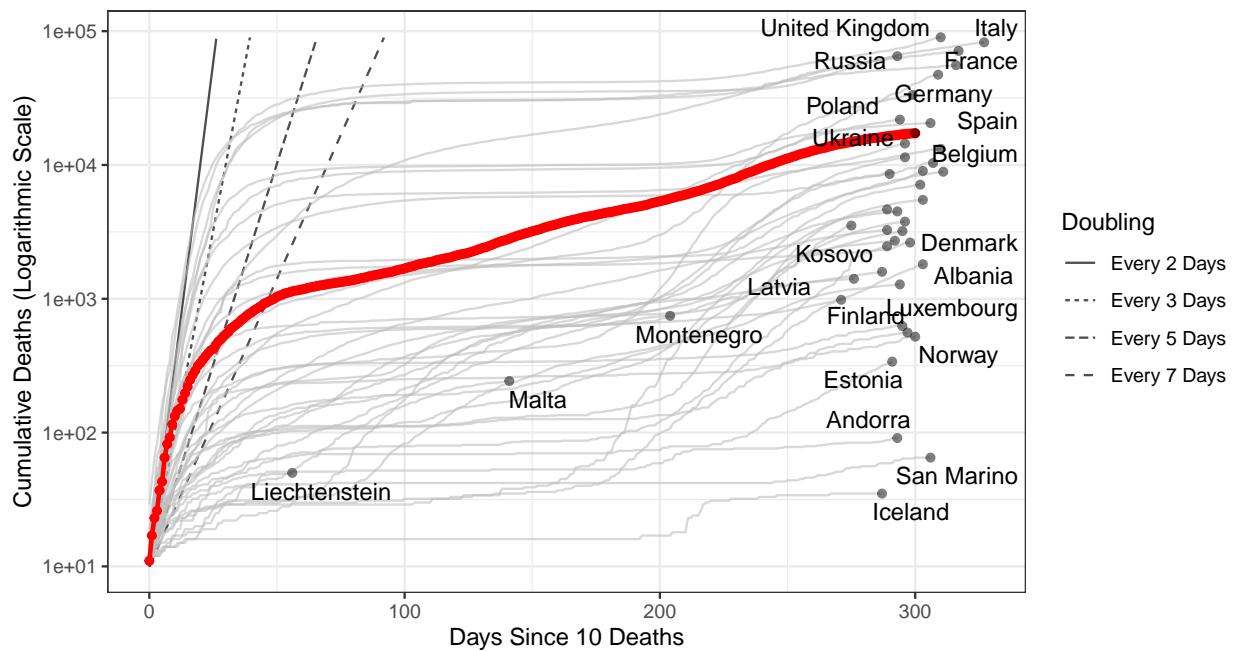


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 685,980 (95% CI: 657,766-714,193) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

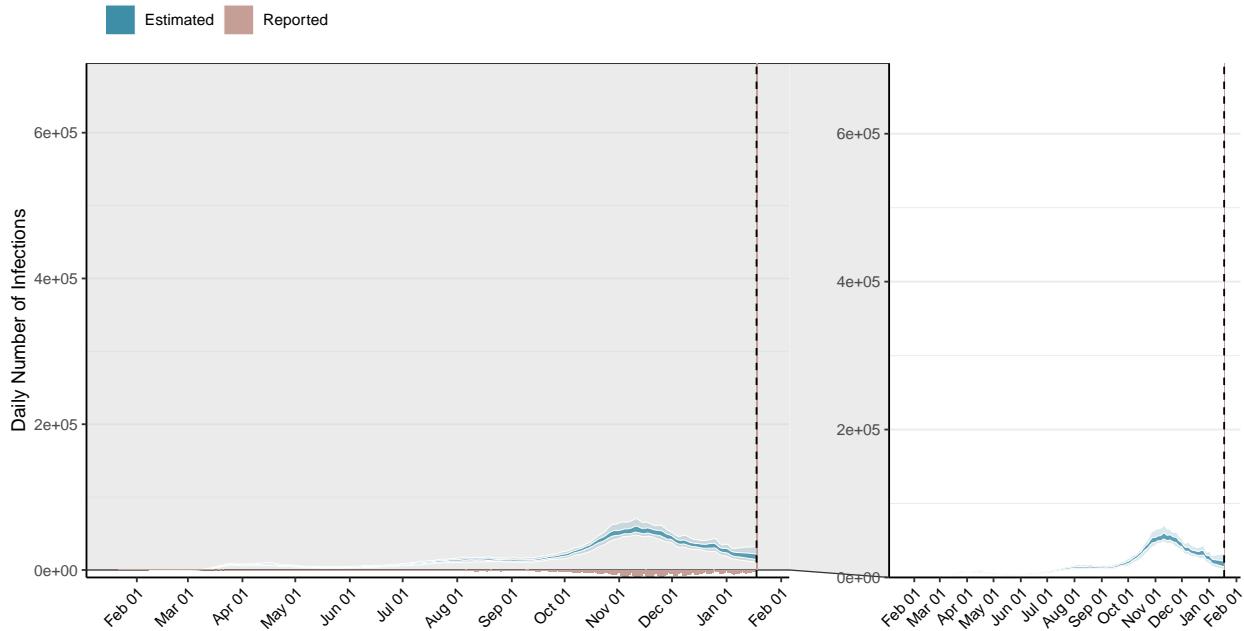


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

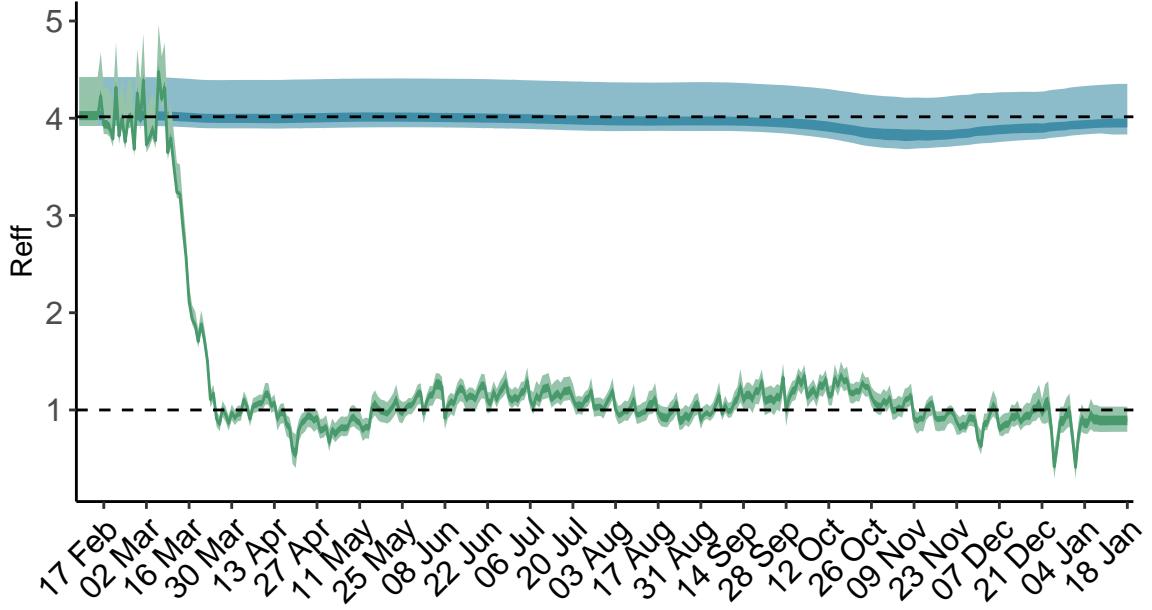


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

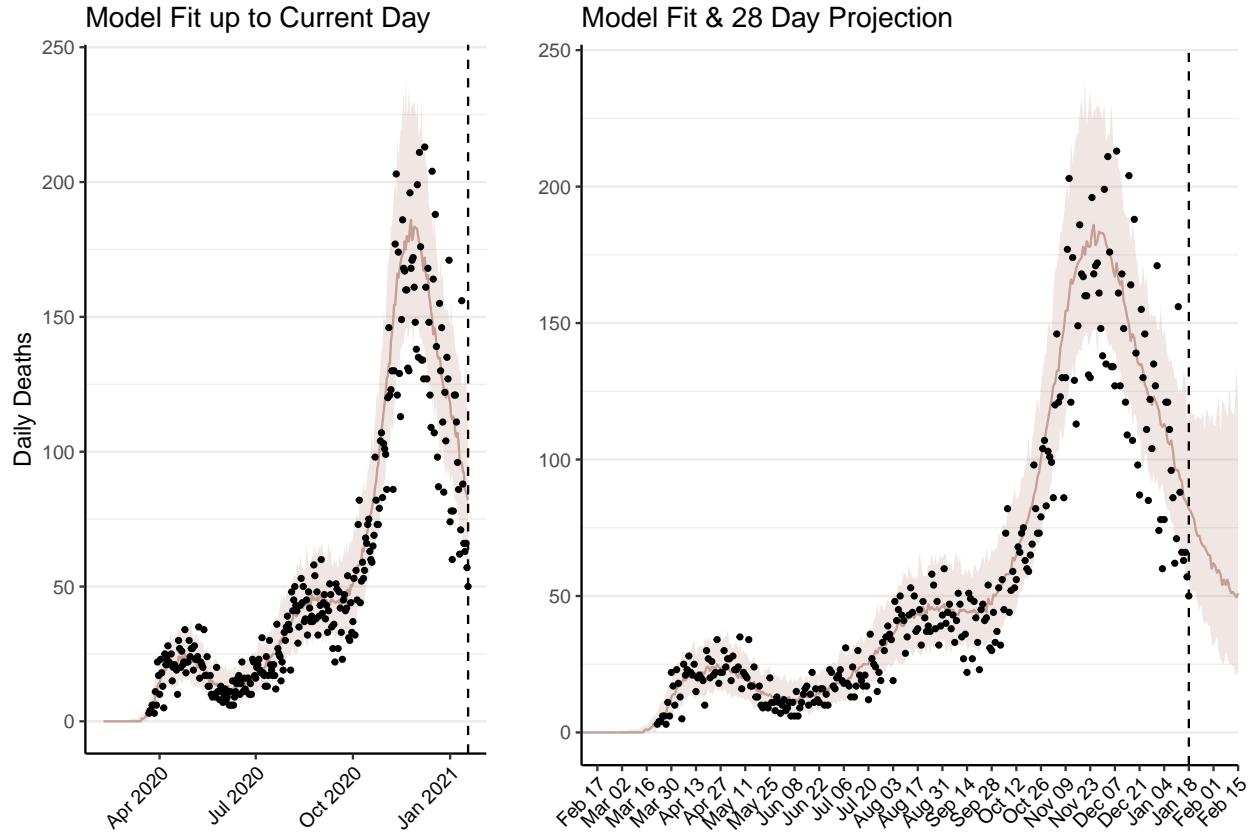


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 2,842 (95% CI: 2,711-2,974) patients requiring treatment with high-pressure oxygen at the current date to 2,018 (95% CI: 1,715-2,320) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 1,110 (95% CI: 1,063-1,156) patients requiring treatment with mechanical ventilation at the current date to 749 (95% CI: 663-836) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

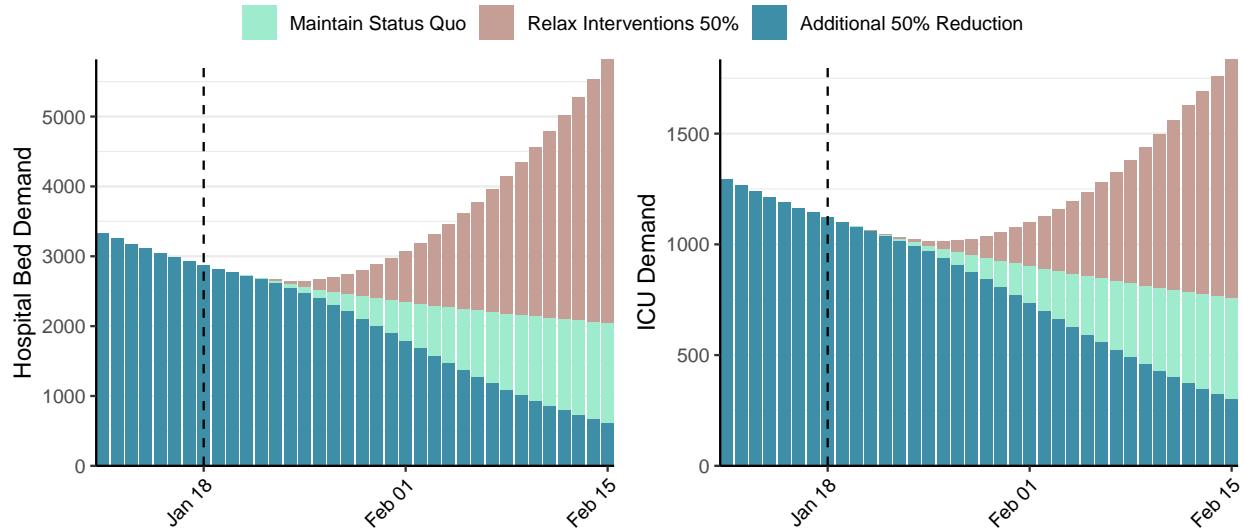


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 18,873 (95% CI: 17,408-20,337) at the current date to 1,334 (95% CI: 1,082-1,586) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 18,873 (95% CI: 17,408-20,337) at the current date to 73,157 (95% CI: 61,078-85,236) by 2021-02-15.

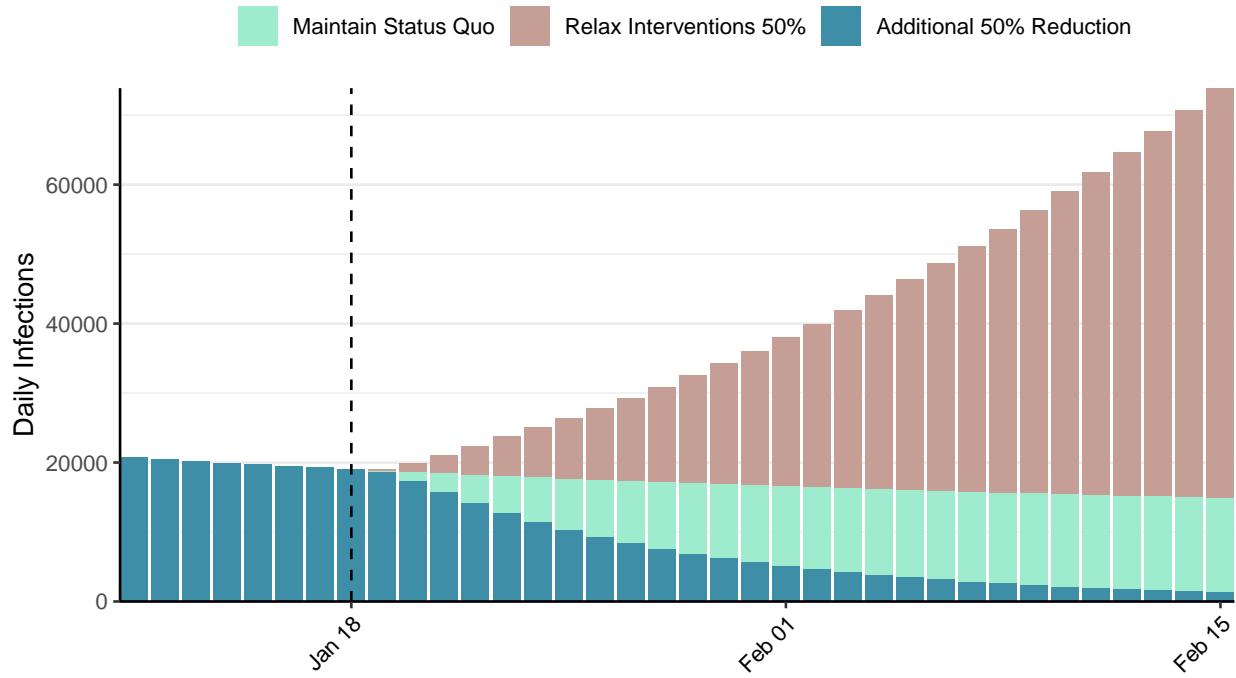


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Russia, 2021-01-18

[Download the report for Russia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.81 (95% CI: 0.65-1)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Russia is not shown in the following plot as only 0 deaths have been reported to date**

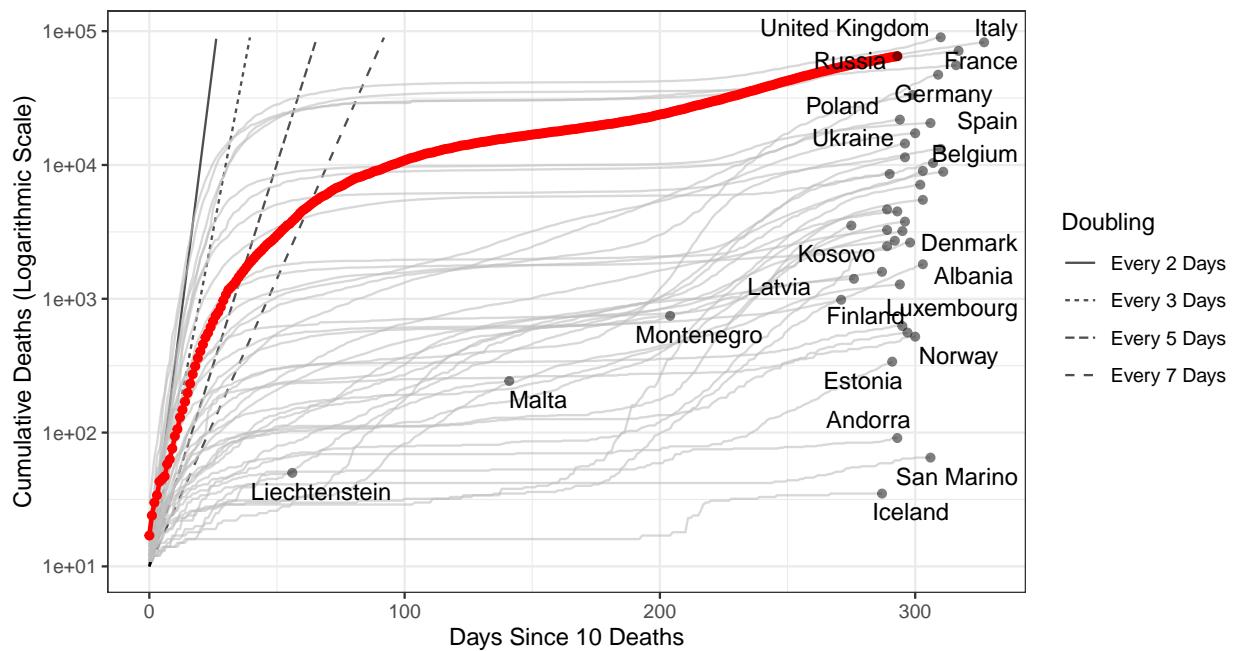


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 4,600,137 (95% CI: 4,412,148-4,788,125) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

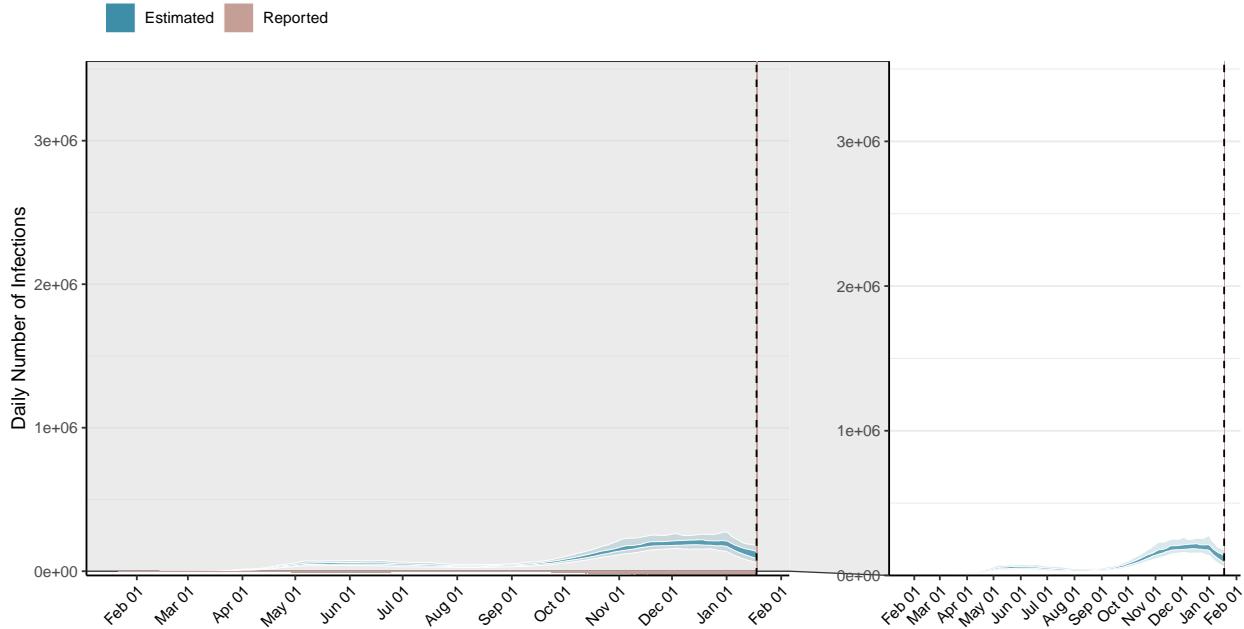


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

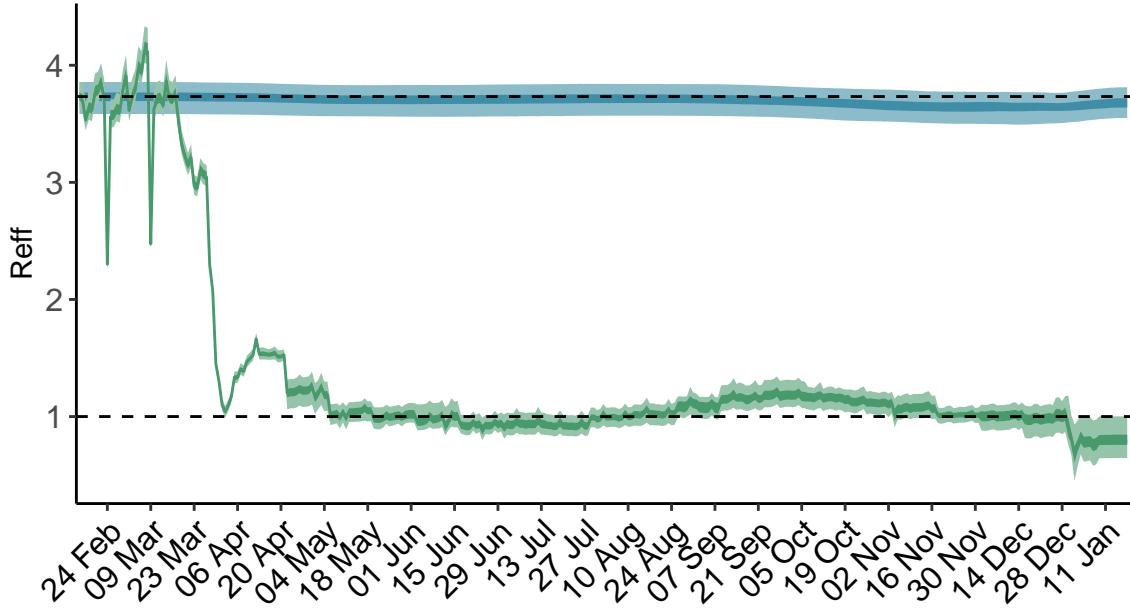


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

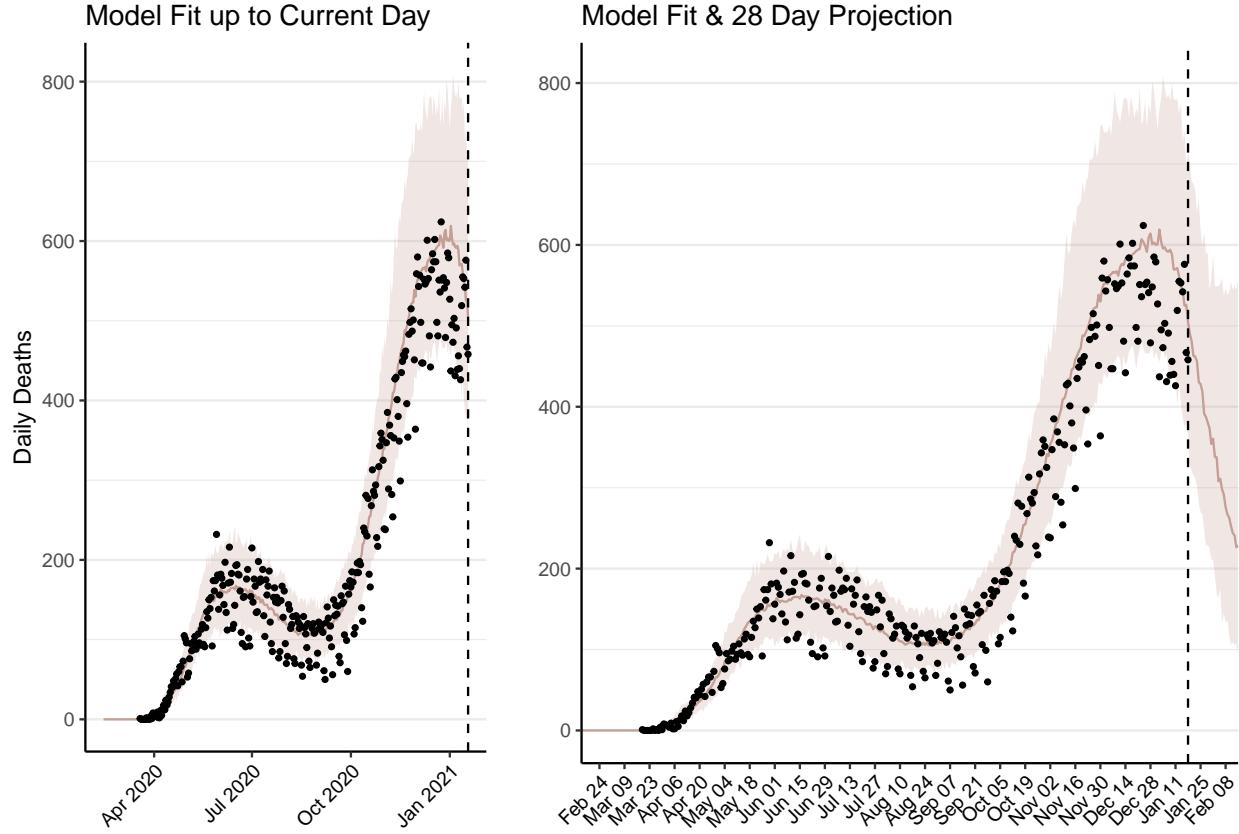


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 17,779 (95% CI: 16,992-18,566) patients requiring treatment with high-pressure oxygen at the current date to 8,657 (95% CI: 7,750-9,563) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 6,996 (95% CI: 6,707-7,286) patients requiring treatment with mechanical ventilation at the current date to 3,515 (95% CI: 3,184-3,845) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B.** These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.

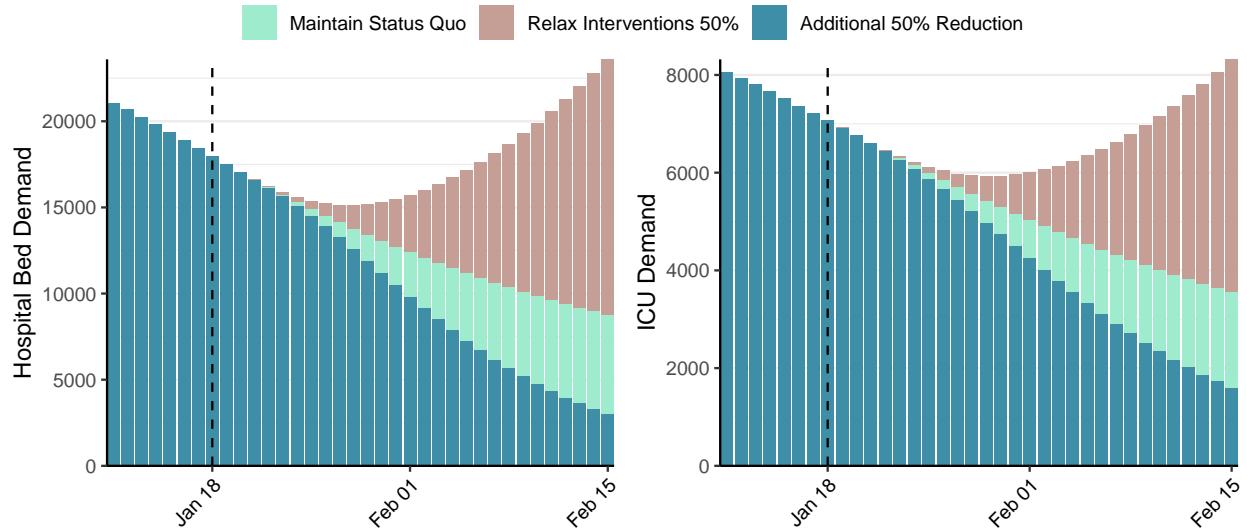


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 112,206 (95% CI: 104,985-119,426) at the current date to 5,517 (95% CI: 4,818-6,216) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 112,206 (95% CI: 104,985-119,426) at the current date to 292,296 (95% CI: 249,003-335,588) by 2021-02-15.

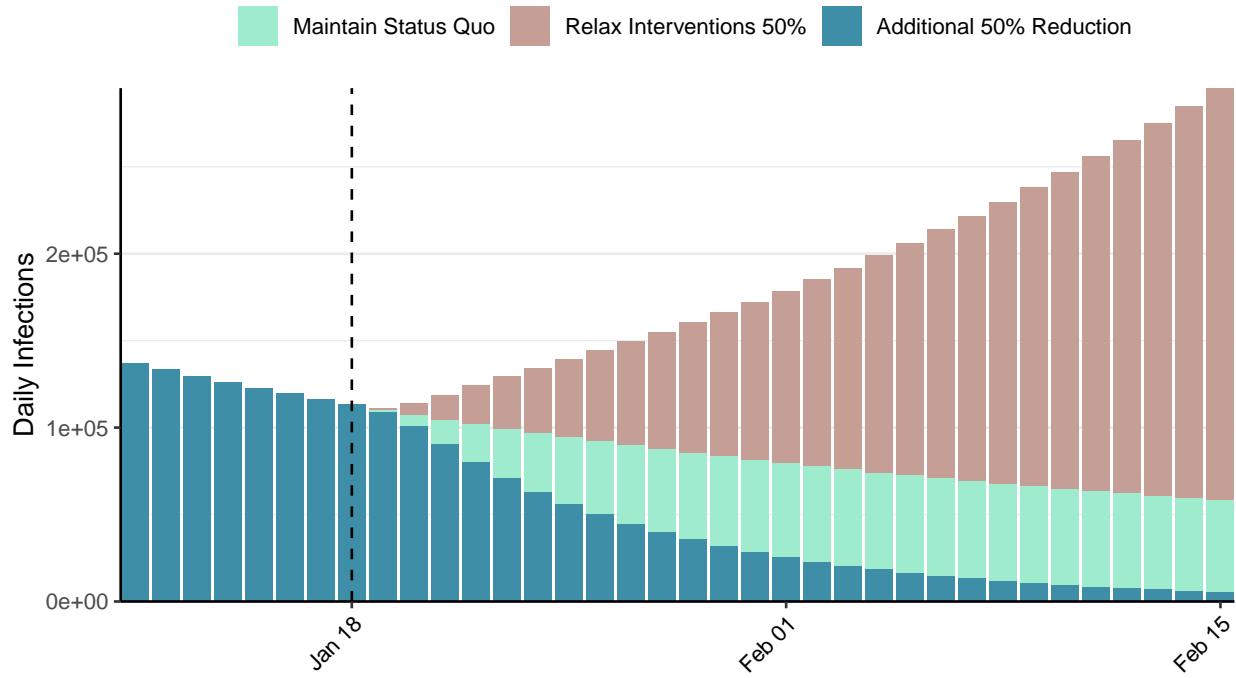


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Rwanda, 2021-01-18

[Download the report for Rwanda, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.19 (95% CI: 1-1.43)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Rwanda is not shown in the following plot as only 0 deaths have been reported to date**

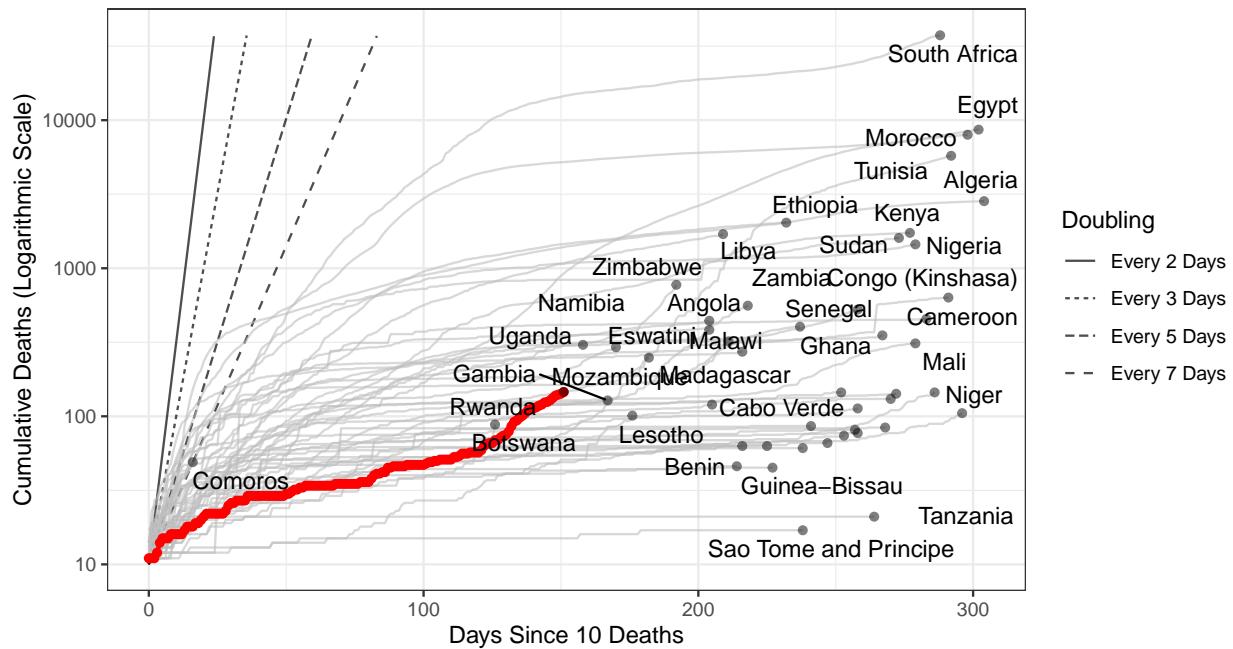


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 109,527 (95% CI: 98,809-120,245) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

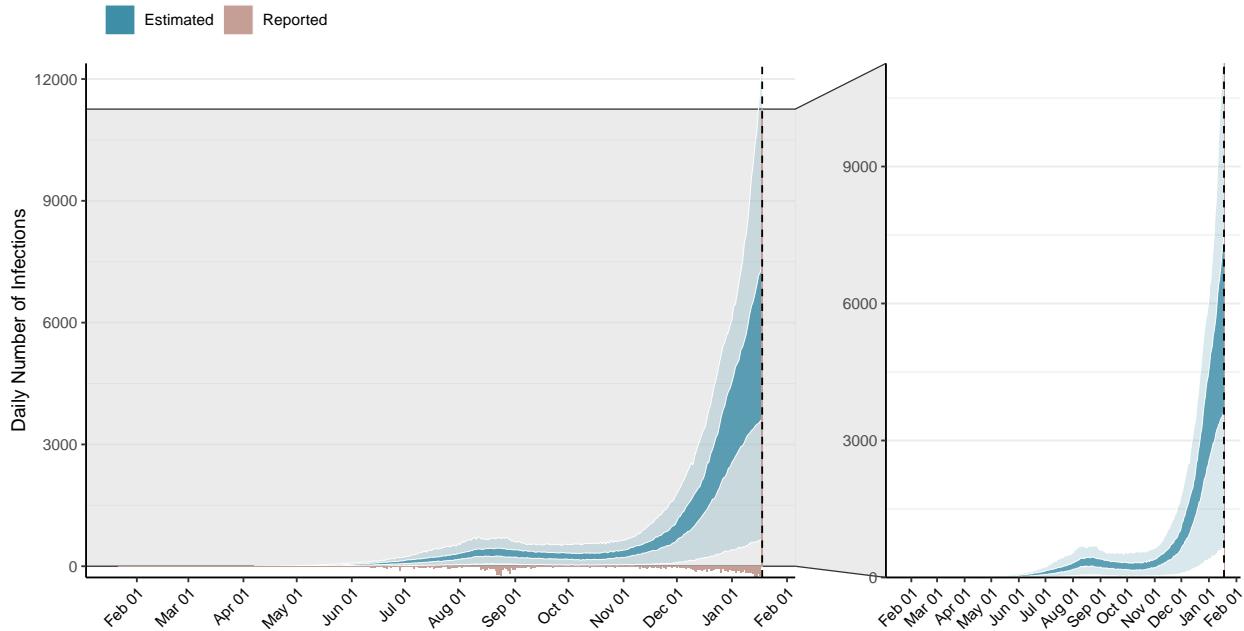


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

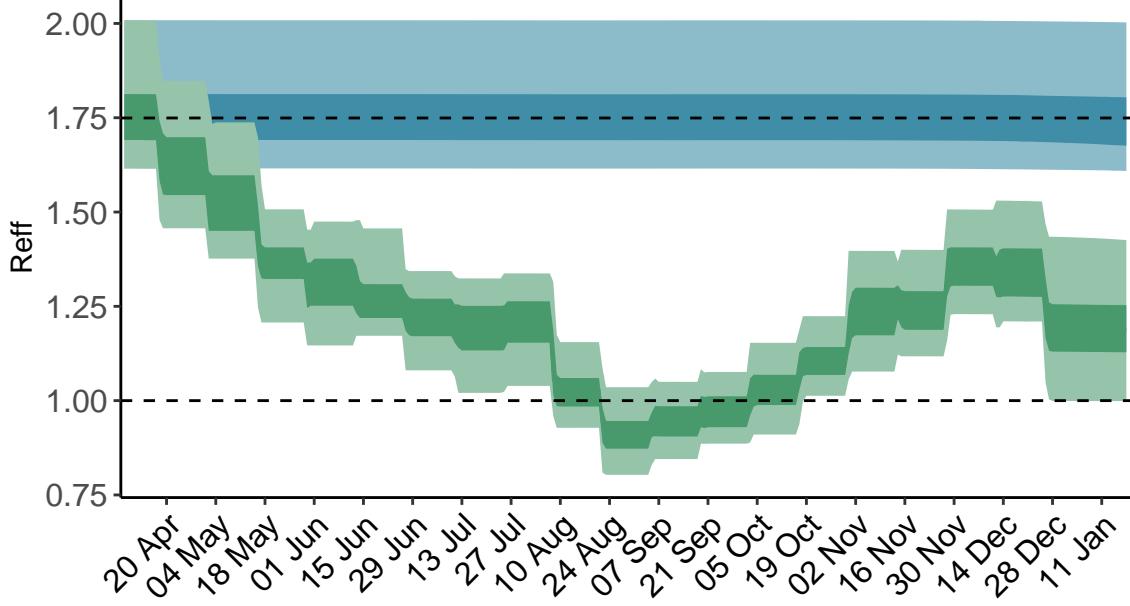


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Rwanda is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

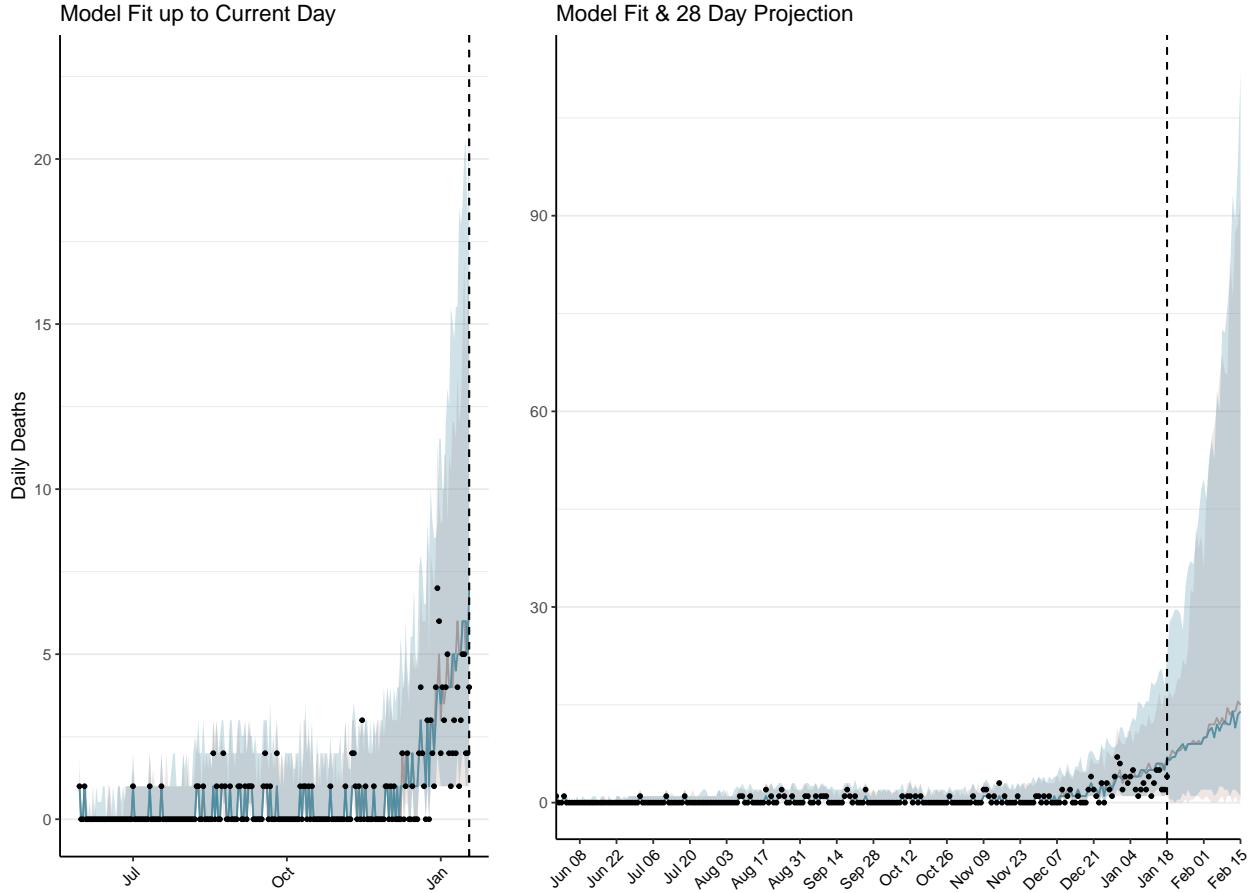


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 334 (95% CI: 301-368) patients requiring treatment with high-pressure oxygen at the current date to 823 (95% CI: 704-941) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 124 (95% CI: 112-137) patients requiring treatment with mechanical ventilation at the current date to 251 (95% CI: 227-275) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

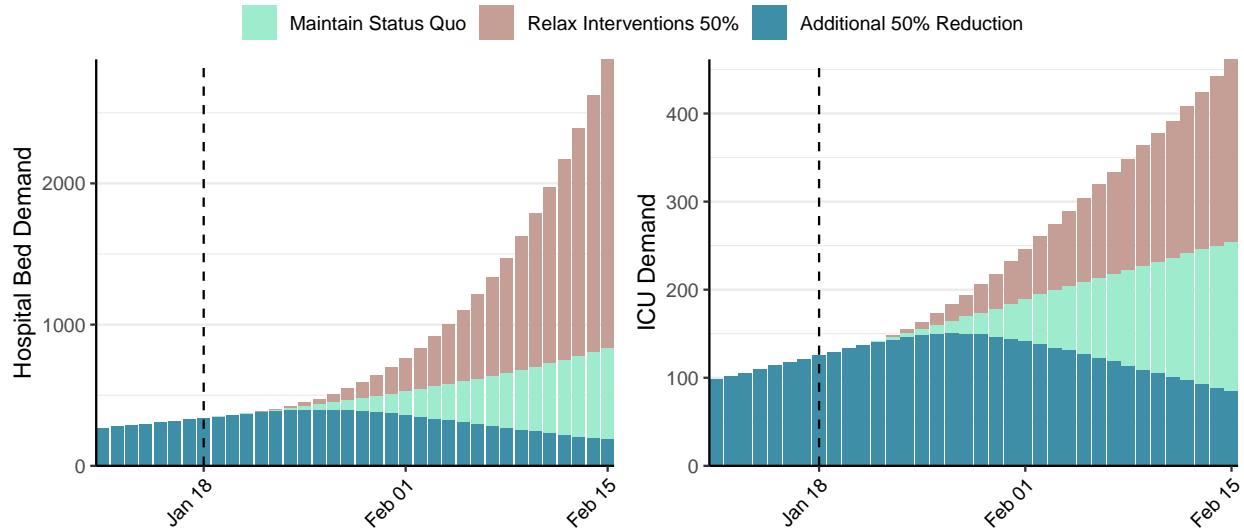


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 5,777 (95% CI: 5,137-6,418) at the current date to 1,030 (95% CI: 869-1,192) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 5,777 (95% CI: 5,137-6,418) at the current date to 85,675 (95% CI: 72,061-99,290) by 2021-02-15.

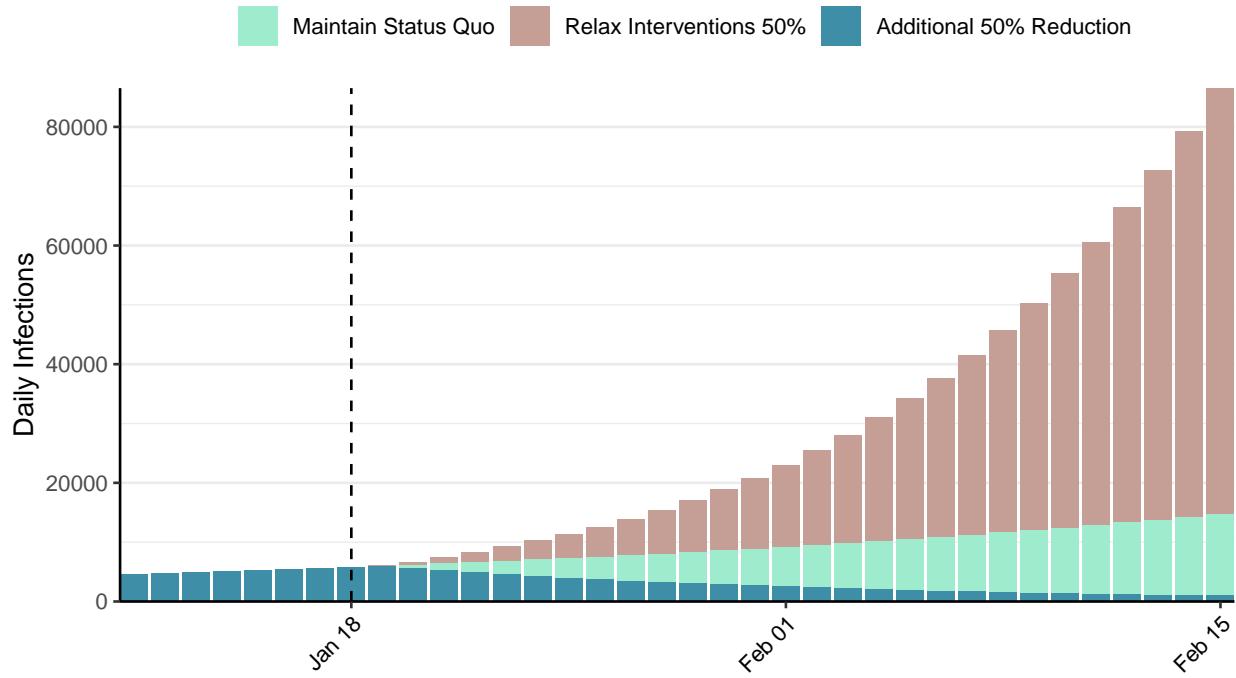


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Sudan, 2021-01-18

[Download the report for Sudan, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.6 (95% CI: 1.34-1.83)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Sudan is not shown in the following plot as only 0 deaths have been reported to date**

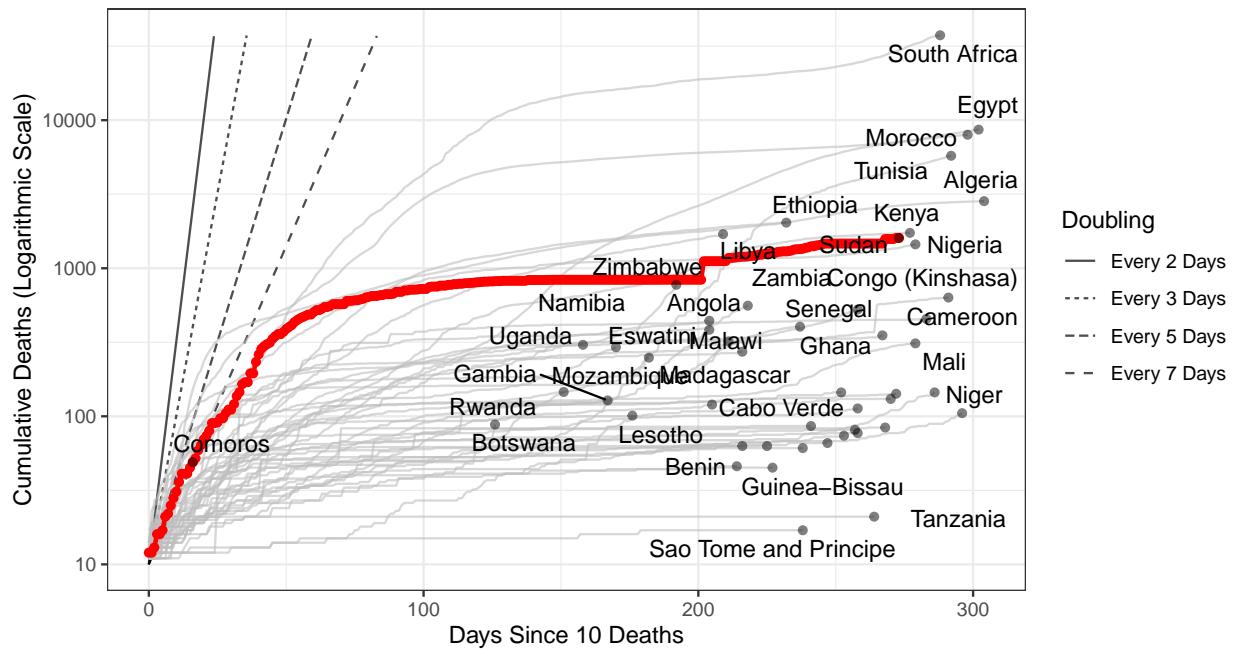


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 257,589 (95% CI: 230,125–285,053) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

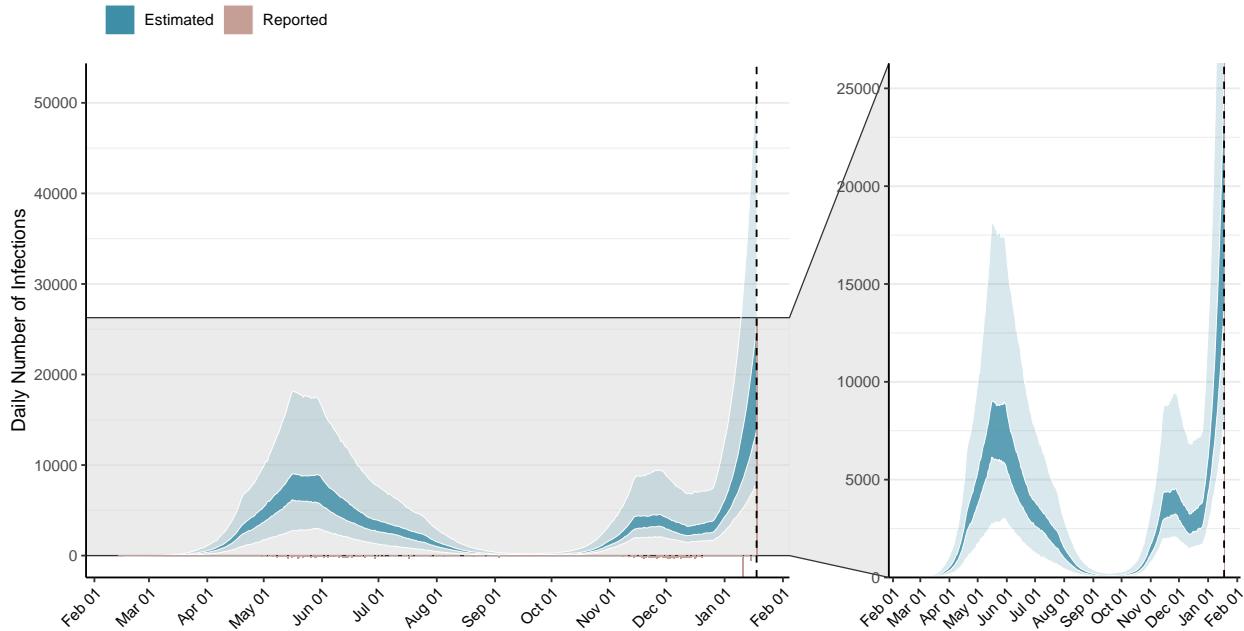


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

We are aware of under-reporting of deaths in Khartoum, Sudan. This is not represented in this report, but please see [Report 39](#)

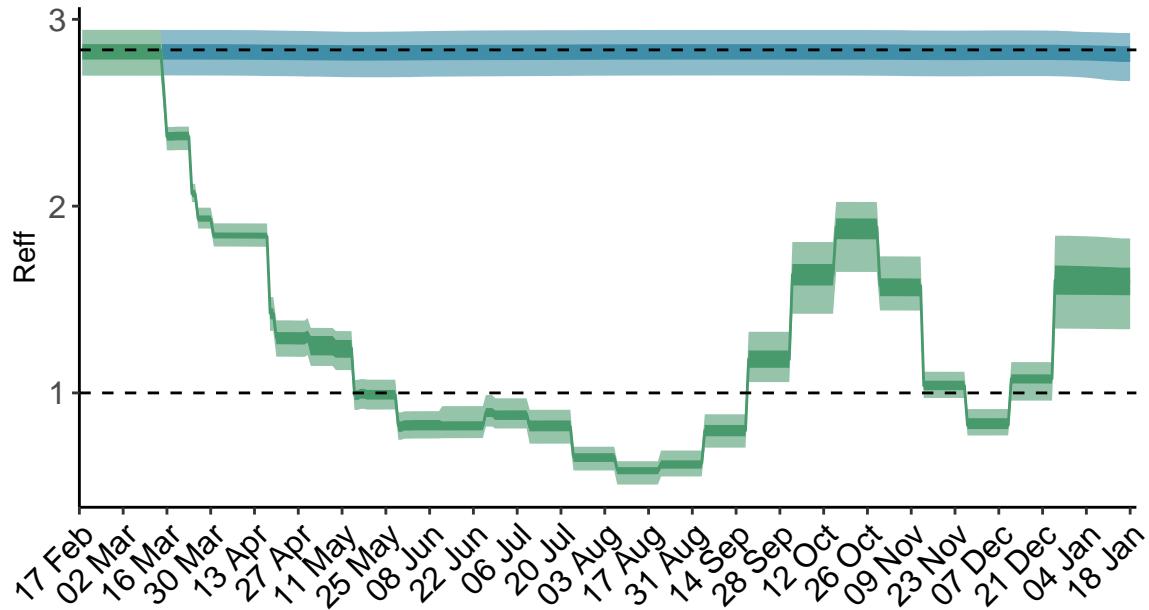


Figure 3: **Time-varying effective reproduction number, R_{eff} .** R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Sudan is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

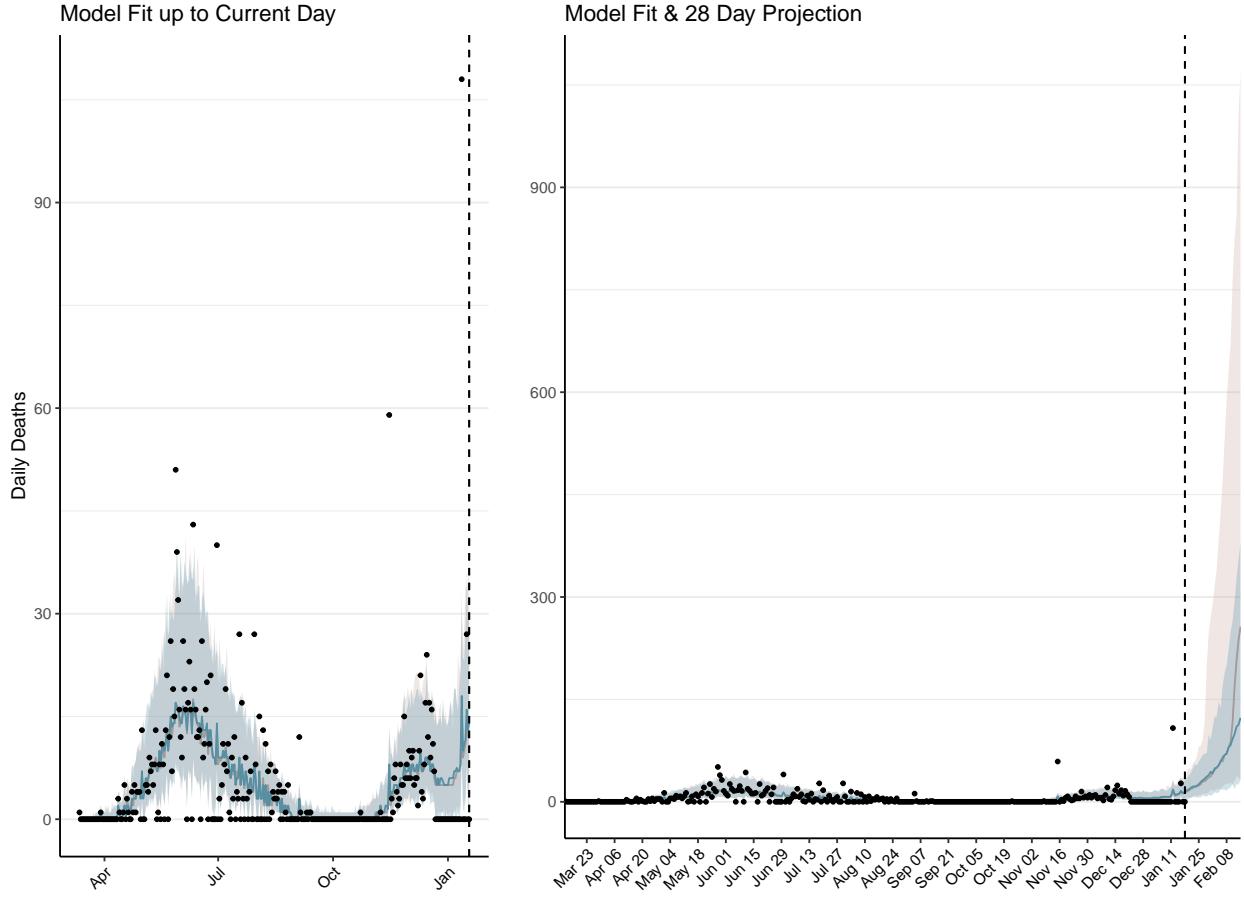


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 866 (95% CI: 774-958) patients requiring treatment with high-pressure oxygen at the current date to 7,801 (95% CI: 6,451-9,150) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 294 (95% CI: 263-325) patients requiring treatment with mechanical ventilation at the current date to 1,682 (95% CI: 1,563-1,801) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

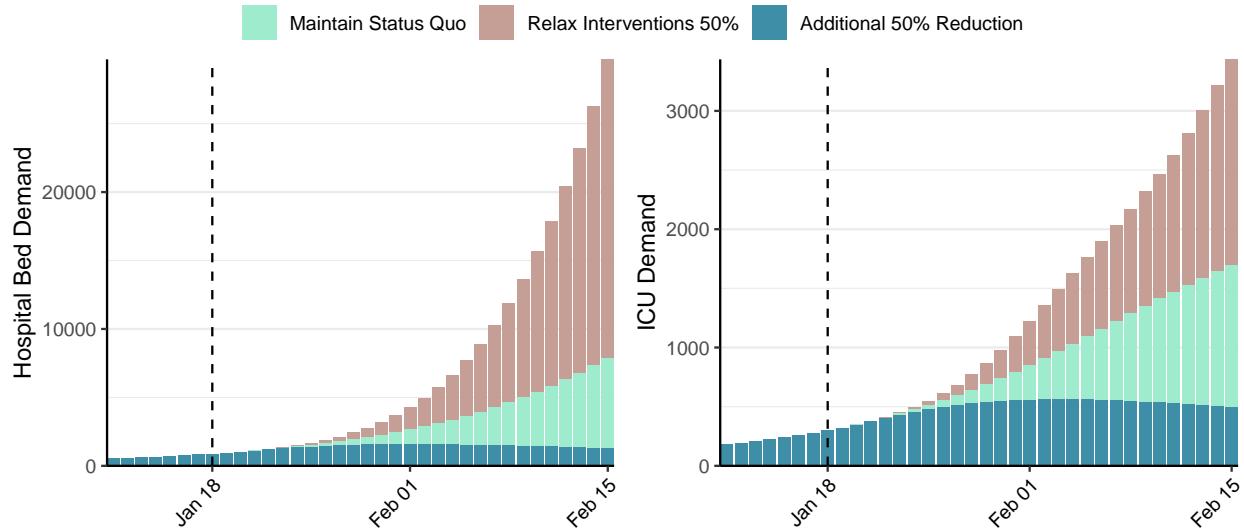


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 21,896 (95% CI: 19,131-24,662) at the current date to 11,475 (95% CI: 9,023-13,928) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 21,896 (95% CI: 19,131-24,662) at the current date to 1,008,202 (95% CI: 900,891-1,115,514) by 2021-02-15.

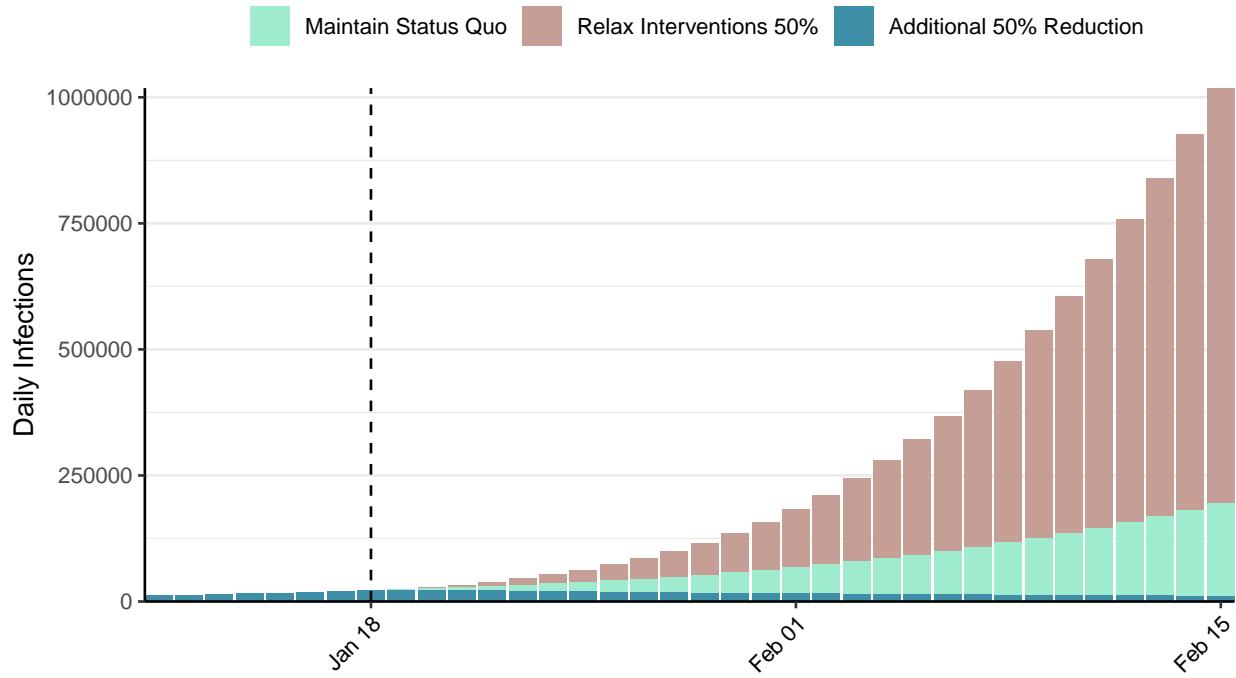


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Senegal, 2021-01-18

[Download the report for Senegal, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.33 (95% CI: 1.17-1.54)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Senegal is not shown in the following plot as only 0 deaths have been reported to date**

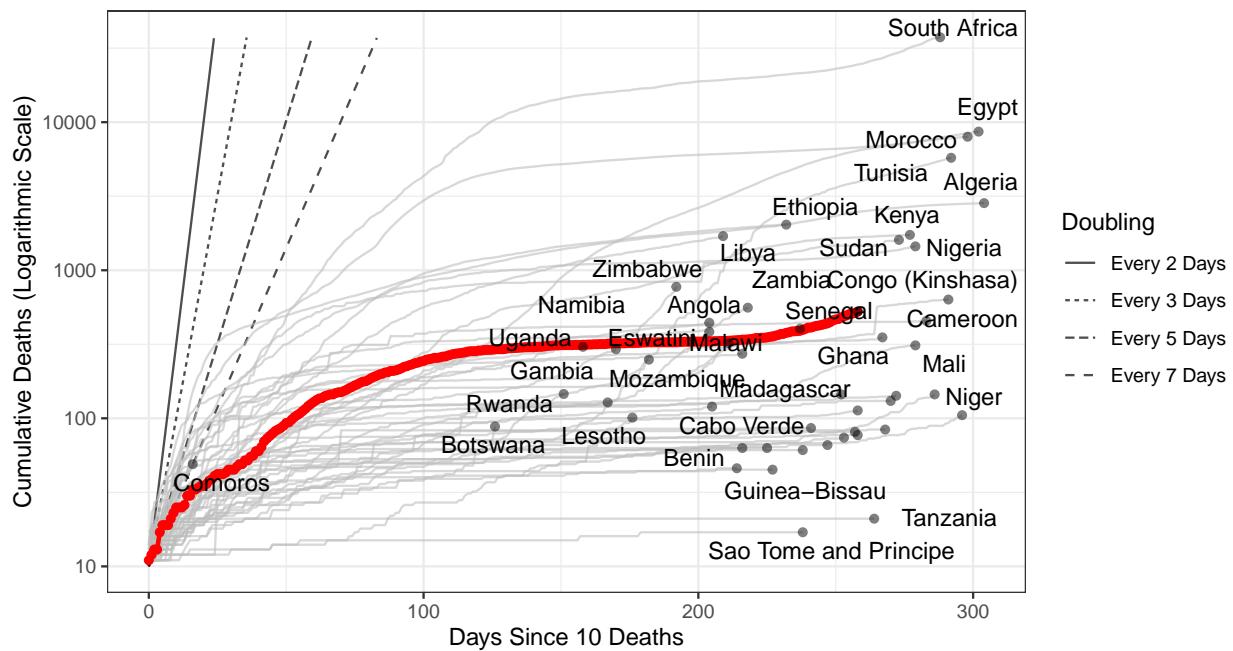


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 272,833 (95% CI: 254,759-290,907) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

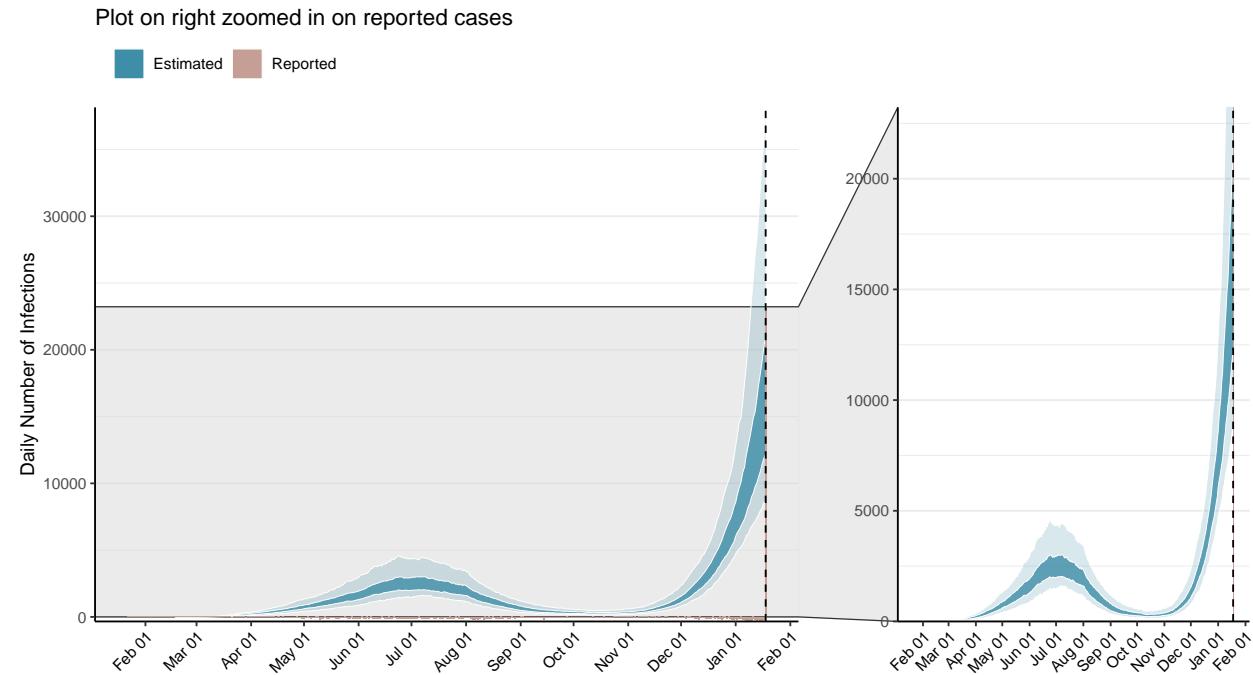


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

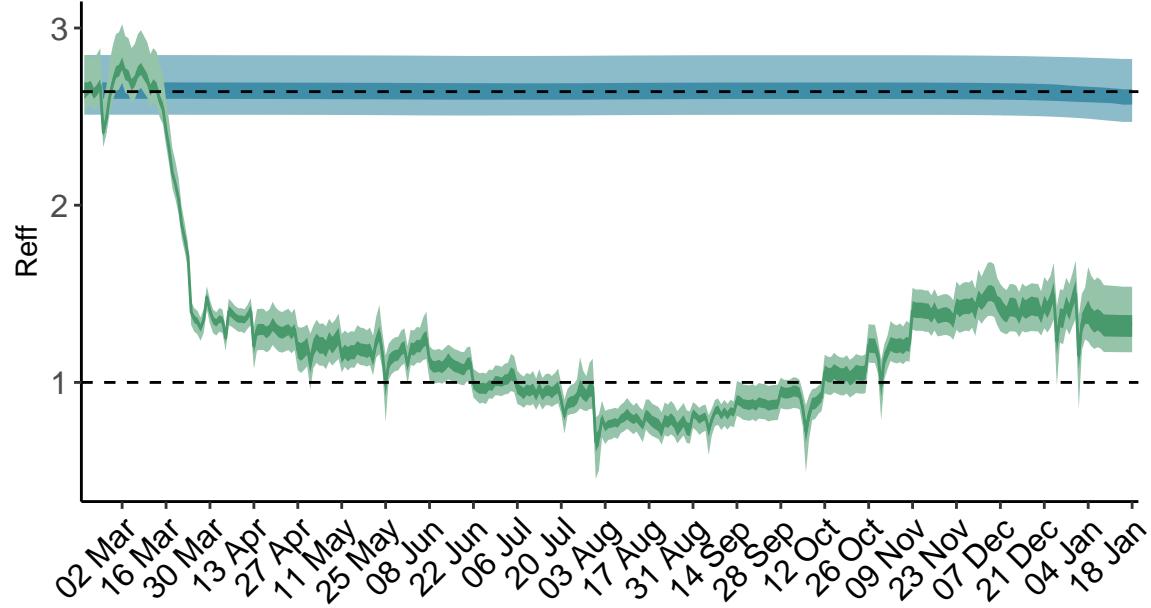


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Senegal is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

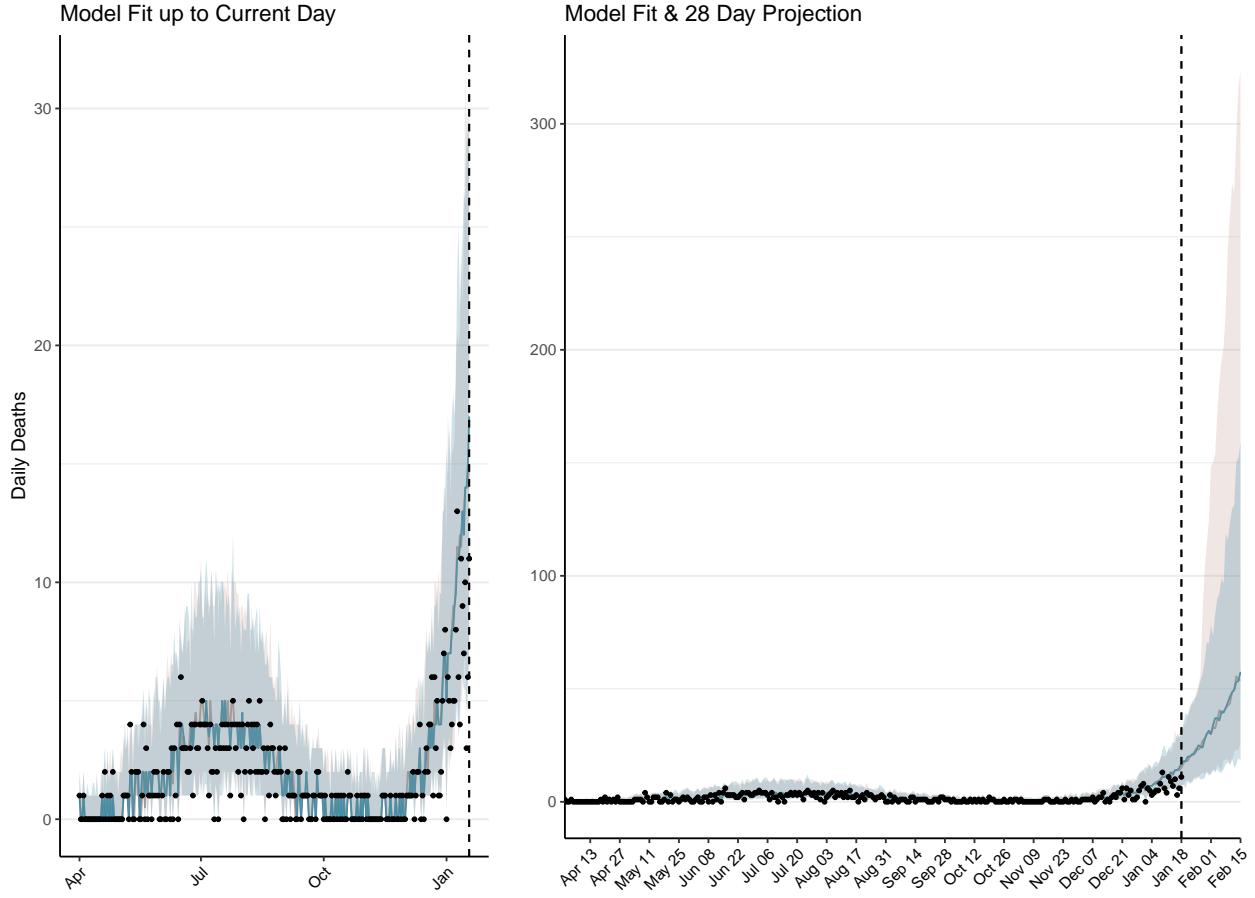


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 836 (95% CI: 780-892) patients requiring treatment with high-pressure oxygen at the current date to 3,129 (95% CI: 2,758-3,500) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 296 (95% CI: 276-317) patients requiring treatment with mechanical ventilation at the current date to 890 (95% CI: 837-942) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

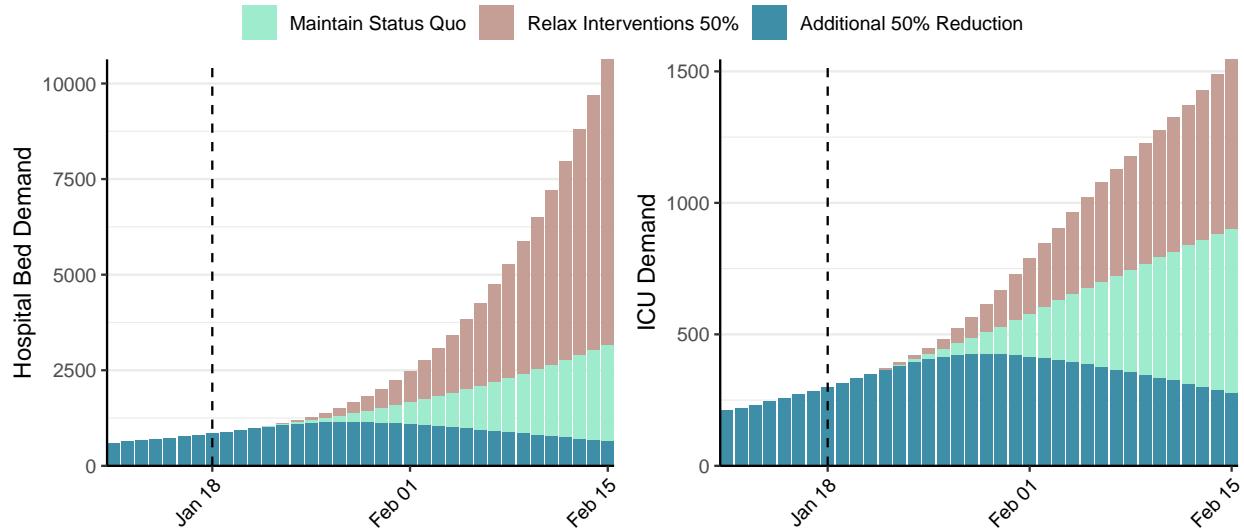


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 17,393 (95% CI: 15,967-18,820) at the current date to 4,379 (95% CI: 3,755-5,002) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 17,393 (95% CI: 15,967-18,820) at the current date to 316,288 (95% CI: 285,735-346,840) by 2021-02-15.

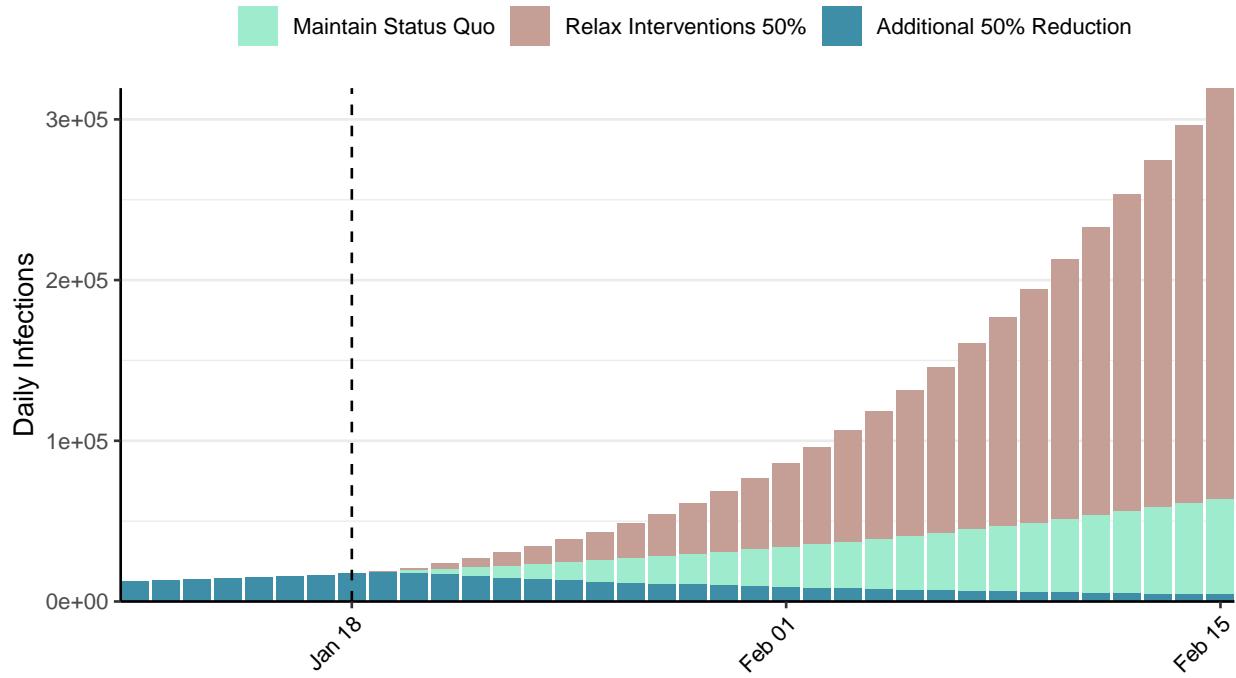


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Sierra Leone, 2021-01-18

[Download the report for Sierra Leone, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.31 (95% CI: 0.93-1.7)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Sierra Leone is not shown in the following plot as only 0 deaths have been reported to date**

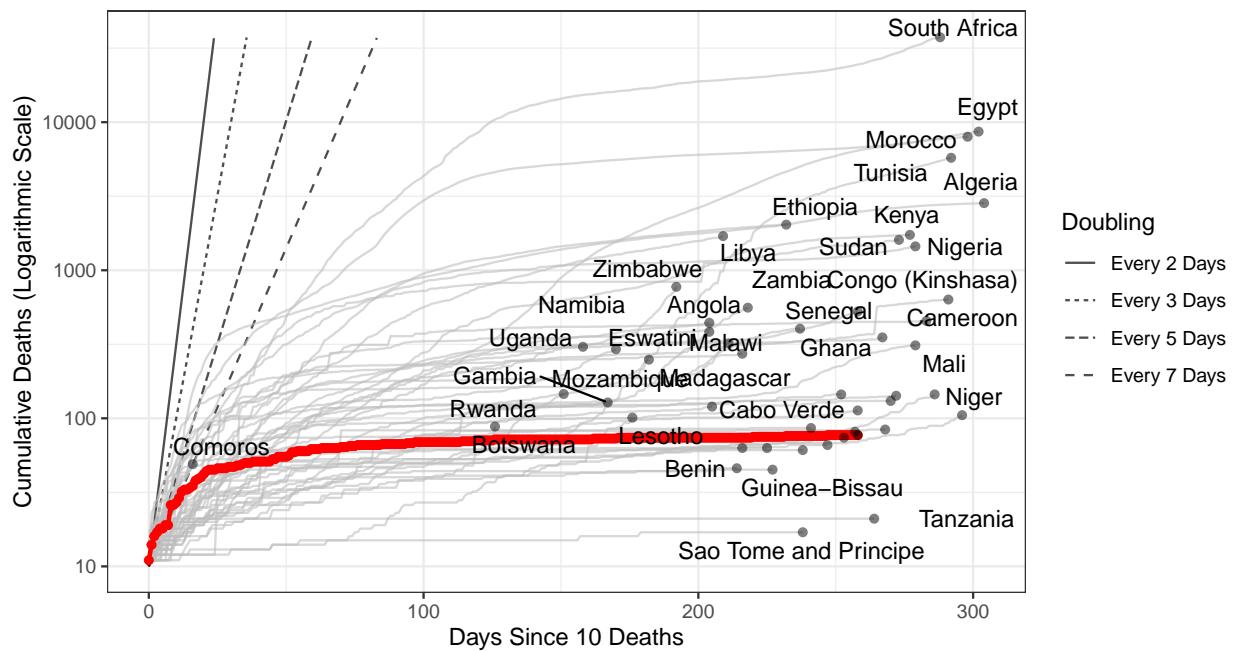


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 2,907 (95% CI: 2,398-3,416) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

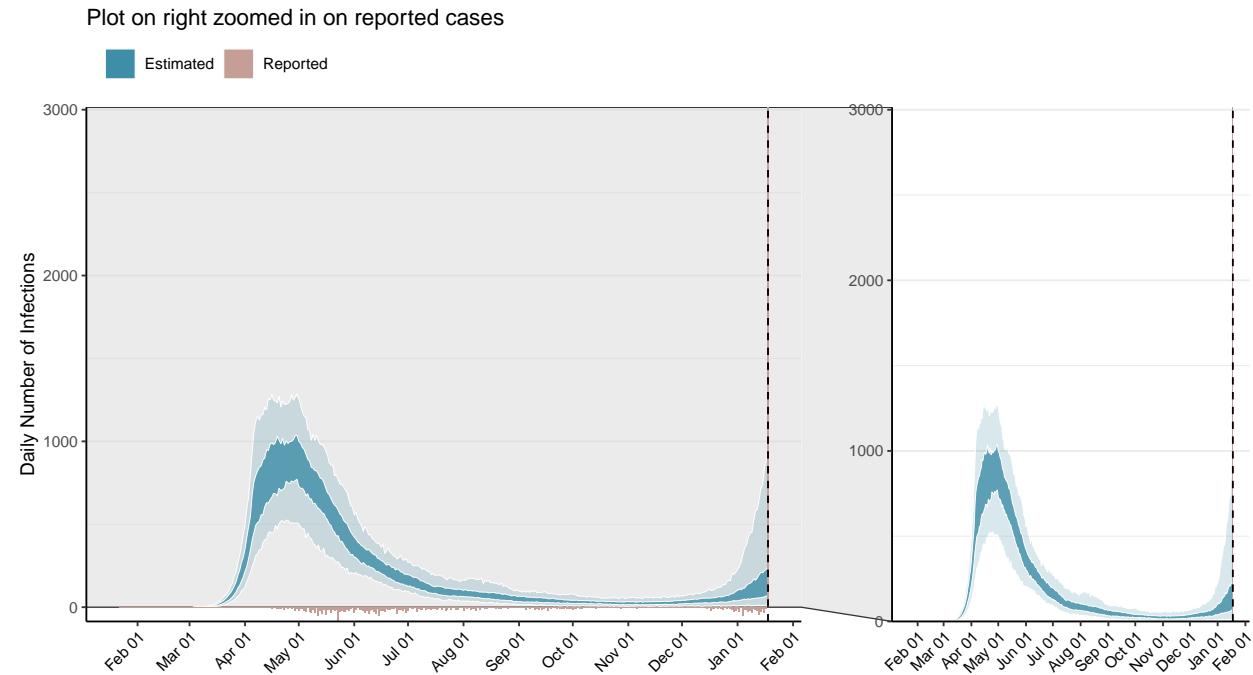


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

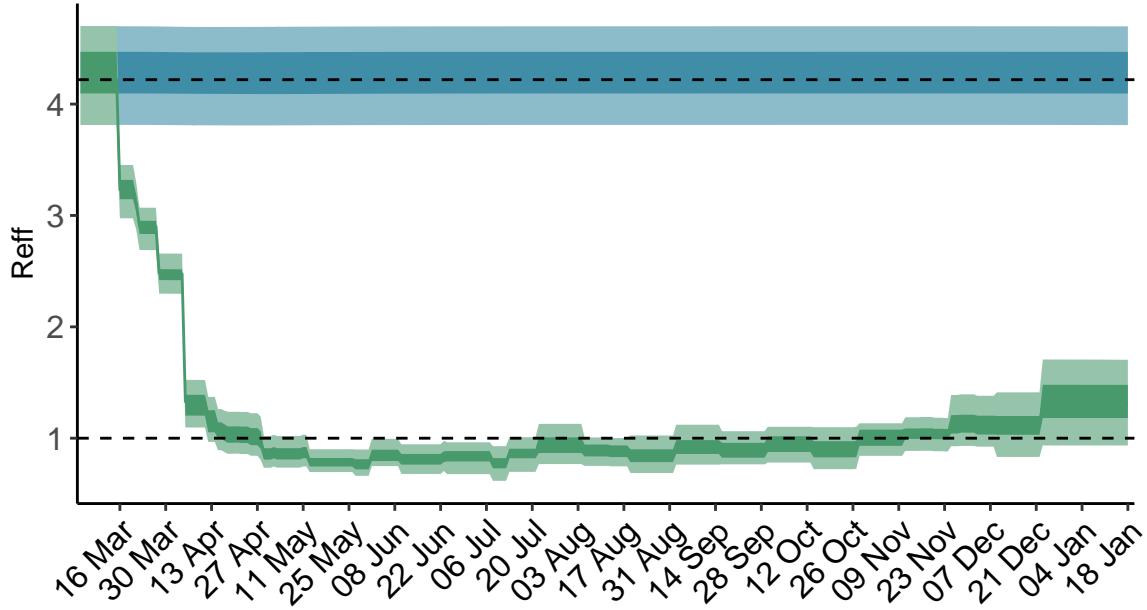


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Sierra Leone is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

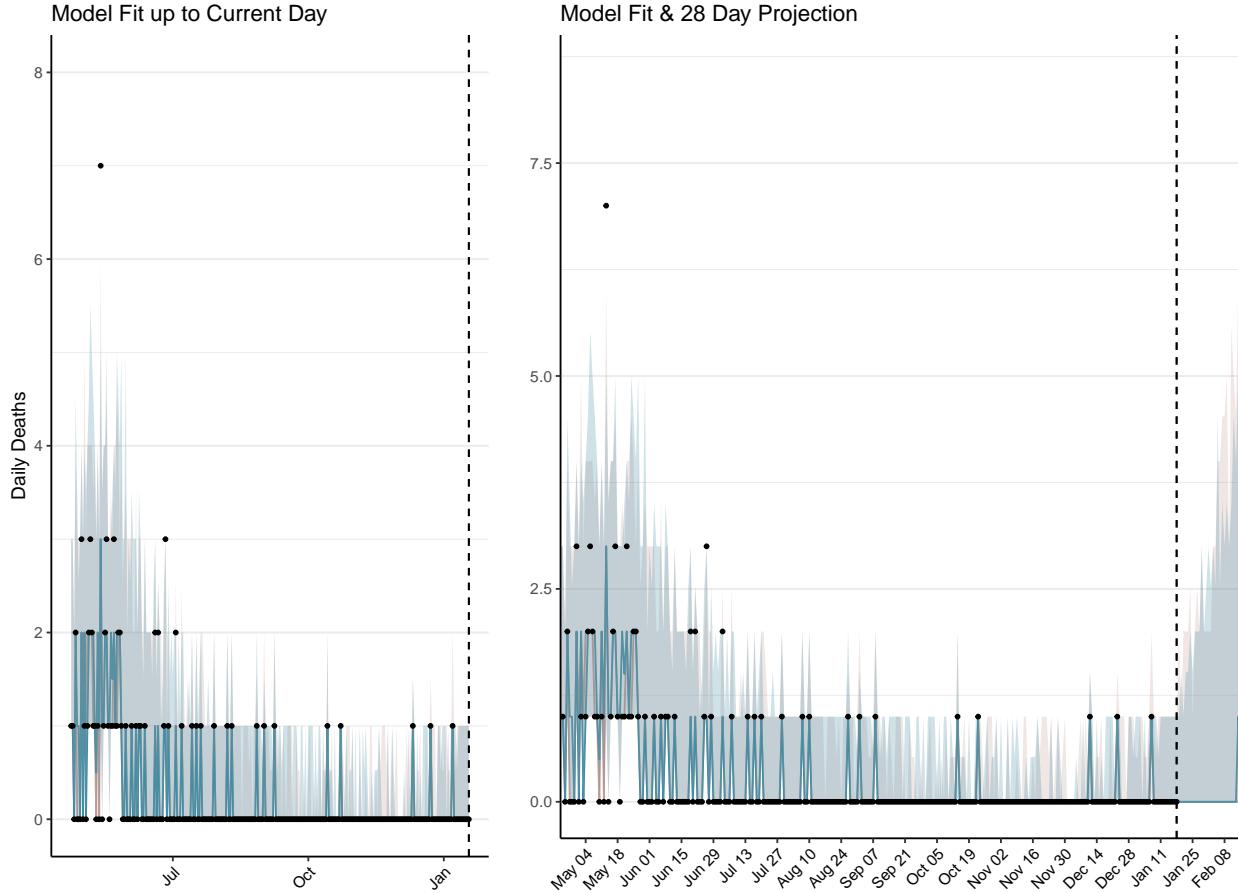


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 10 (95% CI: 8-11) patients requiring treatment with high-pressure oxygen at the current date to 56 (95% CI: 35-77) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 3 (95% CI: 3-4) patients requiring treatment with mechanical ventilation at the current date to 18 (95% CI: 12-25) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

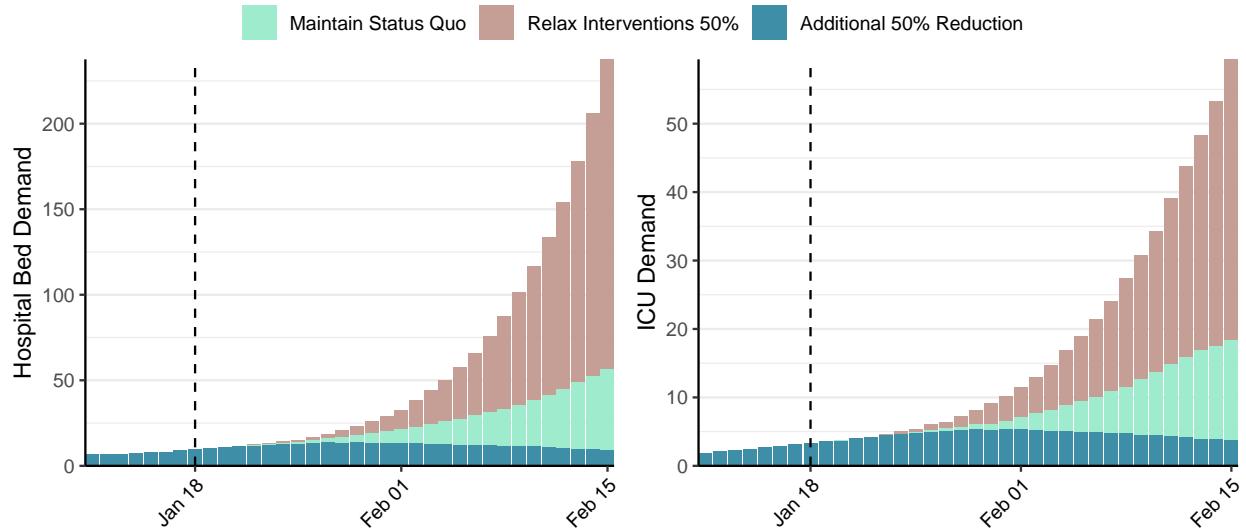


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 202 (95% CI: 155-249) at the current date to 76 (95% CI: 46-106) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 202 (95% CI: 155-249) at the current date to 10,237 (95% CI: 5,702-14,771) by 2021-02-15.

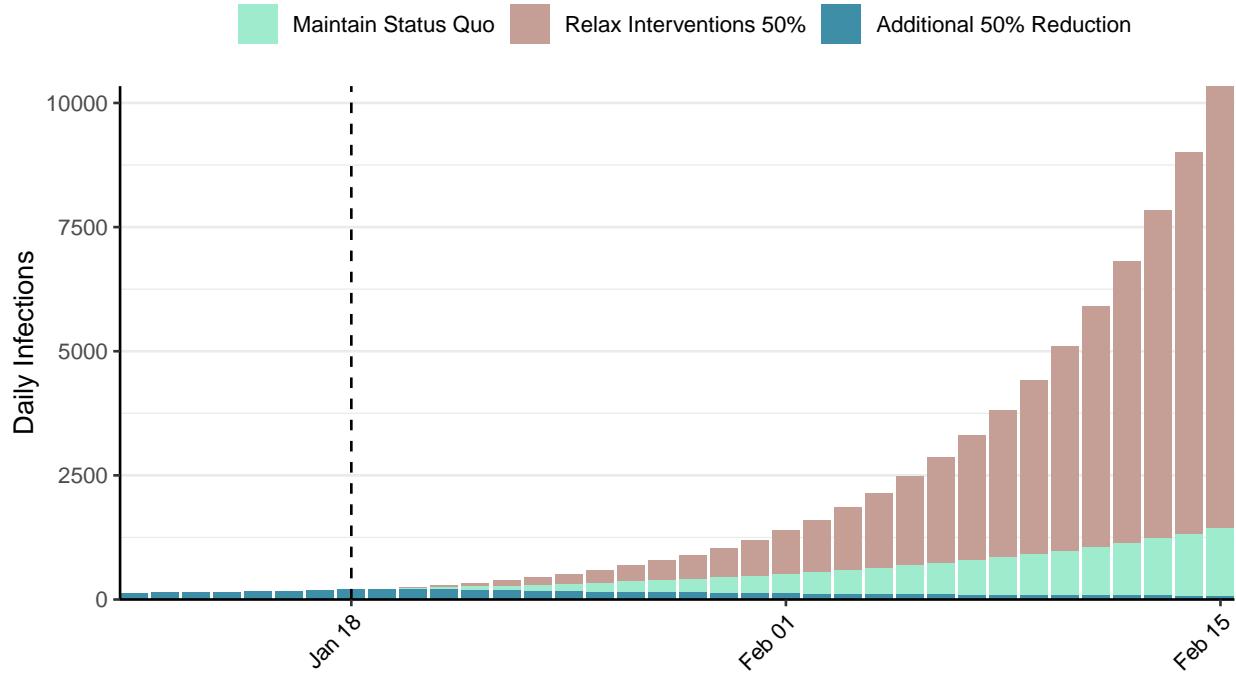


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: El Salvador, 2021-01-18

[Download the report for El Salvador, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.93 (95% CI: 0.8-1.03)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. El Salvador is not shown in the following plot as only 0 deaths have been reported to date**

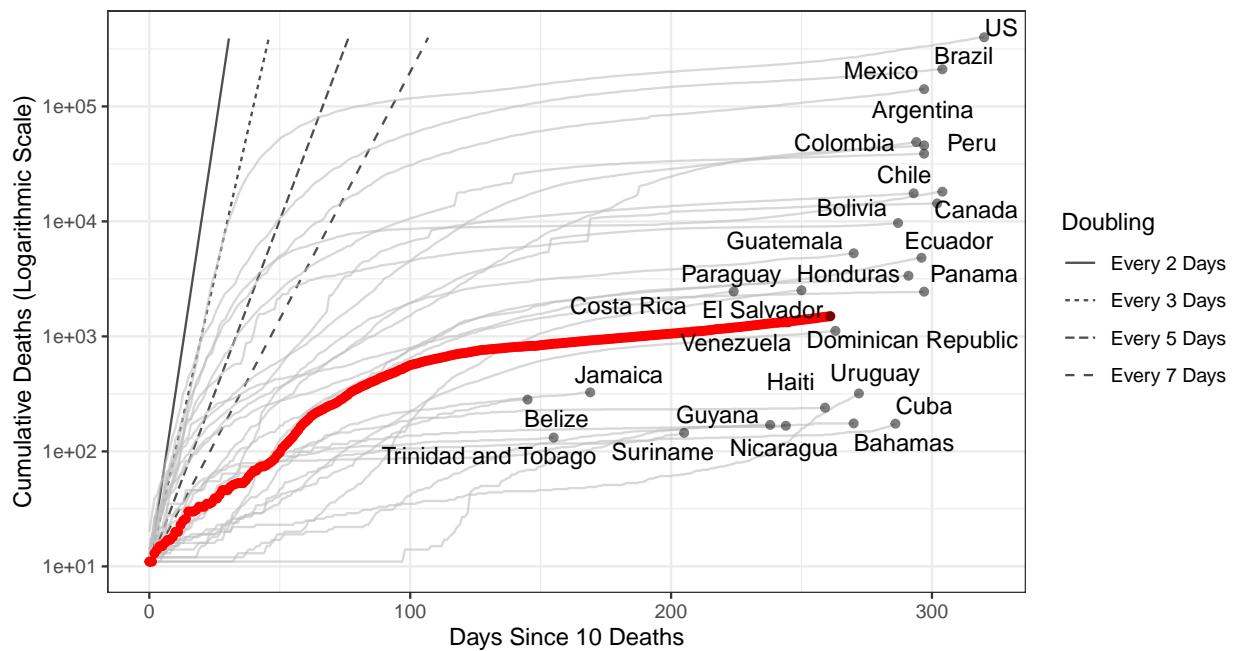


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 74,907 (95% CI: 70,570-79,243) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

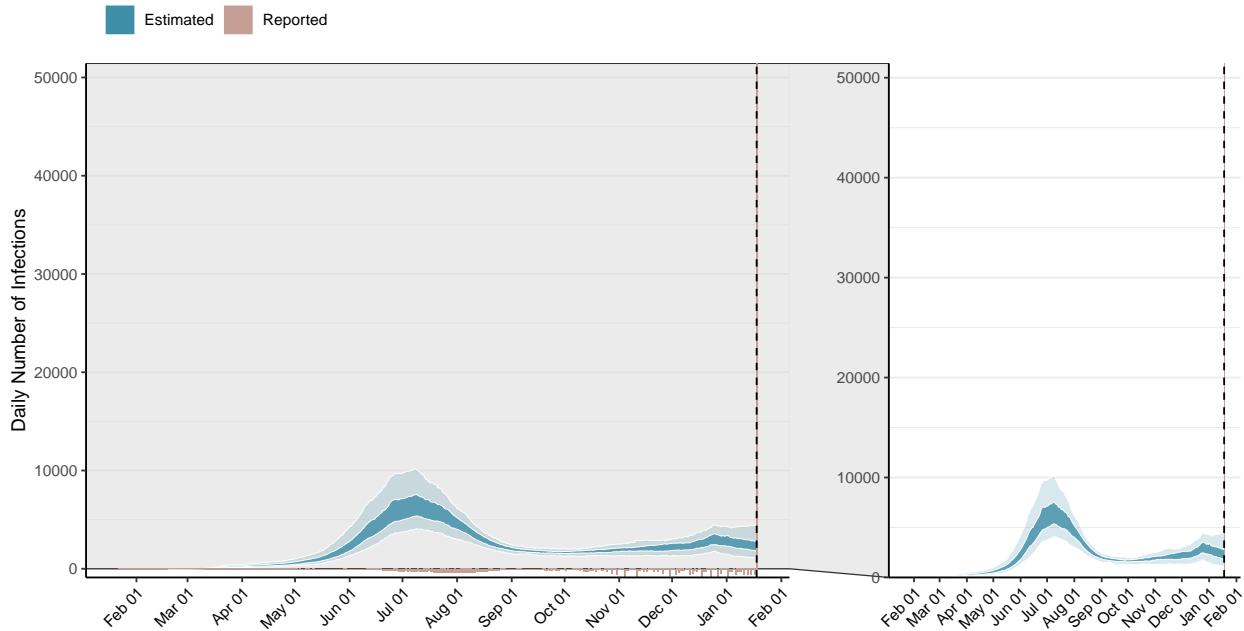


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

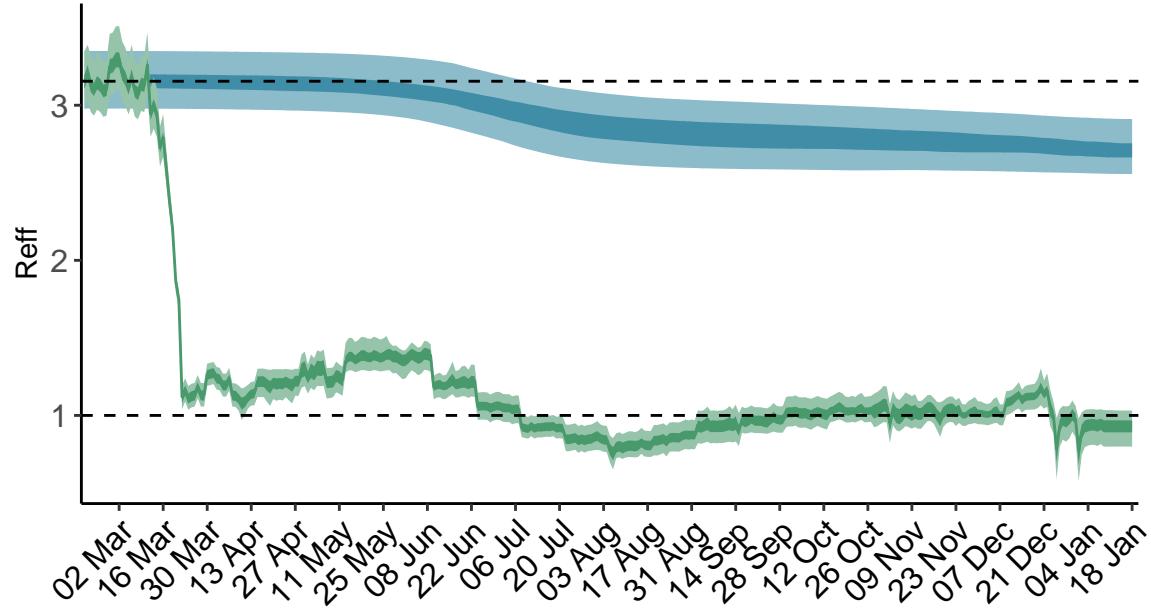


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

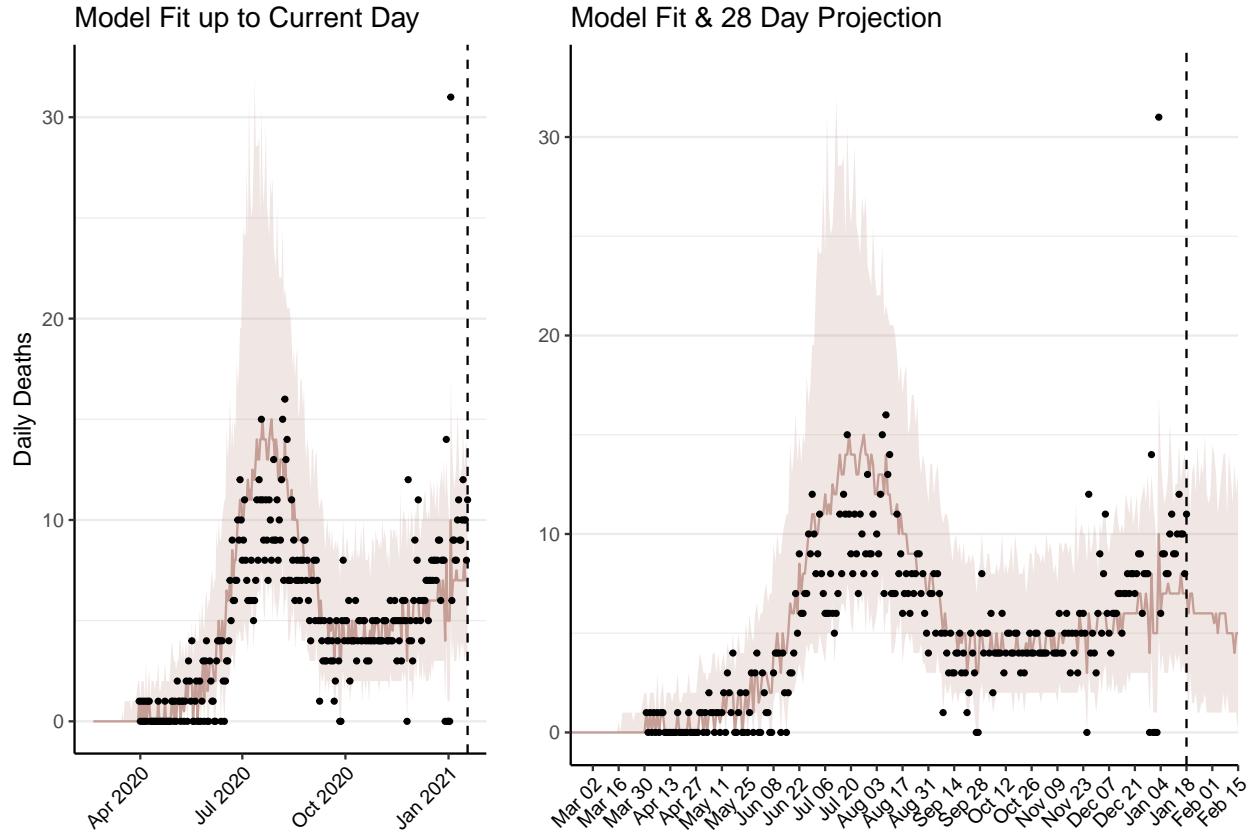


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 248 (95% CI: 234-263) patients requiring treatment with high-pressure oxygen at the current date to 196 (95% CI: 178-215) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 89 (95% CI: 83-95) patients requiring treatment with mechanical ventilation at the current date to 71 (95% CI: 65-78) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

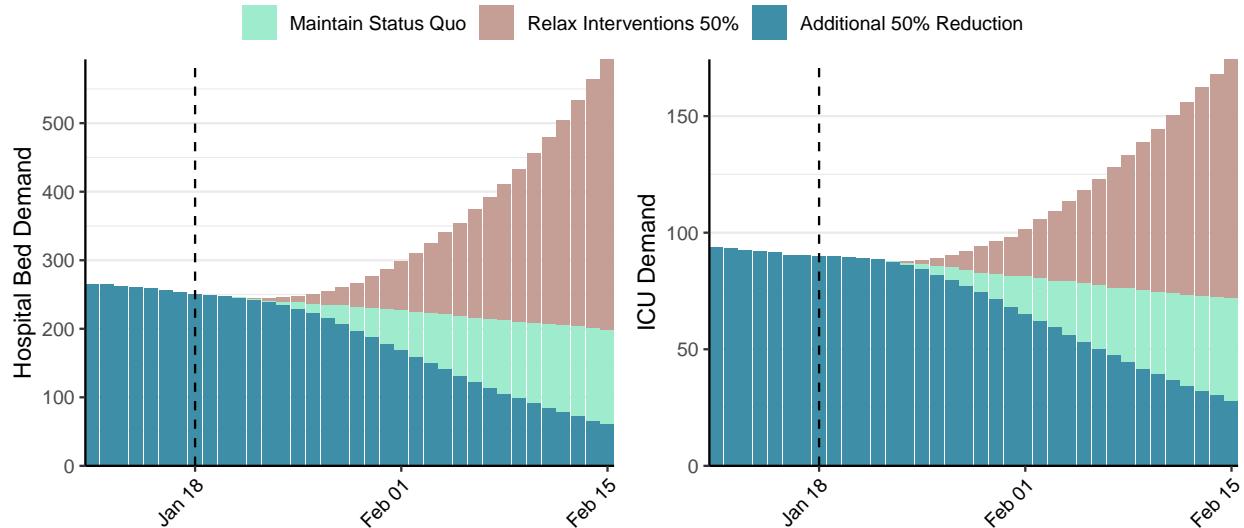


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 2,373 (95% CI: 2,203-2,543) at the current date to 164 (95% CI: 147-181) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,373 (95% CI: 2,203-2,543) at the current date to 10,083 (95% CI: 9,024-11,142) by 2021-02-15.

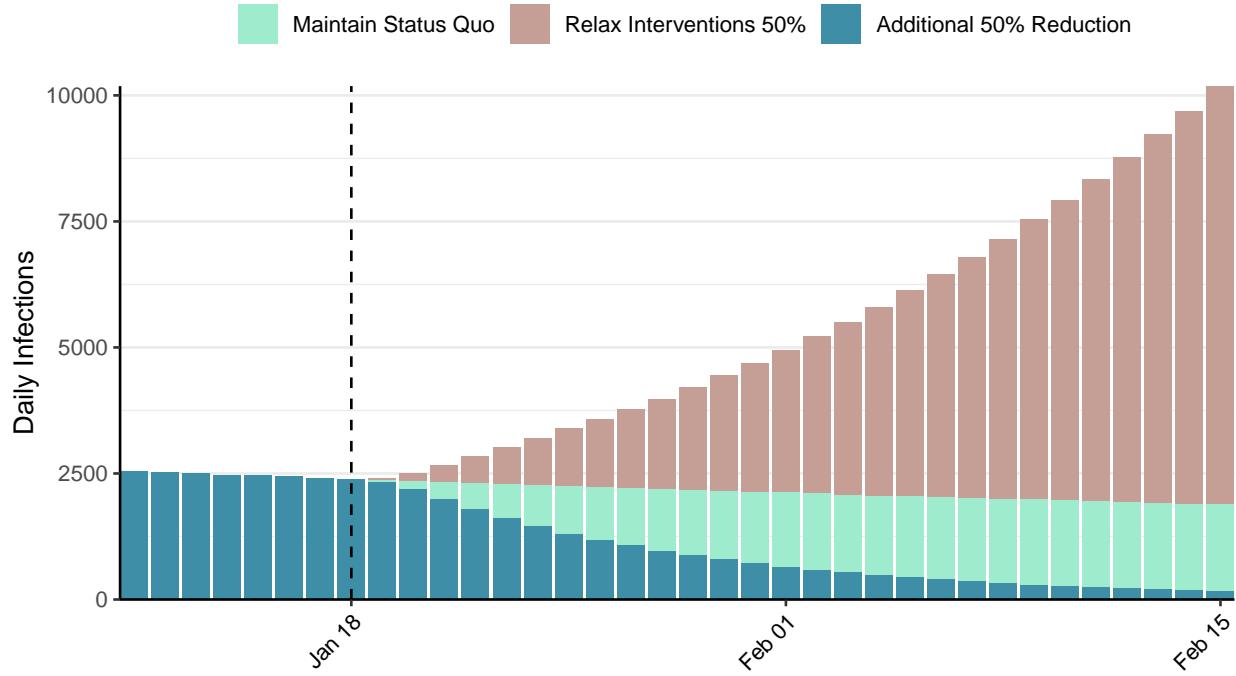


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Somalia, 2021-01-18

[Download the report for Somalia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.81 (95% CI: 0.6-1.15)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Somalia is not shown in the following plot as only 0 deaths have been reported to date**

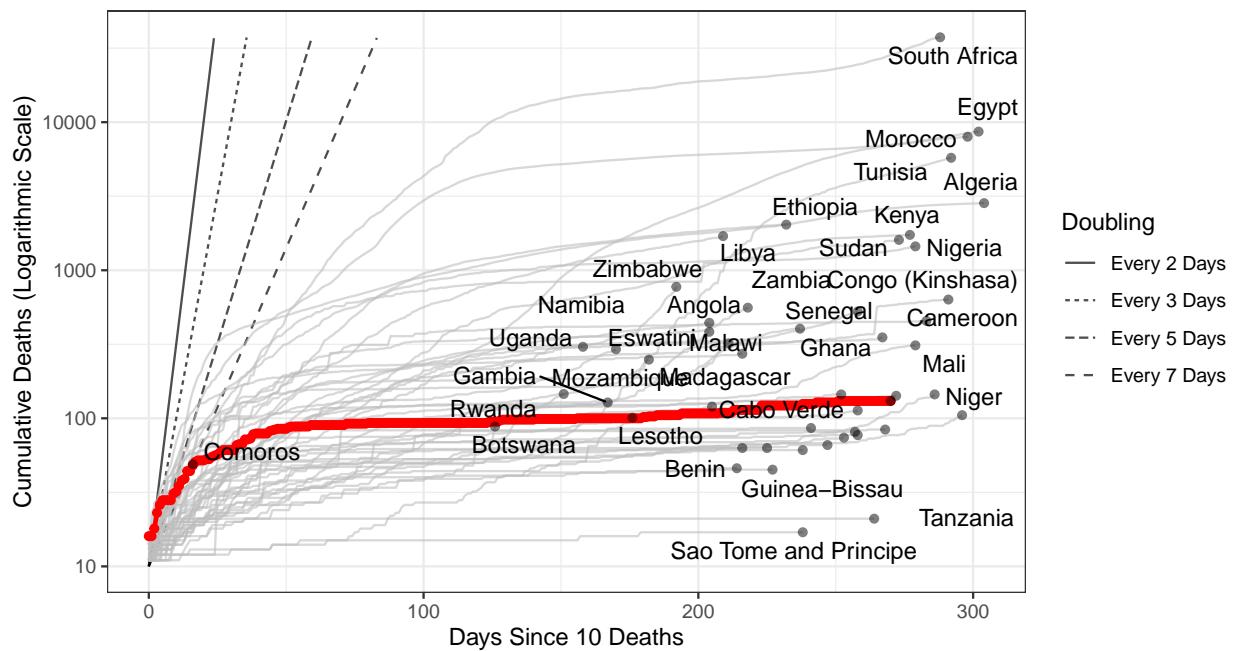


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 2,975 (95% CI: 2,511-3,438) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

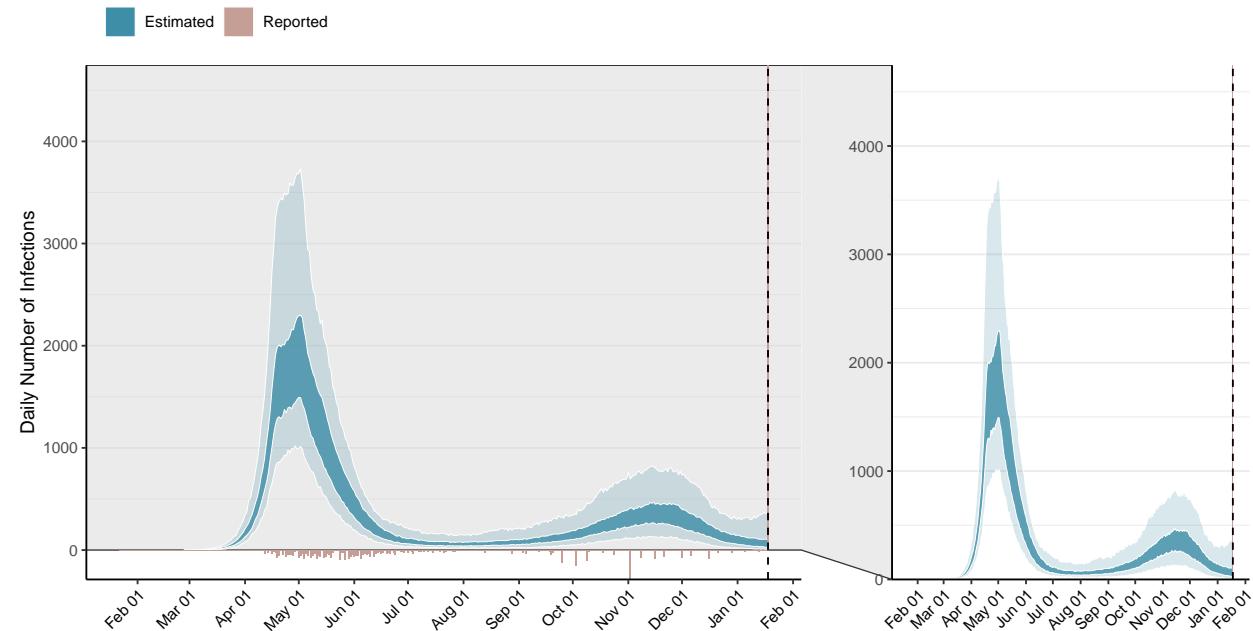


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

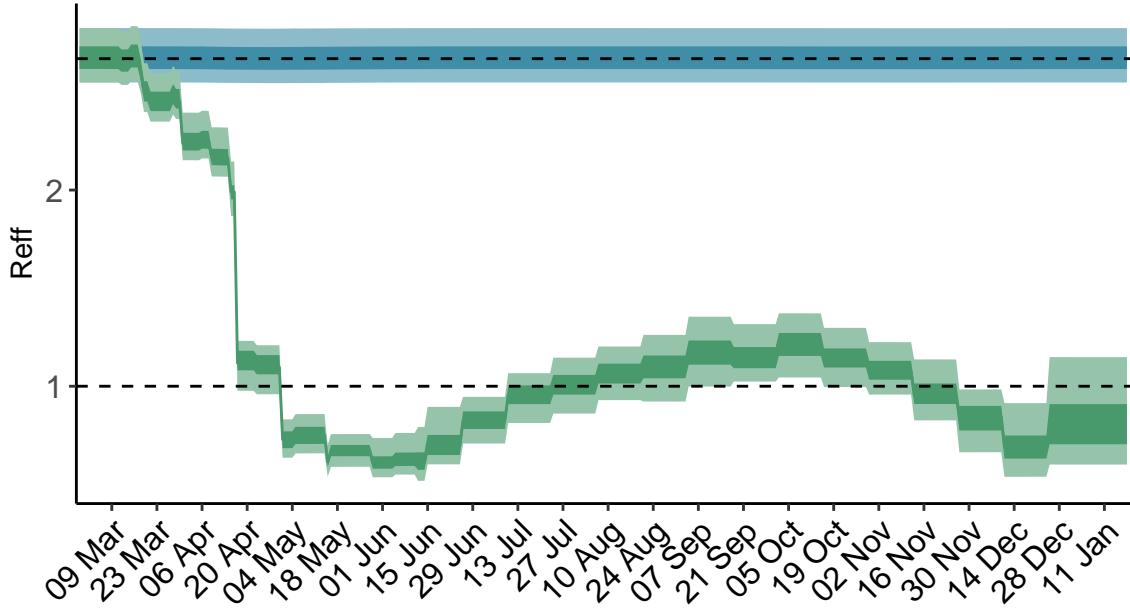


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

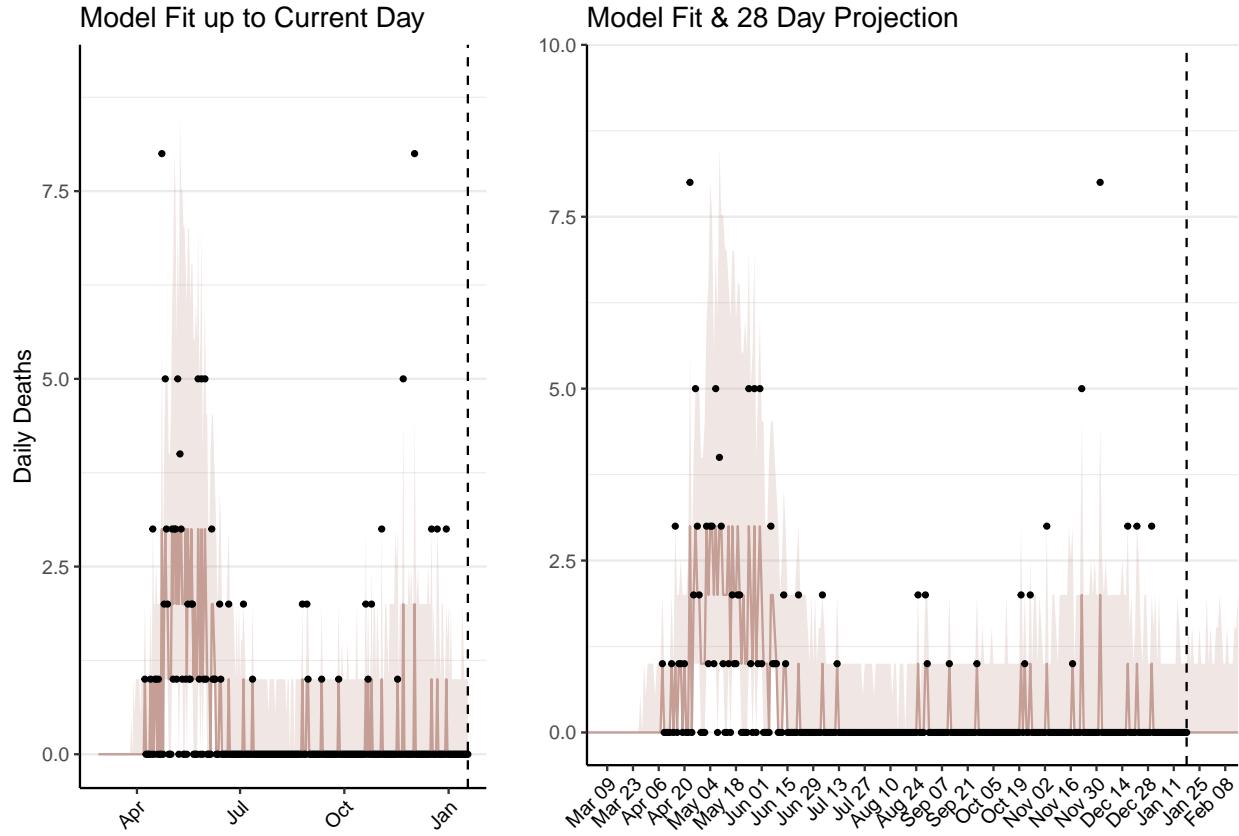


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 7 (95% CI: 6-9) patients requiring treatment with high-pressure oxygen at the current date to 7 (95% CI: 4-9) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 3 (95% CI: 3-4) patients requiring treatment with mechanical ventilation at the current date to 2 (95% CI: 1-3) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

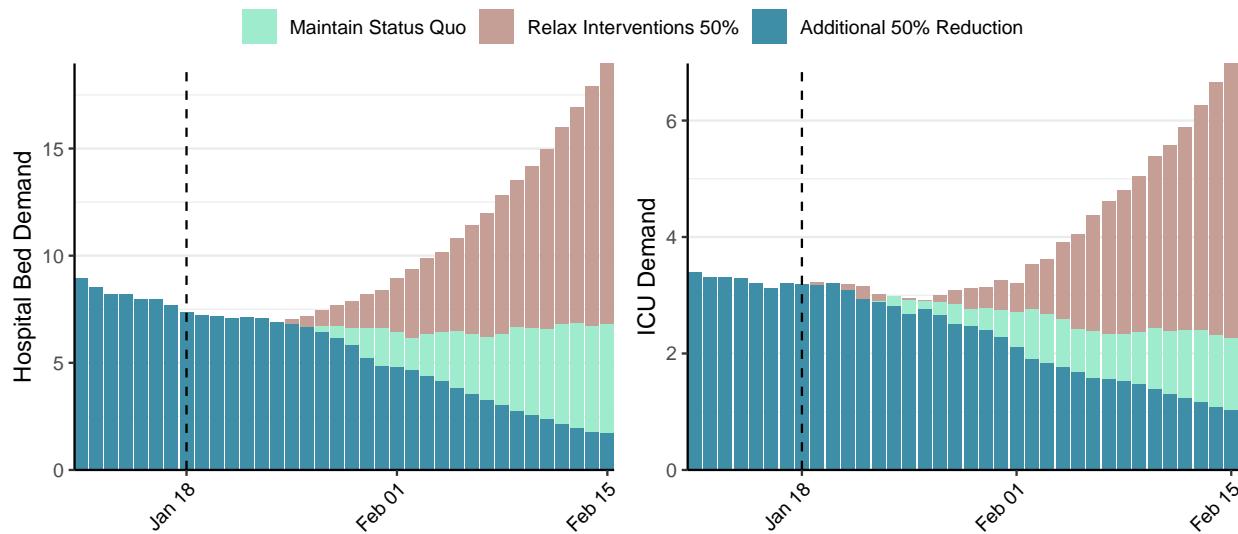


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 84 (95% CI: 63-105) at the current date to 6 (95% CI: 4-9) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 84 (95% CI: 63-105) at the current date to 503 (95% CI: 244-763) by 2021-02-15.

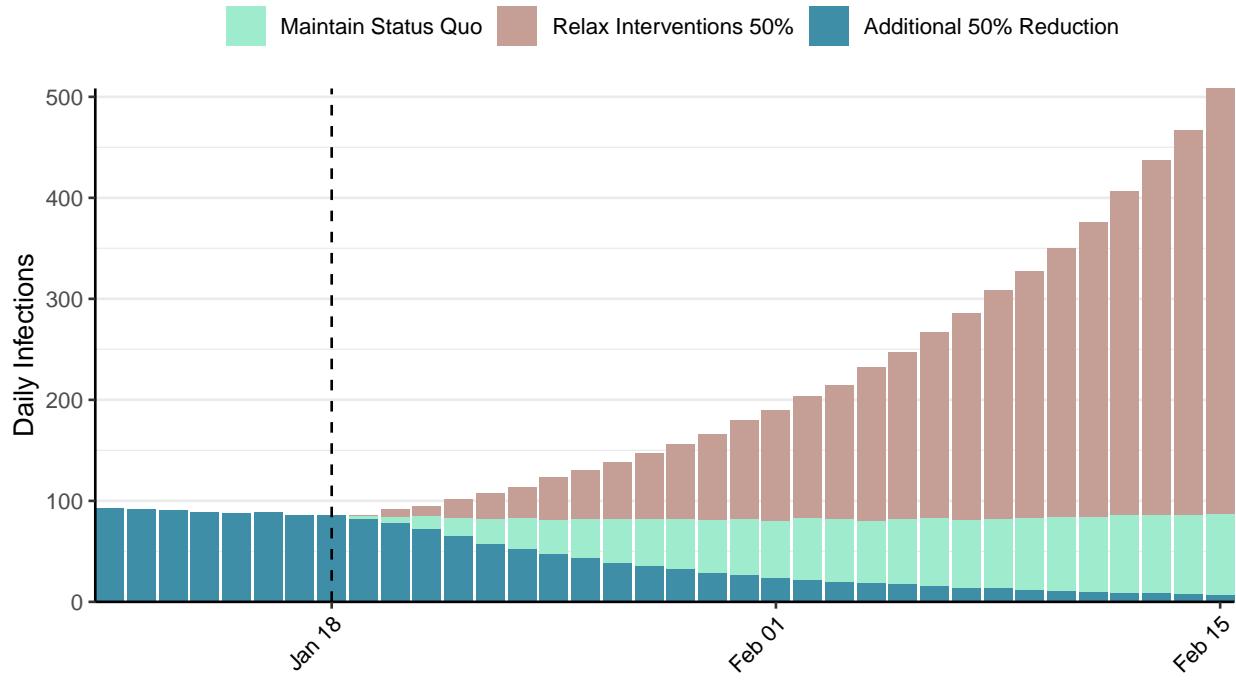


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Serbia, 2021-01-18

[Download the report for Serbia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.71 (95% CI: 0.64-0.8)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Serbia is not shown in the following plot as only 0 deaths have been reported to date**

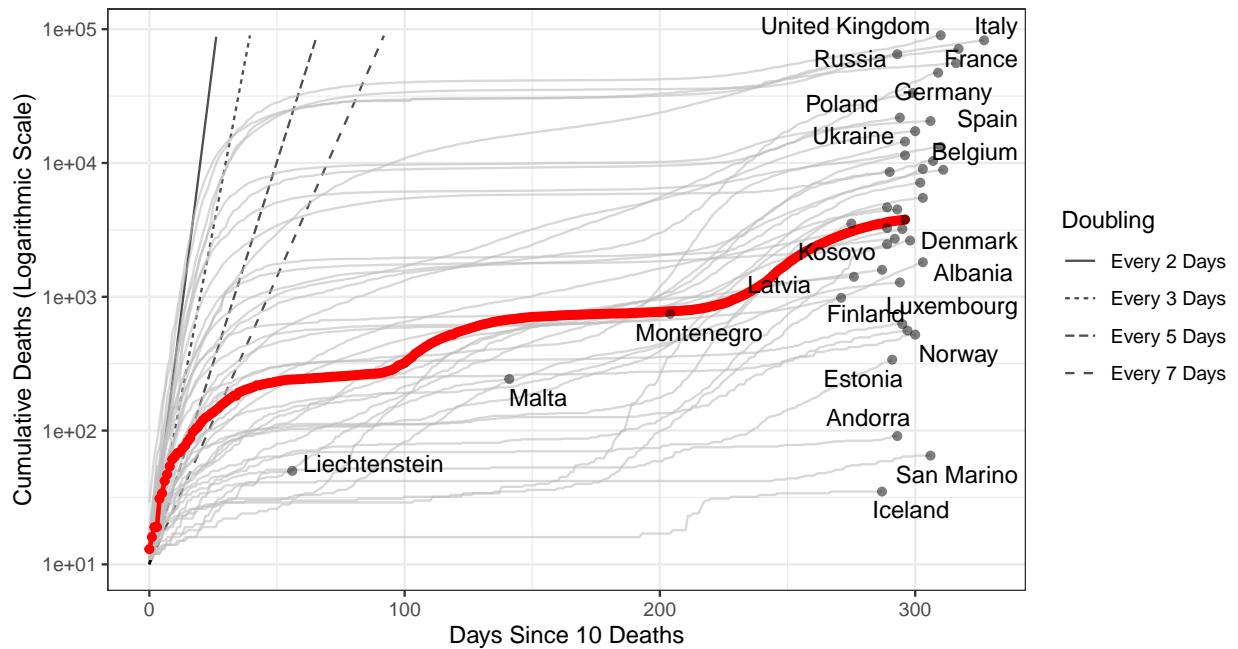


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 161,648 (95% CI: 156,946-166,351) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

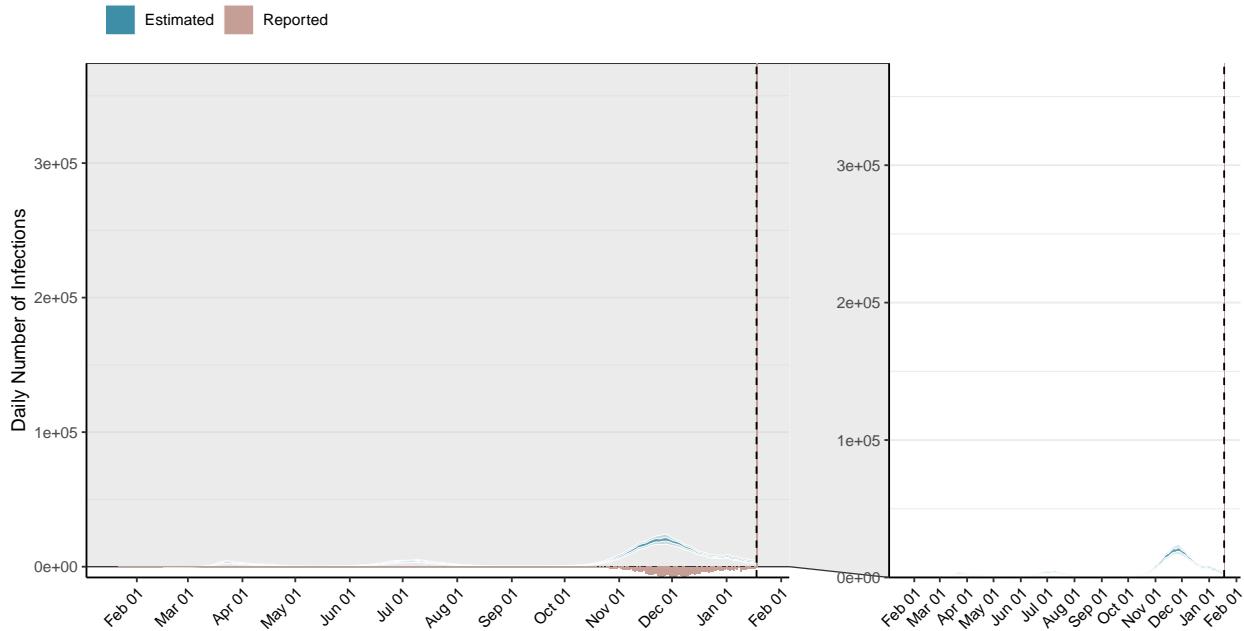


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

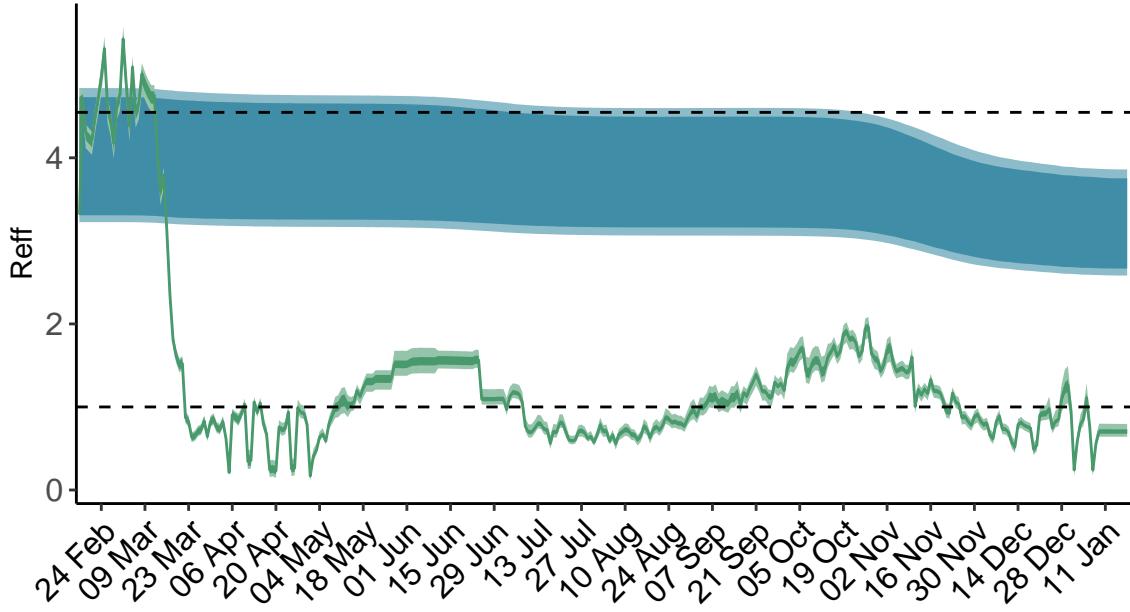


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

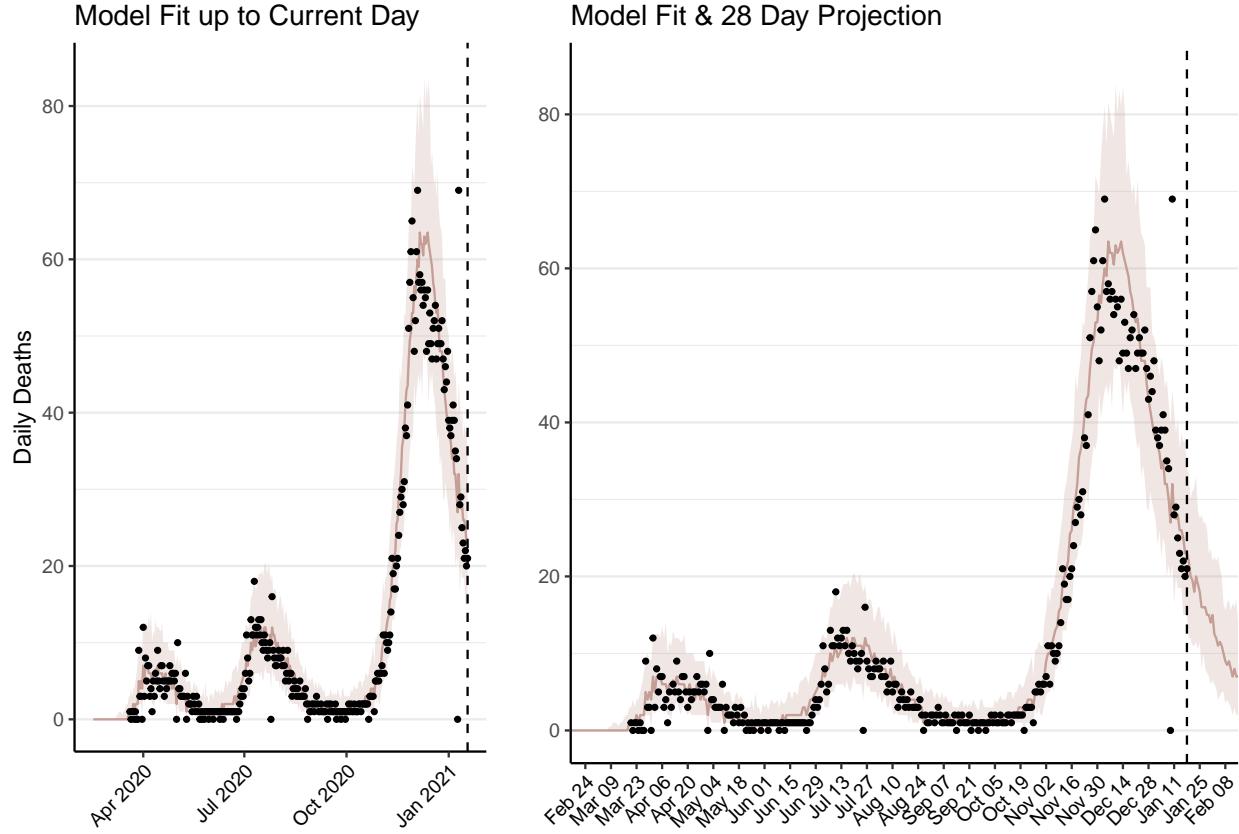


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 759 (95% CI: 734-783) patients requiring treatment with high-pressure oxygen at the current date to 220 (95% CI: 204-236) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 315 (95% CI: 305-325) patients requiring treatment with mechanical ventilation at the current date to 98 (95% CI: 92-105) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

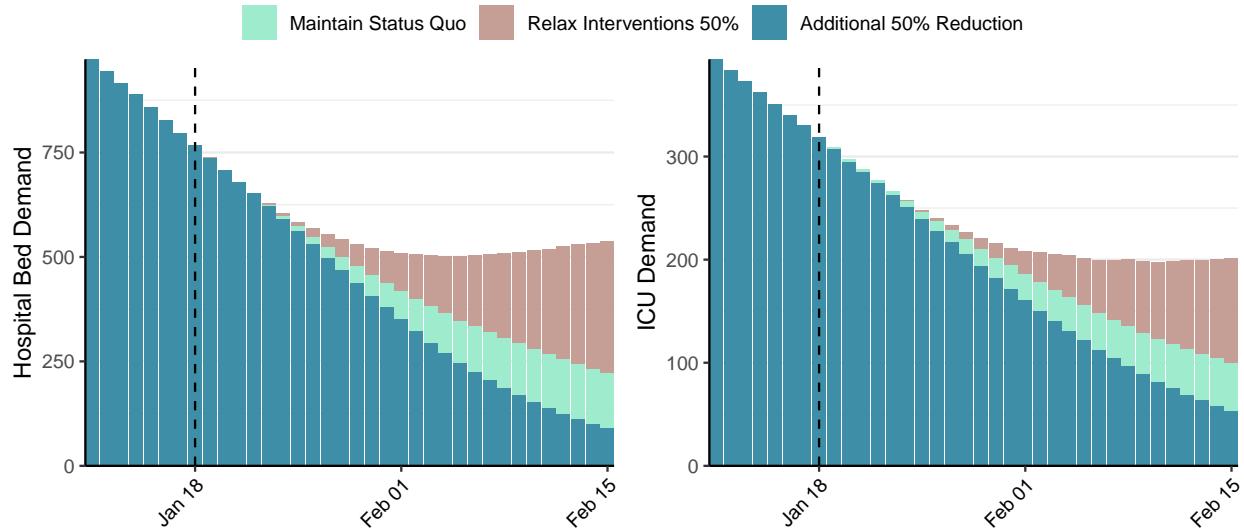


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 3,162 (95% CI: 3,013-3,310) at the current date to 96 (95% CI: 88-104) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,162 (95% CI: 3,013-3,310) at the current date to 4,184 (95% CI: 3,764-4,603) by 2021-02-15.

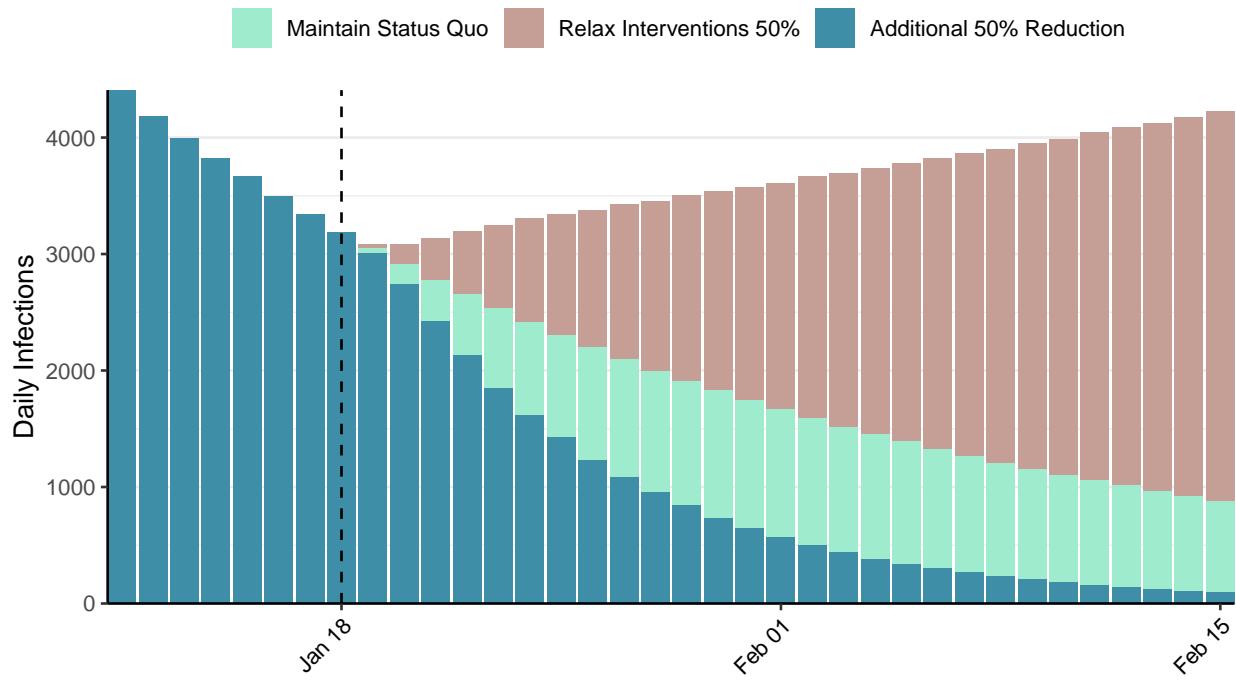


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: South Sudan, 2021-01-18

[Download the report for South Sudan, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.61 (95% CI: 0.36-0.94)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. South Sudan is not shown in the following plot as only 0 deaths have been reported to date**

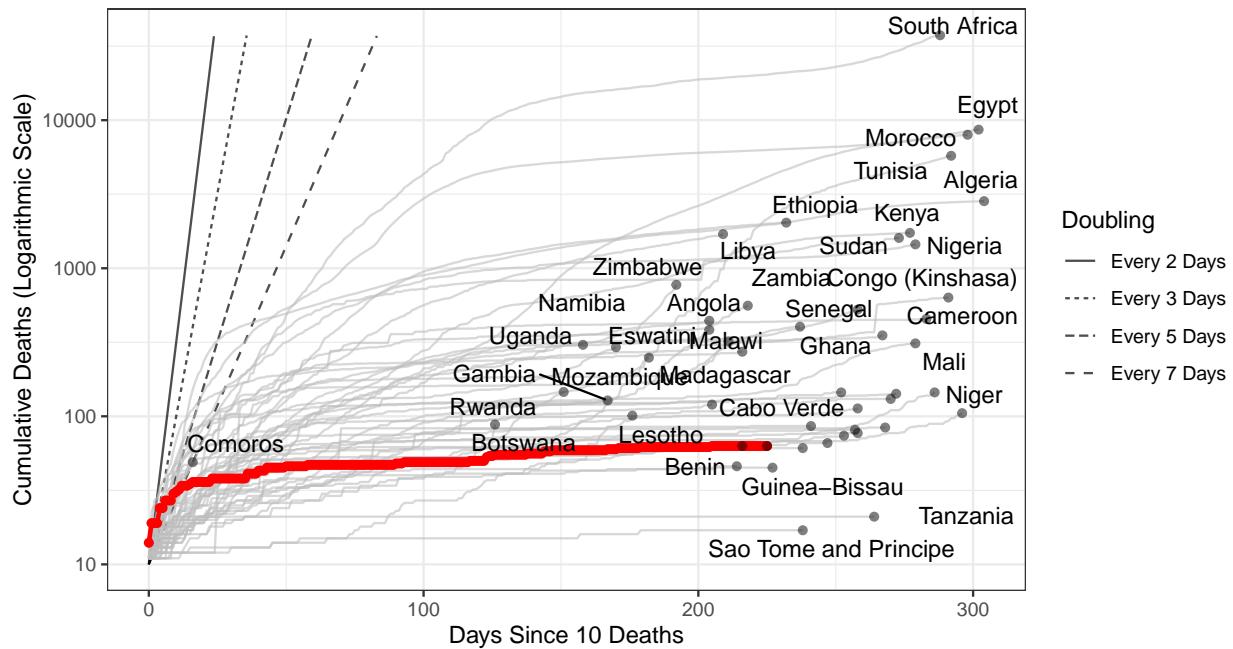


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 134 (95% CI: 105-162) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

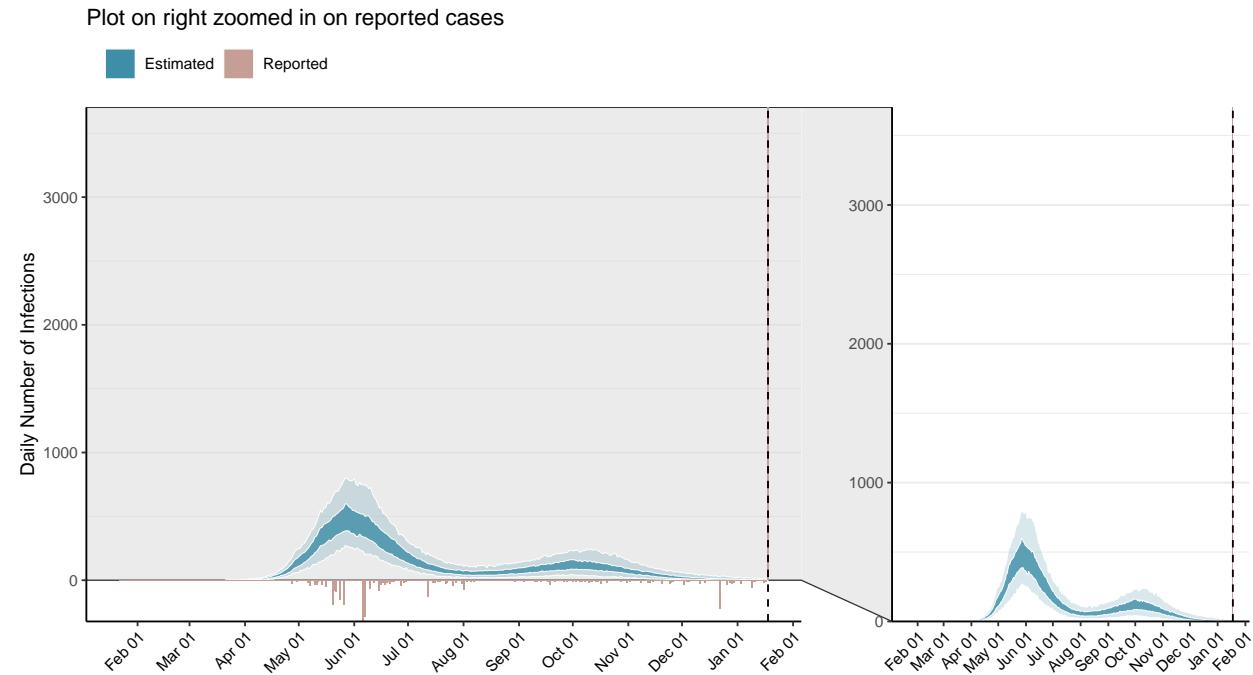


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

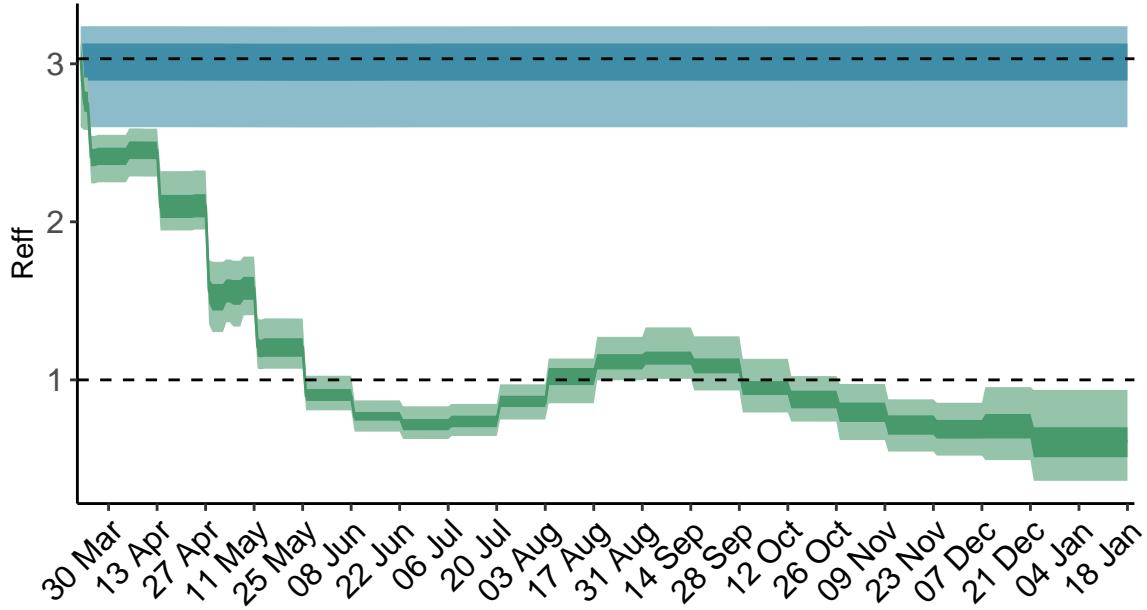


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

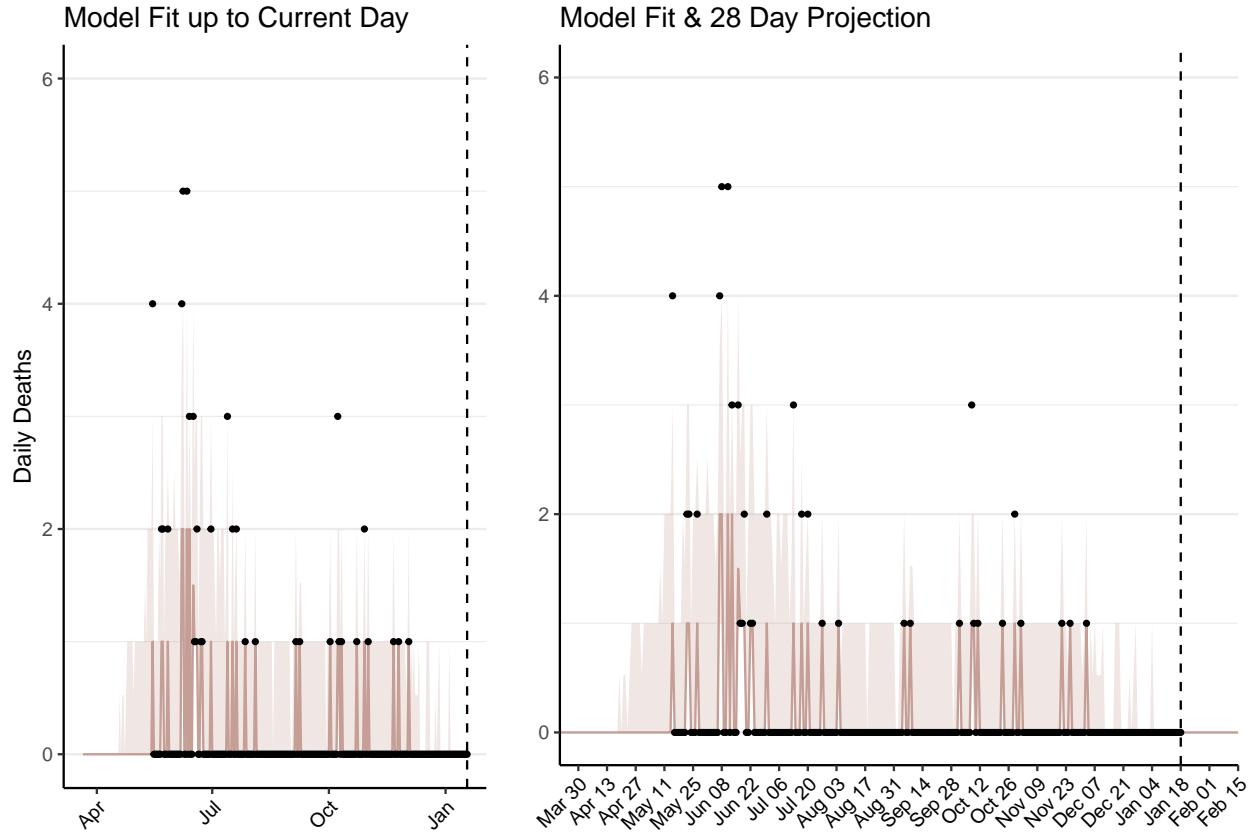


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 0 (95% CI: 0-0) patients requiring treatment with high-pressure oxygen at the current date to 0 (95% CI: 0-0) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 0 (95% CI: 0-0) patients requiring treatment with mechanical ventilation at the current date to 0 (95% CI: 0-0) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

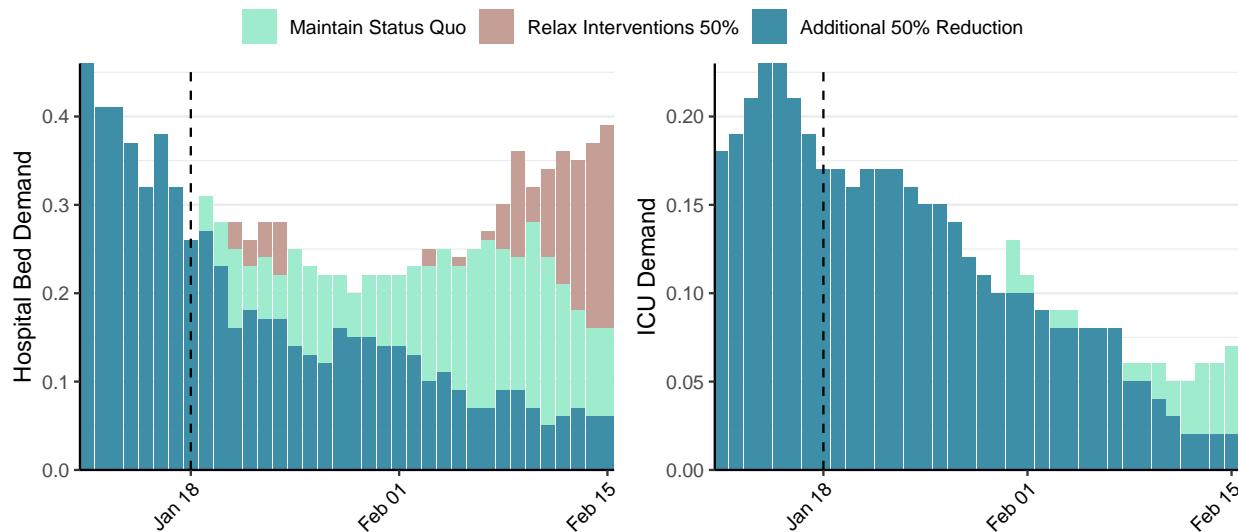


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 3 (95% CI: 2-3) at the current date to 0 (95% CI: 0-0) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3 (95% CI: 2-3) at the current date to 5 (95% CI: 3-7) by 2021-02-15.

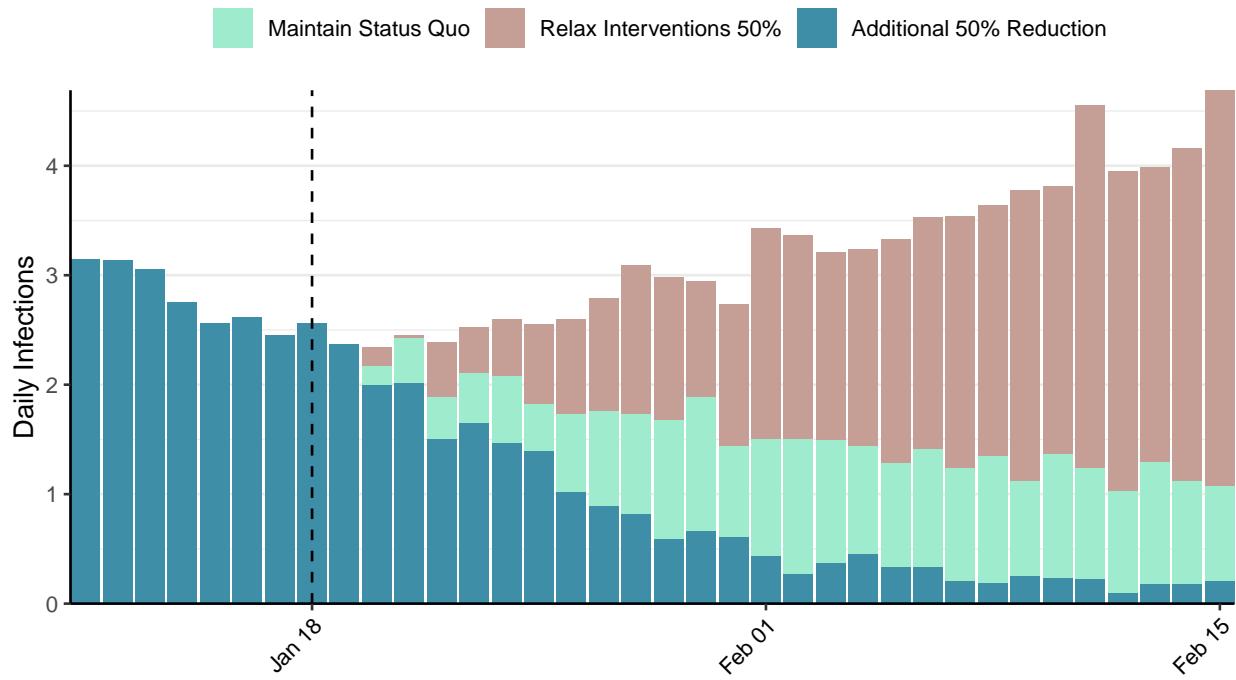


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](#) - <https://covidsim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Sao Tome and Principe, 2021-01-18

[Download the report for Sao Tome and Principe, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.18 (95% CI: 0.68-1.67)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B.** Sao Tome and Principe is not shown in the following plot as only 0 deaths have been reported to date

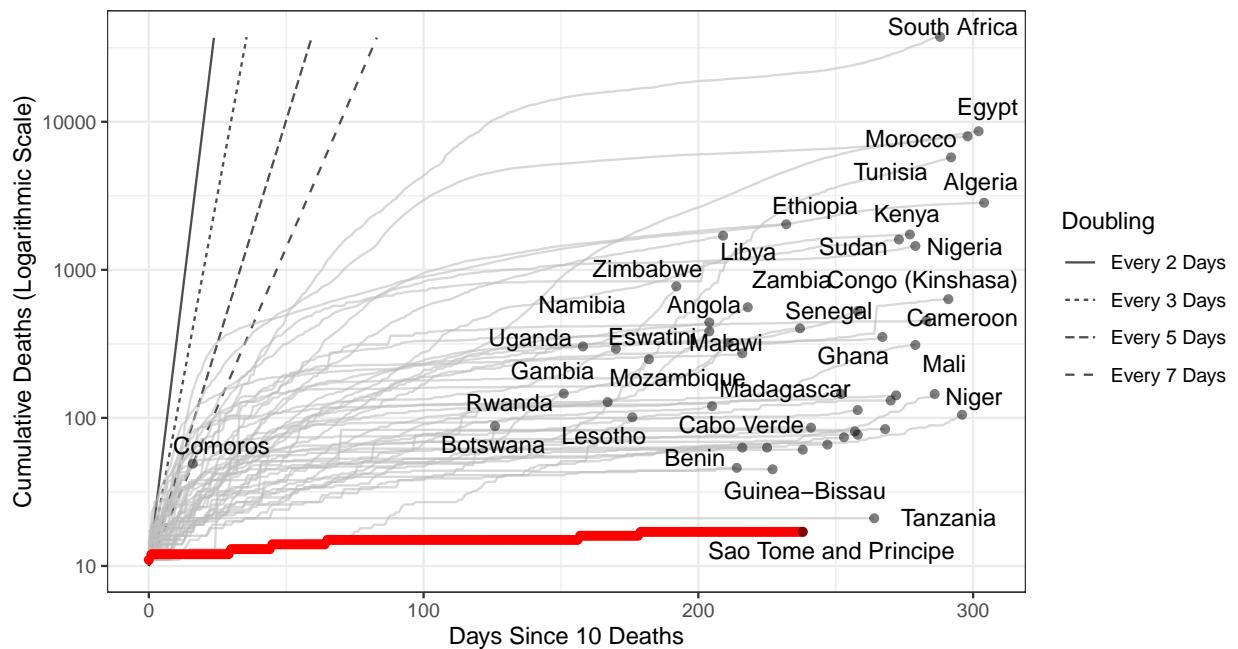


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 285 (95% CI: 107-463) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

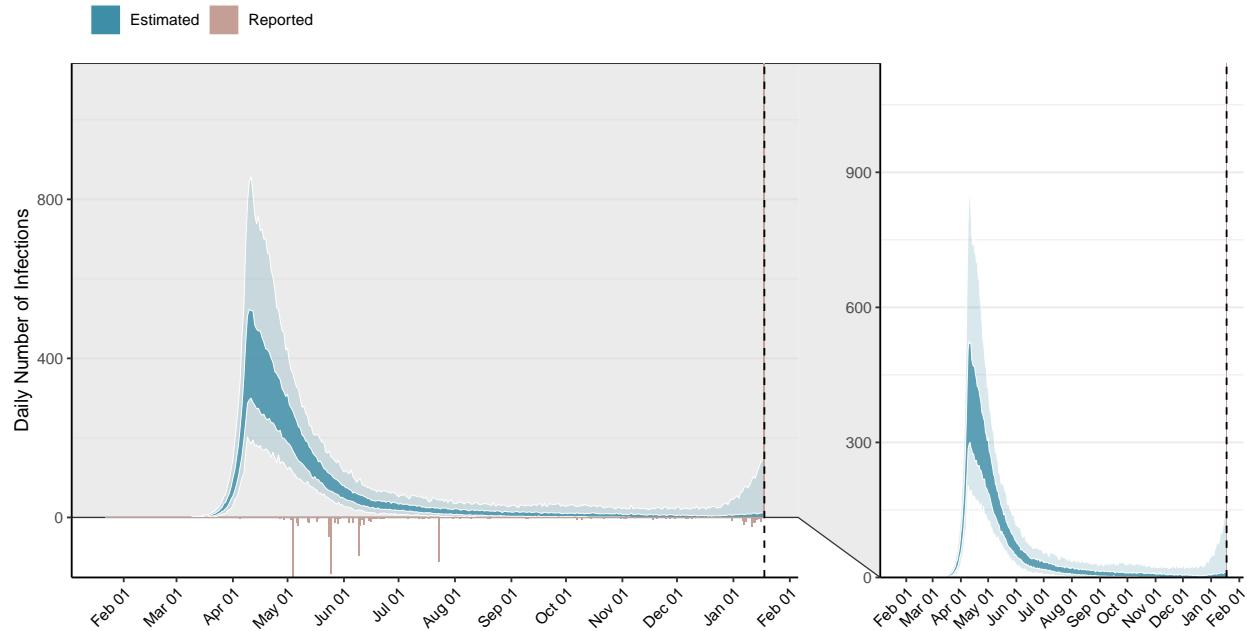


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

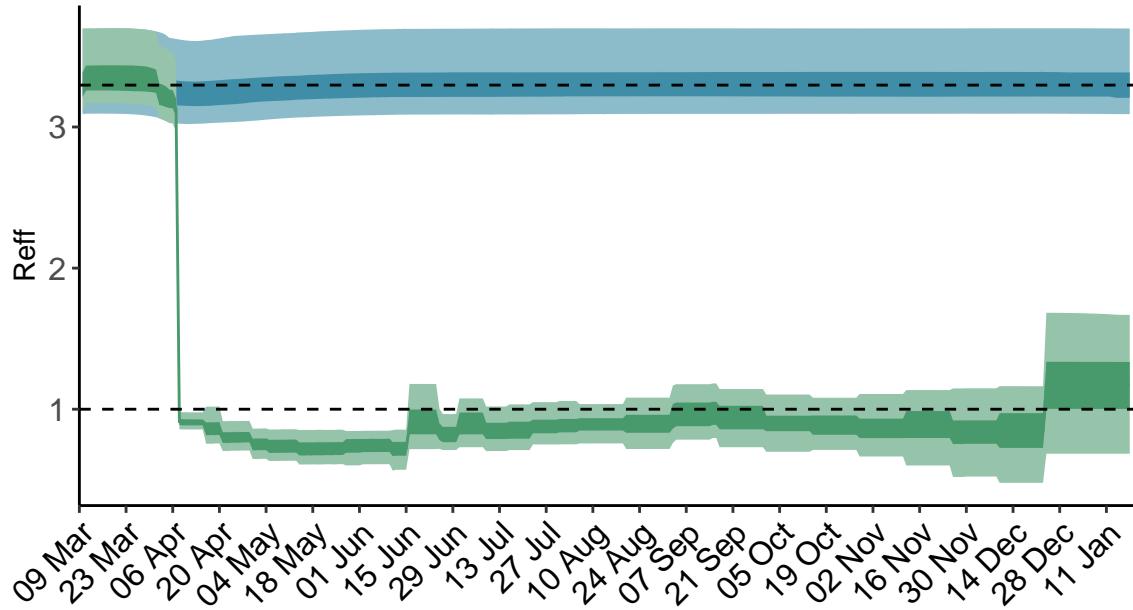


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Sao Tome and Principe is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

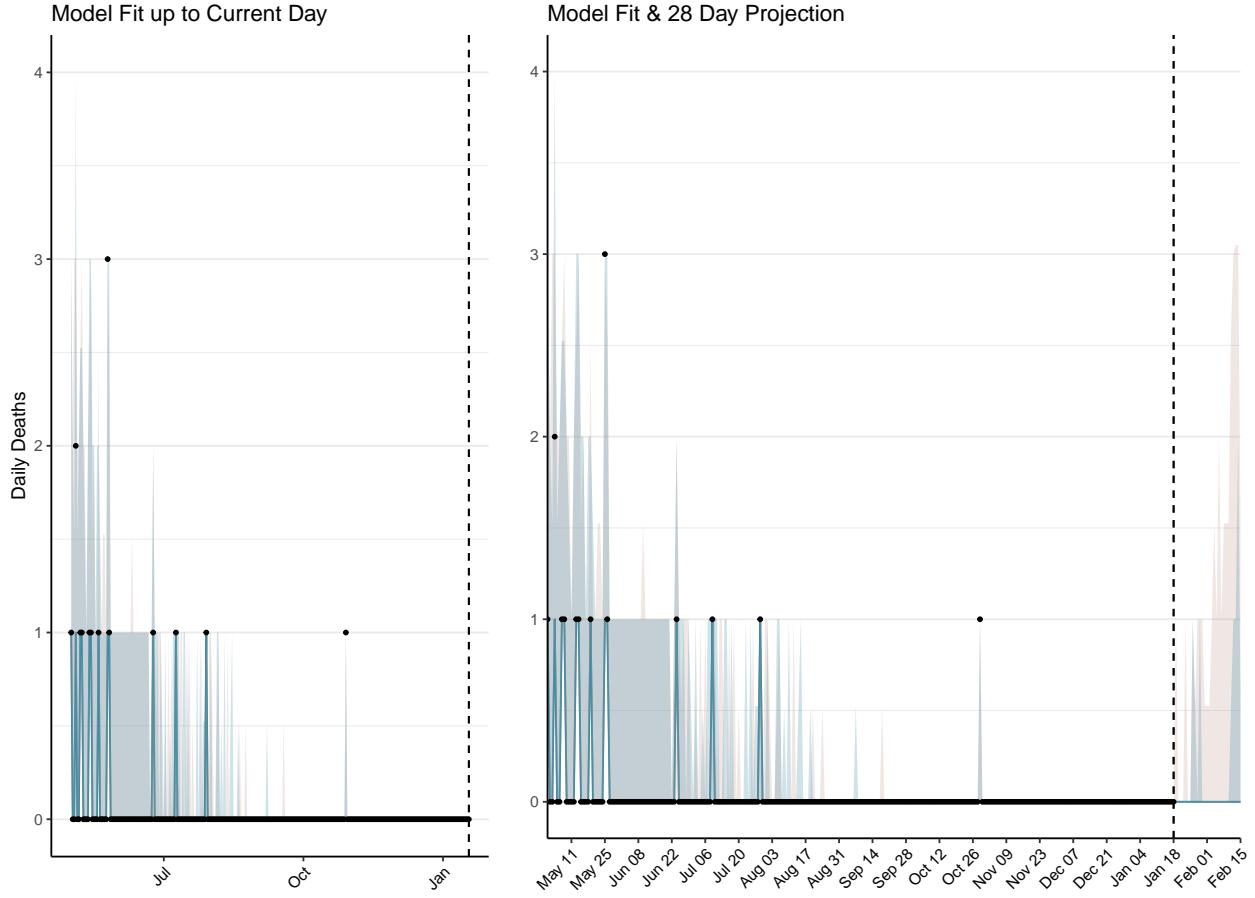


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1 (95% CI: 0-1) patients requiring treatment with high-pressure oxygen at the current date to 7 (95% CI: 0-14) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 0 (95% CI: 0-1) patients requiring treatment with mechanical ventilation at the current date to 1 (95% CI: 1-2) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

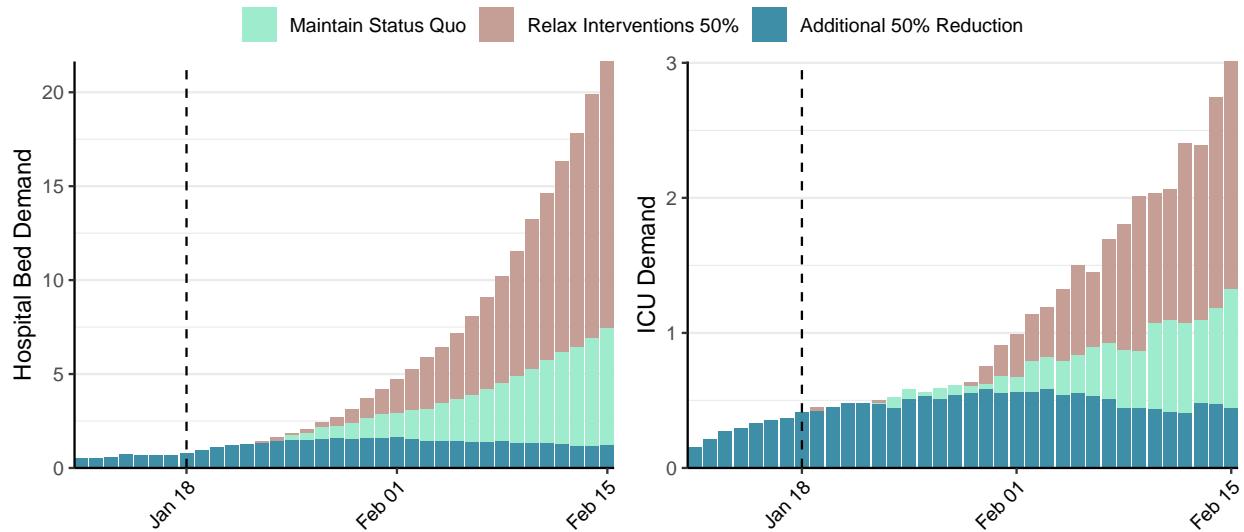


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 24 (95% CI: 6-42) at the current date to 12 (95% CI: -1-25) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 24 (95% CI: 6-42) at the current date to 673 (95% CI: 263-1,083) by 2021-02-15.

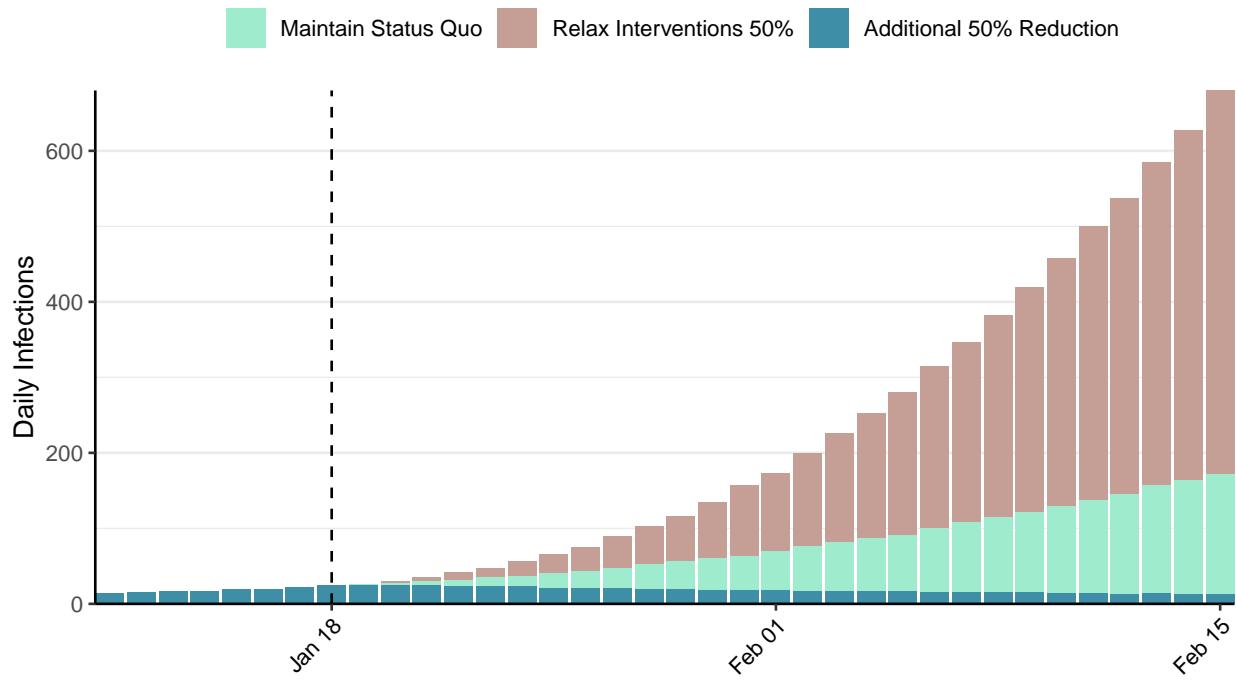


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Suriname, 2021-01-18

[Download the report for Suriname, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1 (95% CI: 0.88-1.13)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Suriname is not shown in the following plot as only 0 deaths have been reported to date**

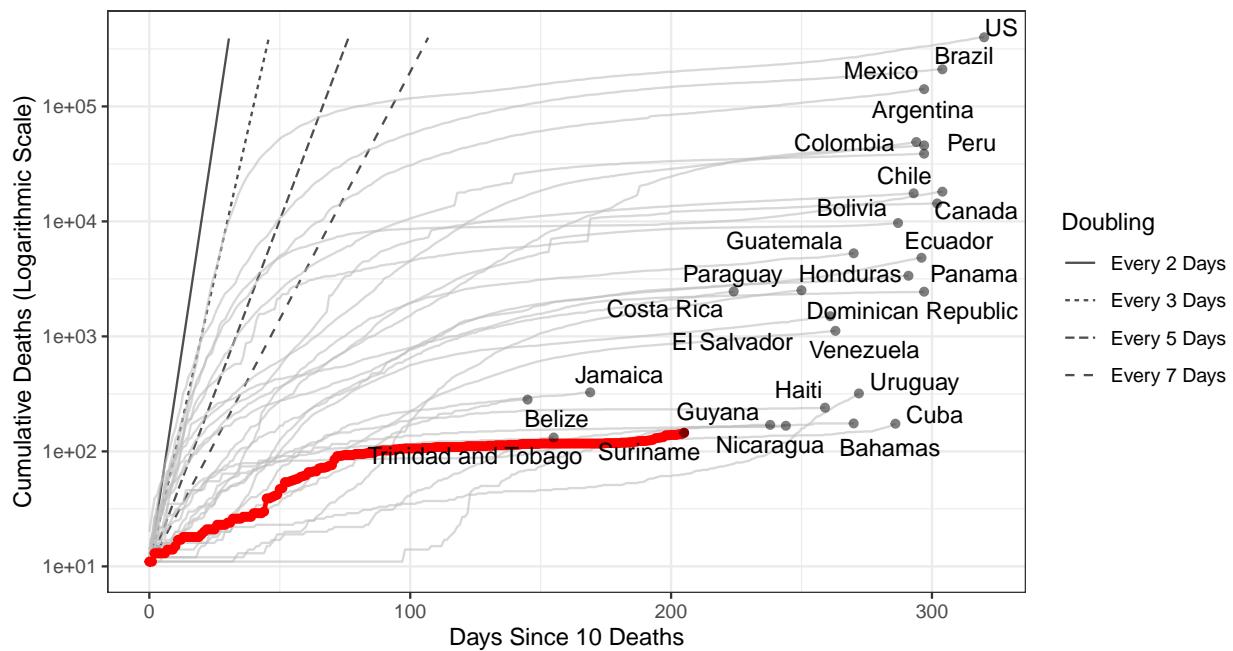


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 11,353 (95% CI: 10,212-12,495) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

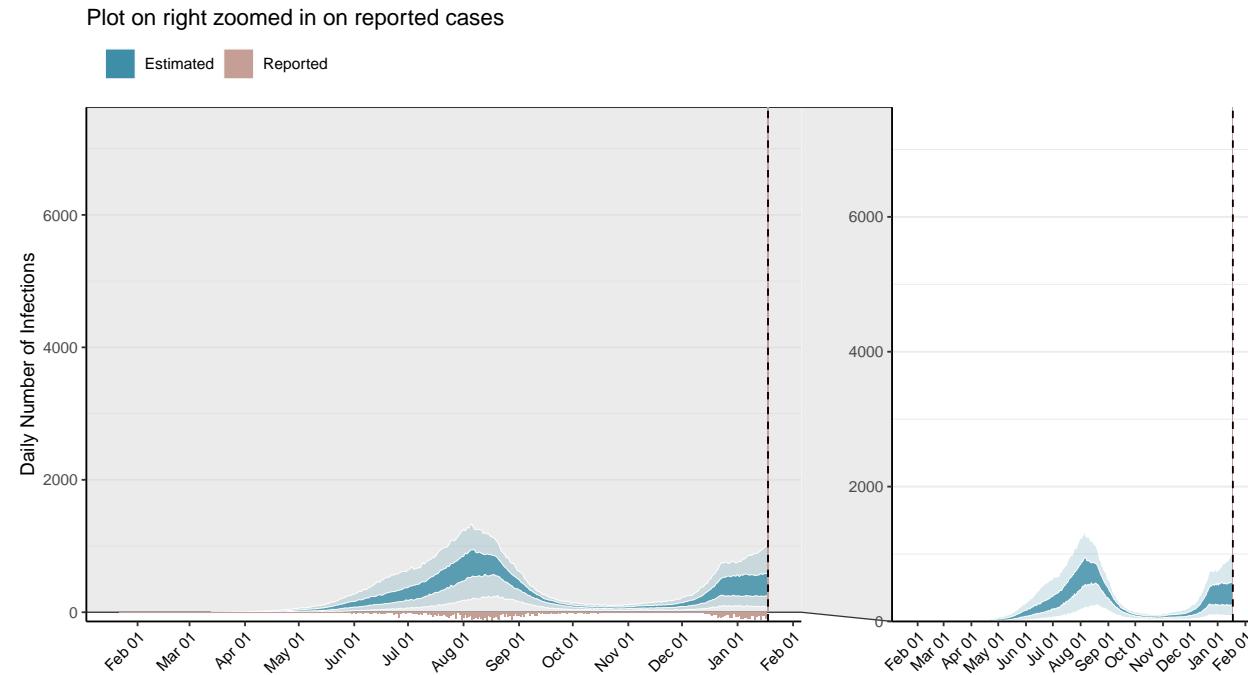


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

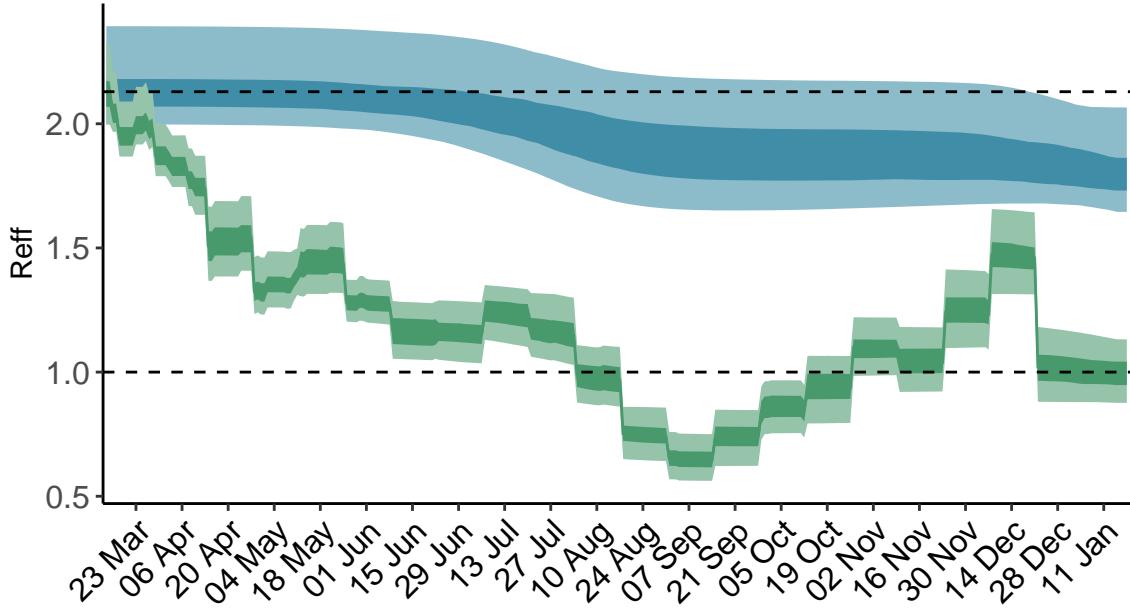


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

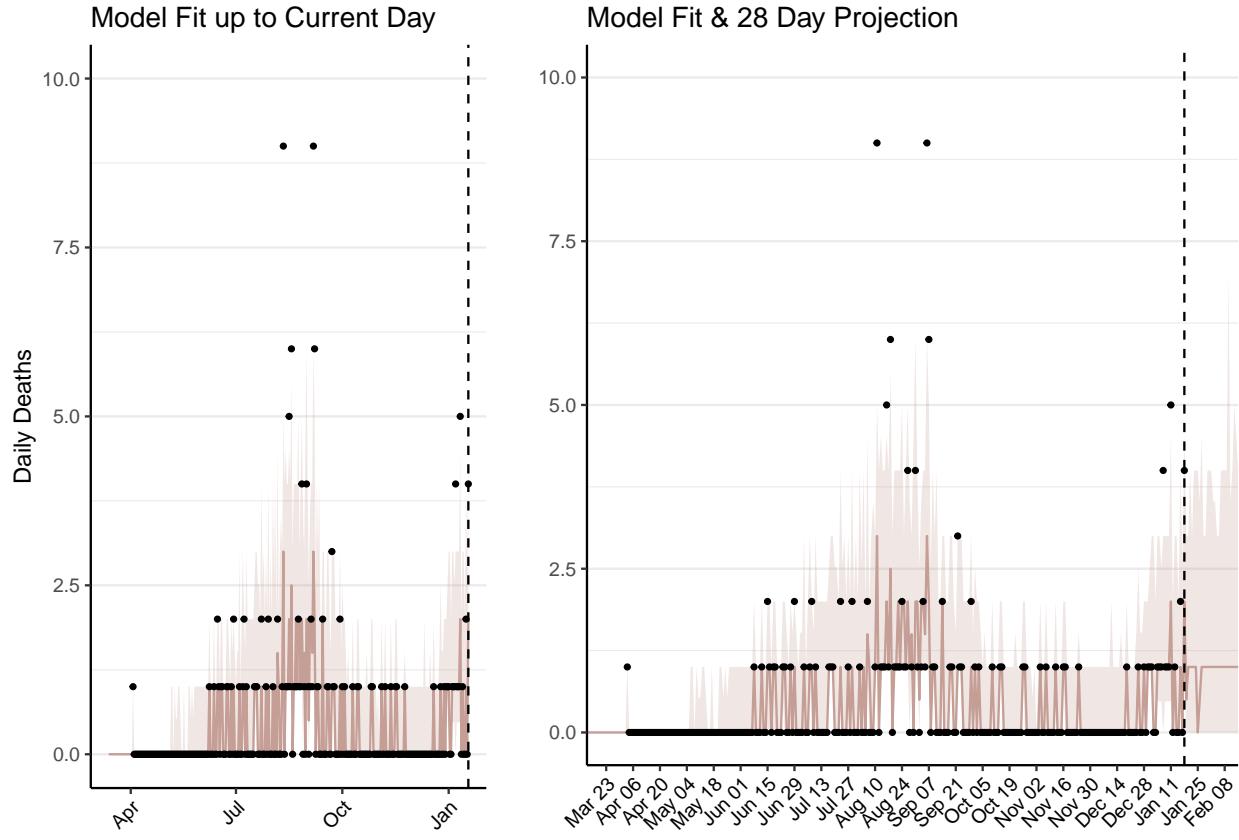


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 37 (95% CI: 33-41) patients requiring treatment with high-pressure oxygen at the current date to 42 (95% CI: 36-48) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 13 (95% CI: 12-15) patients requiring treatment with mechanical ventilation at the current date to 16 (95% CI: 13-18) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

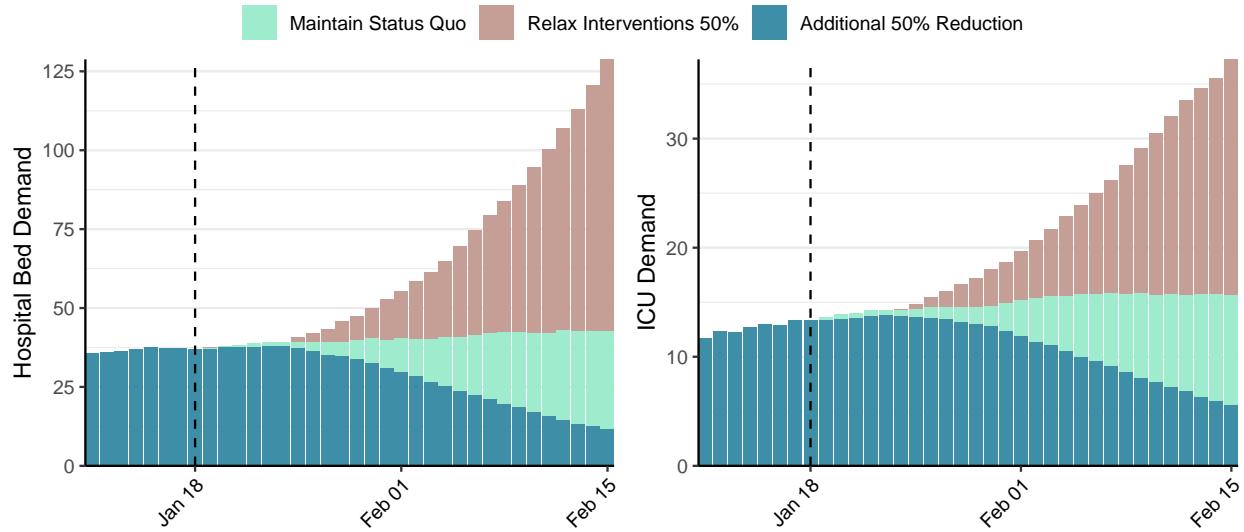


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 431 (95% CI: 381-480) at the current date to 39 (95% CI: 33-45) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 431 (95% CI: 381-480) at the current date to 2,277 (95% CI: 1,971-2,583) by 2021-02-15.

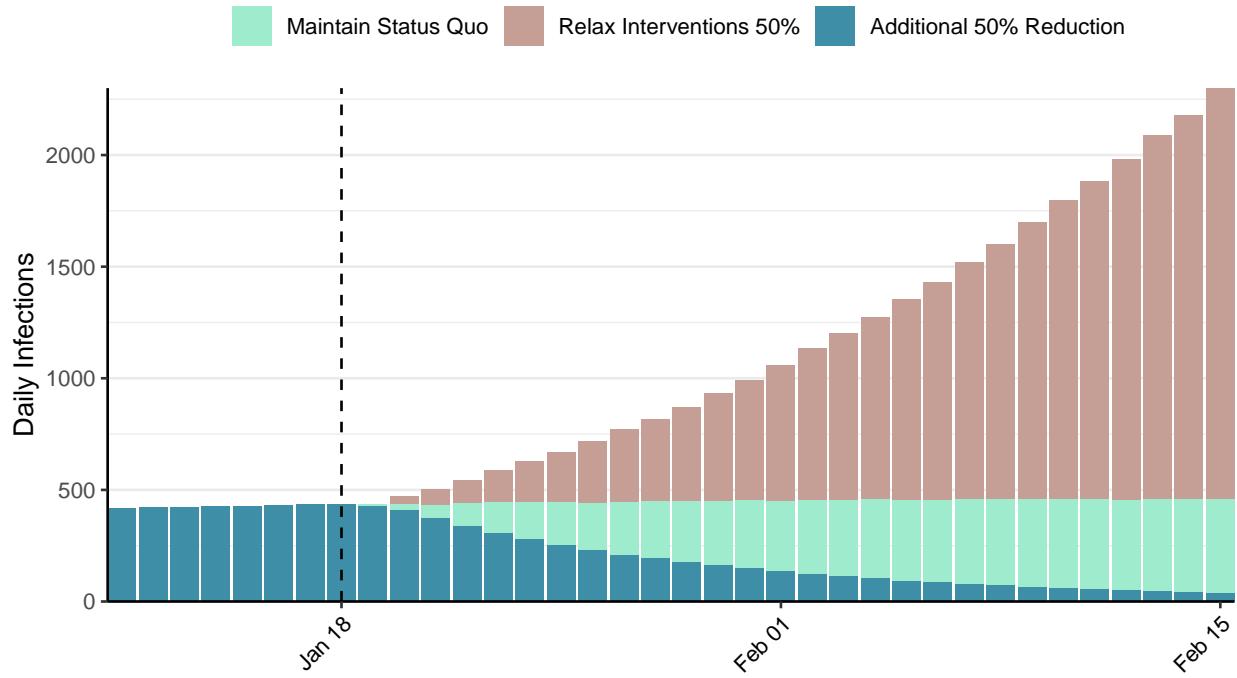


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Eswatini, 2021-01-18

[Download the report for Eswatini, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.15 (95% CI: 1.03-1.26)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Eswatini is not shown in the following plot as only 0 deaths have been reported to date**

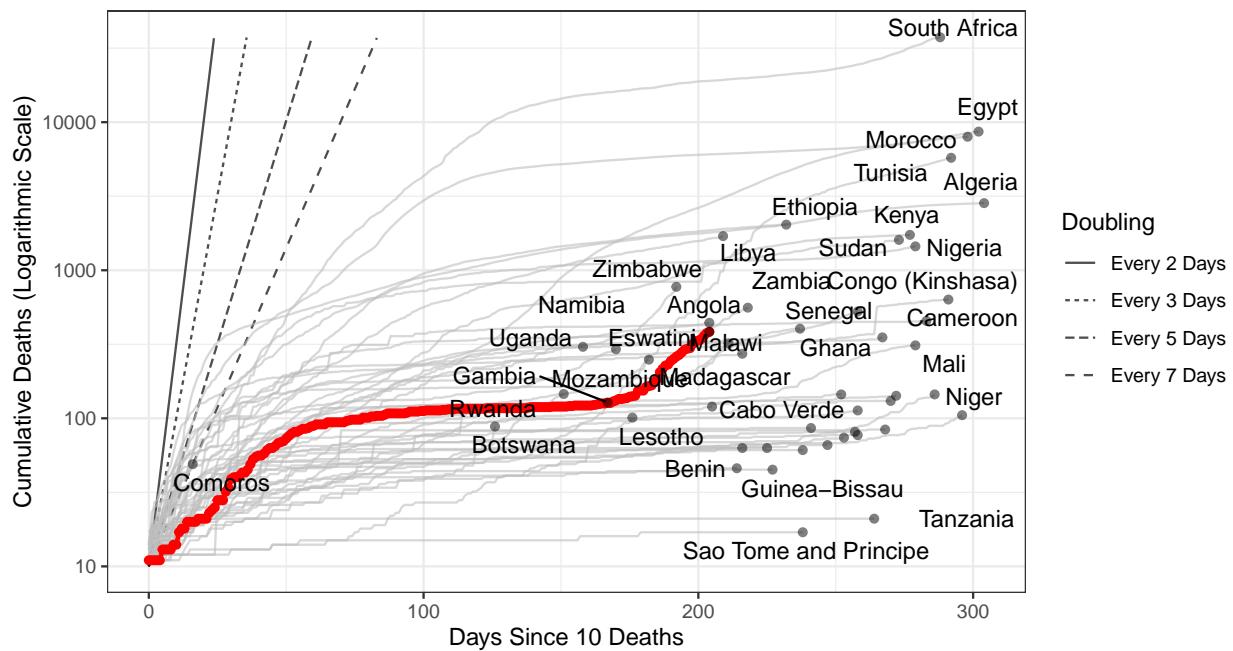


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 140,260 (95% CI: 130,653-149,868) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

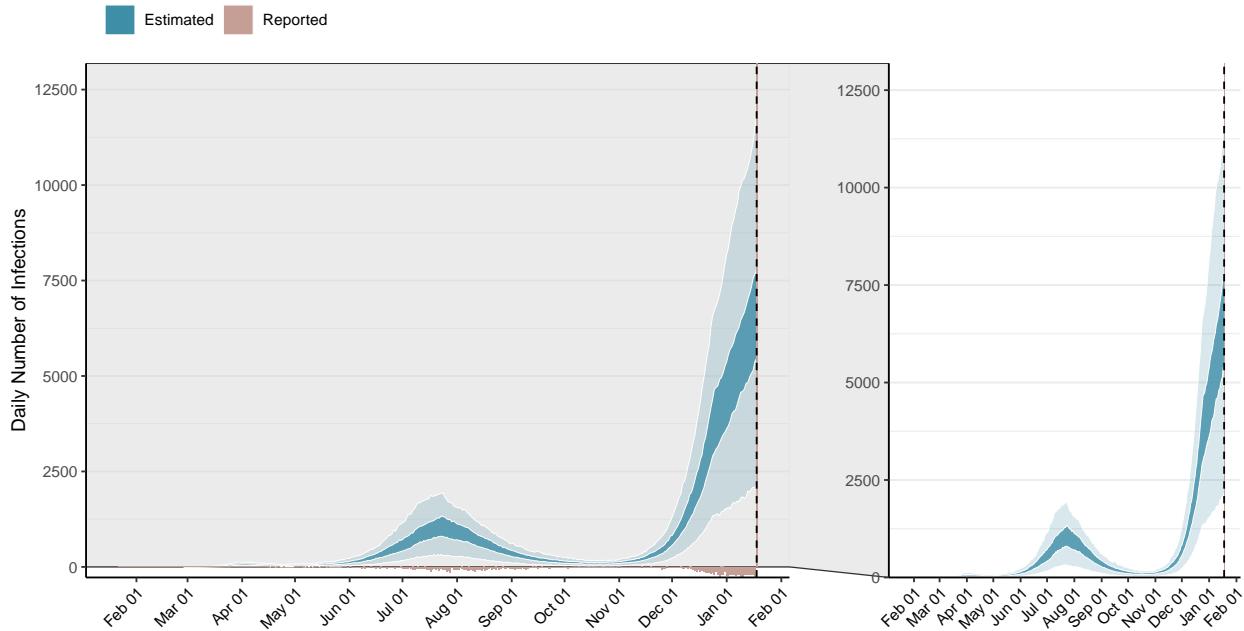


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

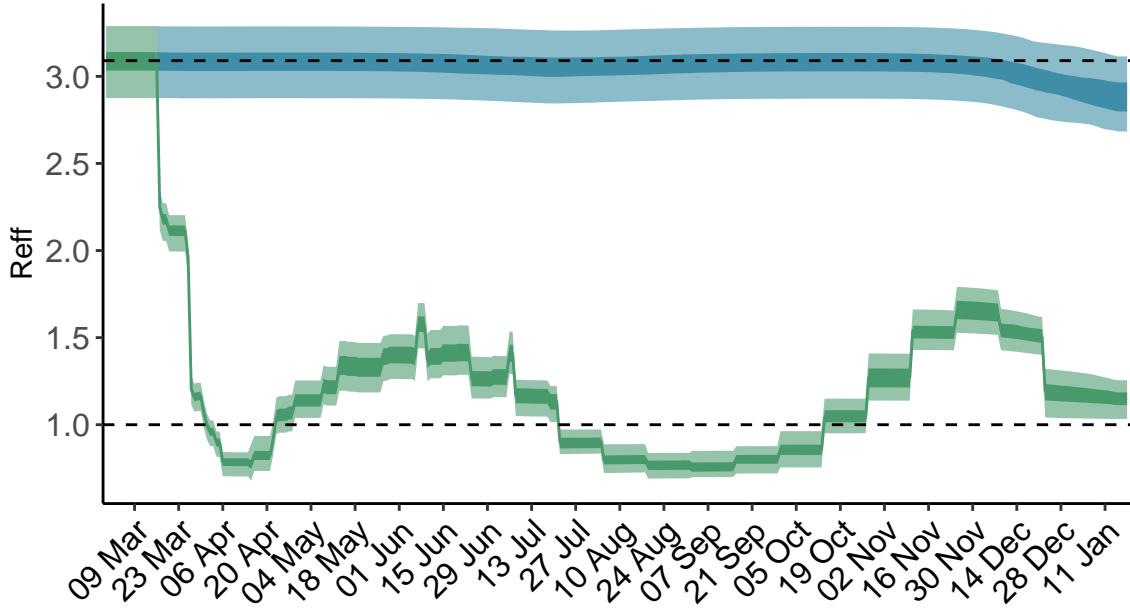


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Eswatini is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

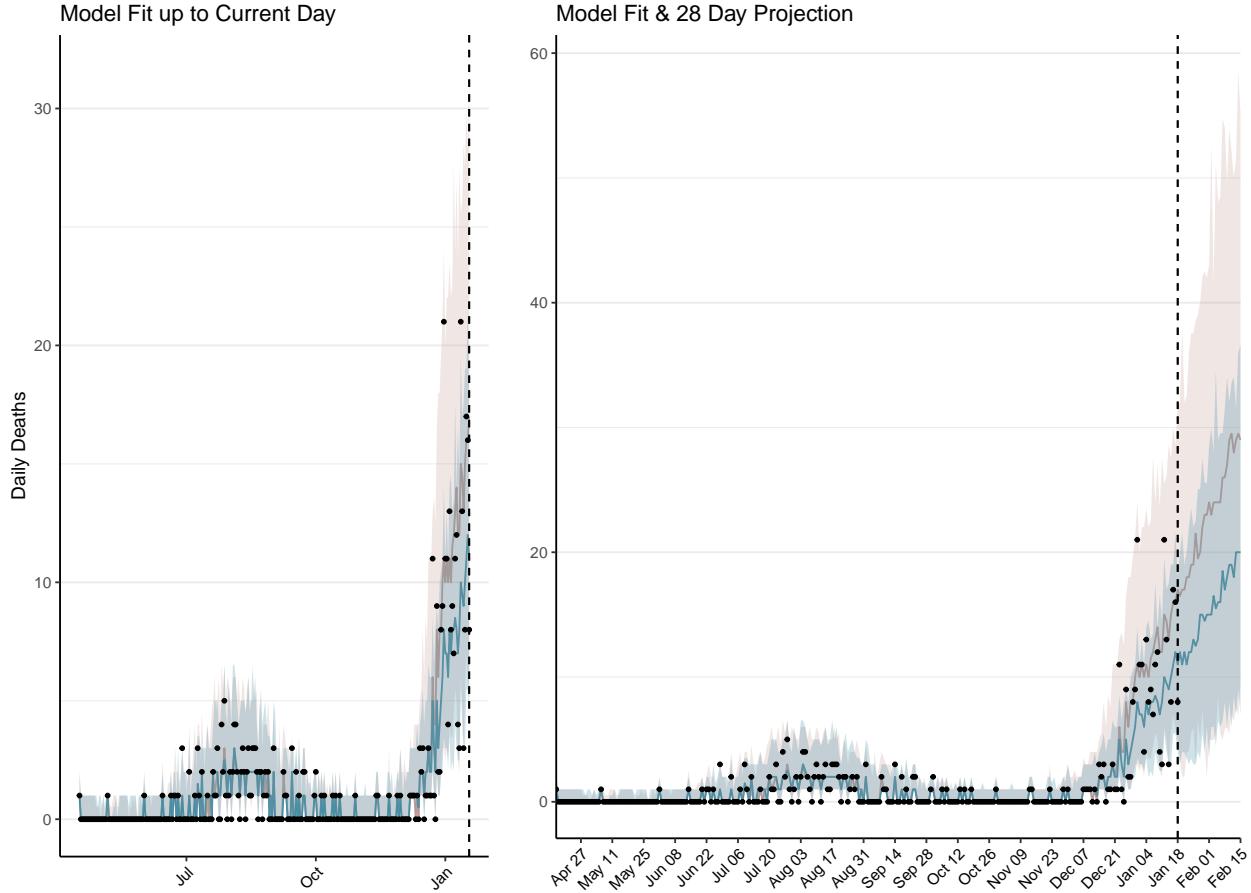


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 434 (95% CI: 405-463) patients requiring treatment with high-pressure oxygen at the current date to 768 (95% CI: 710-826) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 56 (95% CI: 54-59) patients requiring treatment with mechanical ventilation at the current date to 74 (95% CI: 71-78) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

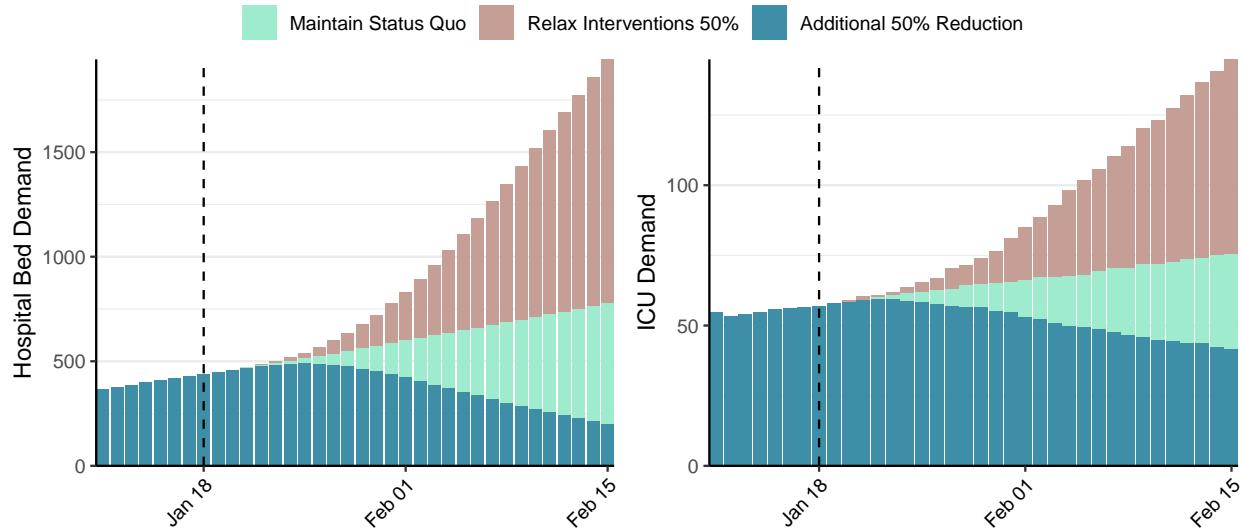


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 6,759 (95% CI: 6,281-7,236) at the current date to 1,054 (95% CI: 955-1,152) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 6,759 (95% CI: 6,281-7,236) at the current date to 37,035 (95% CI: 35,102-38,967) by 2021-02-15.

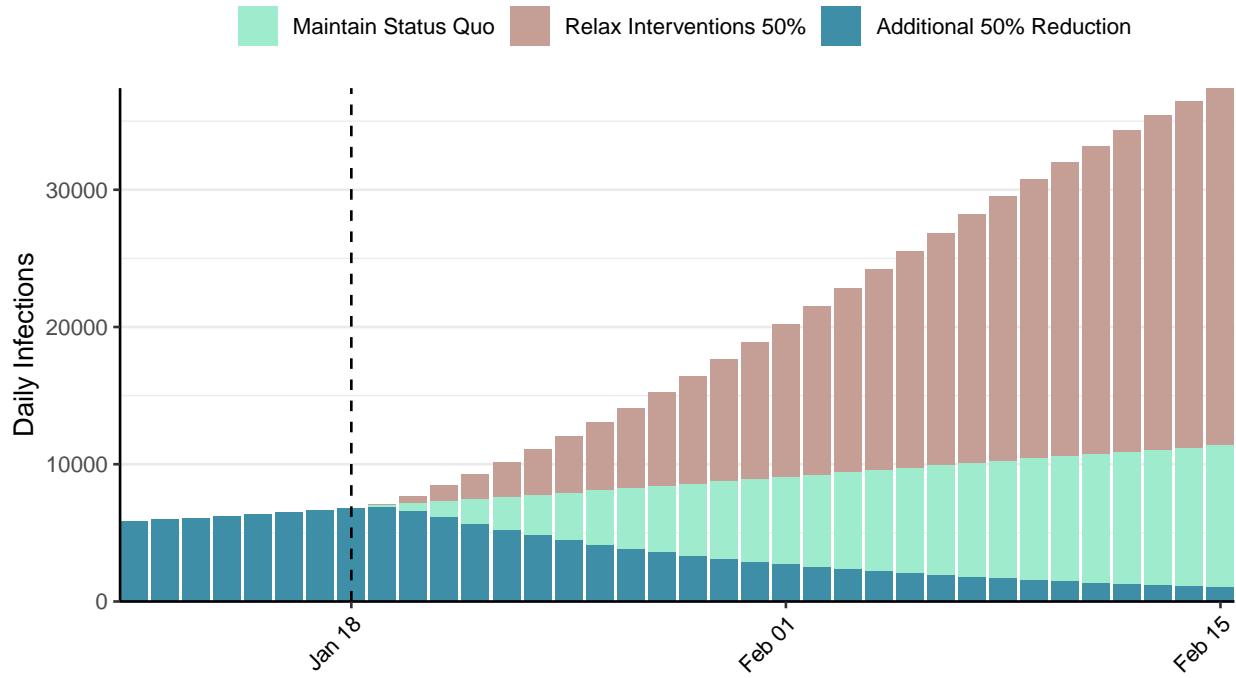


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Syria, 2021-01-18

[Download the report for Syria, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.93 (95% CI: 0.76-1.17)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Syria is not shown in the following plot as only 0 deaths have been reported to date**

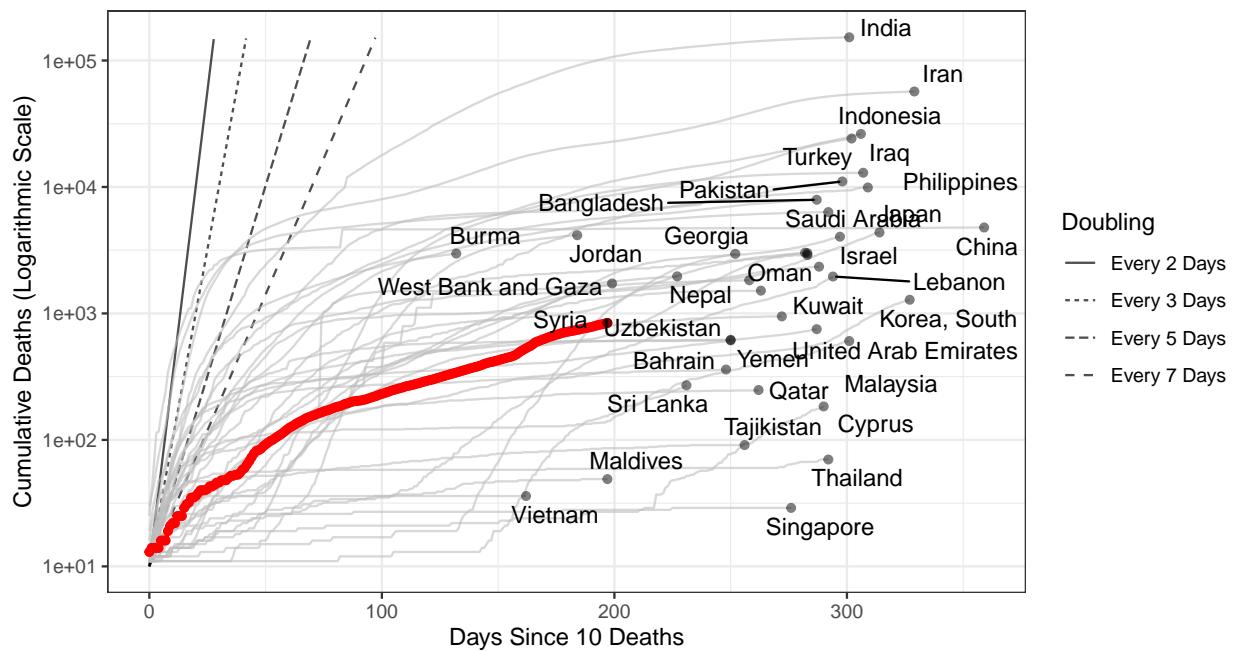


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 118,539 (95% CI: 107,223-129,855) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

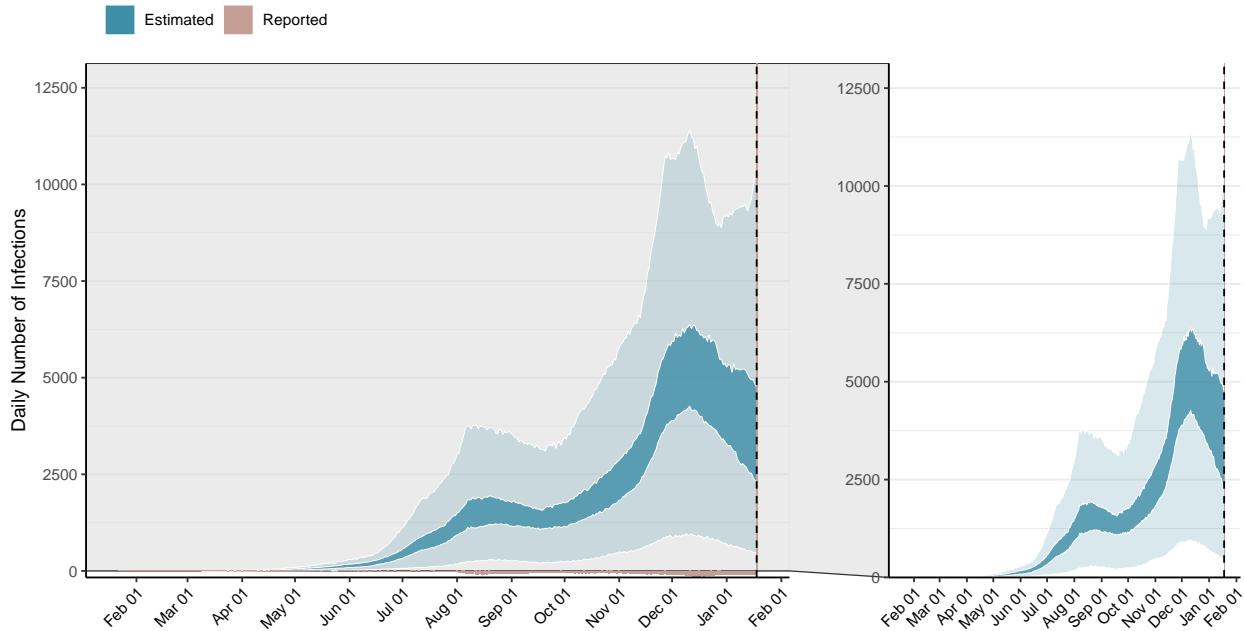


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

We are aware of under-reporting of deaths in Damascus, Syria. This is not represented in this report, but please see [Report 31](#)

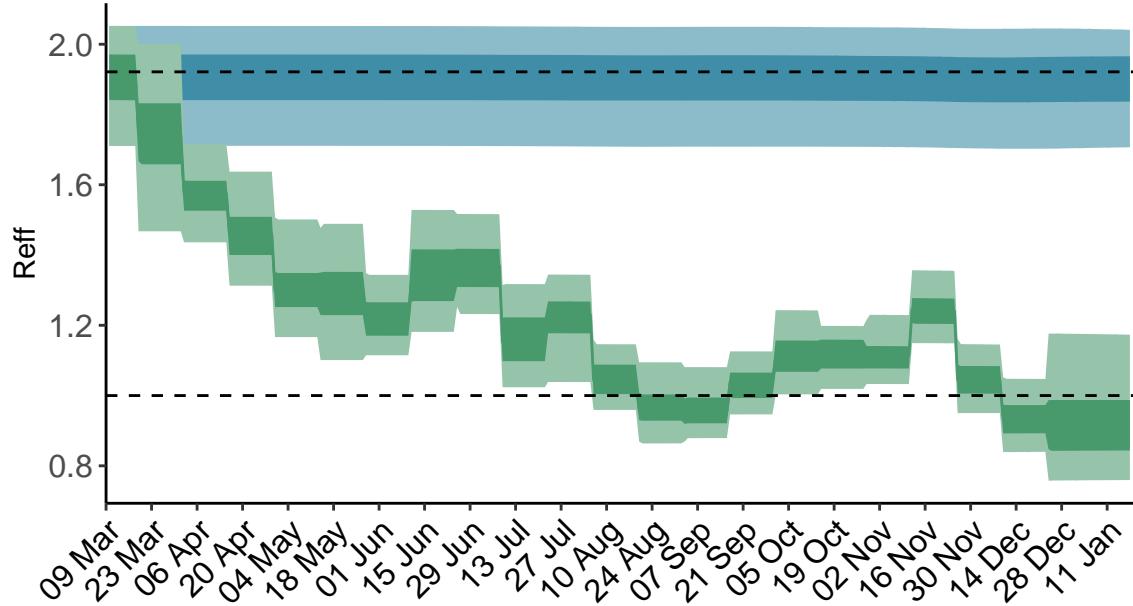


Figure 3: **Time-varying effective reproduction number, R_{eff} .** R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

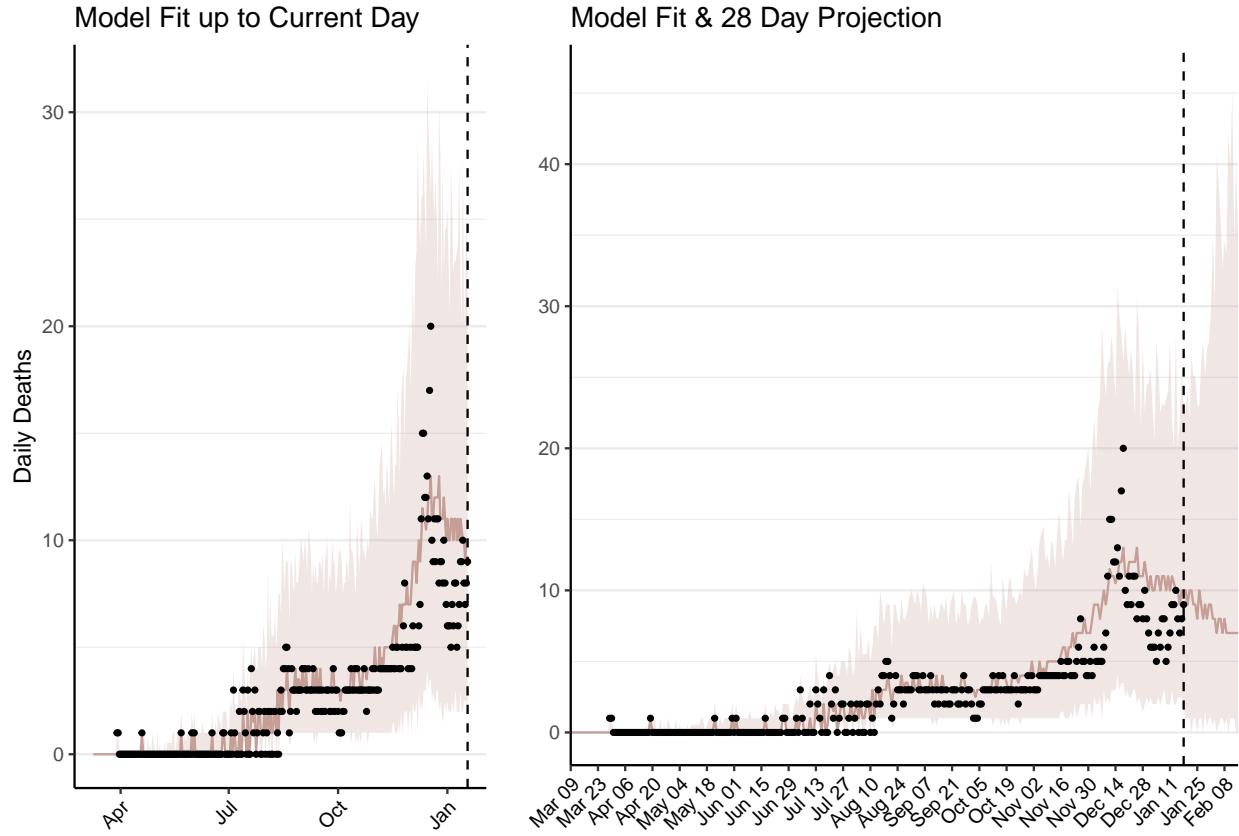


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 394 (95% CI: 355-434) patients requiring treatment with high-pressure oxygen at the current date to 353 (95% CI: 289-417) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 157 (95% CI: 142-173) patients requiring treatment with mechanical ventilation at the current date to 130 (95% CI: 111-149) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

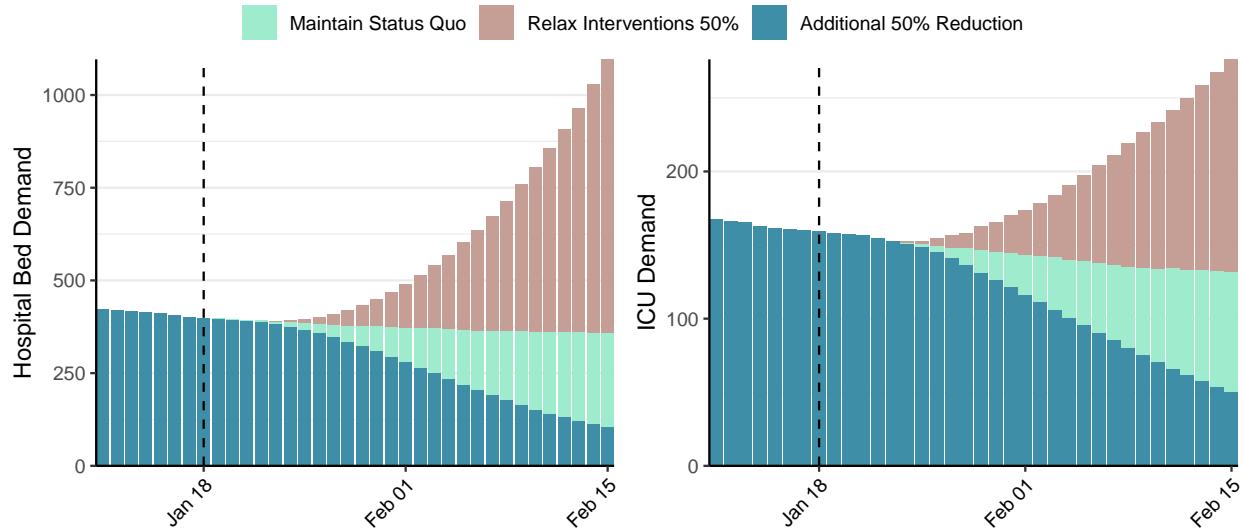


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 3,833 (95% CI: 3,350-4,315) at the current date to 311 (95% CI: 247-375) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,833 (95% CI: 3,350-4,315) at the current date to 21,295 (95% CI: 16,186-26,404) by 2021-02-15.

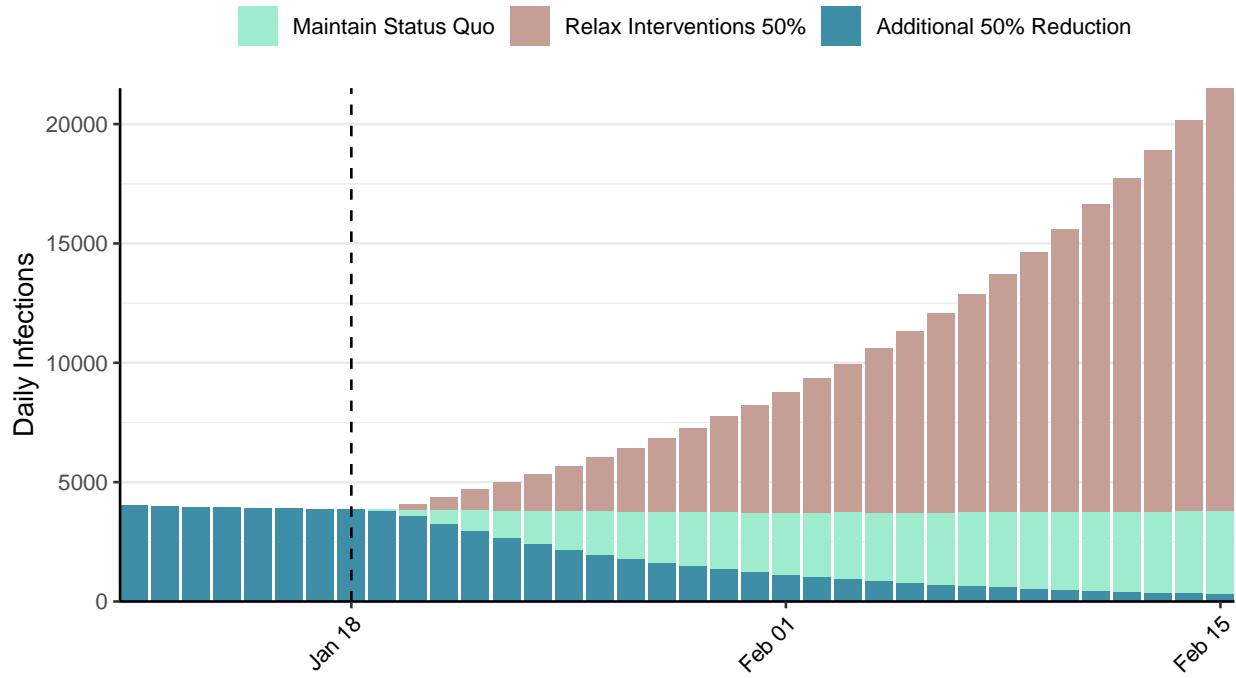


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Chad, 2021-01-18

[Download the report for Chad, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.5 (95% CI: 1.01-1.99)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Chad is not shown in the following plot as only 0 deaths have been reported to date**

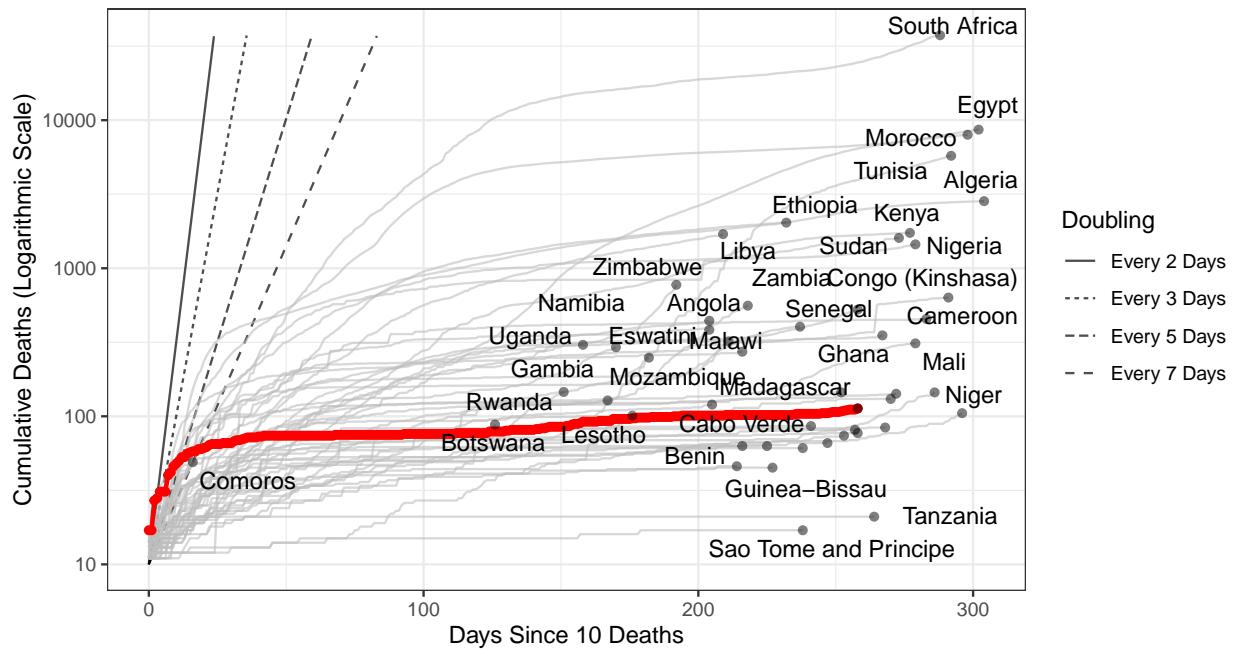


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 19,046 (95% CI: 17,264-20,829) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

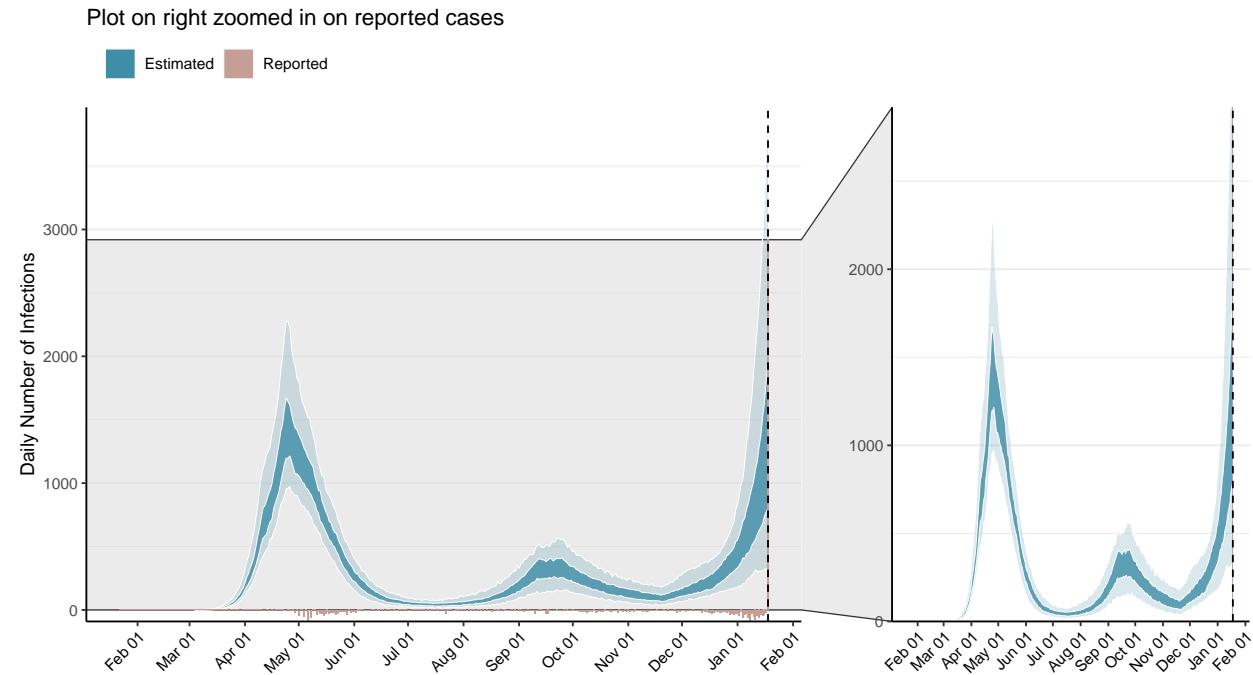


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

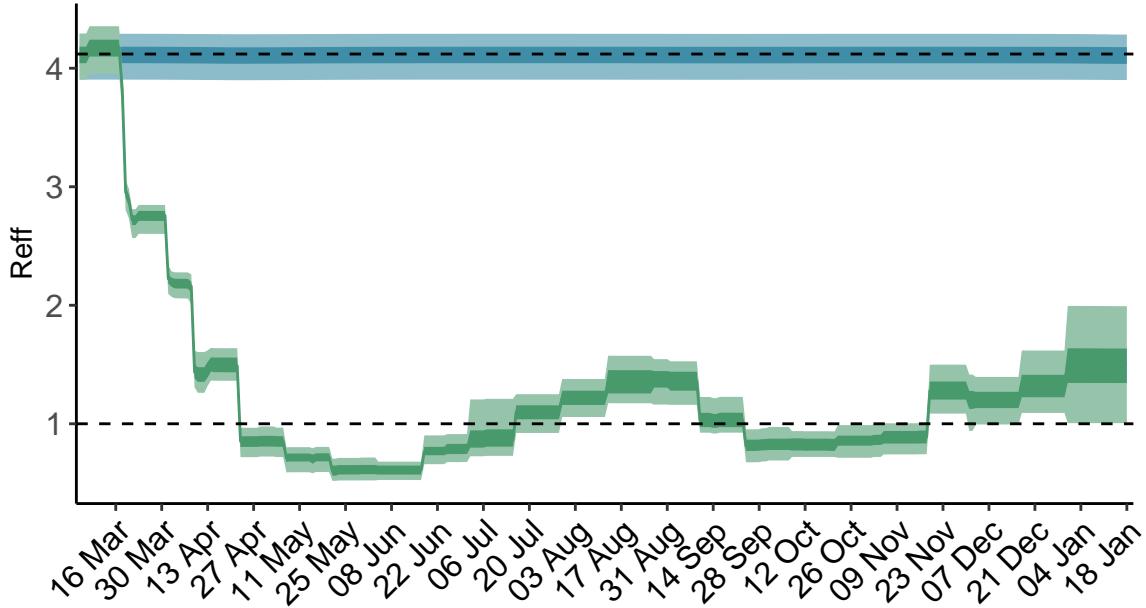


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Chad is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

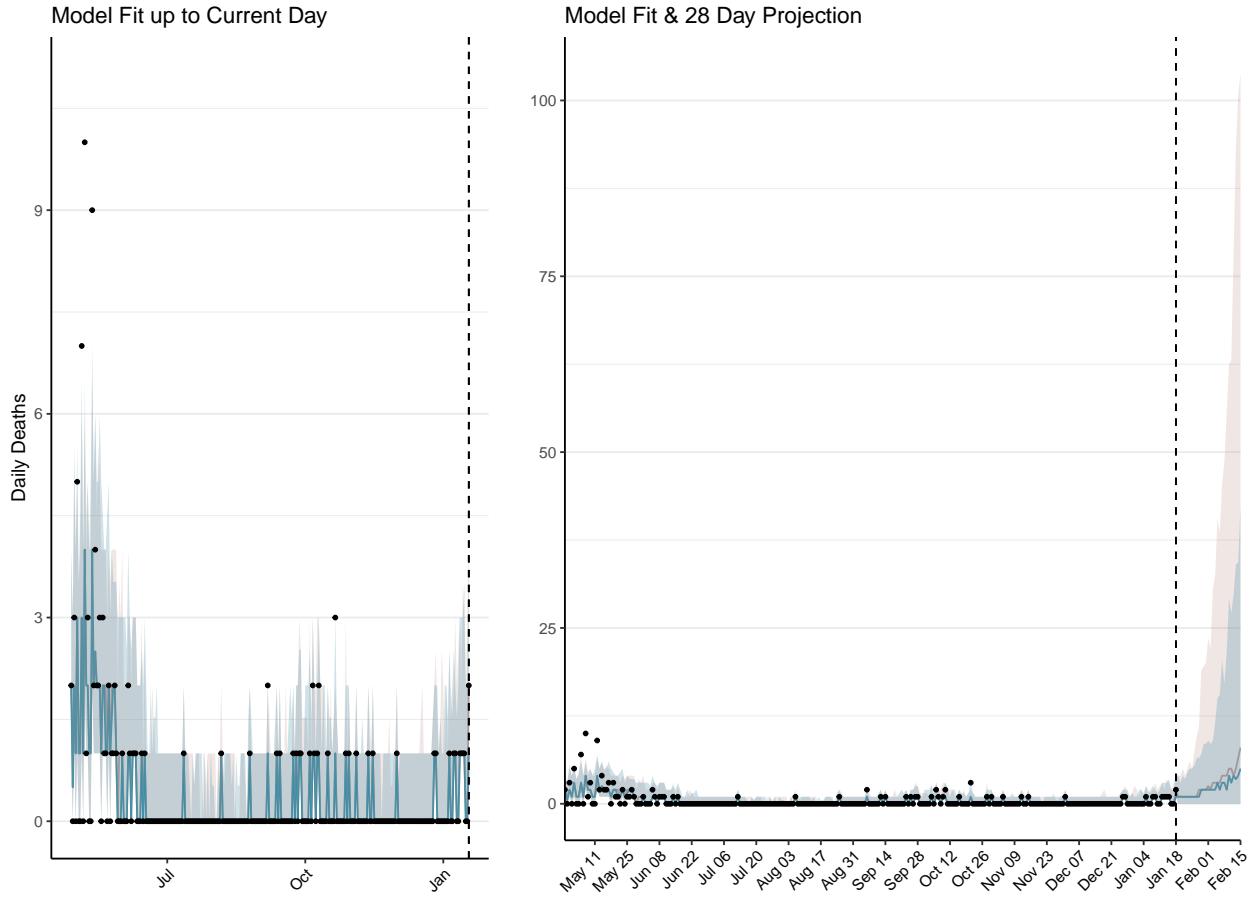


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 55 (95% CI: 49-60) patients requiring treatment with high-pressure oxygen at the current date to 507 (95% CI: 389-625) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 19 (95% CI: 17-21) patients requiring treatment with mechanical ventilation at the current date to 91 (95% CI: 80-102) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

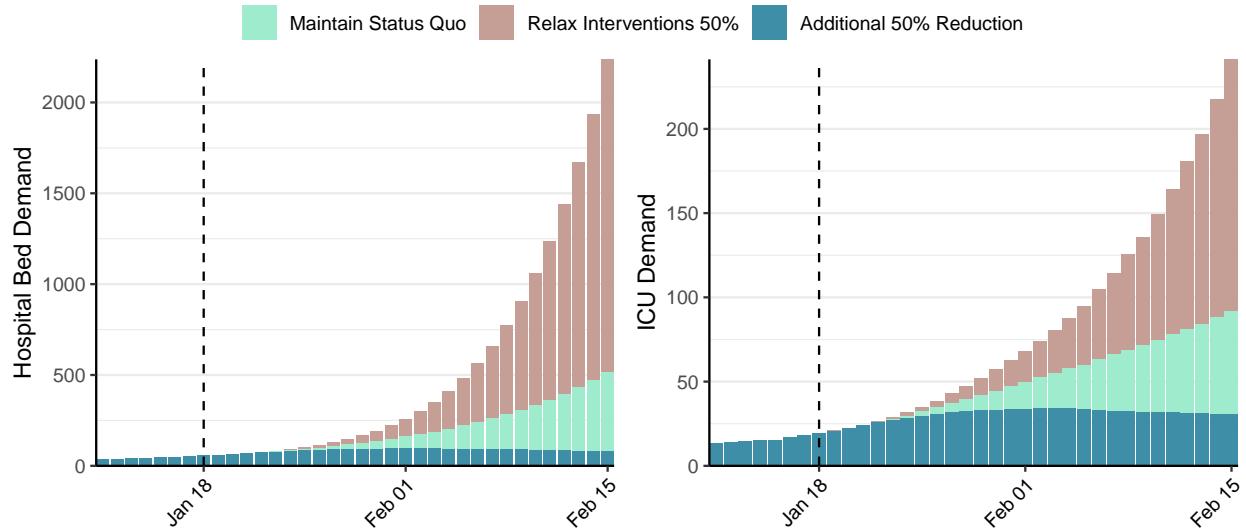


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 1,510 (95% CI: 1,310-1,710) at the current date to 824 (95% CI: 613-1,035) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,510 (95% CI: 1,310-1,710) at the current date to 110,581 (95% CI: 82,175-138,987) by 2021-02-15.

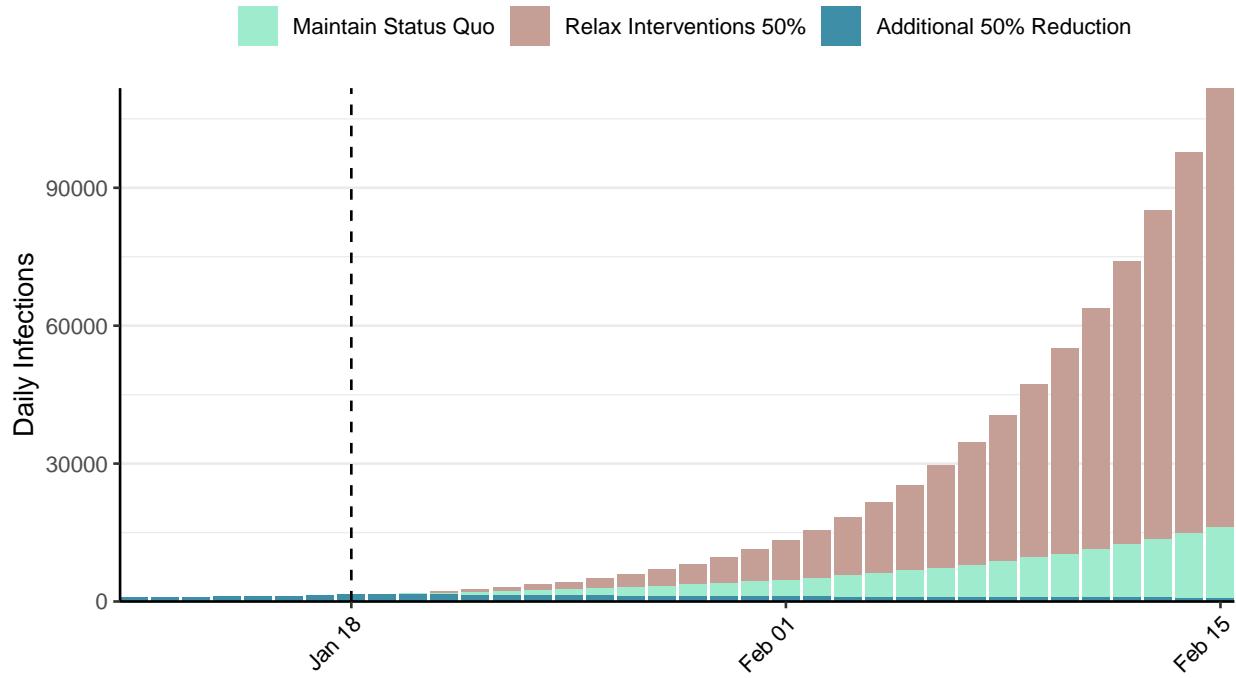


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Togo, 2021-01-18

[Download the report for Togo, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.49 (95% CI: 1.26-1.77)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Togo is not shown in the following plot as only 0 deaths have been reported to date**

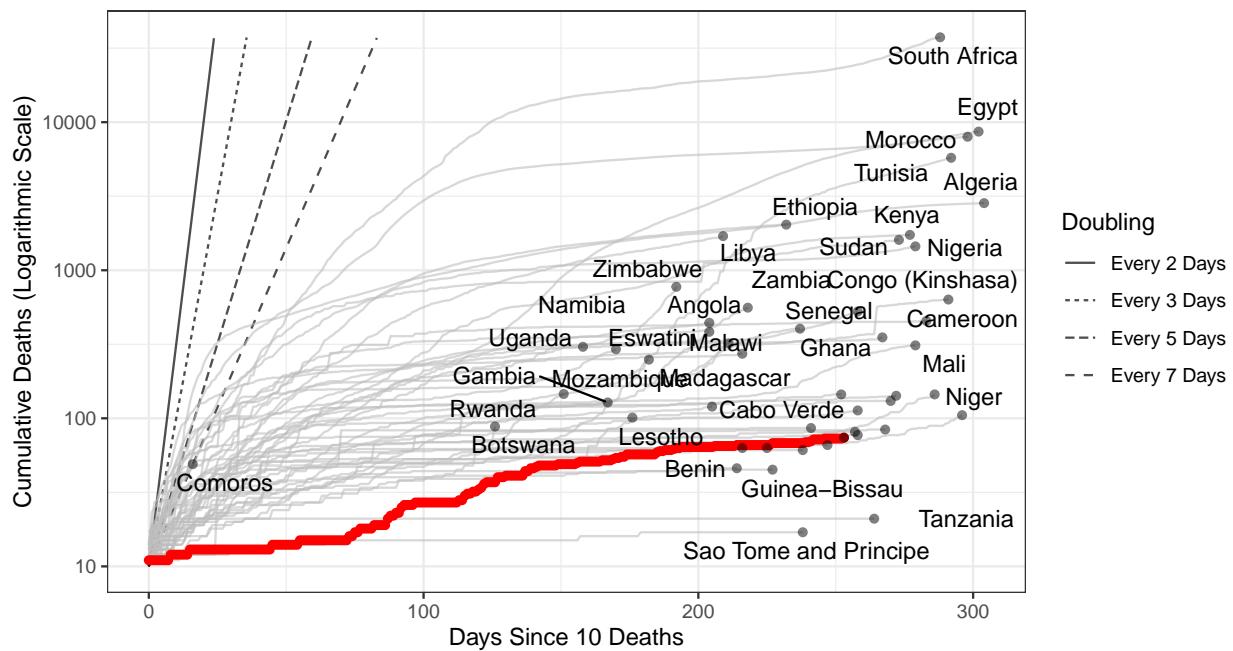


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 19,869 (95% CI: 17,457-22,281) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

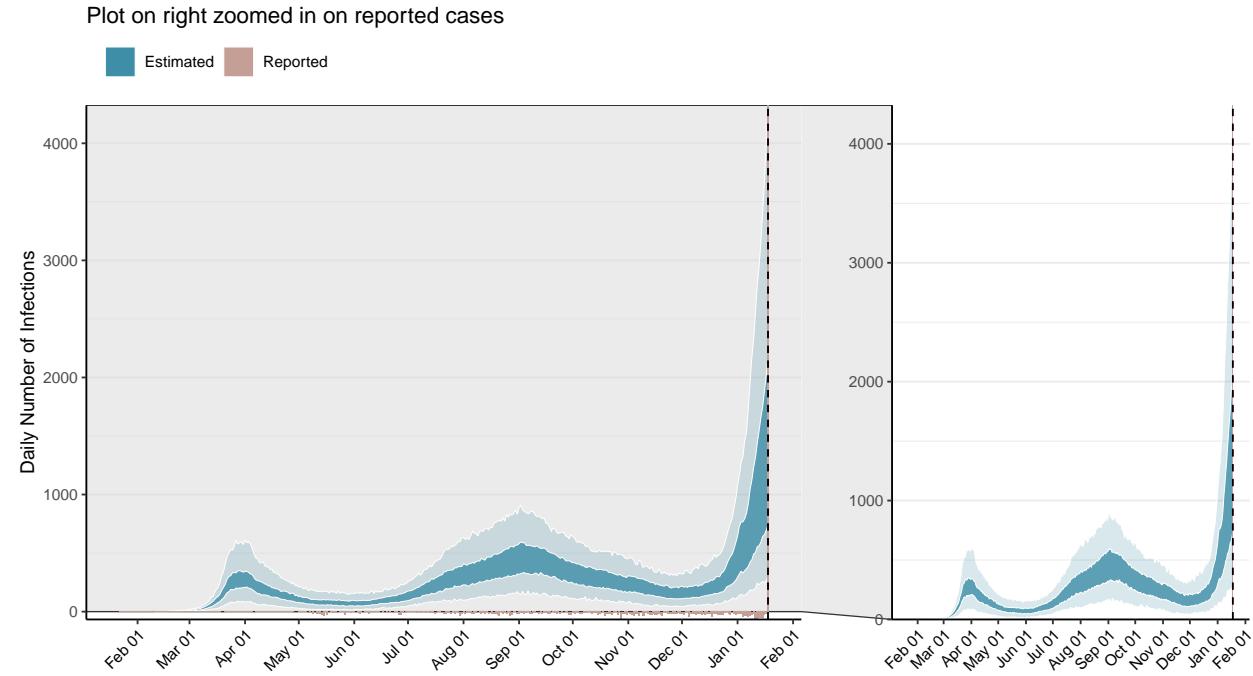


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

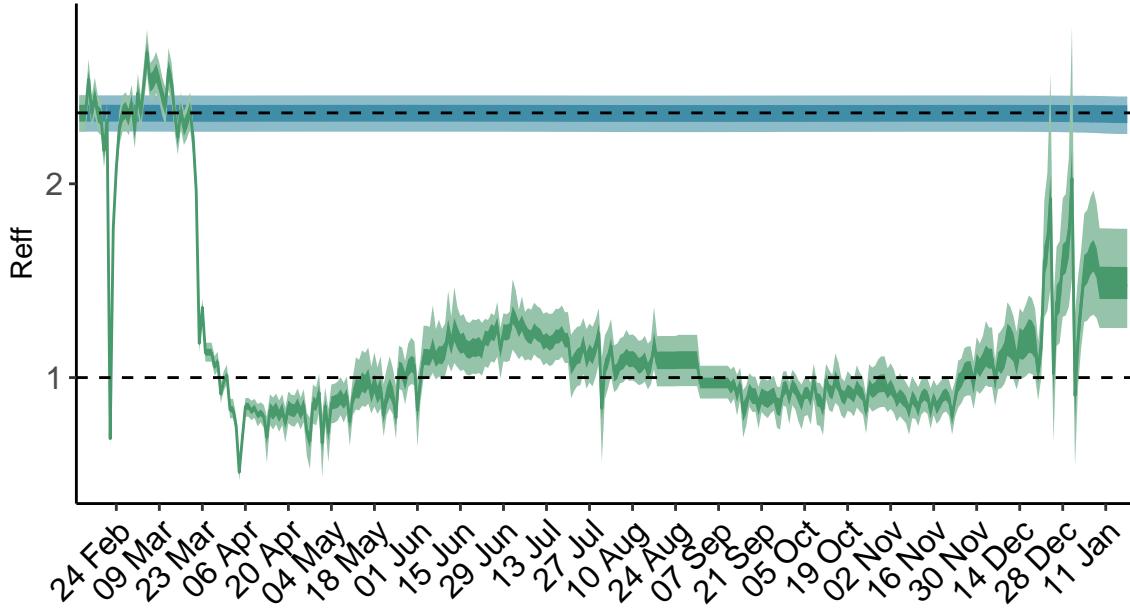


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Togo is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

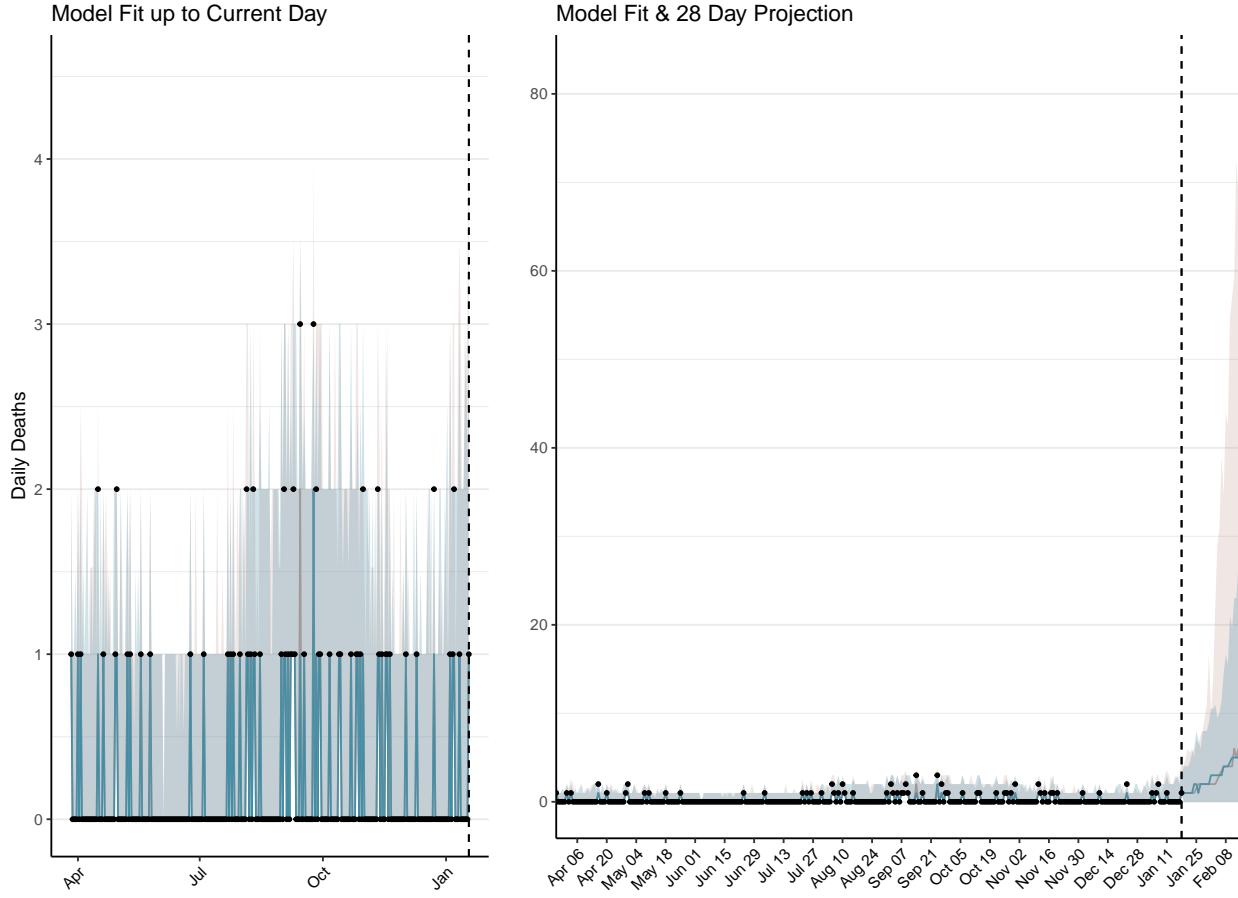


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 63 (95% CI: 55-71) patients requiring treatment with high-pressure oxygen at the current date to 457 (95% CI: 370-544) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 22 (95% CI: 19-25) patients requiring treatment with mechanical ventilation at the current date to 114 (95% CI: 101-128) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

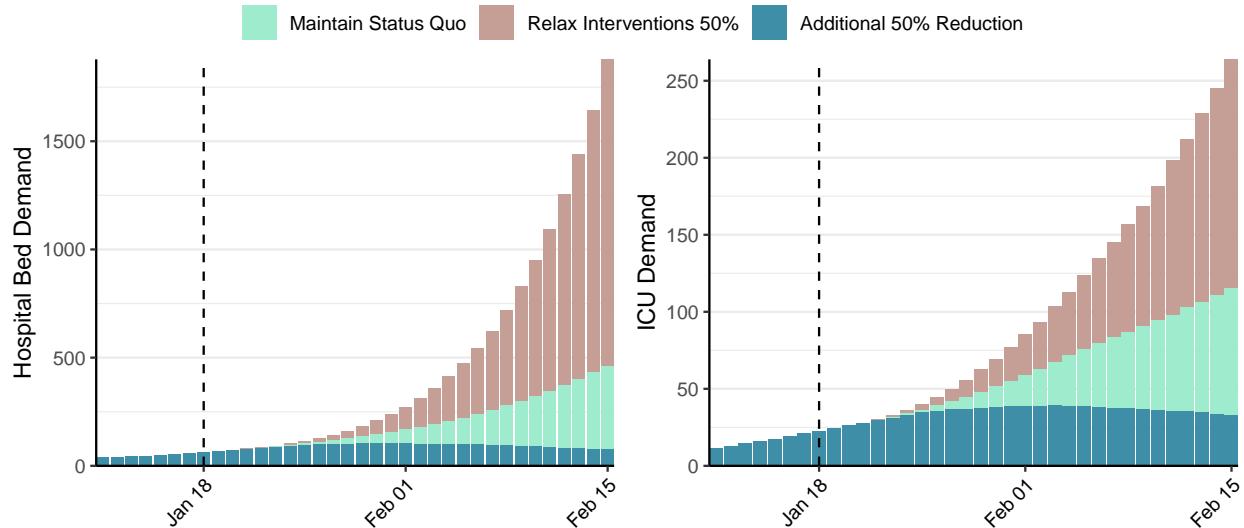


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 1,576 (95% CI: 1,354-1,798) at the current date to 671 (95% CI: 535-806) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,576 (95% CI: 1,354-1,798) at the current date to 75,551 (95% CI: 61,278-89,824) by 2021-02-15.

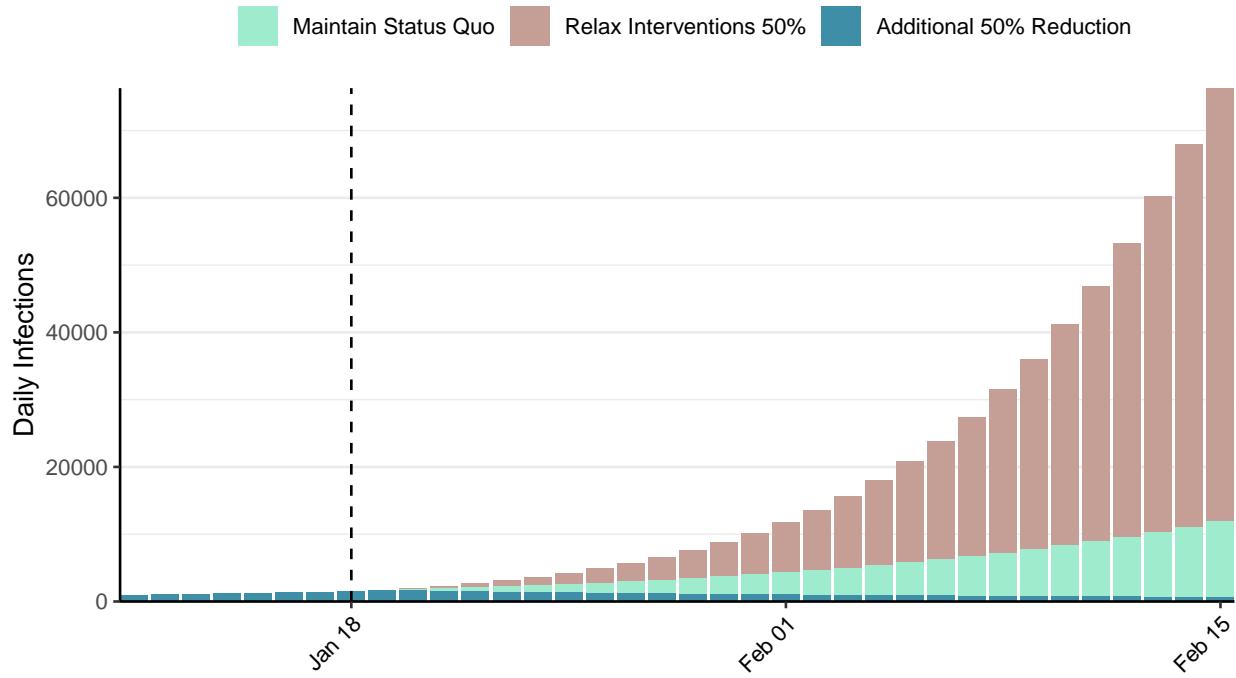


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Thailand, 2021-01-18

[Download the report for Thailand, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.02 (95% CI: 0.83-1.23)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Thailand is not shown in the following plot as only 0 deaths have been reported to date**

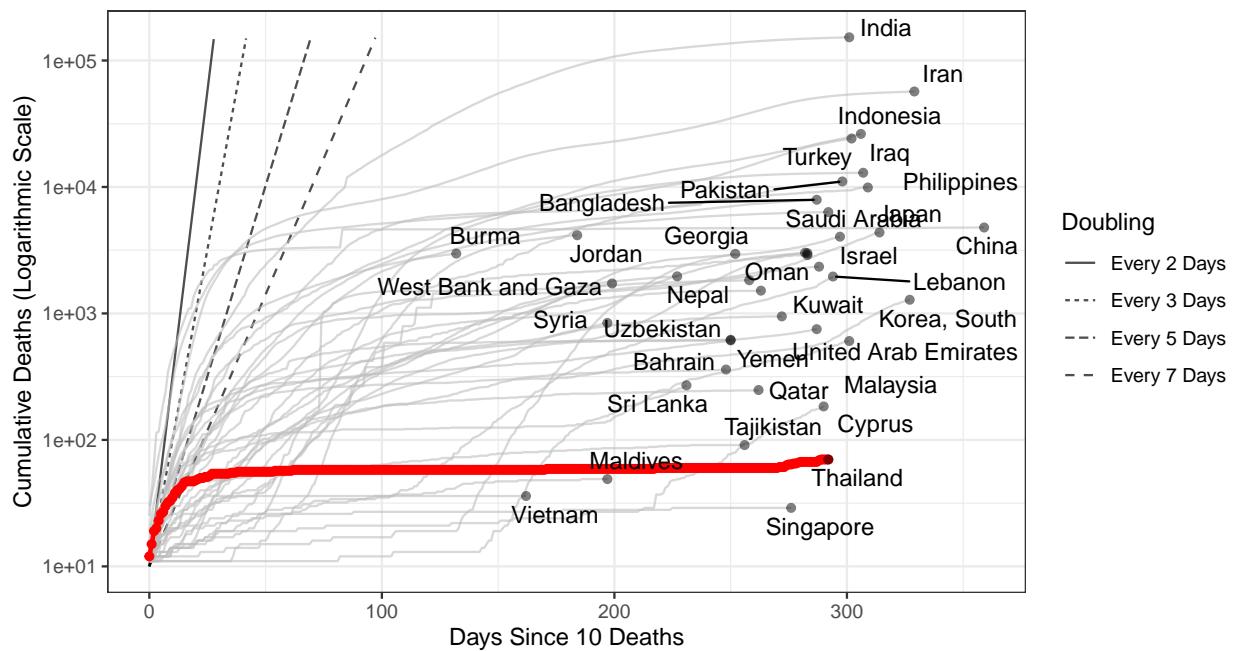


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 3,995 (95% CI: 2,998–4,993) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. Thailand has revised their historic reported cases and thus have reported negative cases.**

Plot on right zoomed in on reported cases

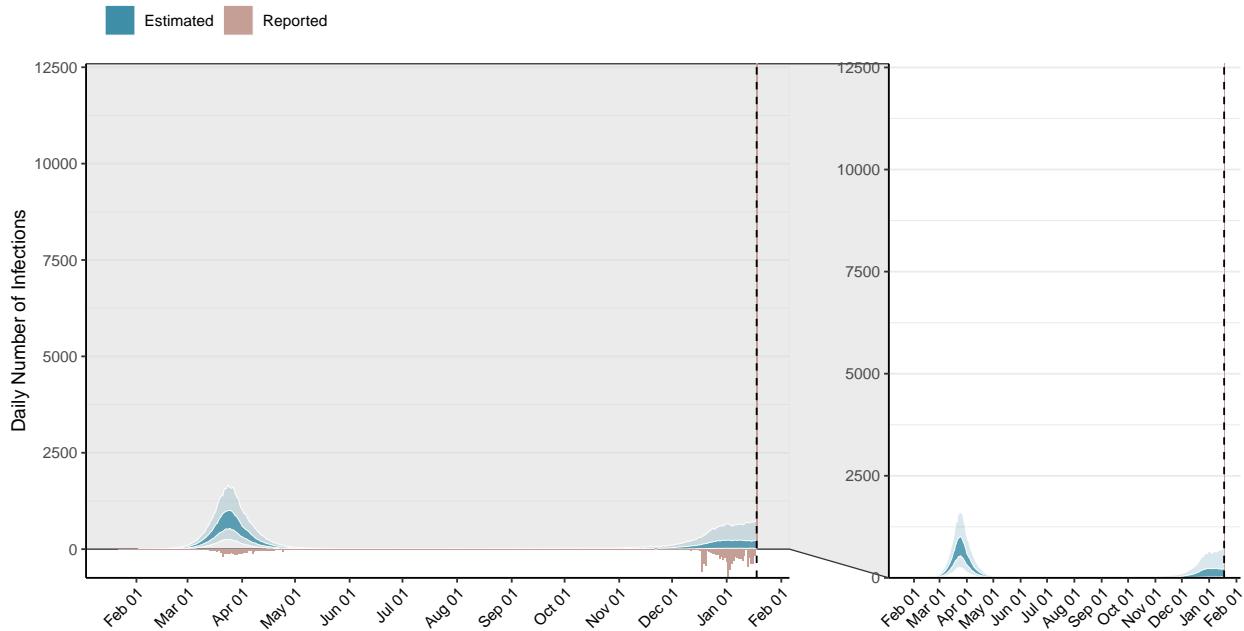


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

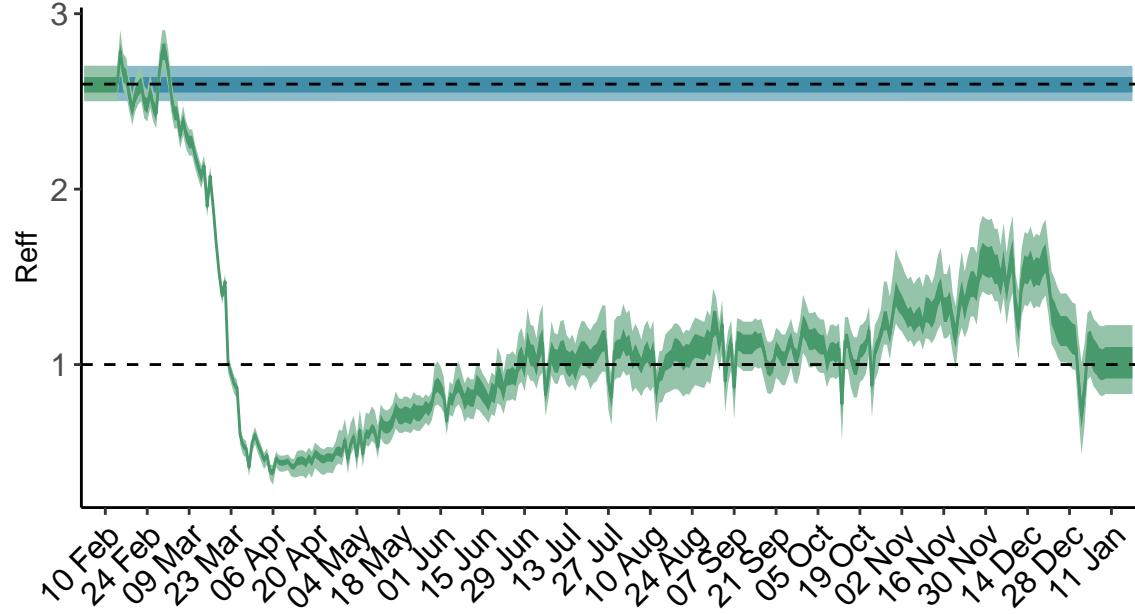


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

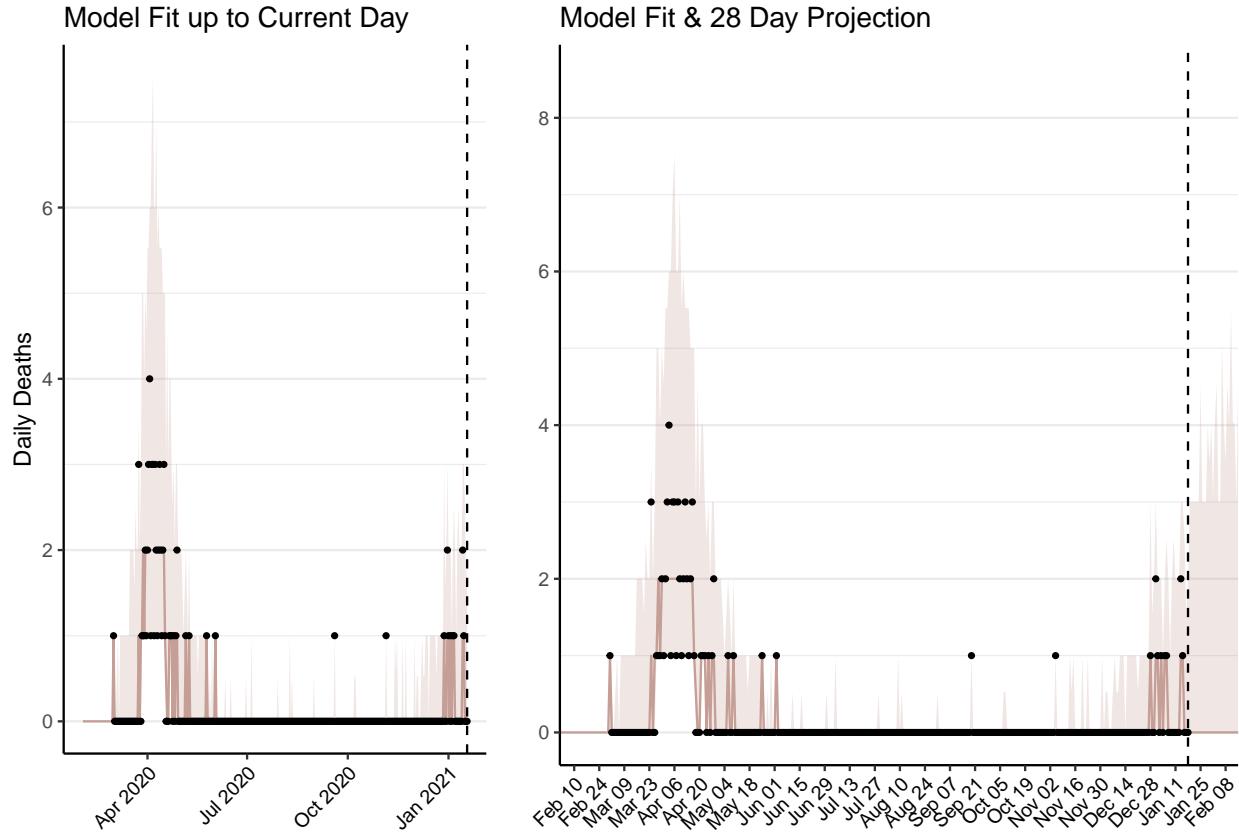


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 21 (95% CI: 16-26) patients requiring treatment with high-pressure oxygen at the current date to 27 (95% CI: 19-36) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 7 (95% CI: 6-9) patients requiring treatment with mechanical ventilation at the current date to 10 (95% CI: 7-13) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

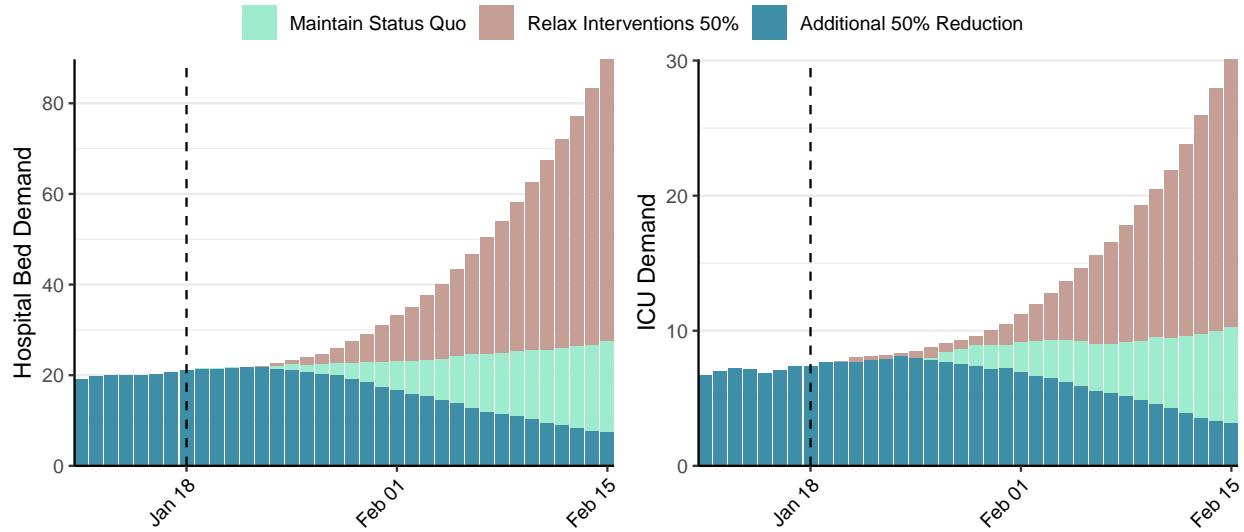


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 158 (95% CI: 116-200) at the current date to 17 (95% CI: 11-23) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 158 (95% CI: 116-200) at the current date to 1,325 (95% CI: 870-1,780) by 2021-02-15.

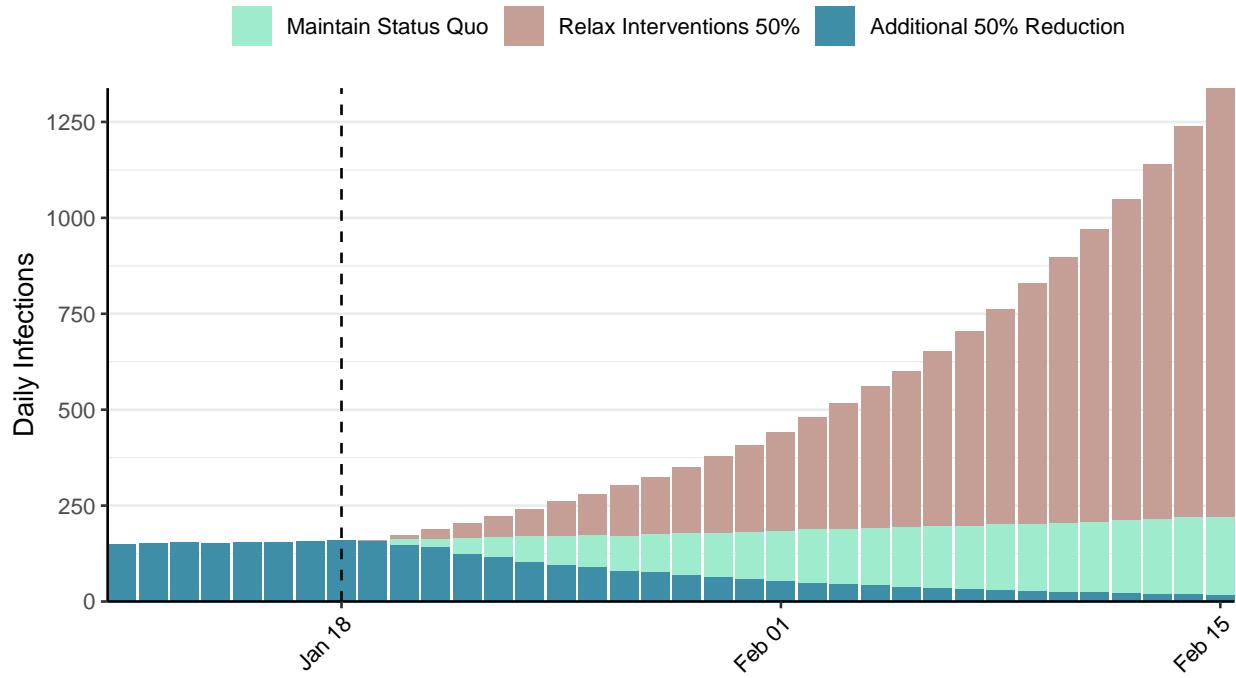


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Tajikistan, 2021-01-18

[Download the report for Tajikistan, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.87 (95% CI: 0.63-1.17)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Tajikistan is not shown in the following plot as only 0 deaths have been reported to date**

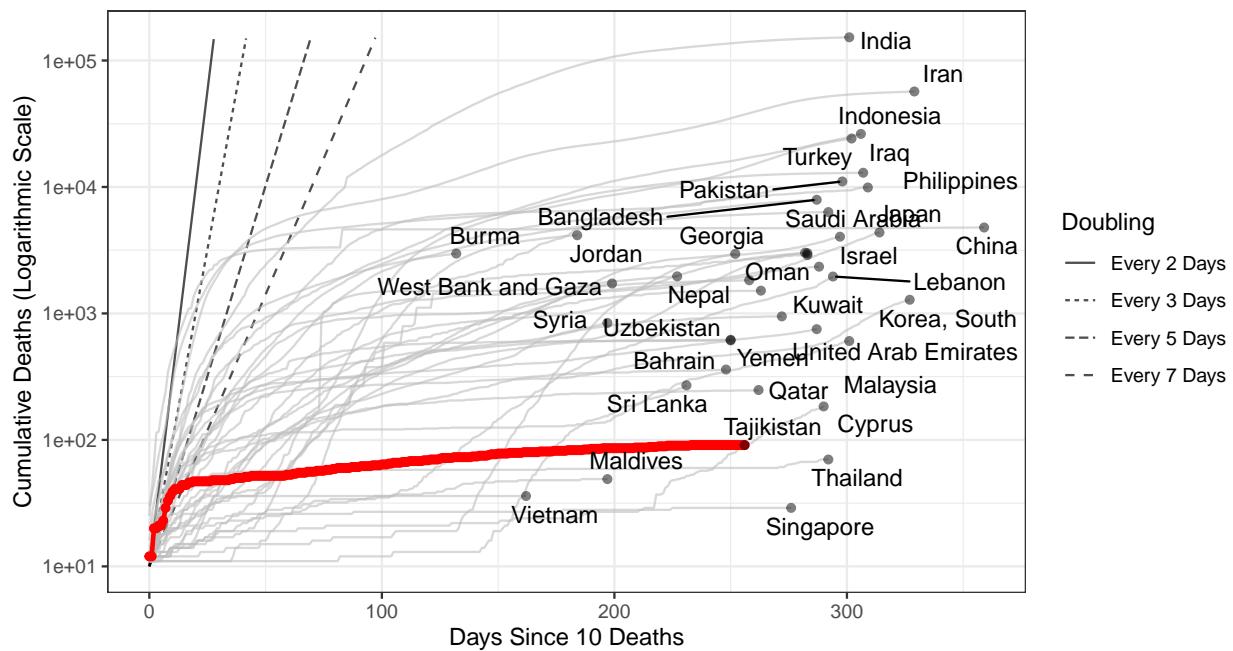


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 1,698 (95% CI: 1,424-1,972) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

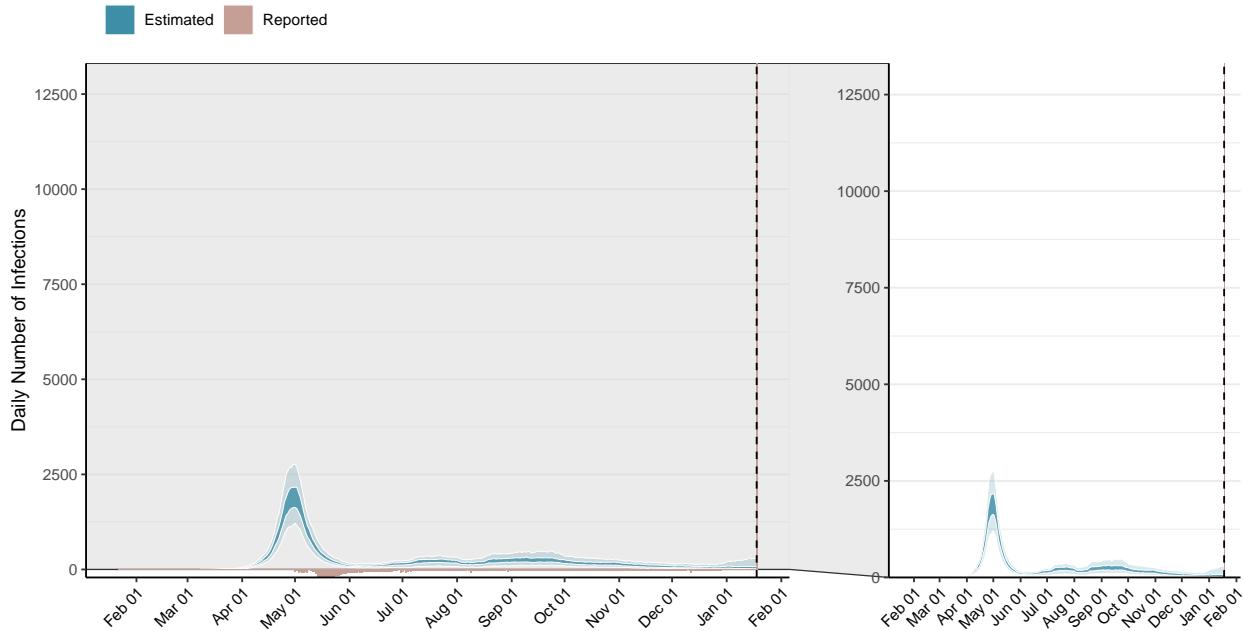


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

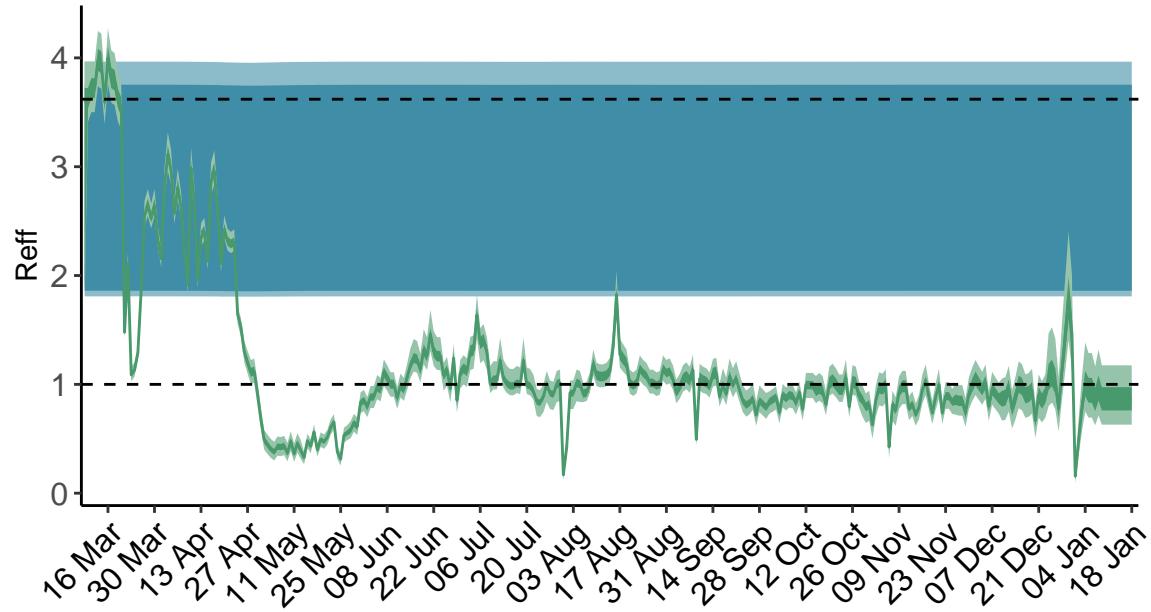


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

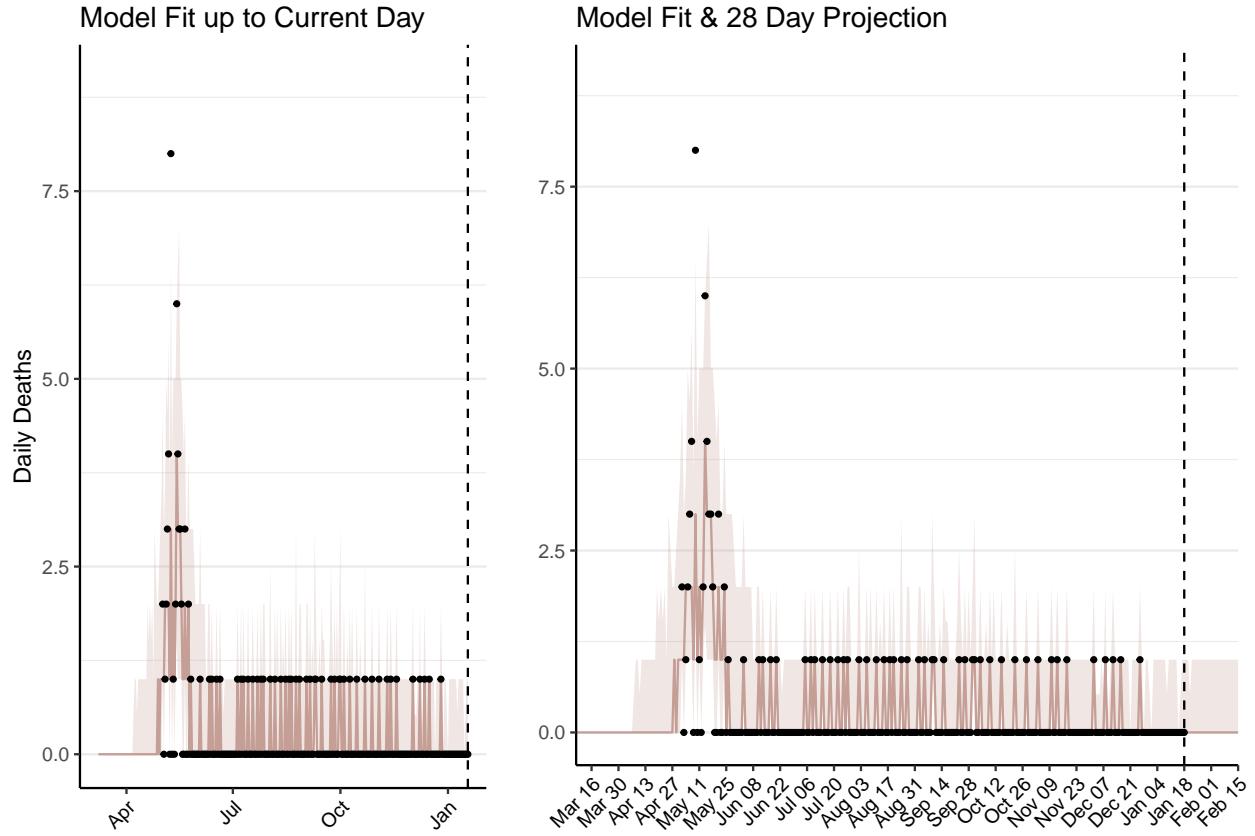


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 4 (95% CI: 4-5) patients requiring treatment with high-pressure oxygen at the current date to 5 (95% CI: 3-7) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 2 (95% CI: 2-2) patients requiring treatment with mechanical ventilation at the current date to 2 (95% CI: 1-3) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

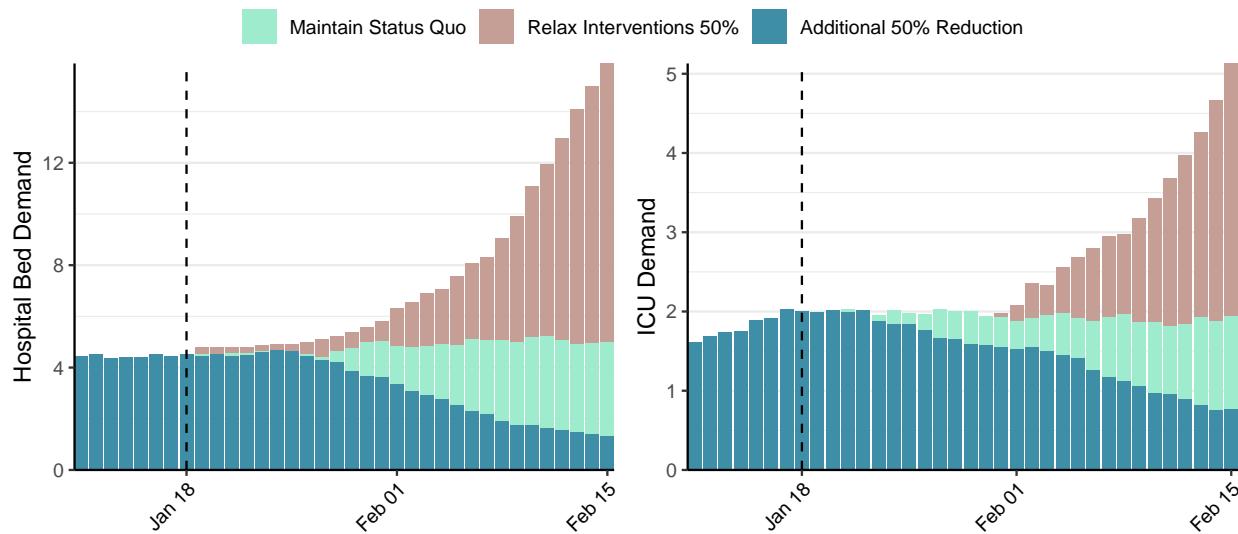


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 61 (95% CI: 47-76) at the current date to 5 (95% CI: 3-8) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 61 (95% CI: 47-76) at the current date to 458 (95% CI: 208-709) by 2021-02-15.

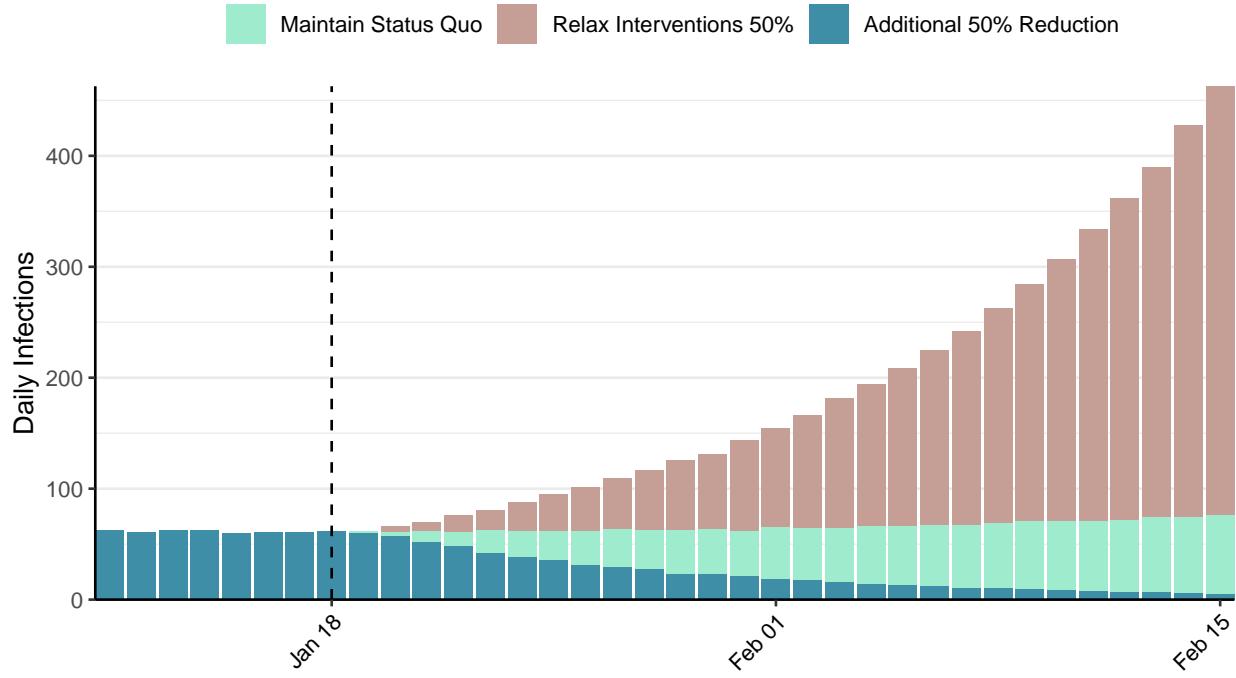


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](#) - <https://covidsim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Tunisia, 2021-01-18

[Download the report for Tunisia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.09 (95% CI: 0.96-1.23)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Tunisia is not shown in the following plot as only 0 deaths have been reported to date**

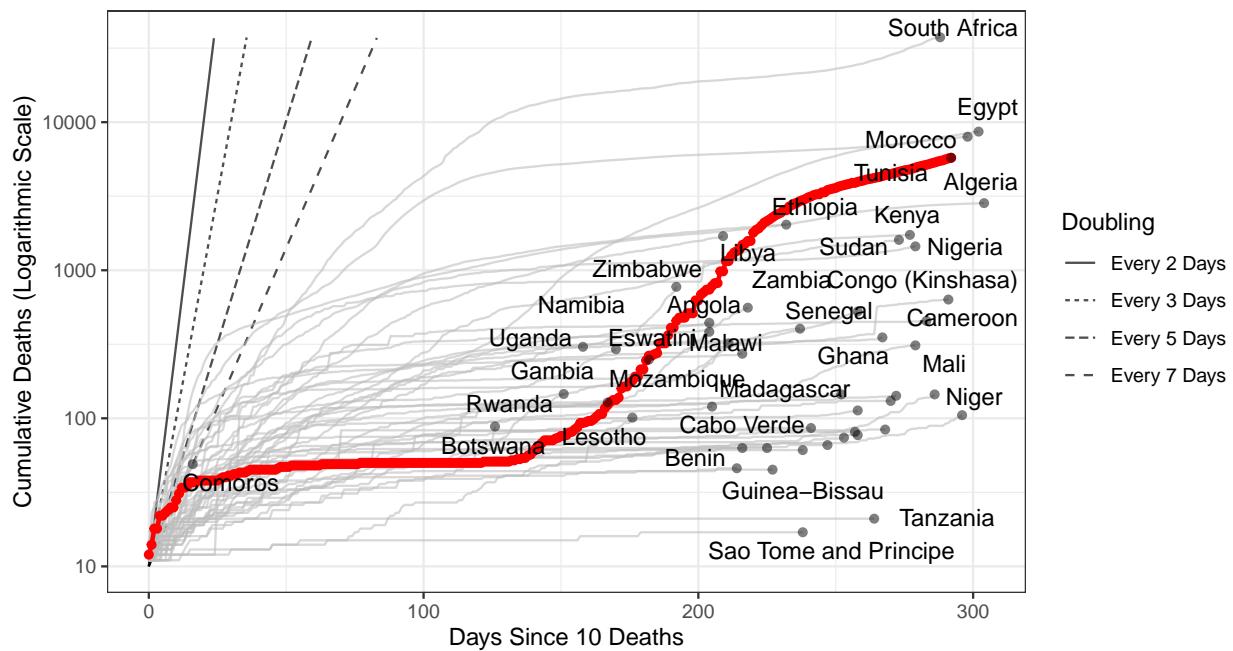


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 404,219 (95% CI: 392,904-415,535) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

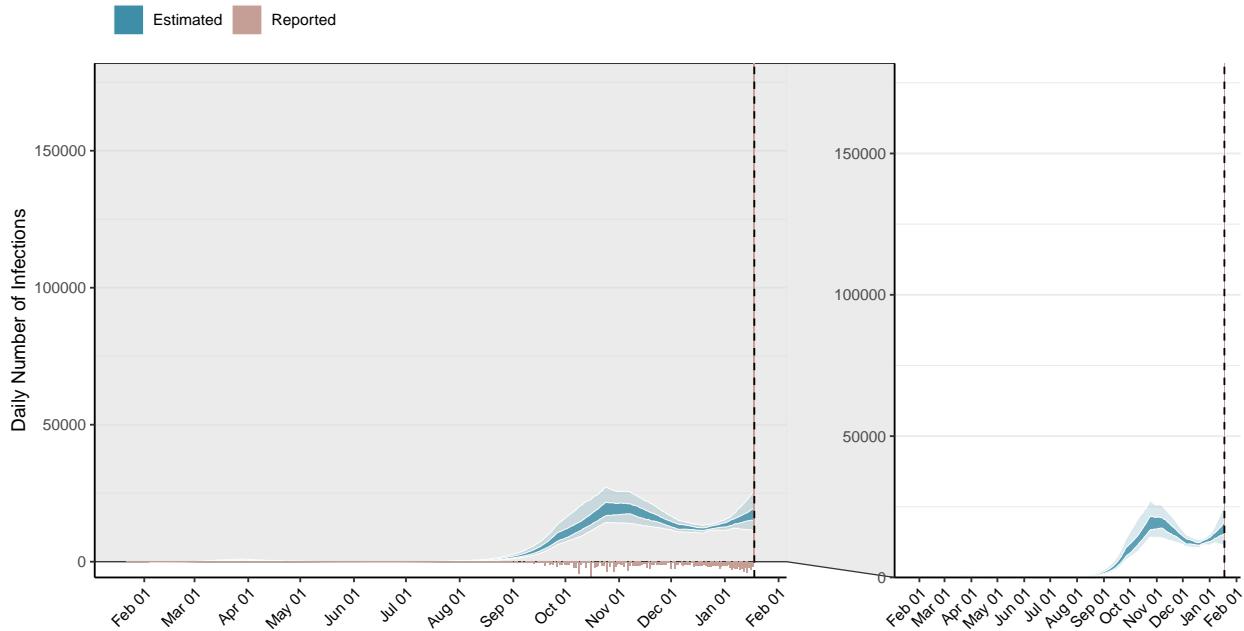


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

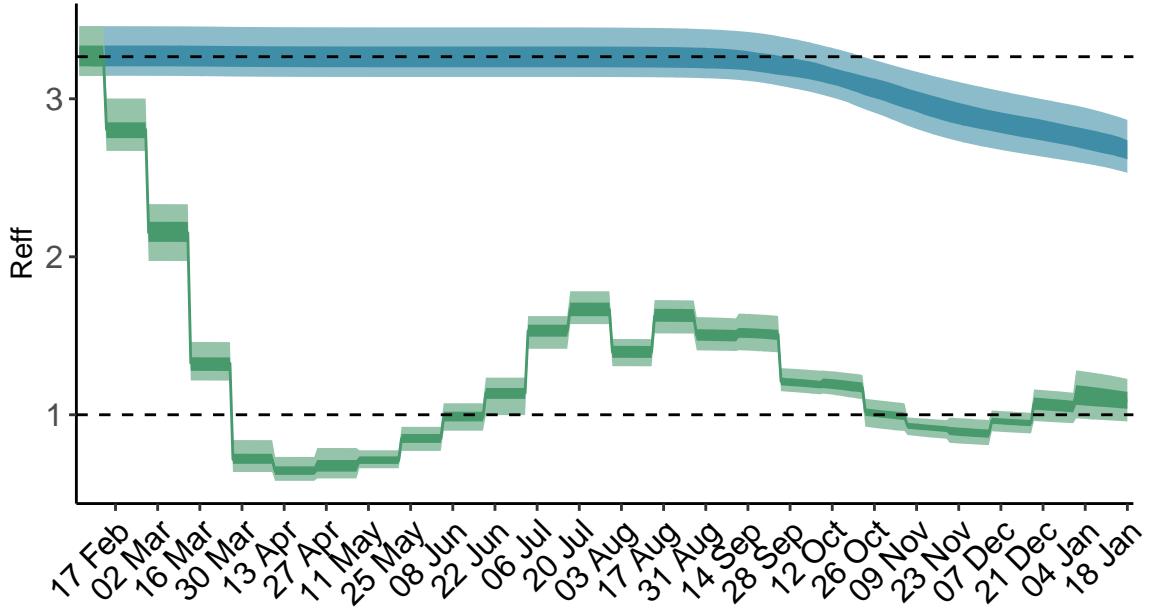


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Tunisia is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

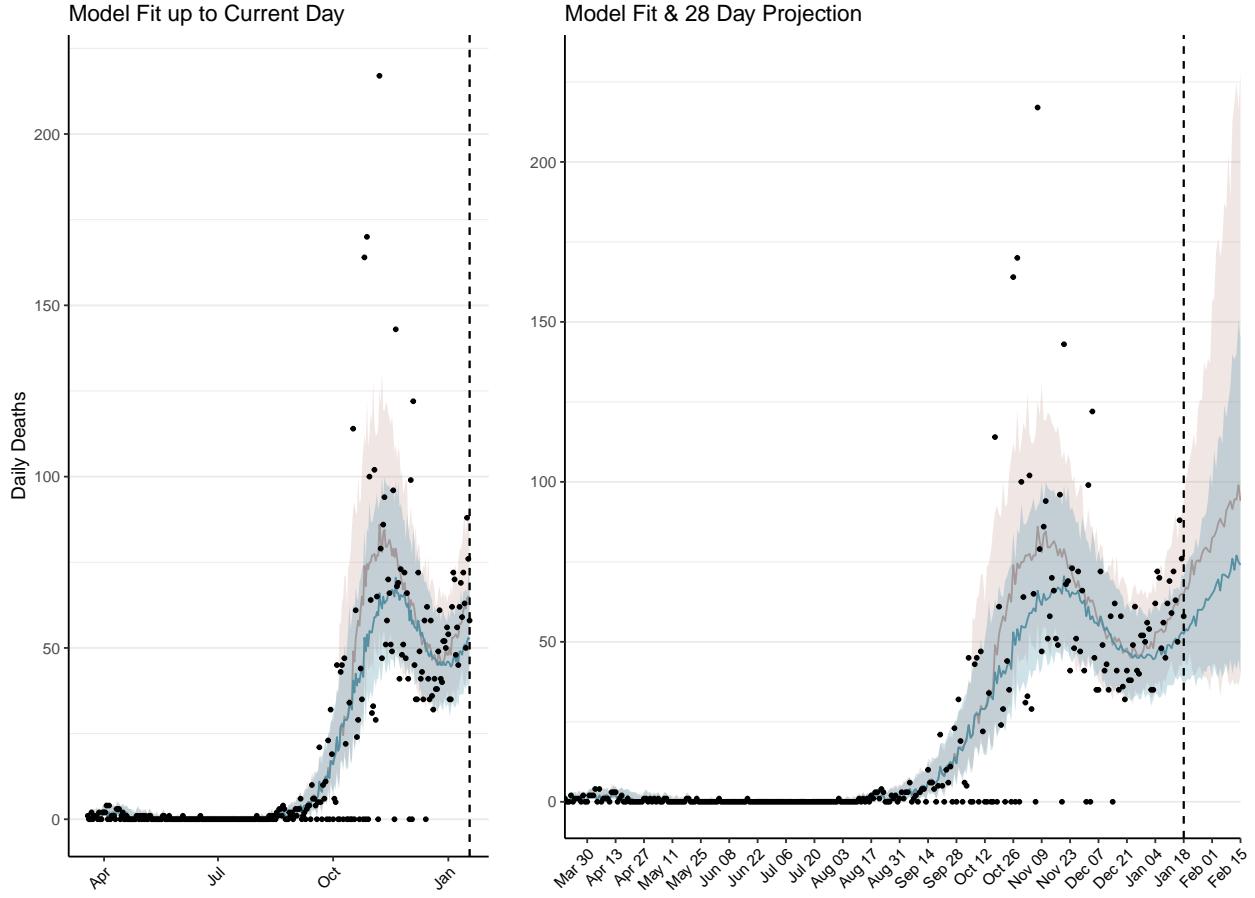


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1,934 (95% CI: 1,877-1,991) patients requiring treatment with high-pressure oxygen at the current date to 2,884 (95% CI: 2,660-3,108) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 527 (95% CI: 516-538) patients requiring treatment with mechanical ventilation at the current date to 575 (95% CI: 558-592) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

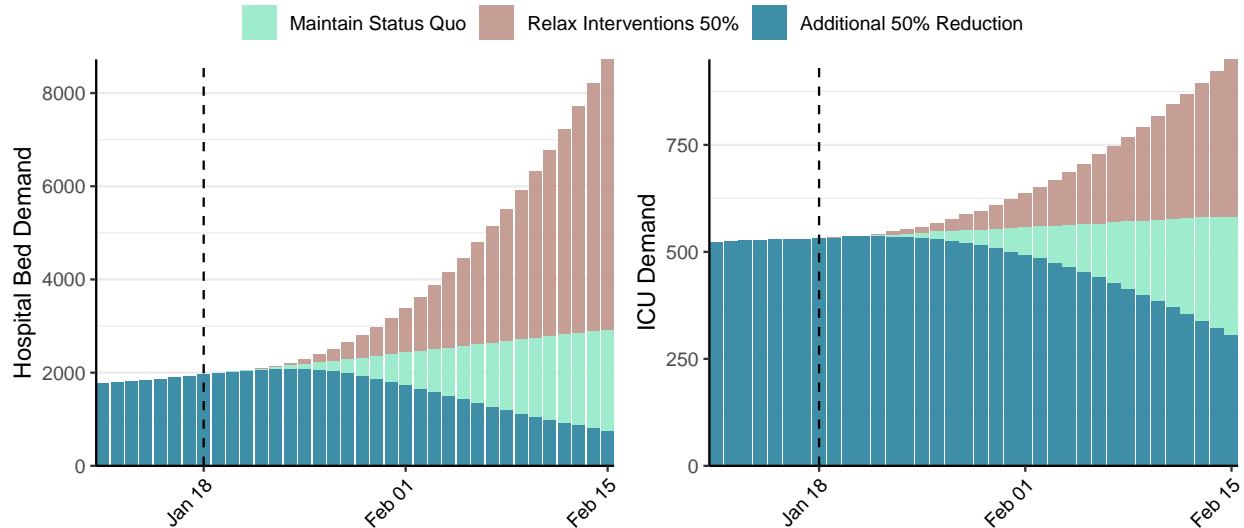


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 17,760 (95% CI: 16,937-18,584) at the current date to 2,090 (95% CI: 1,896-2,285) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 17,760 (95% CI: 16,937-18,584) at the current date to 111,457 (95% CI: 103,169-119,746) by 2021-02-15.

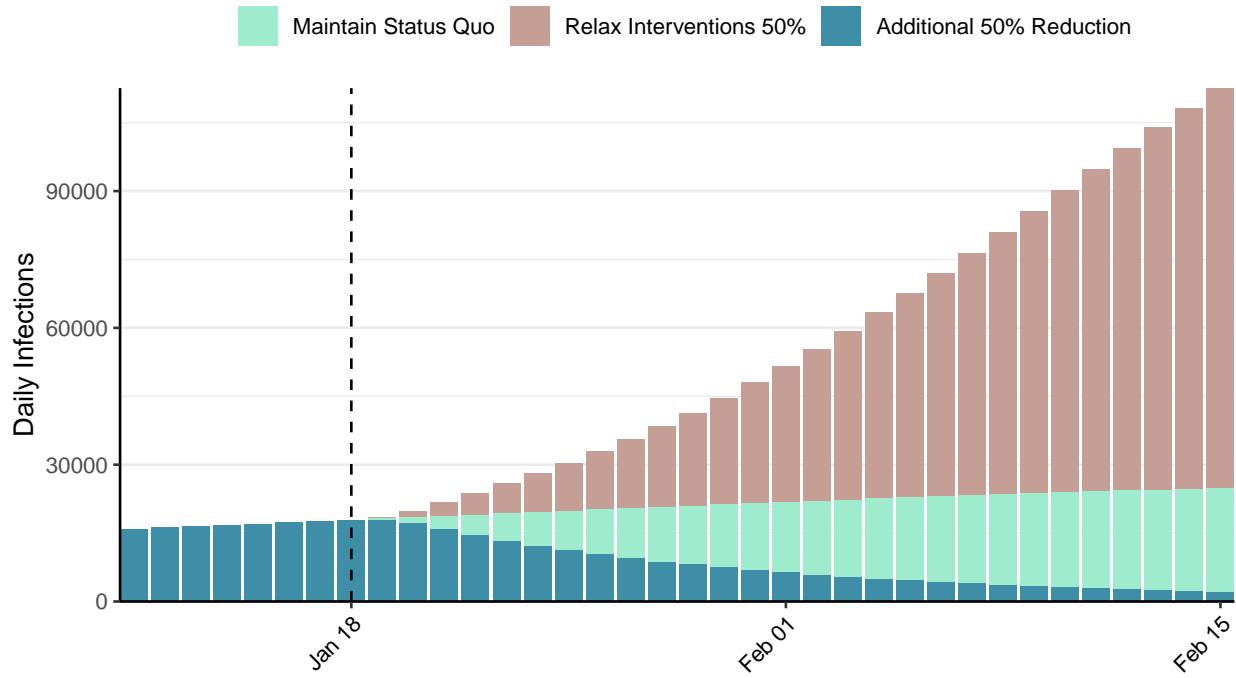


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Turkey, 2021-01-18

[Download the report for Turkey, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.63 (95% CI: 0.49-0.9)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Turkey is not shown in the following plot as only 0 deaths have been reported to date**

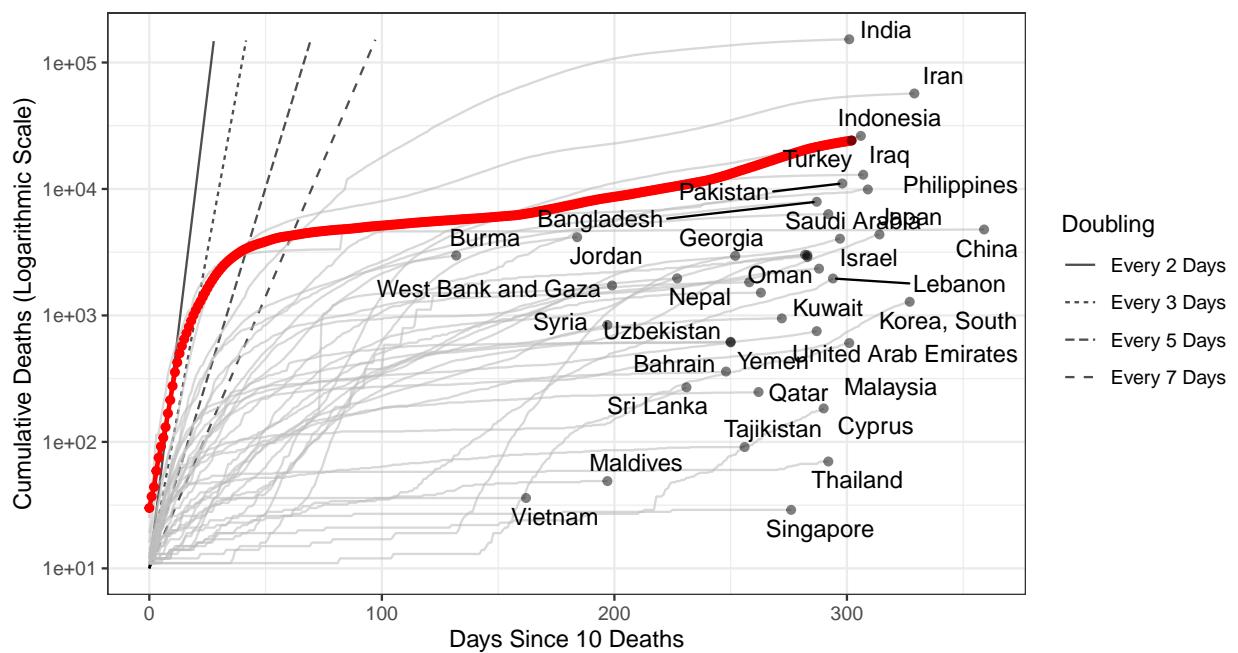


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 1,666,372 (95% CI: 1,601,201-1,731,542) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

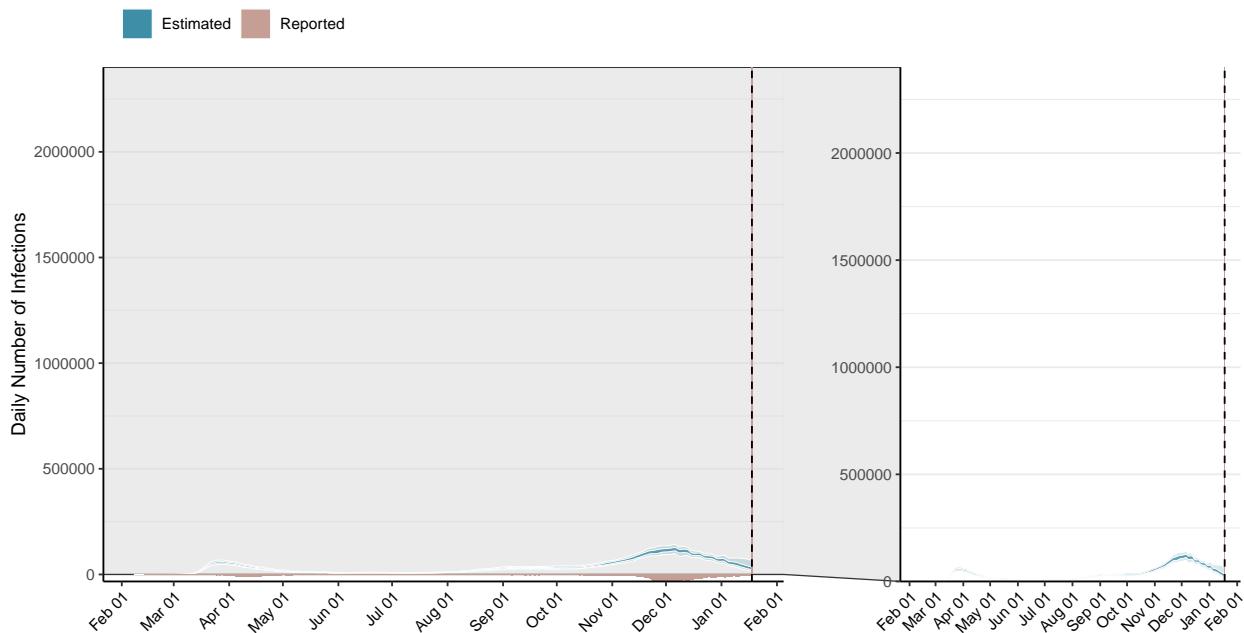


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

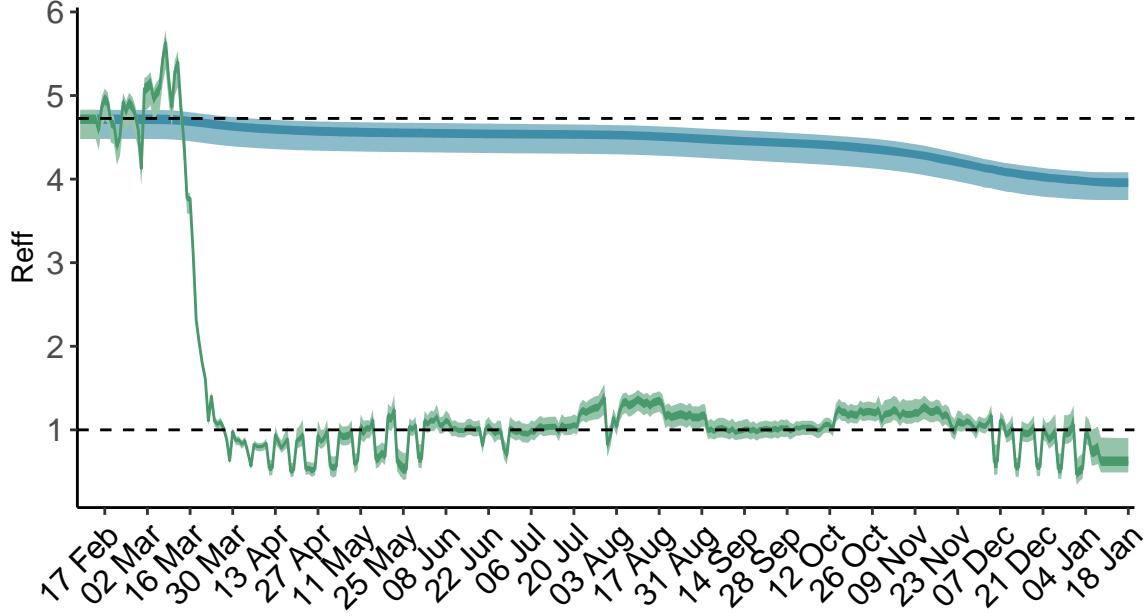


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

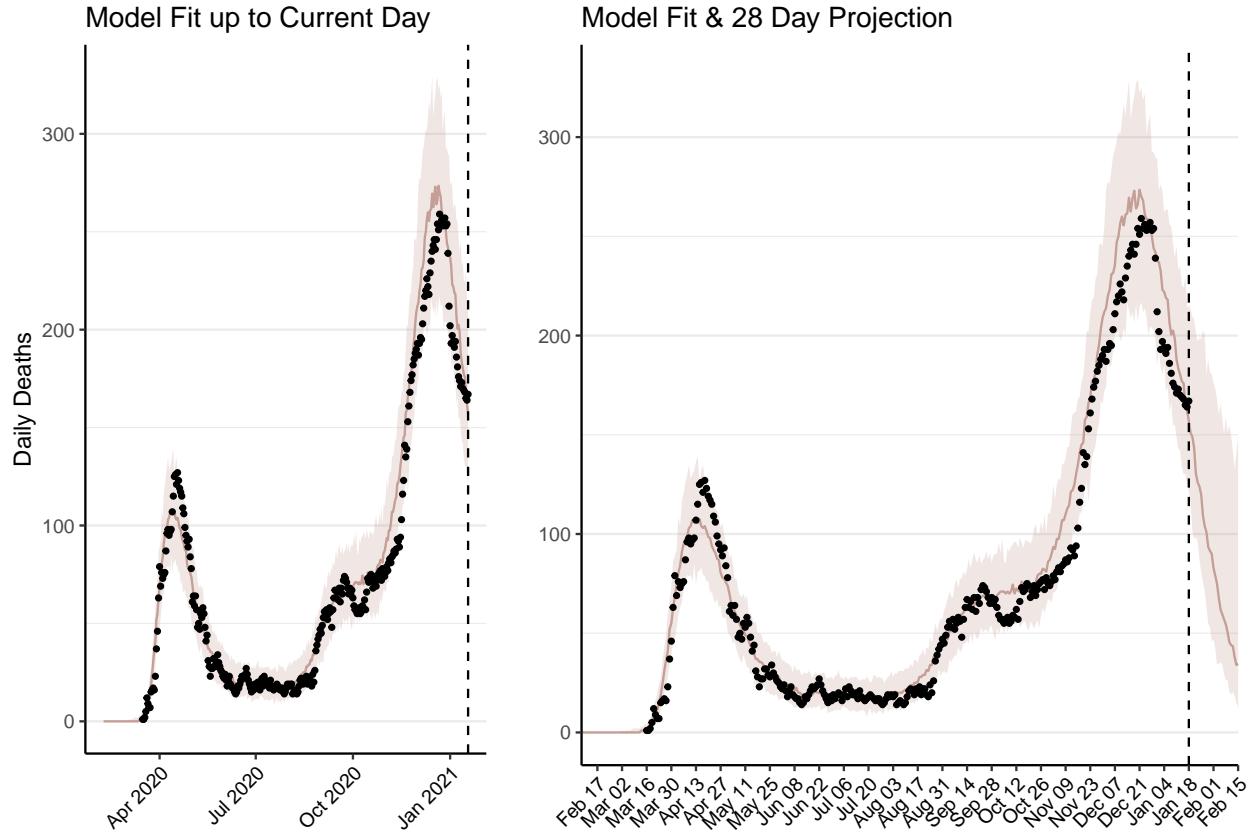


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 5,521 (95% CI: 5,271-5,772) patients requiring treatment with high-pressure oxygen at the current date to 1,450 (95% CI: 1,186-1,713) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 2,331 (95% CI: 2,241-2,422) patients requiring treatment with mechanical ventilation at the current date to 673 (95% CI: 572-775) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

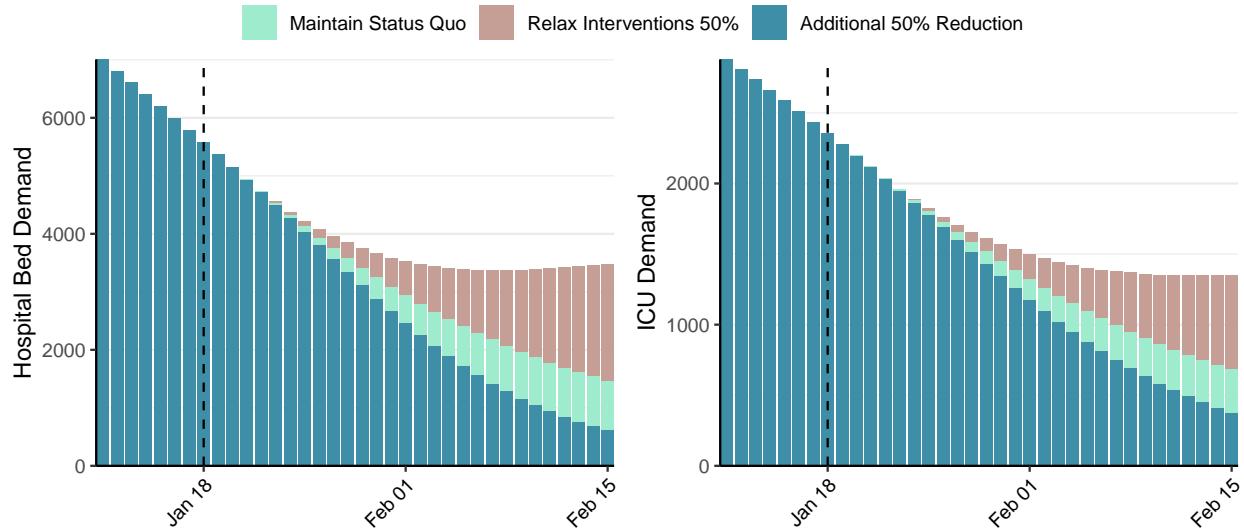


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 31,094 (95% CI: 28,182-34,007) at the current date to 854 (95% CI: 643-1,066) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 31,094 (95% CI: 28,182-34,007) at the current date to 37,458 (95% CI: 25,902-49,014) by 2021-02-15.

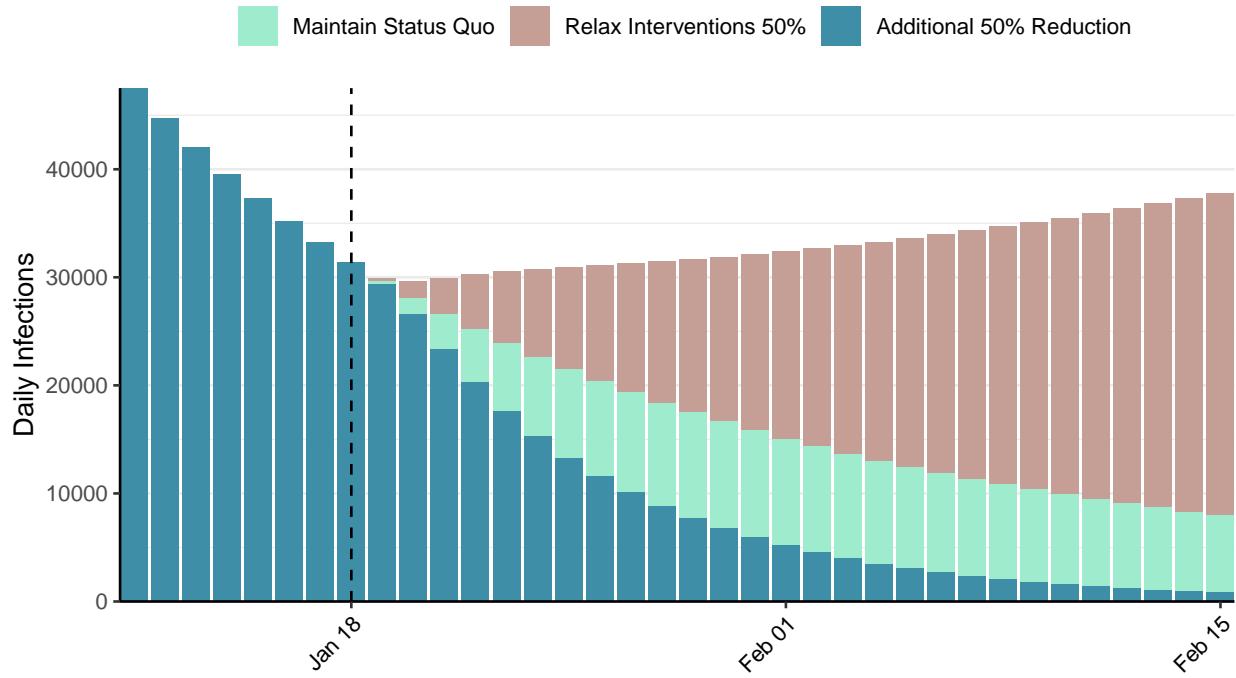


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Tanzania, 2021-01-18

[Download the report for Tanzania, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.75 (95% CI: 0.33-1.4)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Tanzania is not shown in the following plot as only 0 deaths have been reported to date**

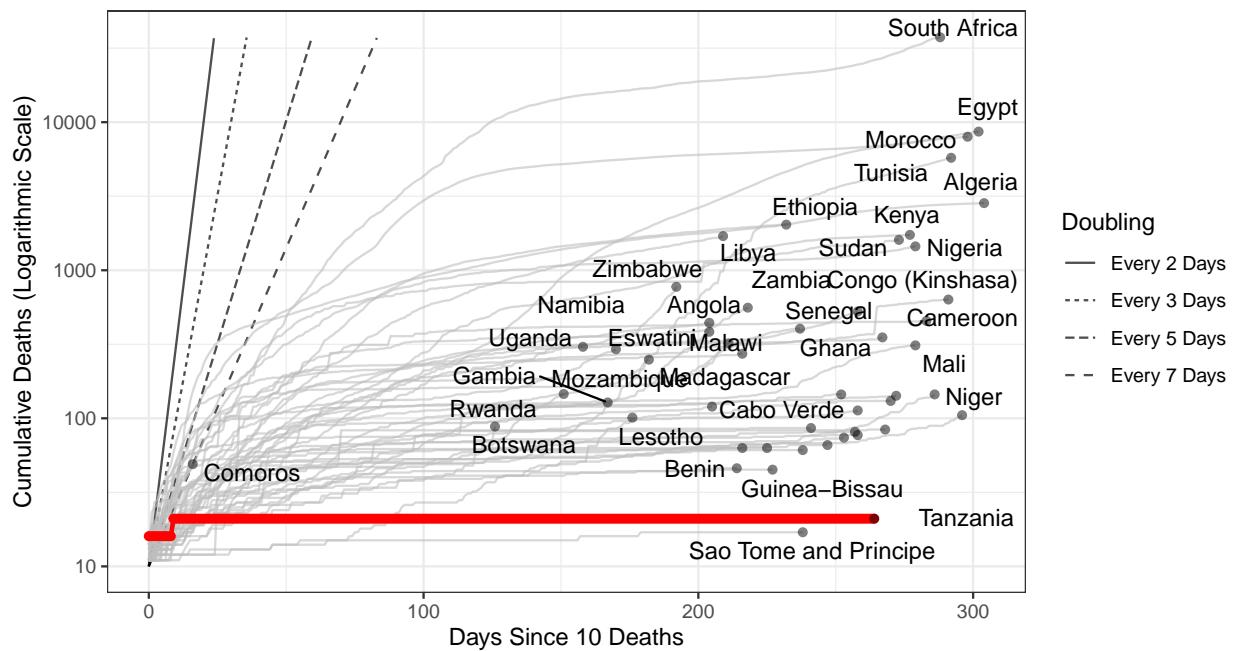


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 1 (95% CI: -1-3) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

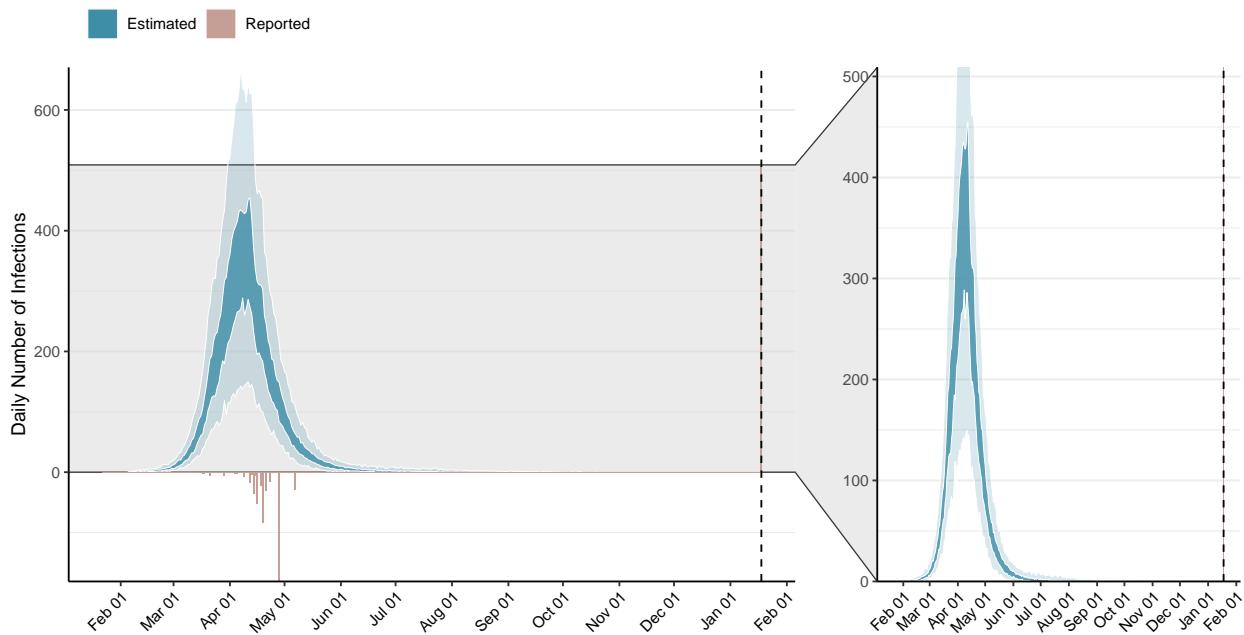


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

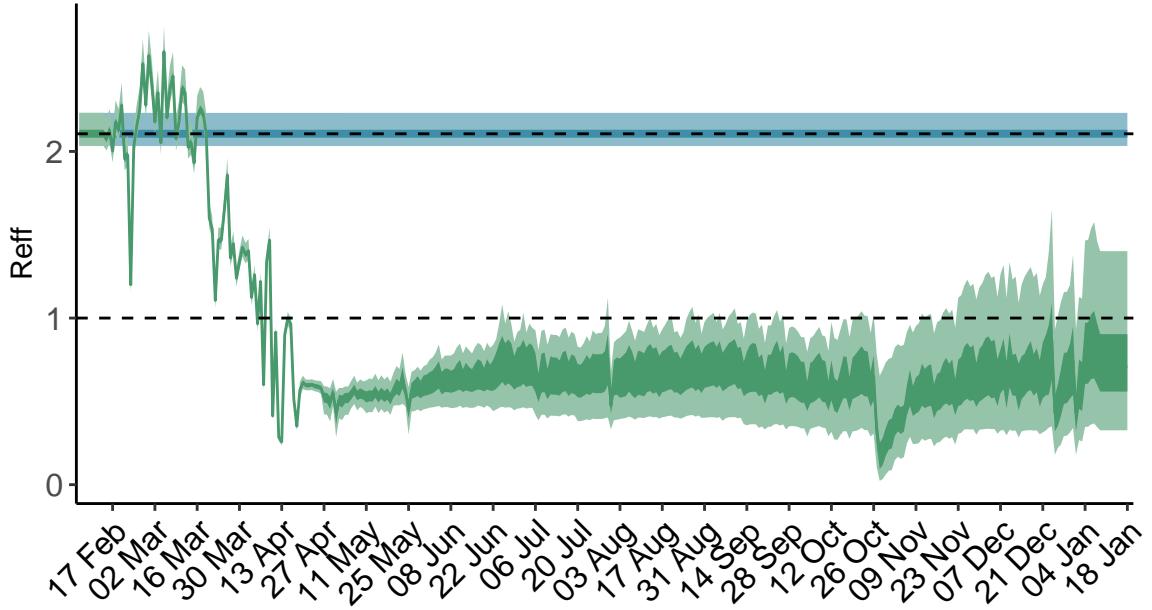


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

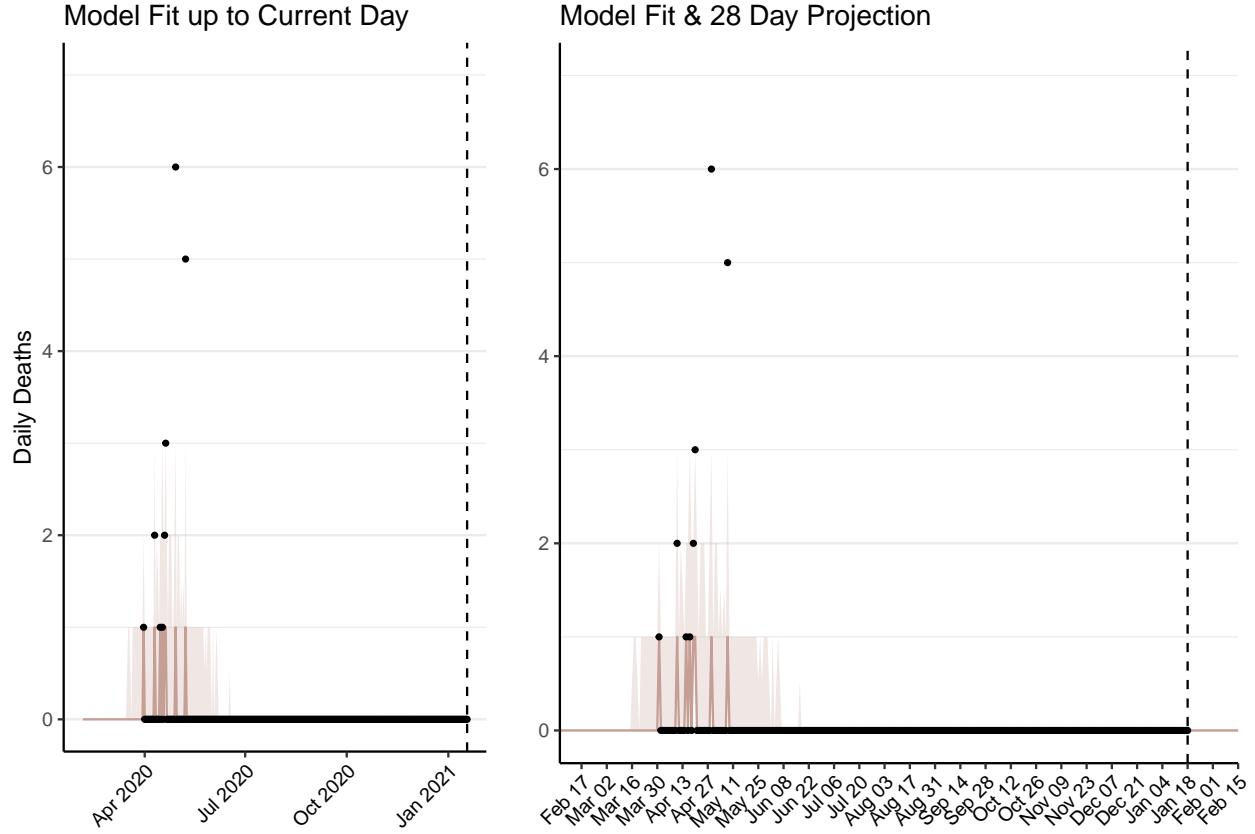


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 0 (95% CI: NaN-NaN) patients requiring treatment with high-pressure oxygen at the current date to 0 (95% CI: 0-0) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 0 (95% CI: NaN-NaN) patients requiring treatment with mechanical ventilation at the current date to 0 (95% CI: 0-0) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

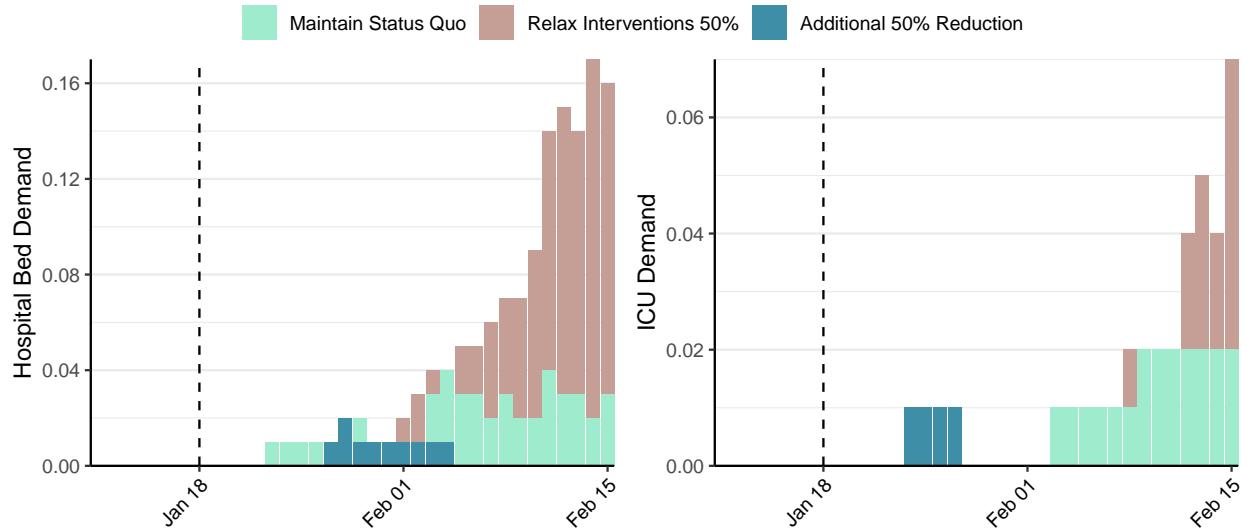


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 0 (95% CI: 0-0) at the current date to 0 (95% CI: 0-0) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 0 (95% CI: 0-0) at the current date to 14 (95% CI: -13-40) by 2021-02-15.

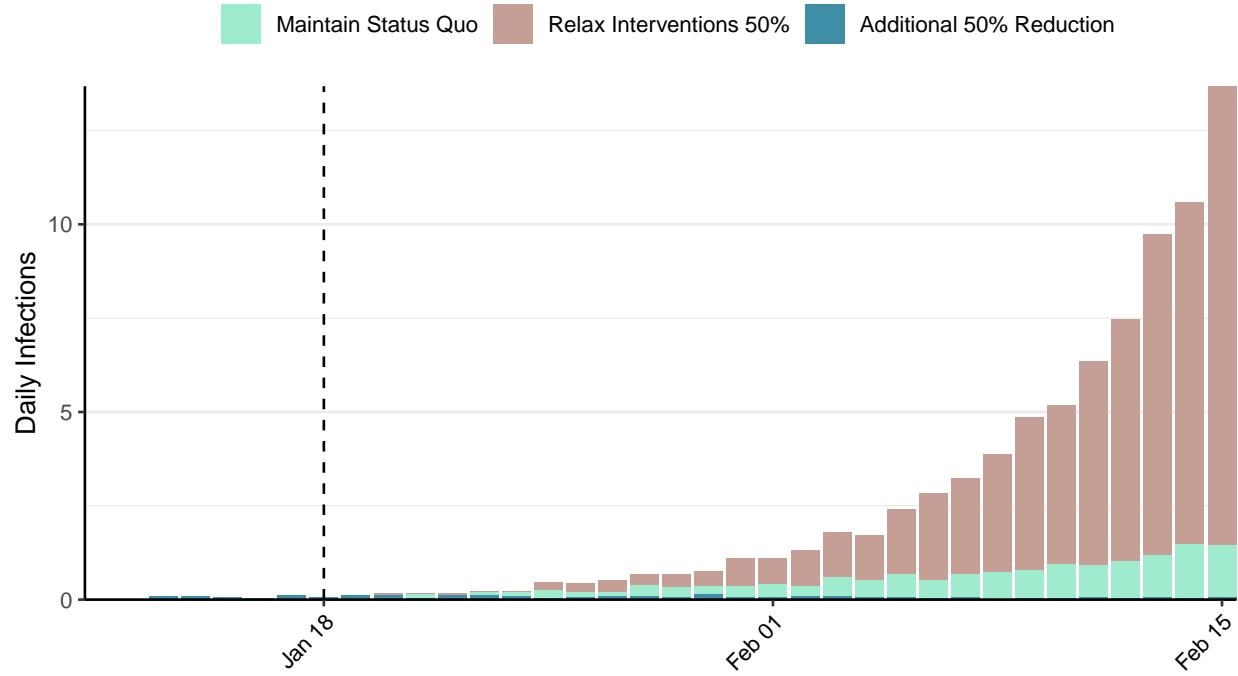


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](#) - <https://covidsim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Uganda, 2021-01-18

[Download the report for Uganda, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.82 (95% CI: 0.64-1.05)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Uganda is not shown in the following plot as only 0 deaths have been reported to date**

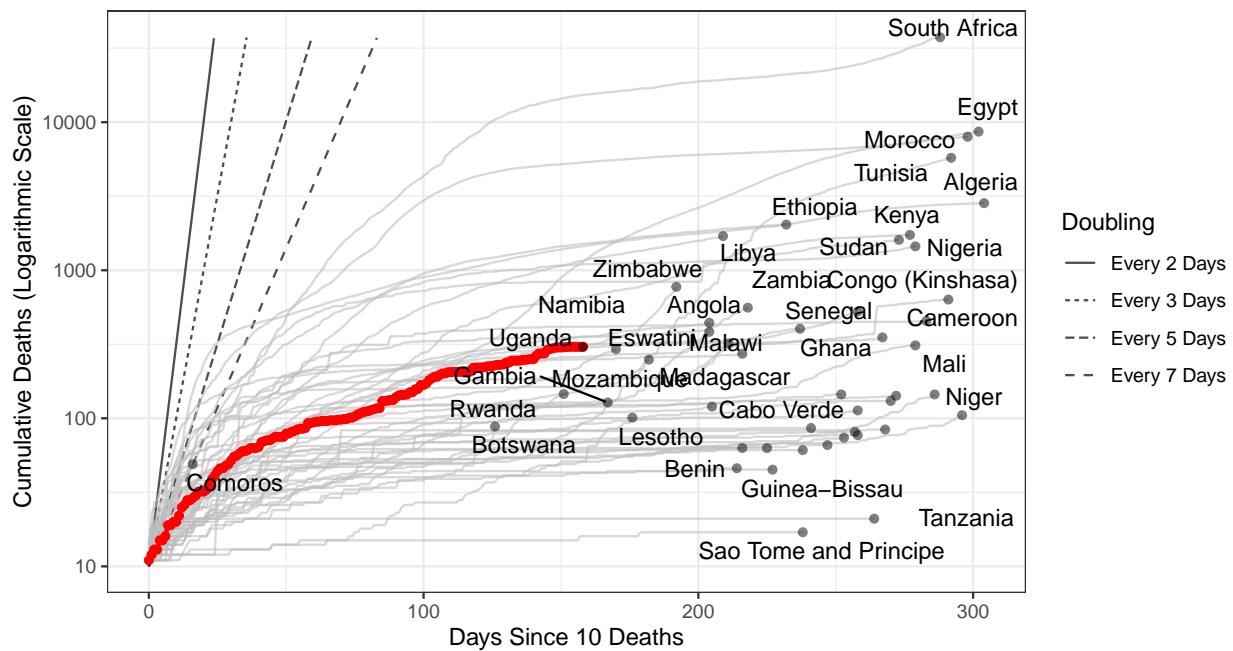


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 49,093 (95% CI: 45,275-52,910) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. Uganda has revised their historic reported cases and thus have reported negative cases.**

Plot on right zoomed in on reported cases

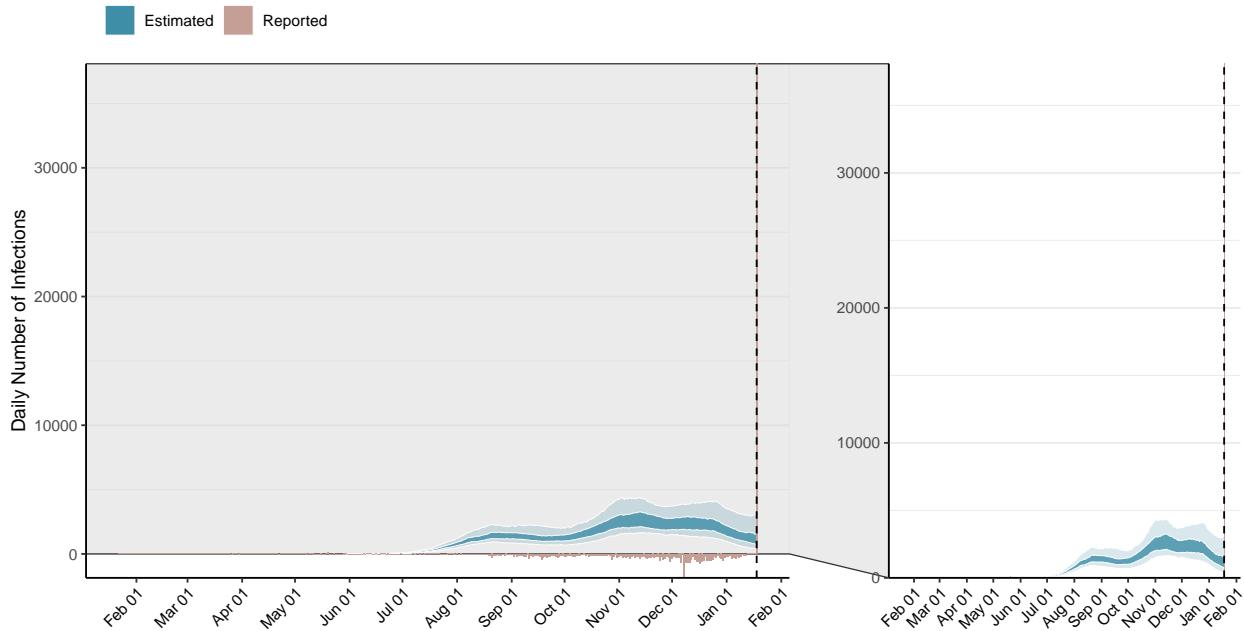


Figure 2: Daily number of infections estimated by fitting to the current total of deaths. Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

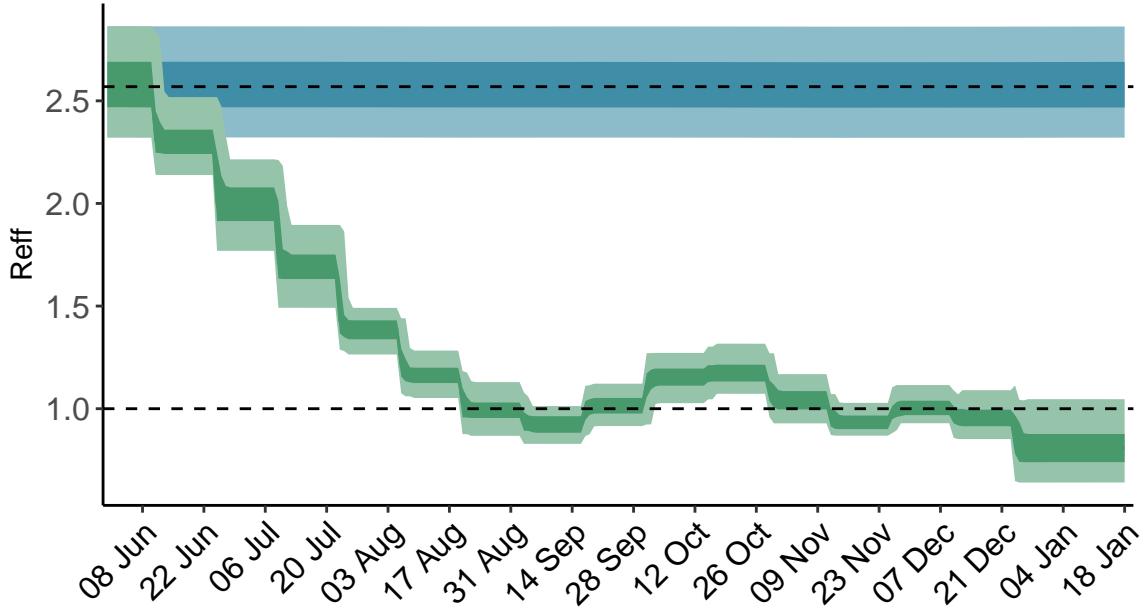


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

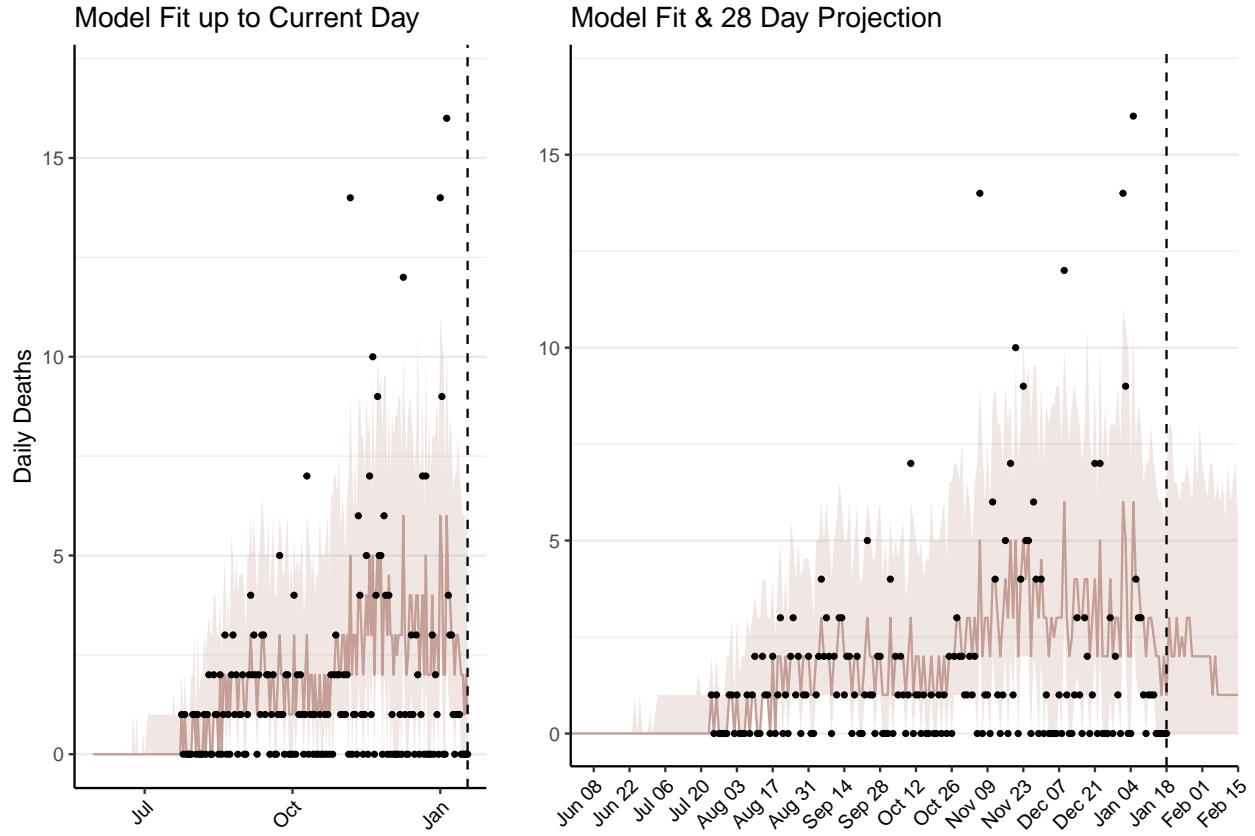


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 116 (95% CI: 106-127) patients requiring treatment with high-pressure oxygen at the current date to 67 (95% CI: 55-79) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 48 (95% CI: 45-52) patients requiring treatment with mechanical ventilation at the current date to 28 (95% CI: 24-33) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

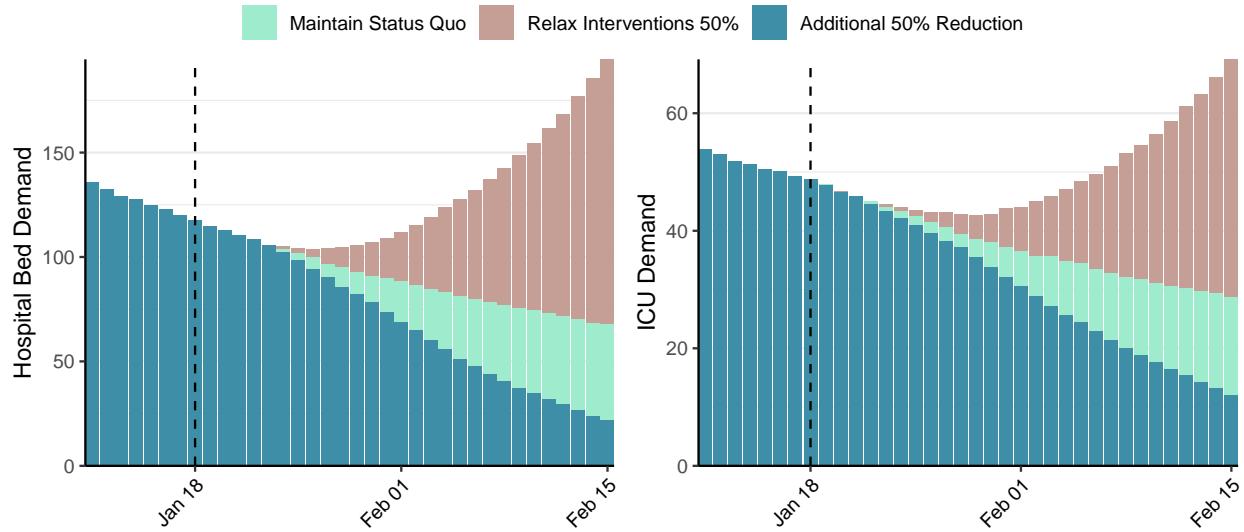


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 1,252 (95% CI: 1,109-1,395) at the current date to 72 (95% CI: 58-87) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,252 (95% CI: 1,109-1,395) at the current date to 4,435 (95% CI: 3,343-5,527) by 2021-02-15.

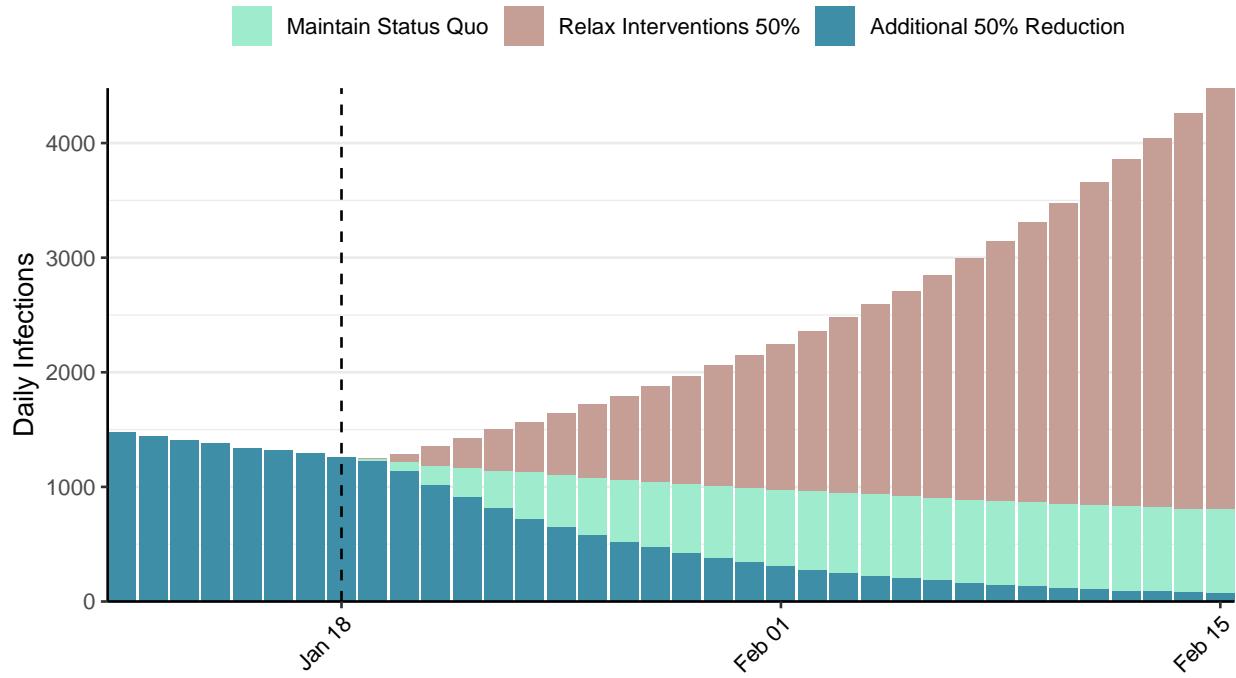


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Ukraine, 2021-01-18

[Download the report for Ukraine, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.87 (95% CI: 0.68-1.07)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Ukraine is not shown in the following plot as only 0 deaths have been reported to date**

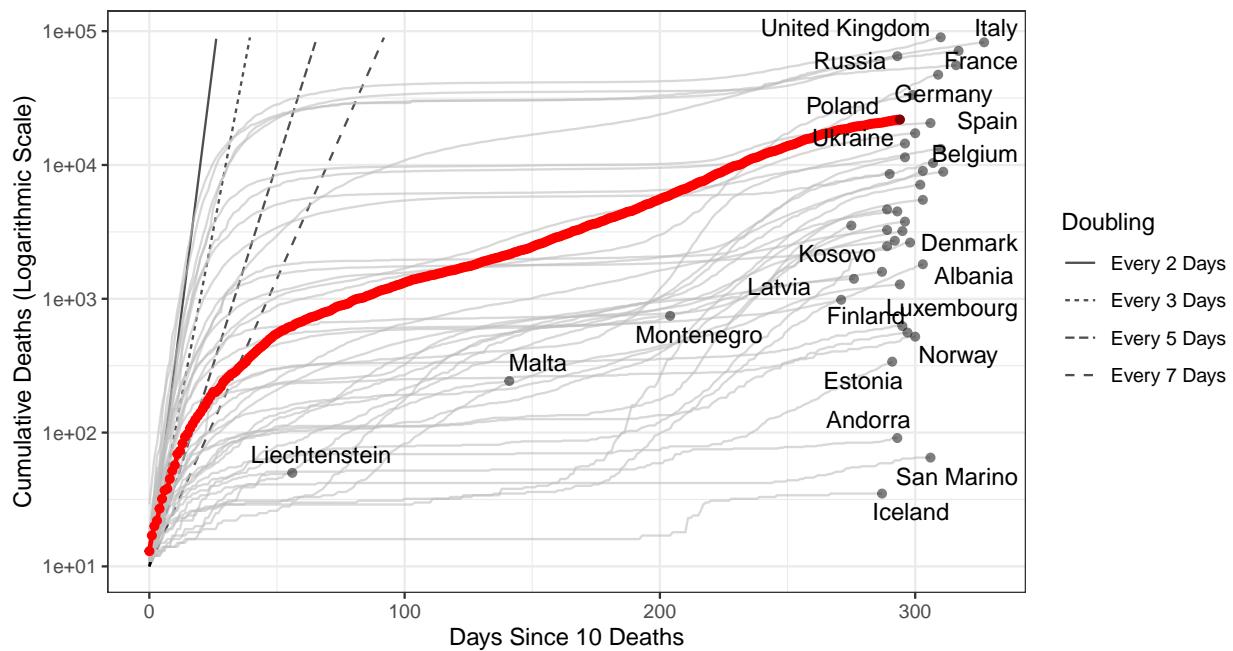


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 1,510,221 (95% CI: 1,406,305-1,614,137) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

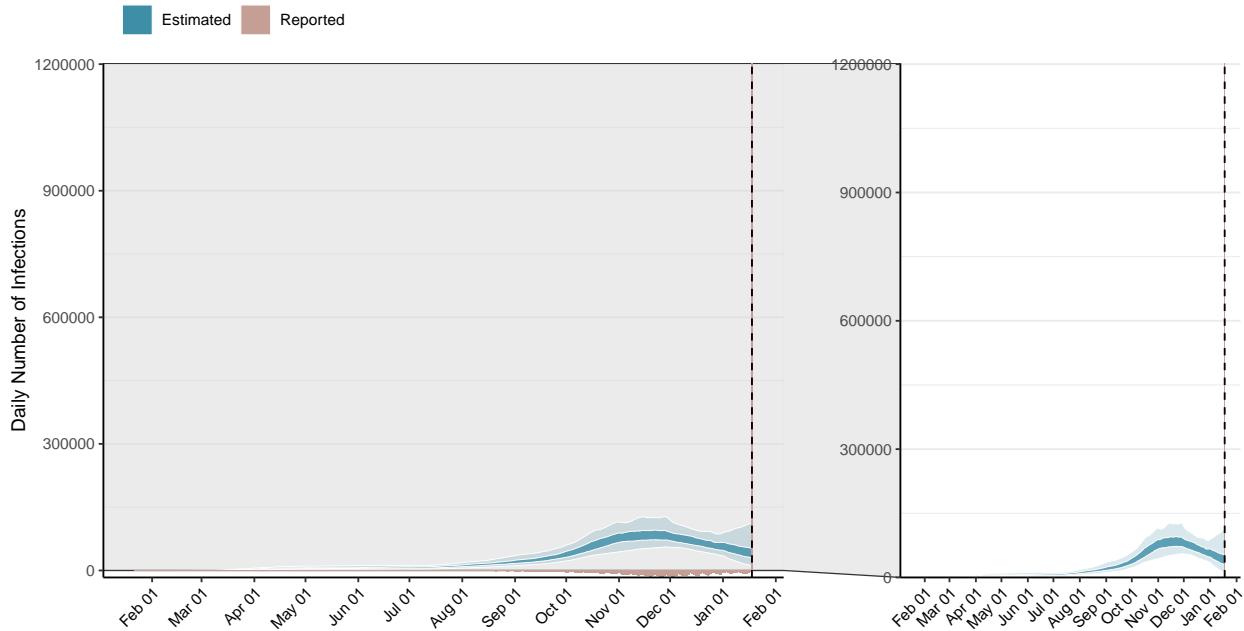


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

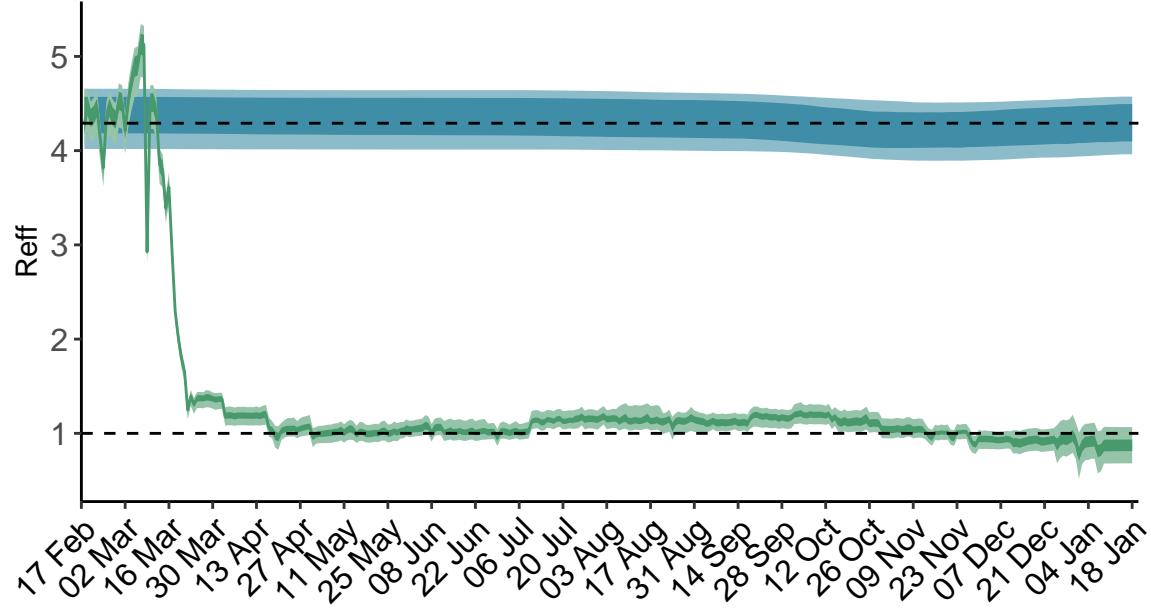


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

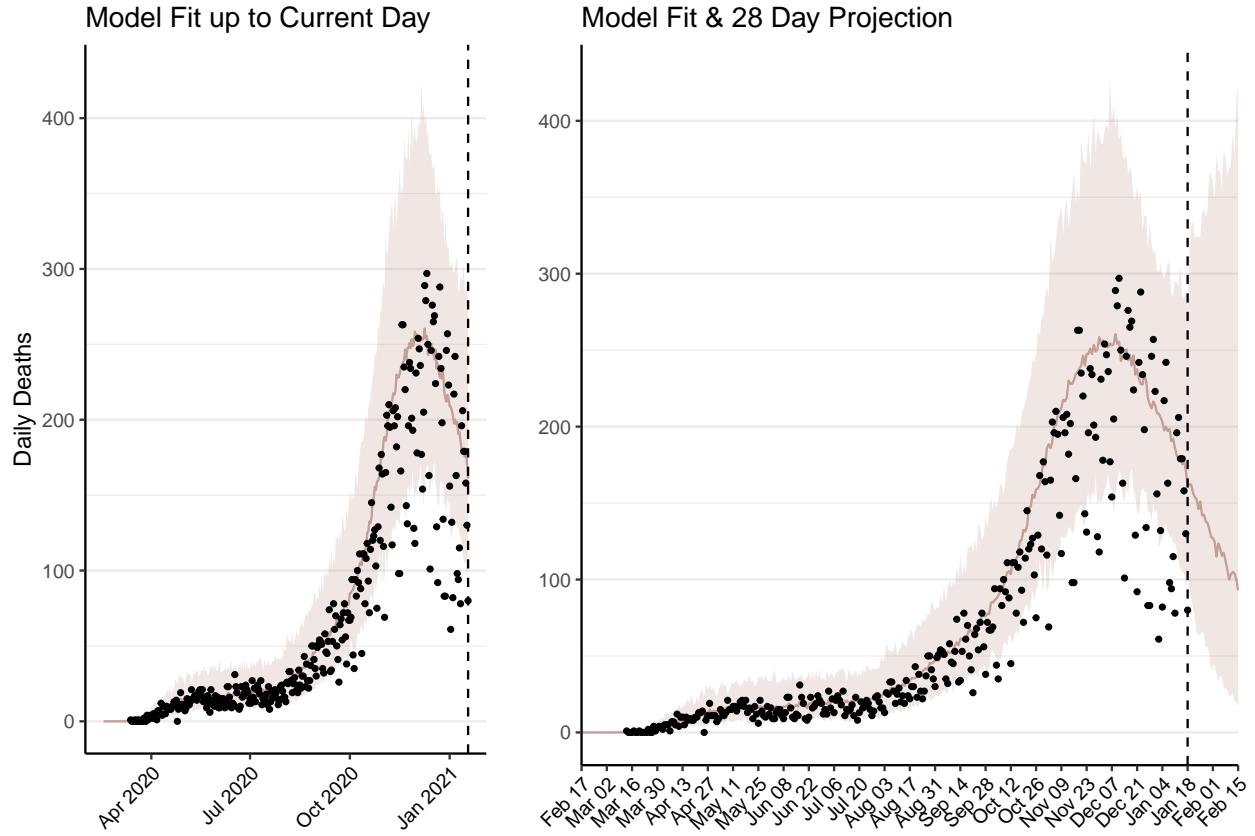


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 6,239 (95% CI: 5,768-6,710) patients requiring treatment with high-pressure oxygen at the current date to 4,391 (95% CI: 3,654-5,128) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 2,418 (95% CI: 2,248-2,588) patients requiring treatment with mechanical ventilation at the current date to 1,690 (95% CI: 1,426-1,954) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

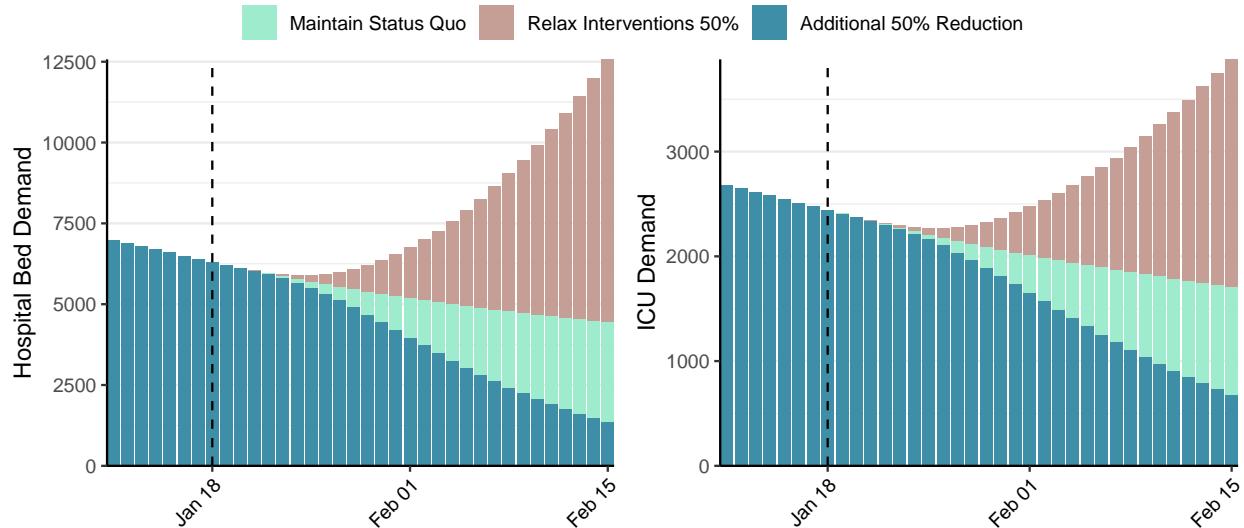


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 43,922 (95% CI: 39,184-48,660) at the current date to 2,995 (95% CI: 2,399-3,591) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 43,922 (95% CI: 39,184-48,660) at the current date to 162,720 (95% CI: 131,429-194,010) by 2021-02-15.

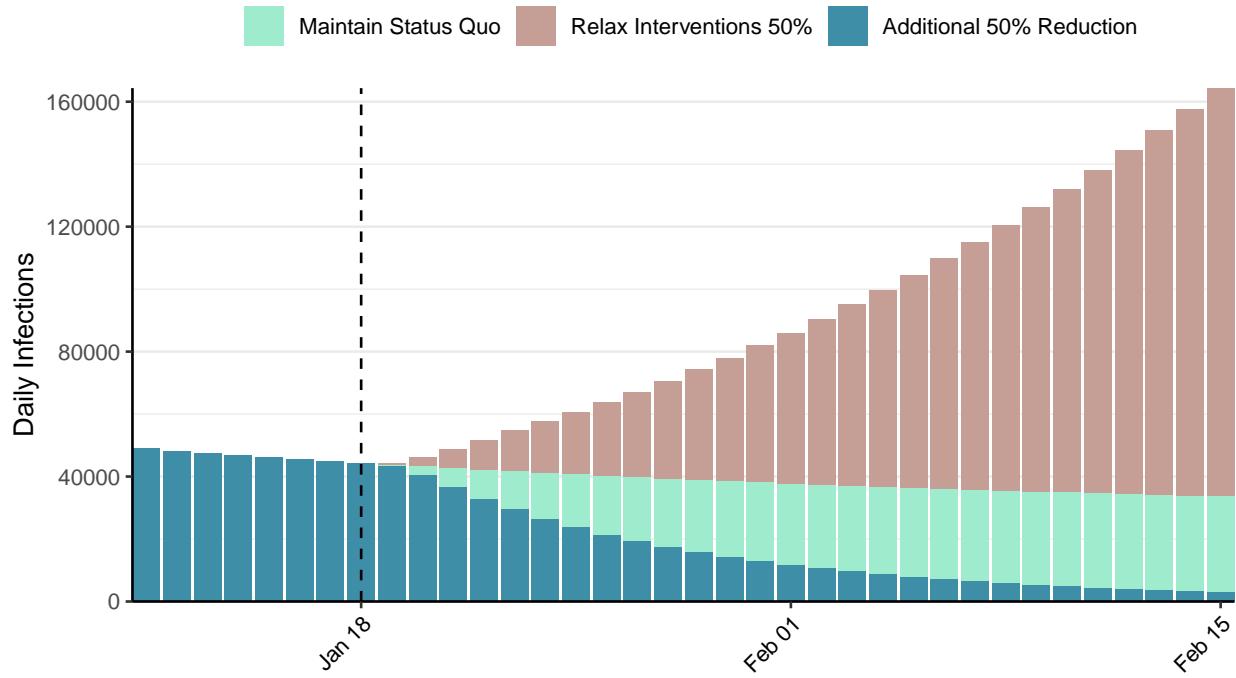


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Uruguay, 2021-01-18

[Download the report for Uruguay, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.01 (95% CI: 0.88-1.16)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Uruguay is not shown in the following plot as only 0 deaths have been reported to date**

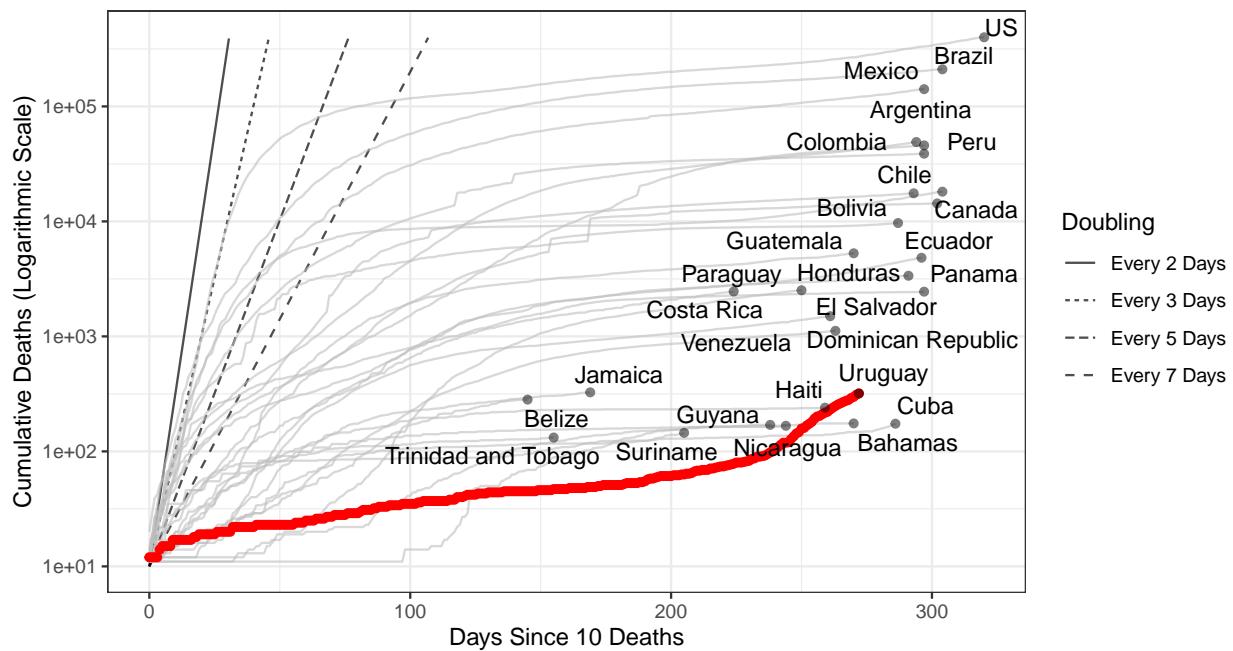


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 95,070 (95% CI: 90,483-99,657) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. Uruguay has revised their historic reported cases and thus have reported negative cases.**

Plot on right zoomed in on reported cases

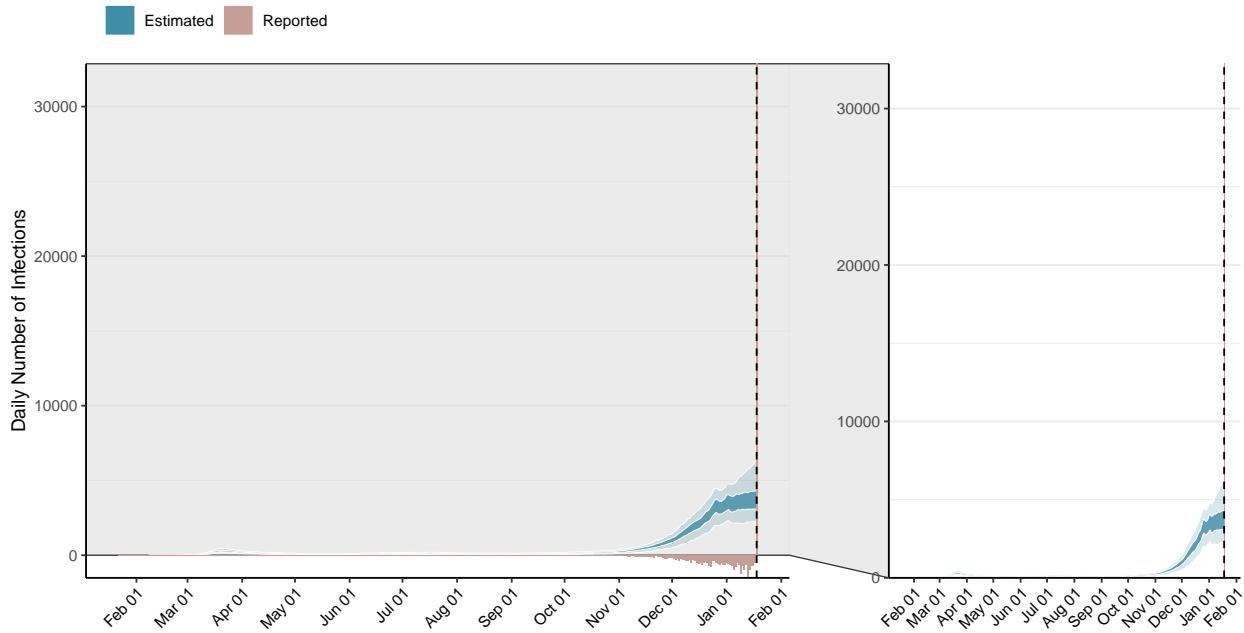


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

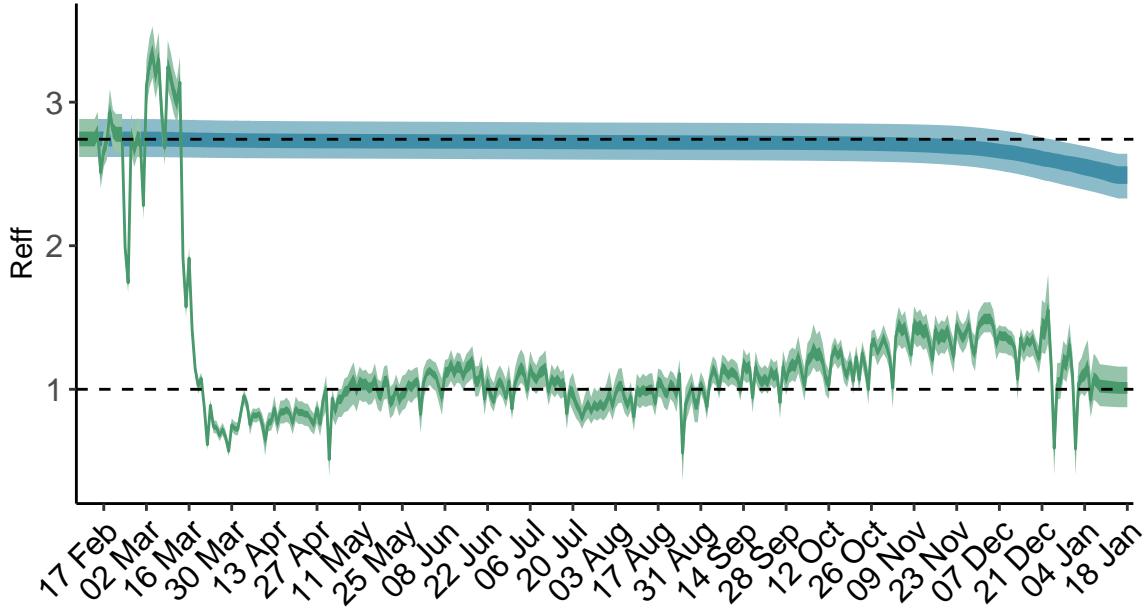


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in **blue** shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

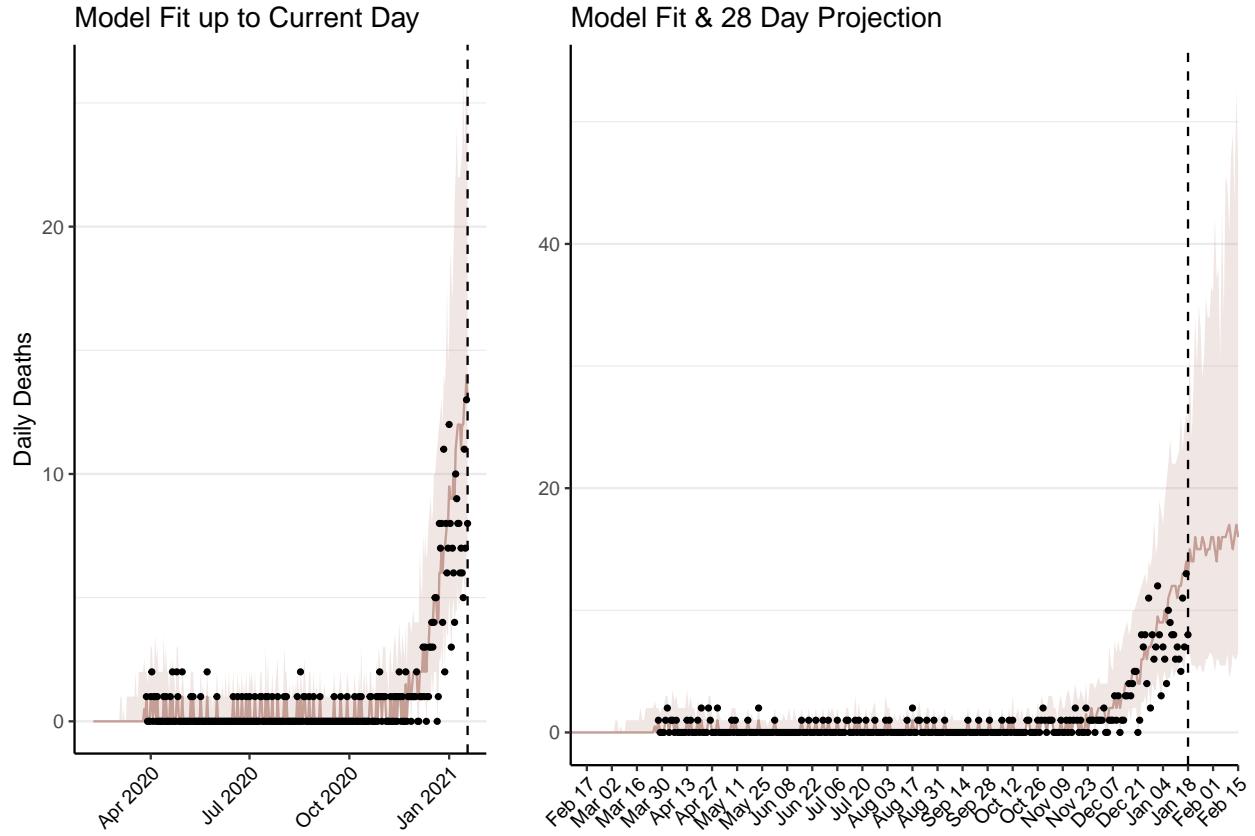


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 439 (95% CI: 417-462) patients requiring treatment with high-pressure oxygen at the current date to 510 (95% CI: 465-555) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 125 (95% CI: 120-130) patients requiring treatment with mechanical ventilation at the current date to 129 (95% CI: 124-135) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

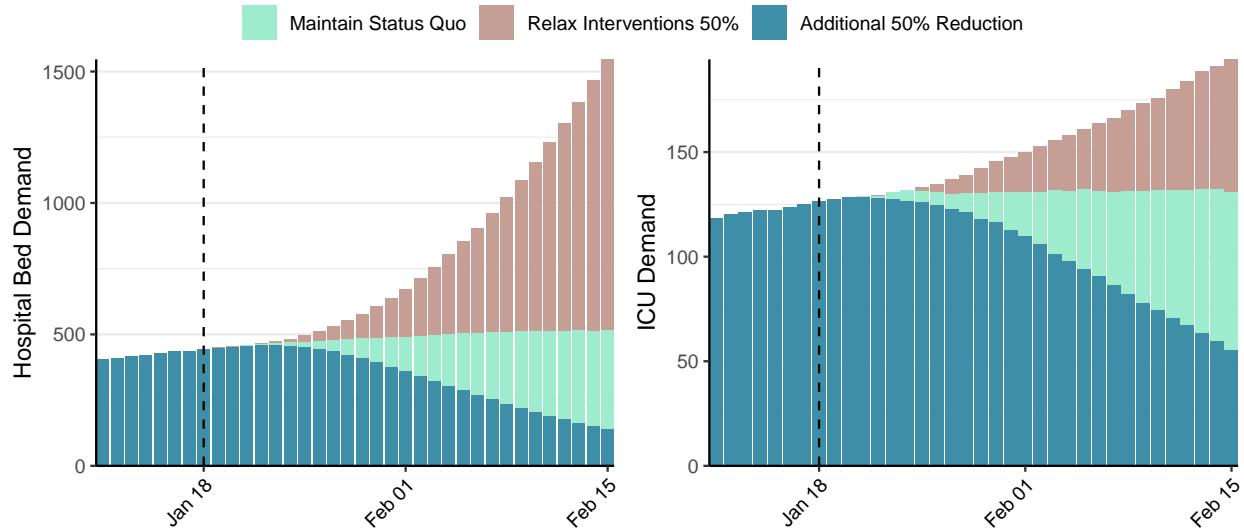


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 3,762 (95% CI: 3,538-3,986) at the current date to 345 (95% CI: 312-379) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,762 (95% CI: 3,538-3,986) at the current date to 18,621 (95% CI: 16,998-20,245) by 2021-02-15.

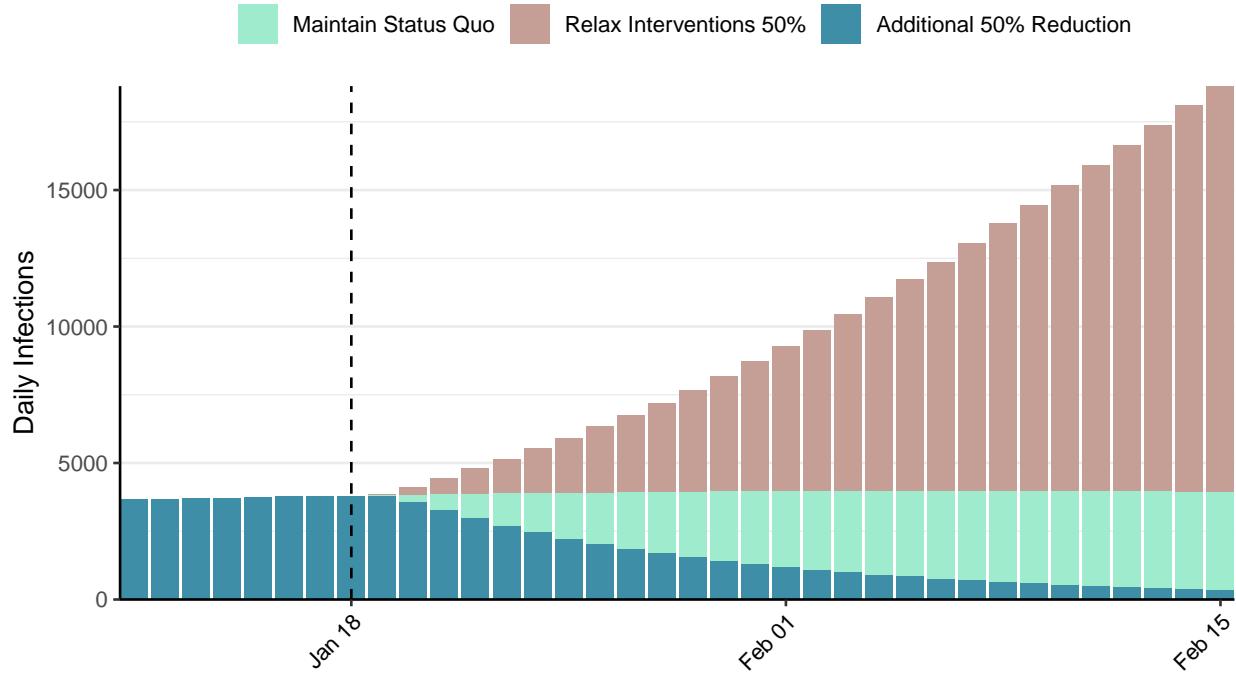


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Uzbekistan, 2021-01-18

Download the report for Uzbekistan, 2021-01-18 here. This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see Report 12 for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.71 (95% CI: 0.57-0.89)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Uzbekistan is not shown in the following plot as only 0 deaths have been reported to date**

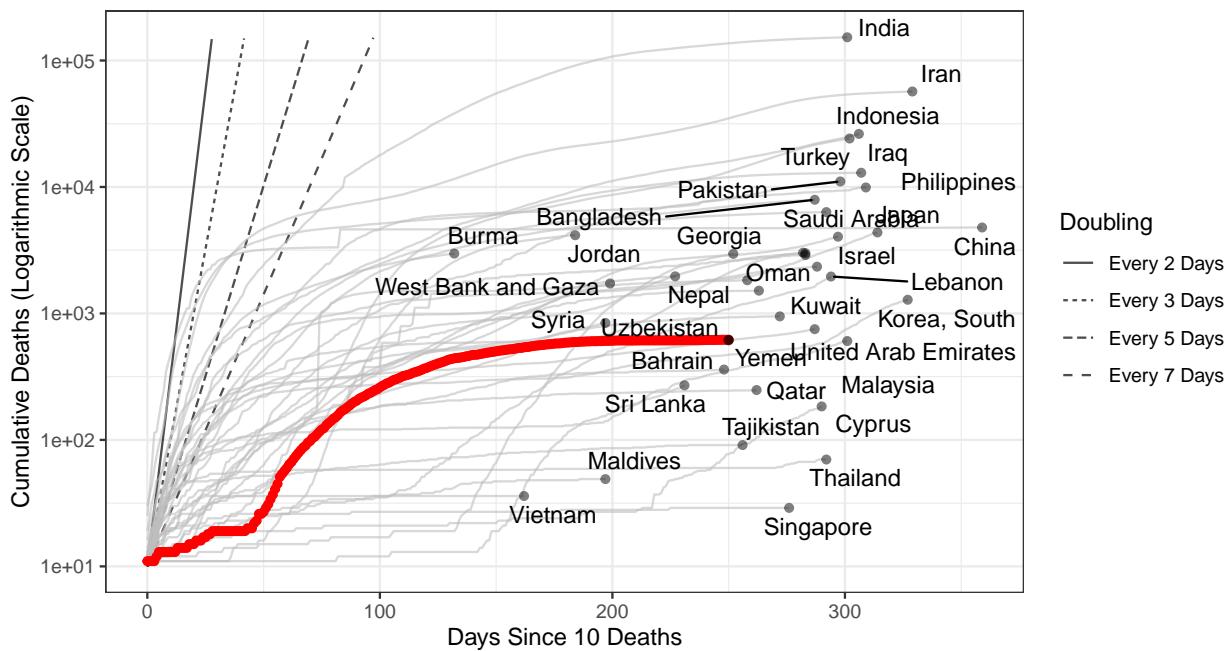


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 2,407 (95% CI: 2,202-2,612) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

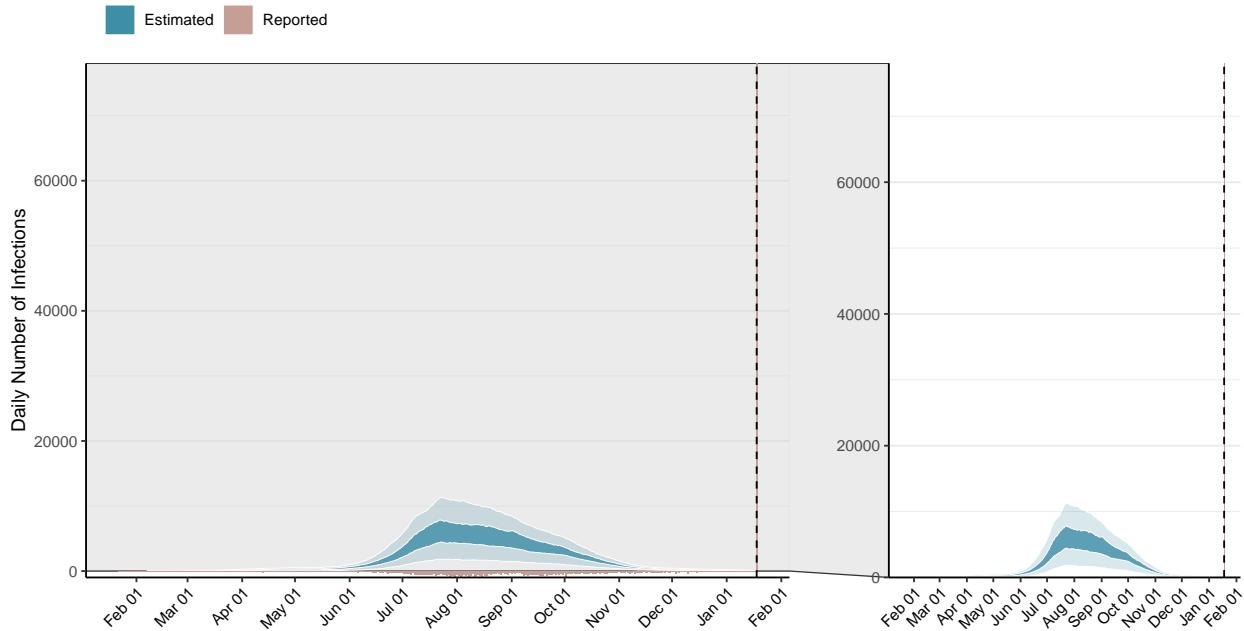


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

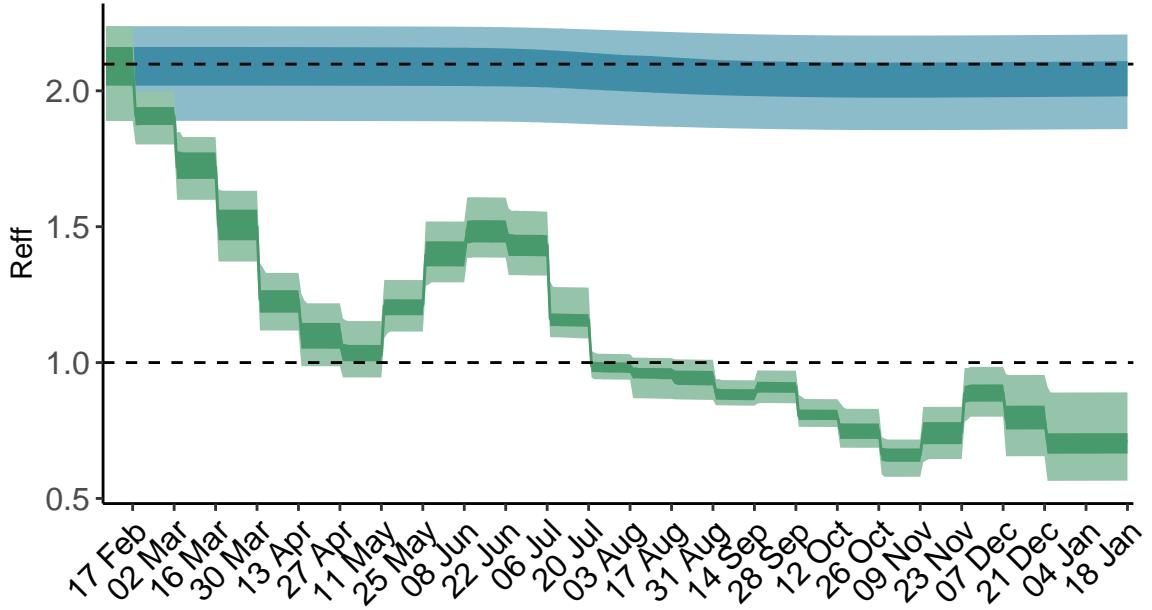


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

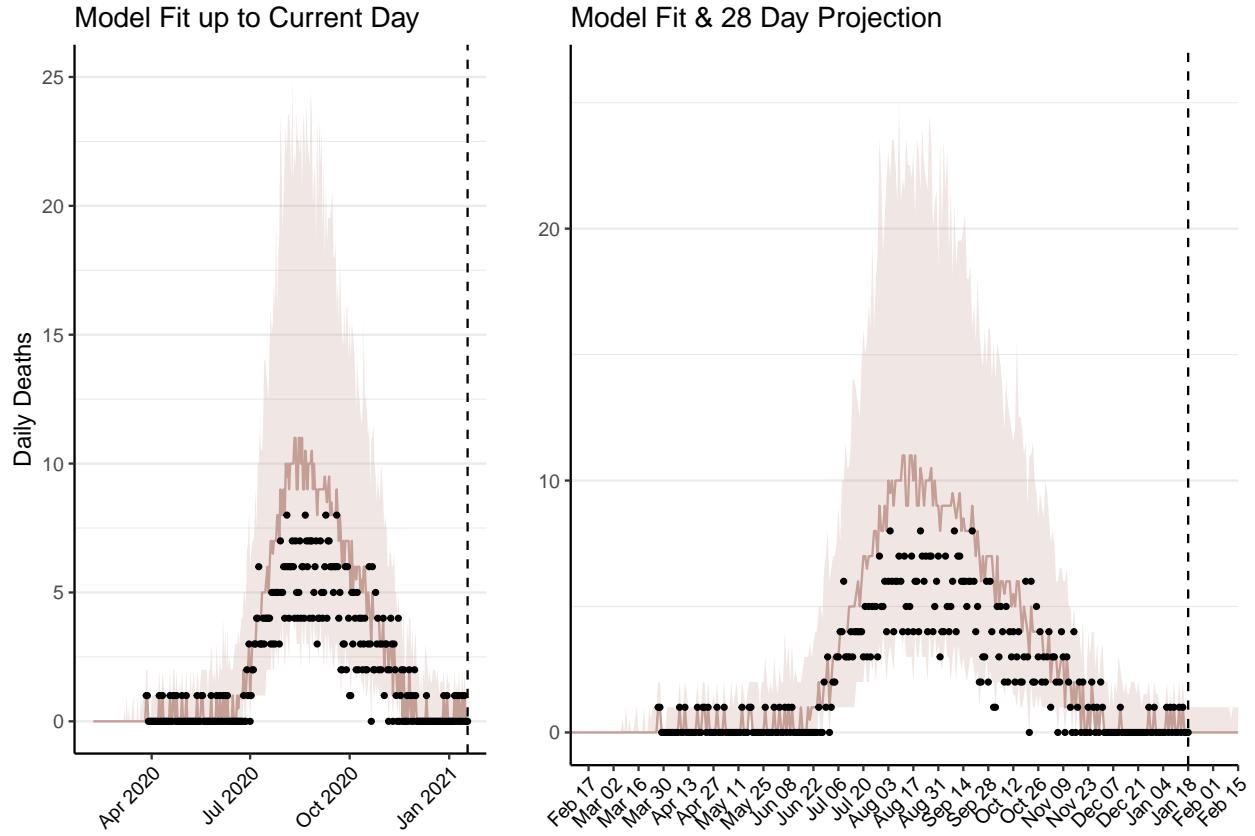


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 6 (95% CI: 5-7) patients requiring treatment with high-pressure oxygen at the current date to 2 (95% CI: 1-2) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 3 (95% CI: 3-3) patients requiring treatment with mechanical ventilation at the current date to 1 (95% CI: 1-1) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

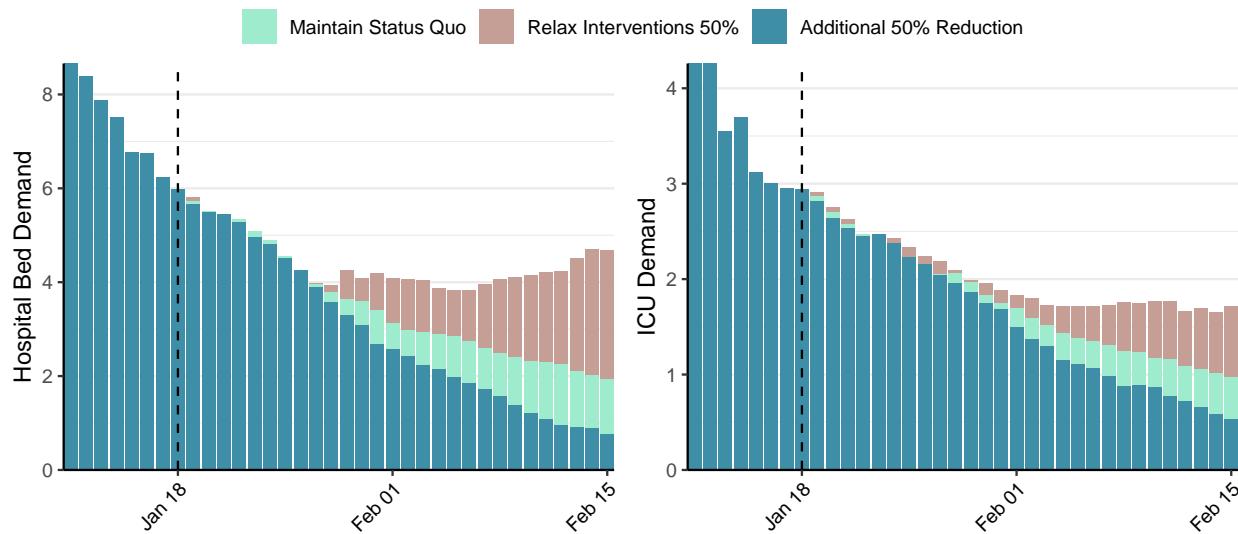


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 43 (95% CI: 38-49) at the current date to 1 (95% CI: 1-2) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 43 (95% CI: 38-49) at the current date to 69 (95% CI: 53-85) by 2021-02-15.

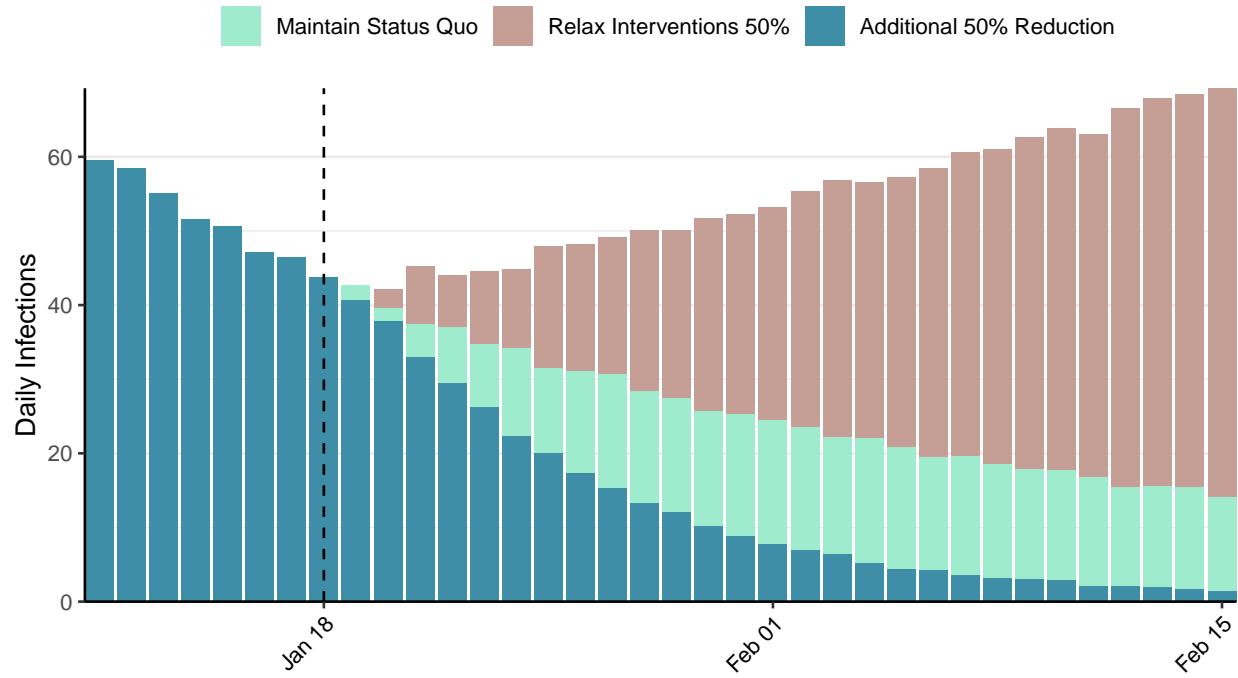


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](#) - <https://covidsim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: St. Vincent and the Grenadines, 2021-01-18

[Download the report for St. Vincent and the Grenadines, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	2.08 (95% CI: 1.51-2.6)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B.** St. Vincent and the Grenadines is not shown in the following plot as only 0 deaths have been reported to date

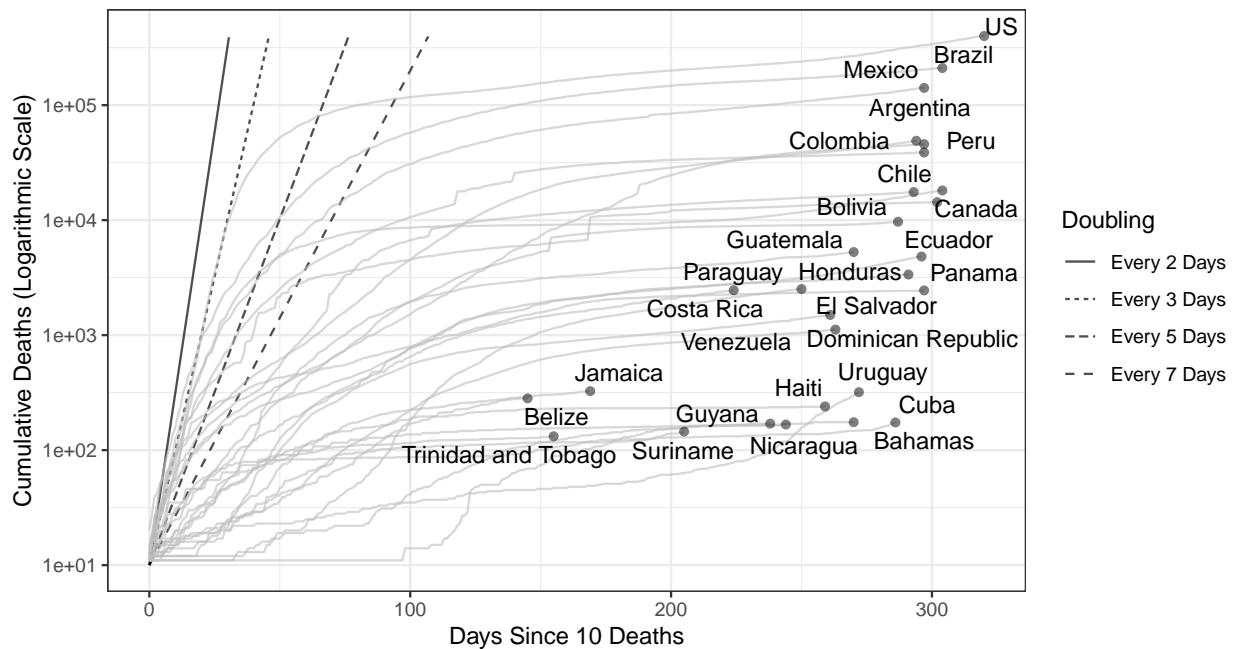


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 3,256 (95% CI: 2,779-3,734) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

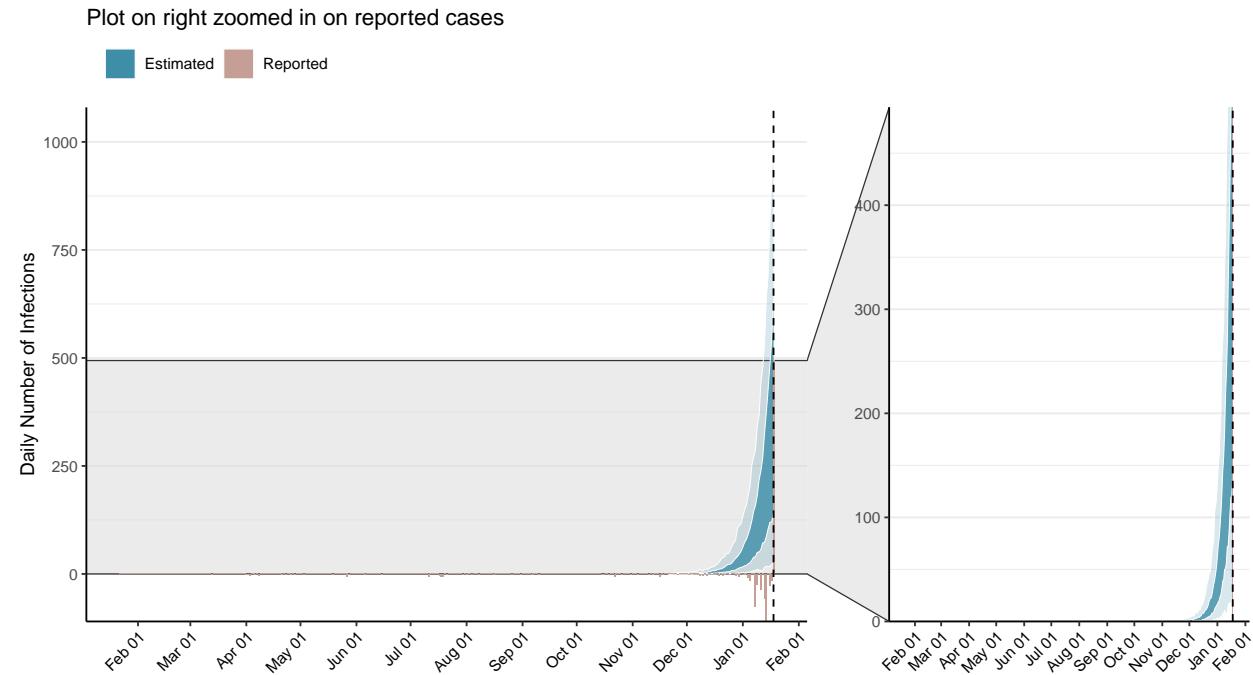


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

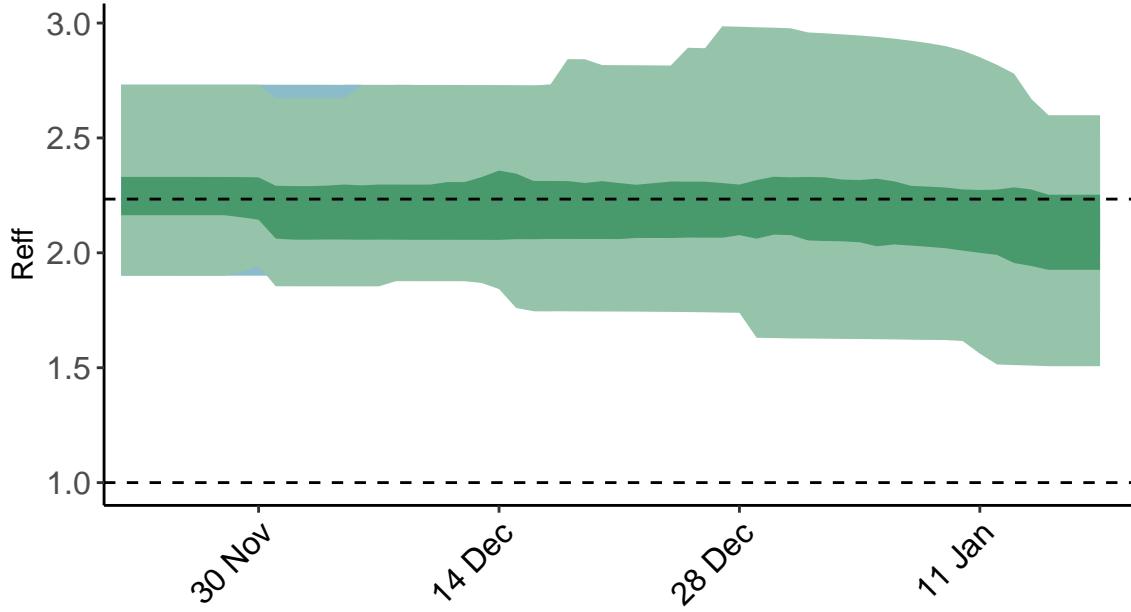


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. St. Vincent and the Grenadines is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

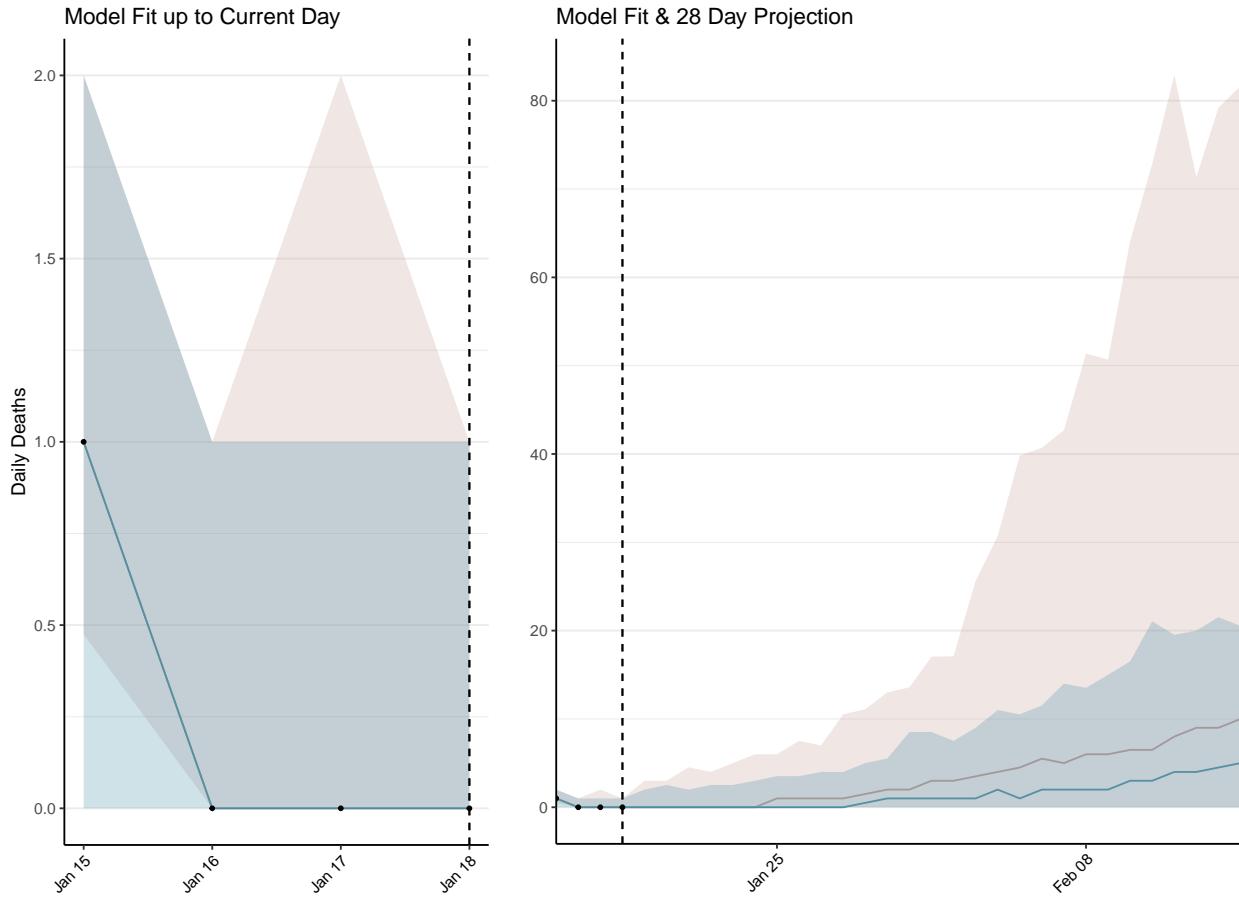


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 13 (95% CI: 11-15) patients requiring treatment with high-pressure oxygen at the current date to 250 (95% CI: 212-287) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 4 (95% CI: 3-4) patients requiring treatment with mechanical ventilation at the current date to 21 (95% CI: 19-24) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

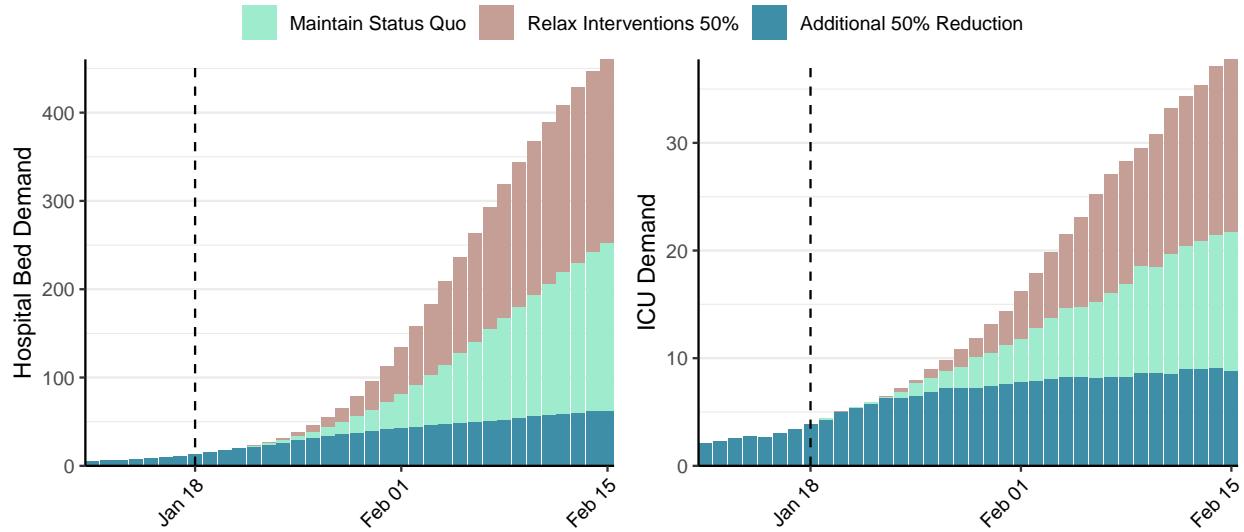


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 407 (95% CI: 345-468) at the current date to 683 (95% CI: 491-875) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 407 (95% CI: 345-468) at the current date to 5,610 (95% CI: 5,248-5,972) by 2021-02-15.

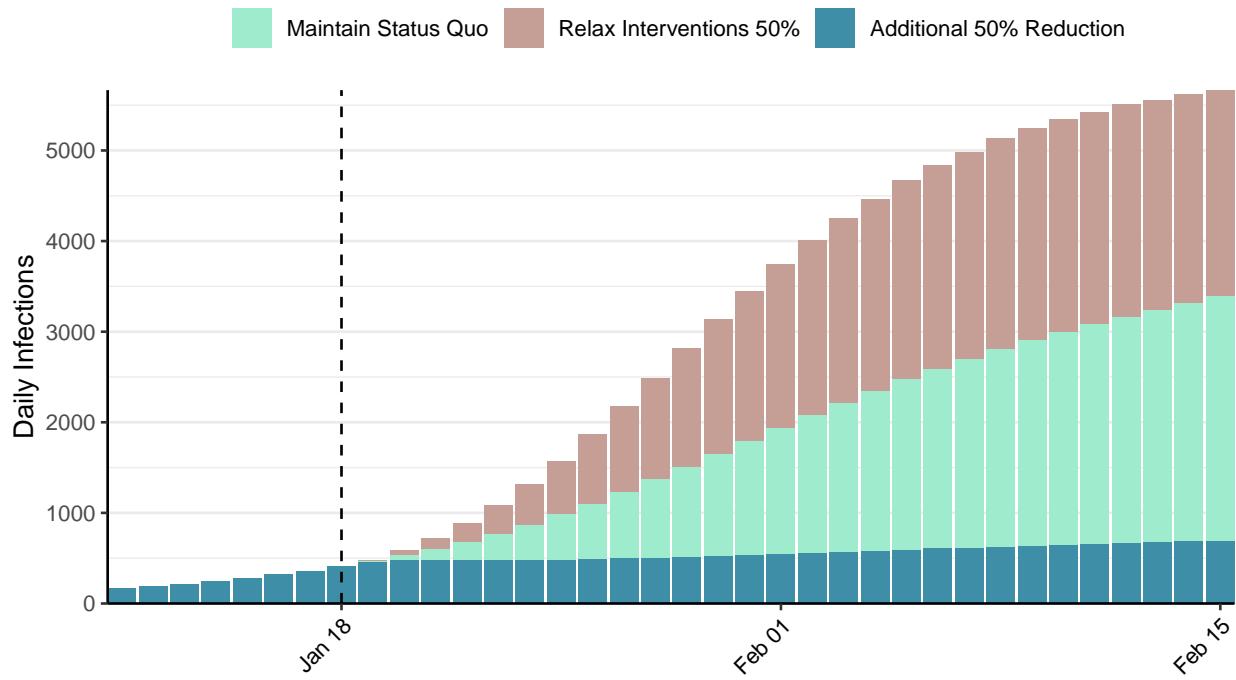


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Venezuela, 2021-01-18

[Download the report for Venezuela, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.05 (95% CI: 0.89-1.21)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Venezuela is not shown in the following plot as only 0 deaths have been reported to date**

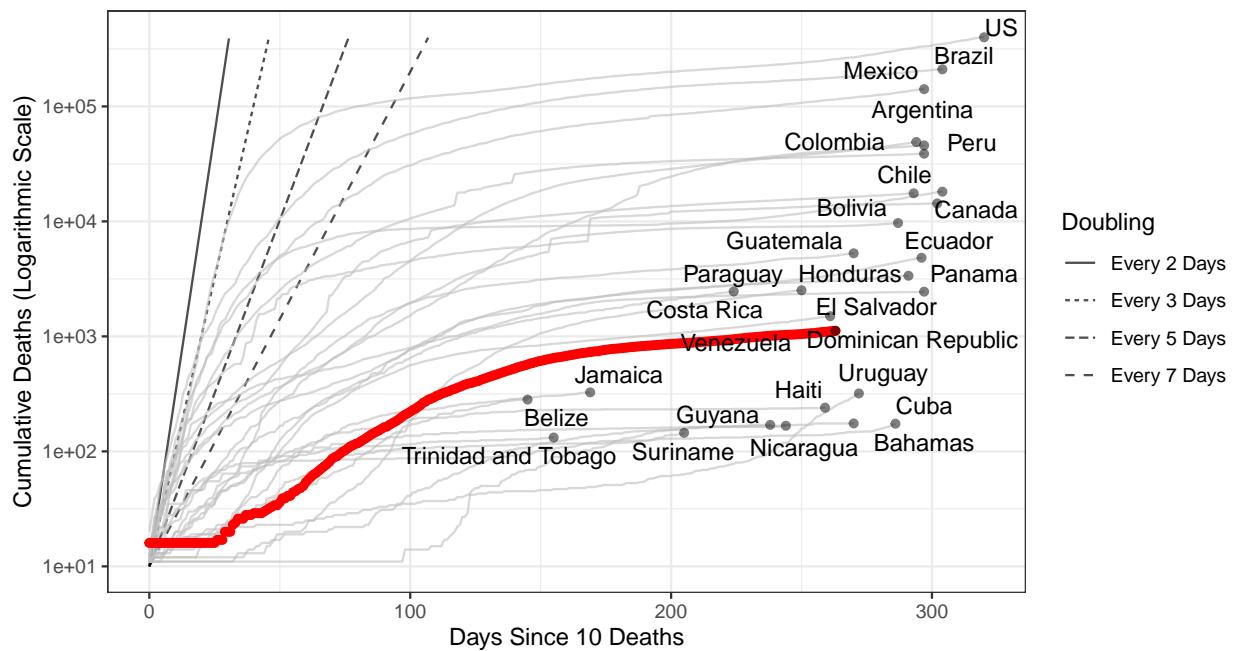


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 140,832 (95% CI: 132,710-148,955) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

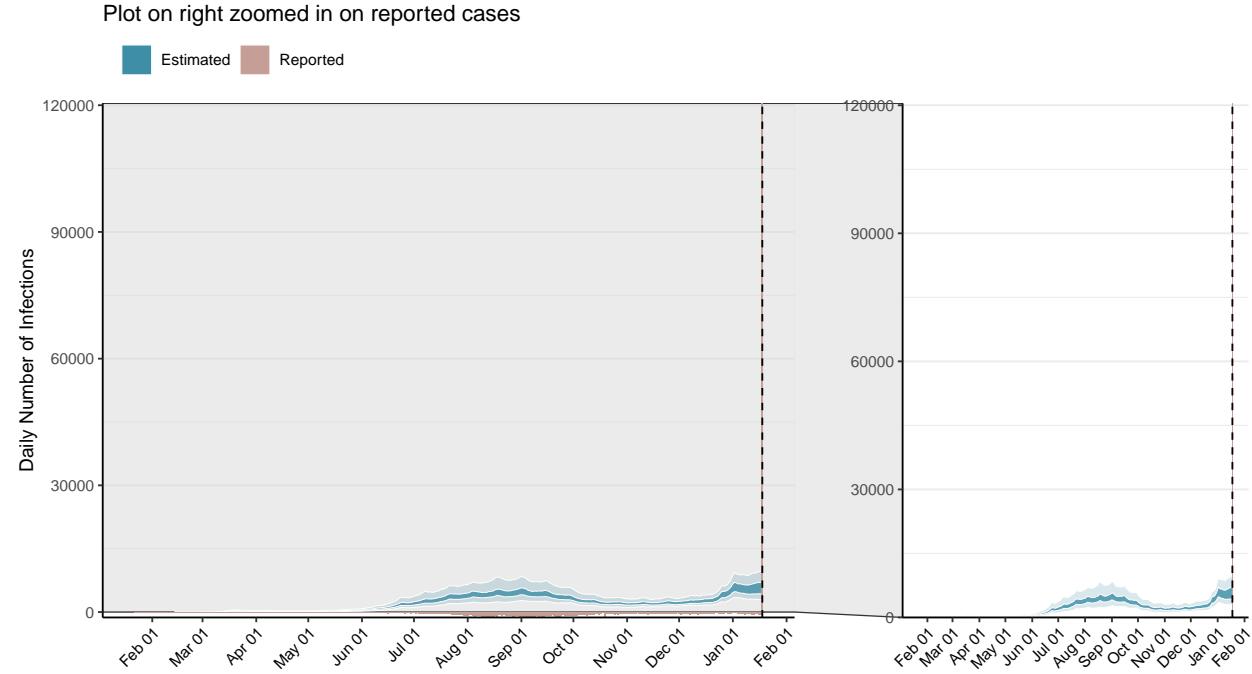


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

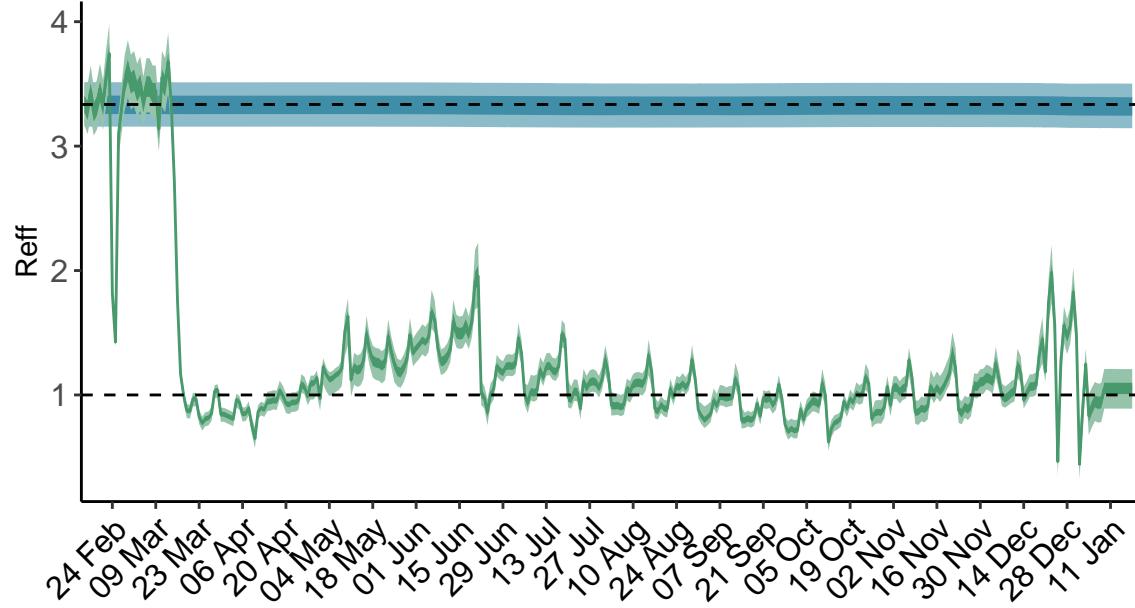


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

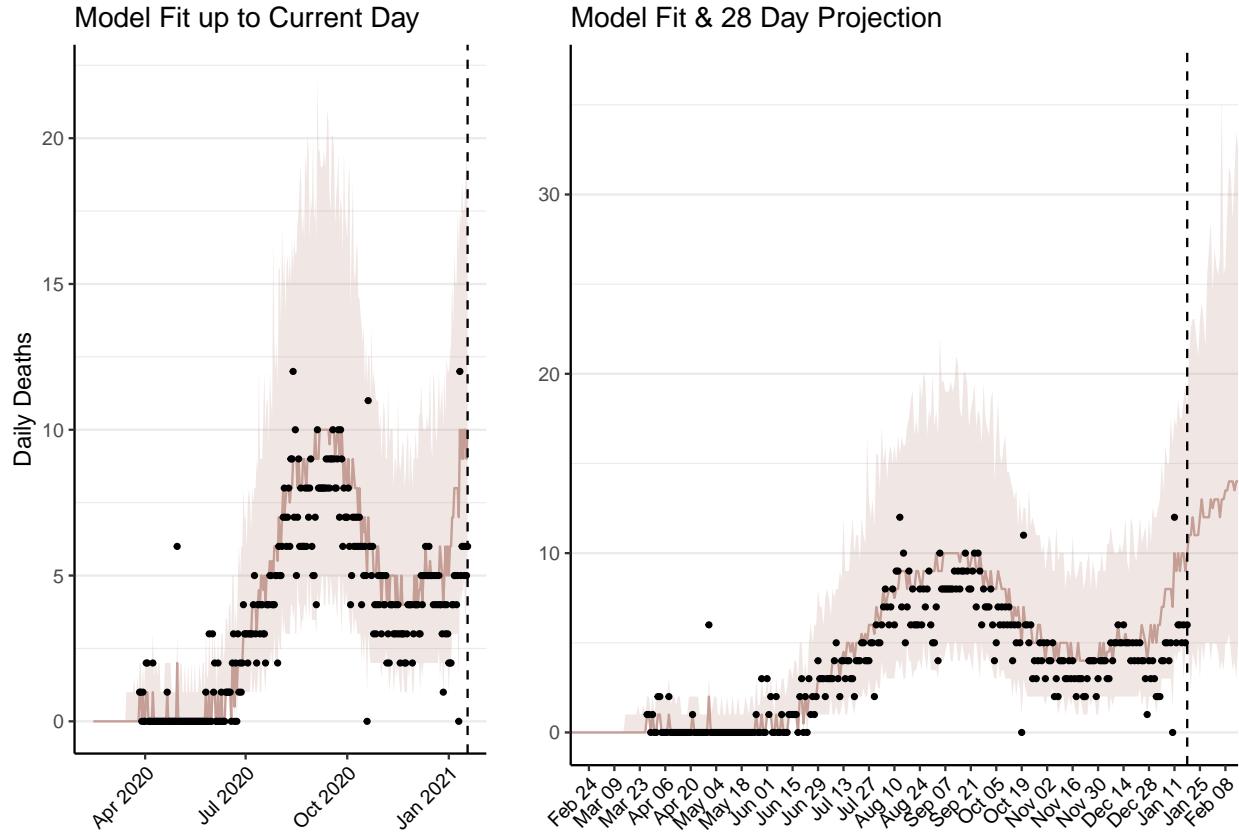


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 447 (95% CI: 420-474) patients requiring treatment with high-pressure oxygen at the current date to 595 (95% CI: 538-652) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 158 (95% CI: 148-168) patients requiring treatment with mechanical ventilation at the current date to 215 (95% CI: 195-235) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

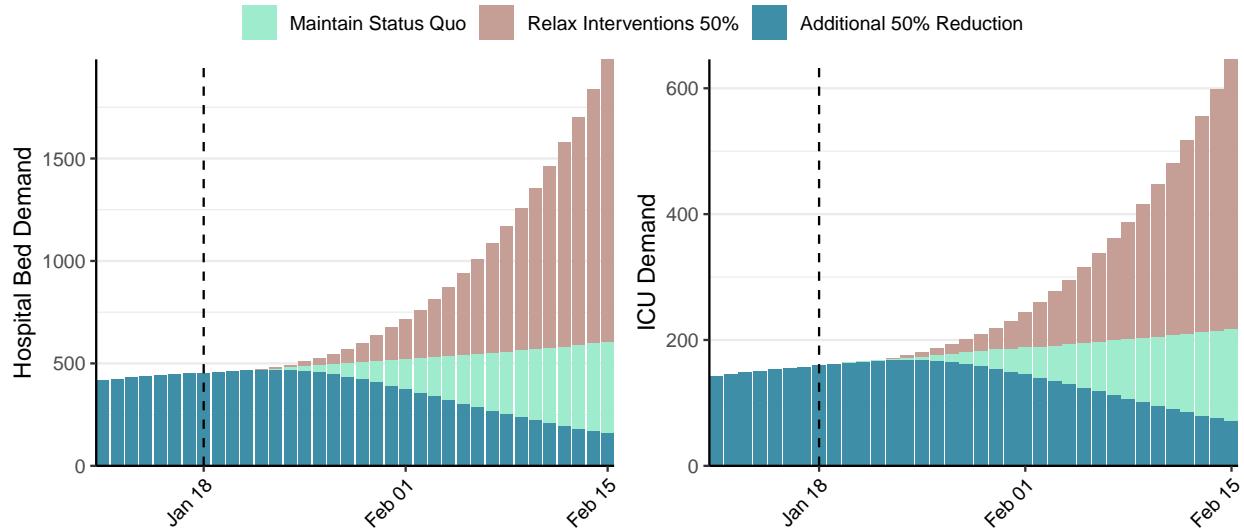


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 5,771 (95% CI: 5,372-6,170) at the current date to 621 (95% CI: 553-688) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 5,771 (95% CI: 5,372-6,170) at the current date to 47,363 (95% CI: 41,557-53,169) by 2021-02-15.

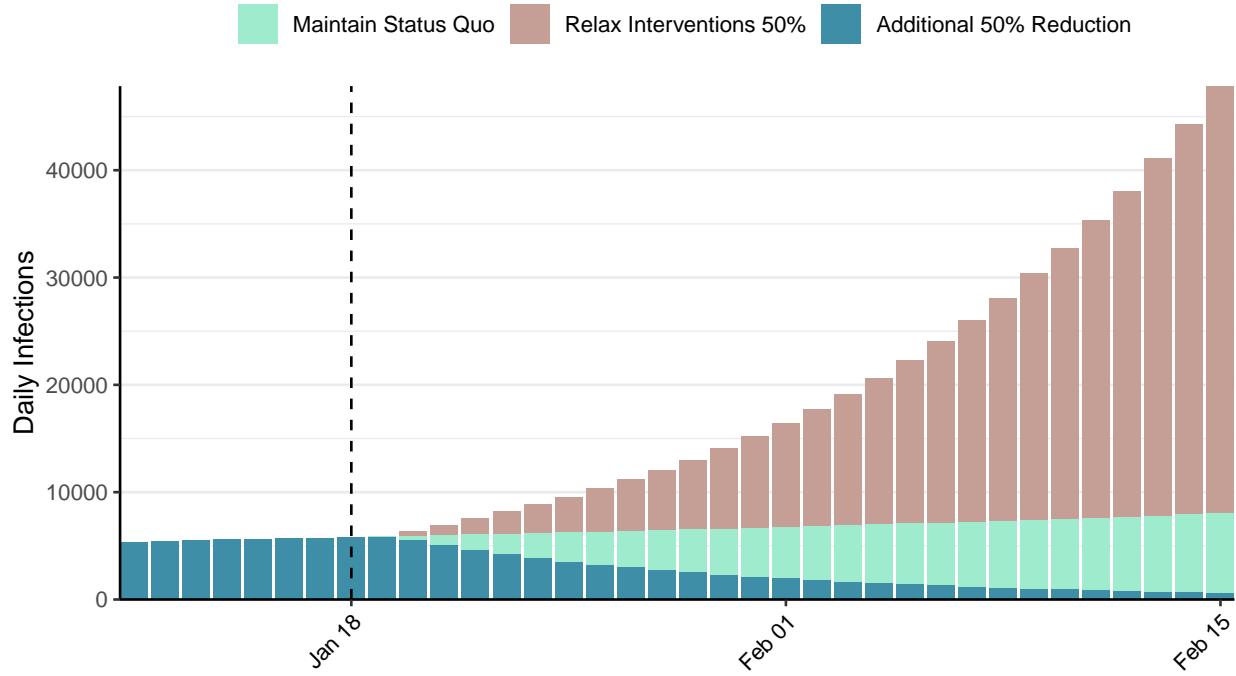


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Vietnam, 2021-01-18

[Download the report for Vietnam, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.75 (95% CI: 0.41-1.21)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Vietnam is not shown in the following plot as only 0 deaths have been reported to date**

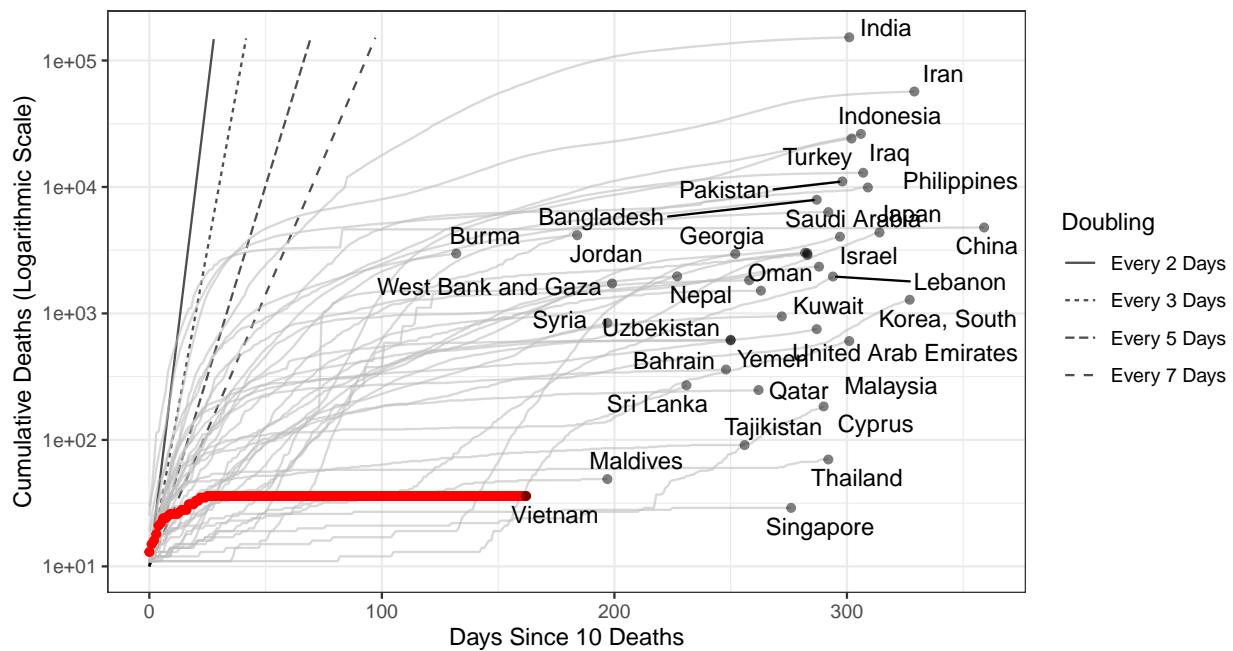


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 2 (95% CI: 0-4) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

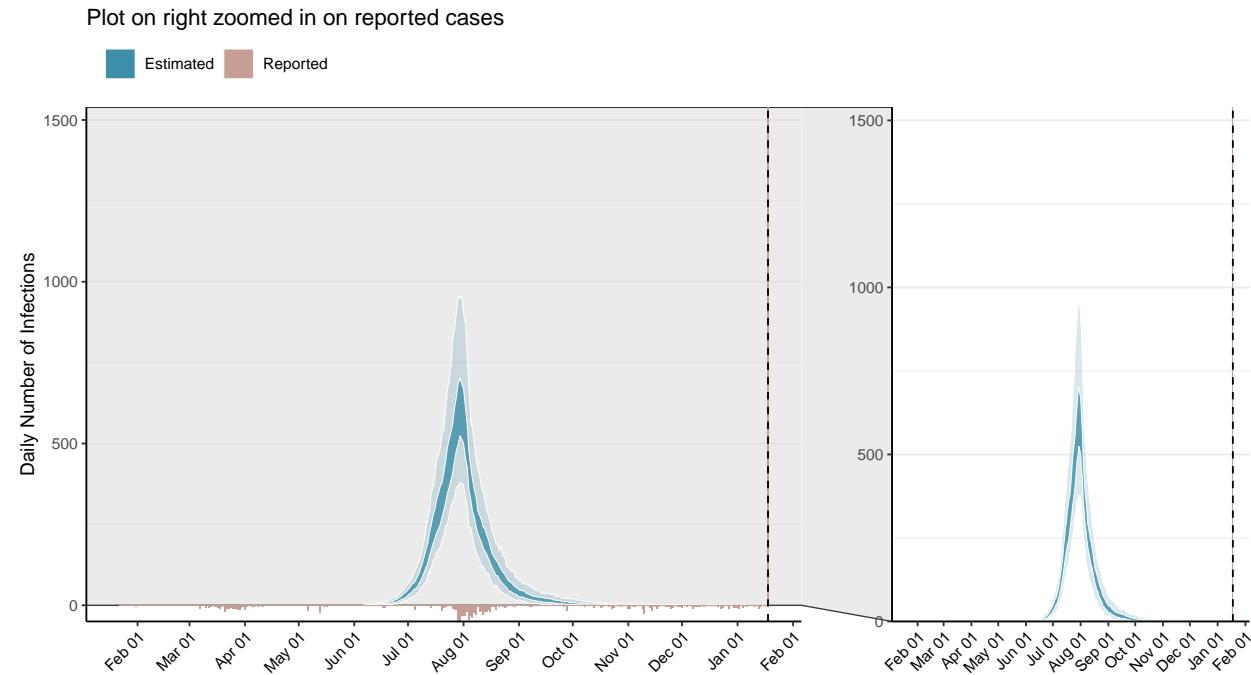


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

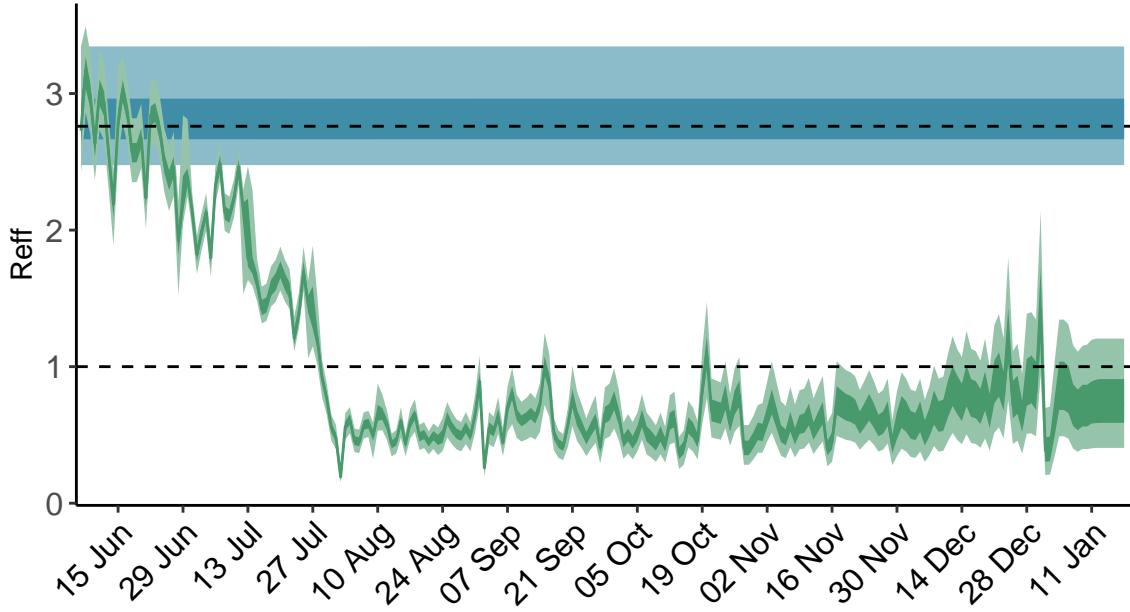


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

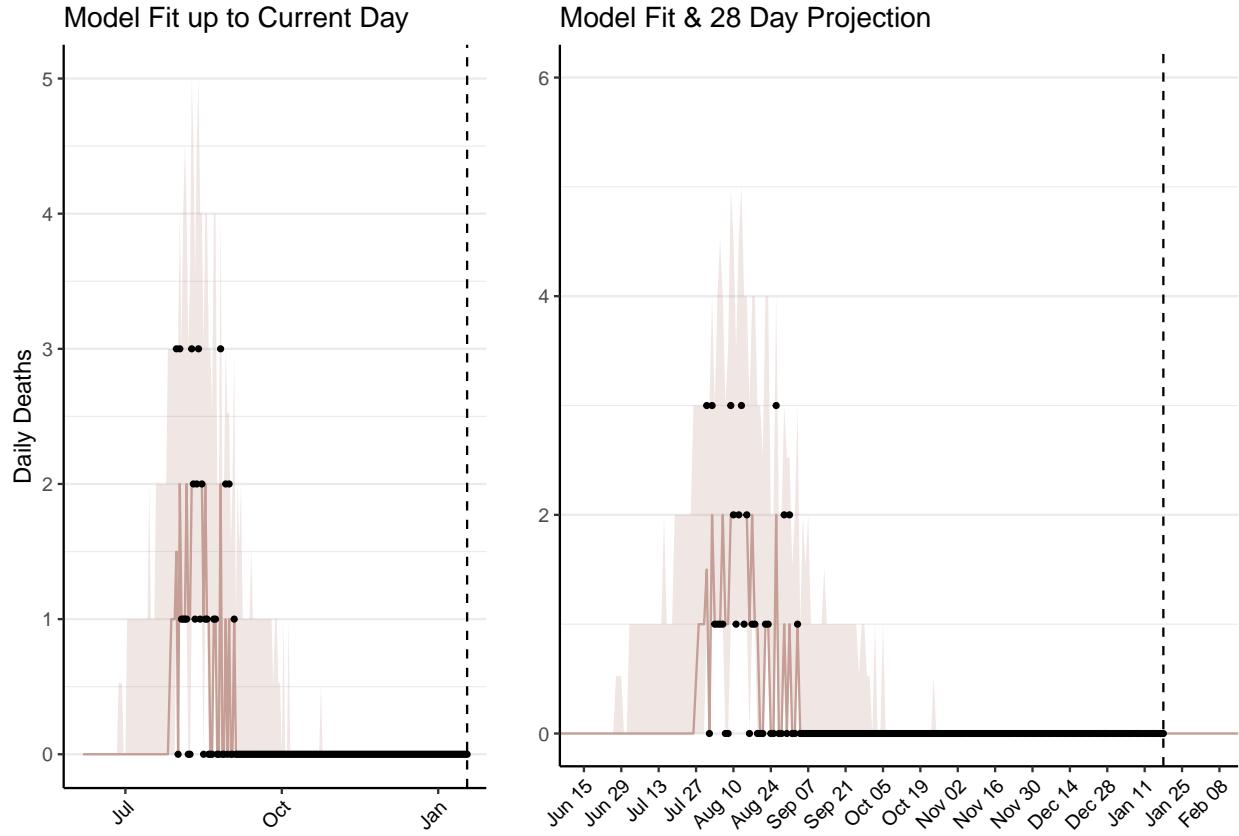


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 0 (95% CI: NaN-NaN) patients requiring treatment with high-pressure oxygen at the current date to 0 (95% CI: 0-0) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 0 (95% CI: 0-0) patients requiring treatment with mechanical ventilation at the current date to 0 (95% CI: 0-0) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

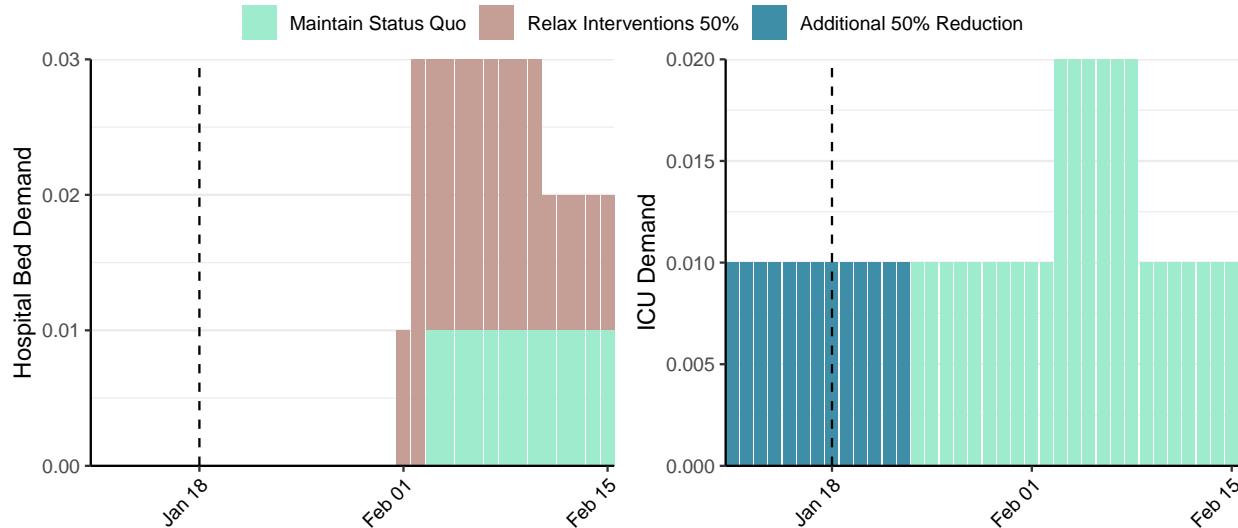


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 0 (95% CI: 0-0) at the current date to 0 (95% CI: 0-0) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 0 (95% CI: 0-0) at the current date to 0 (95% CI: 0-0) by 2021-02-15.

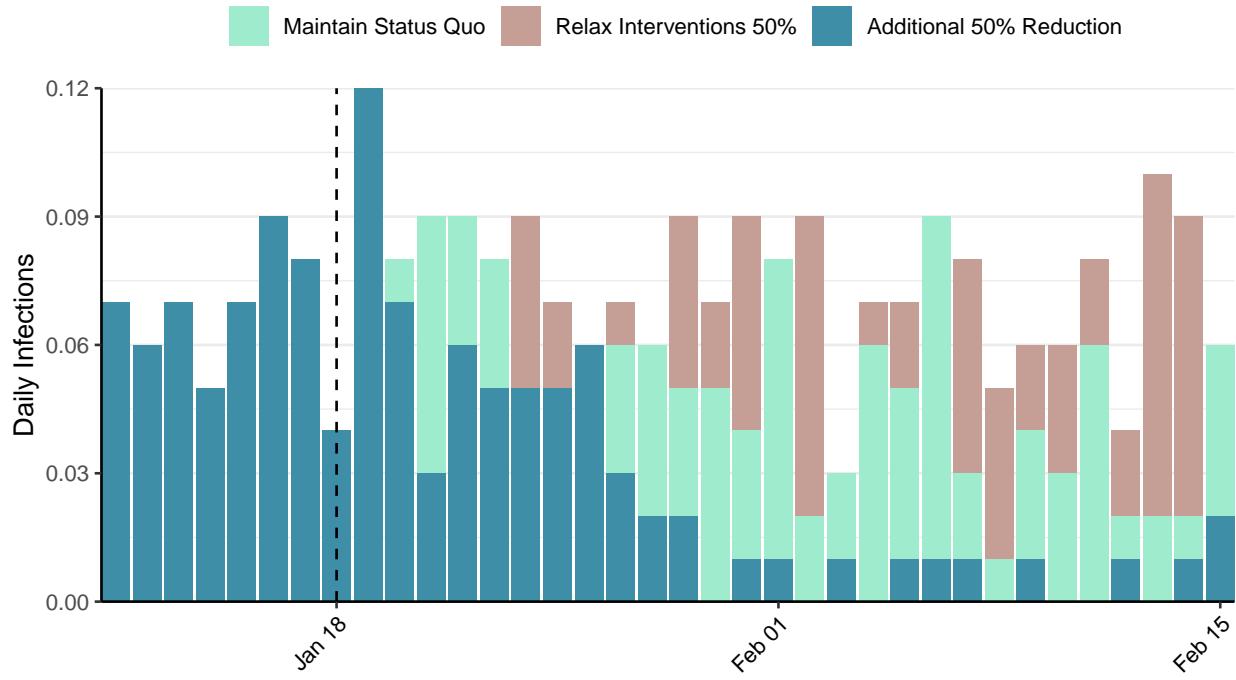


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](#) - <https://covidsim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: Yemen, 2021-01-18

[Download the report for Yemen, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.78 (95% CI: 0.56-1)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Yemen is not shown in the following plot as only 0 deaths have been reported to date**

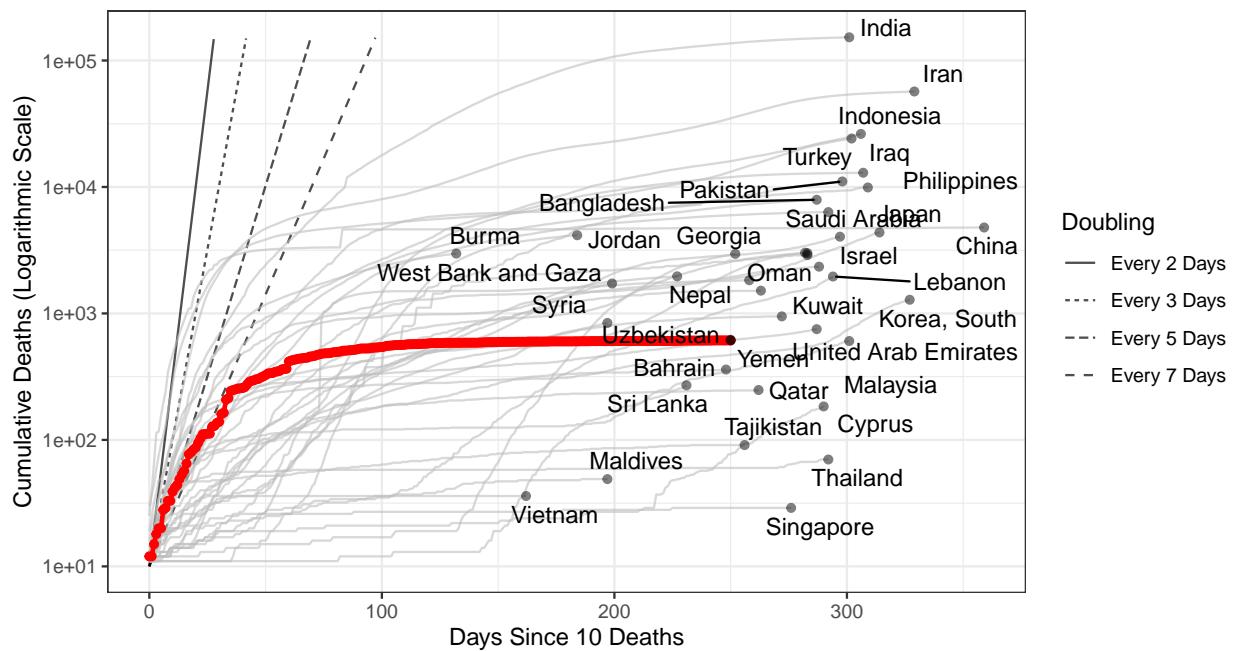


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 2,009 (95% CI: 1,803-2,215) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. Yemen has revised their historic reported cases and thus have reported negative cases.**

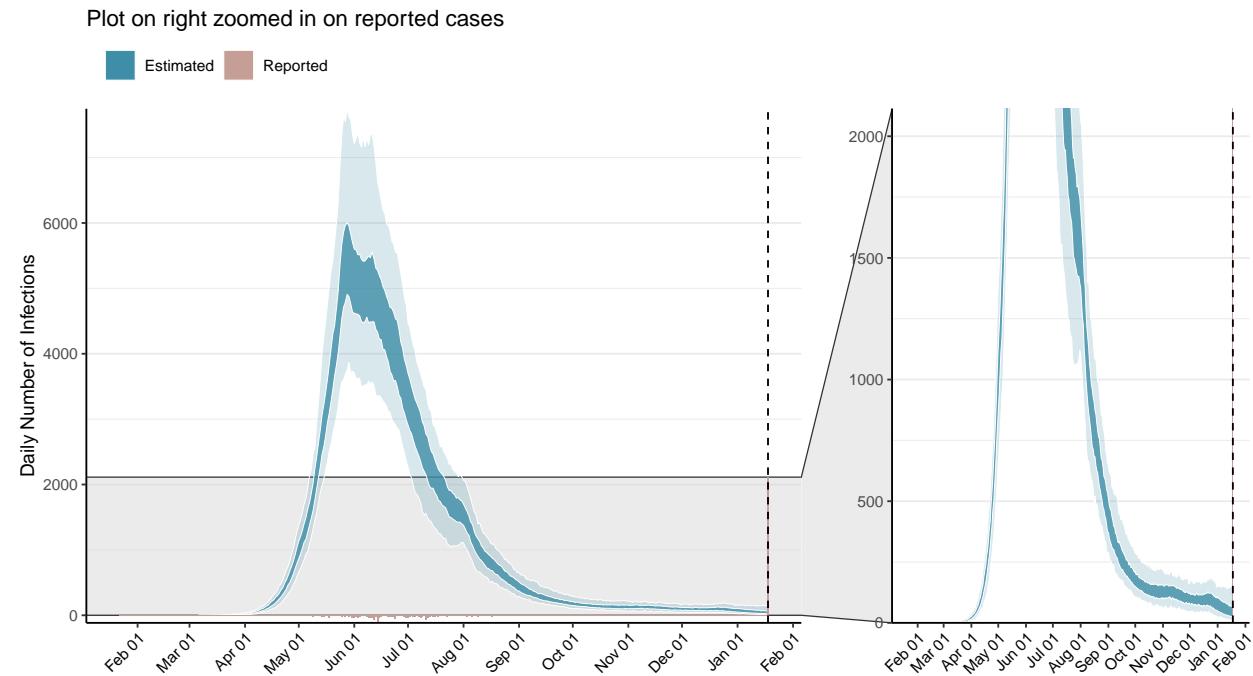


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

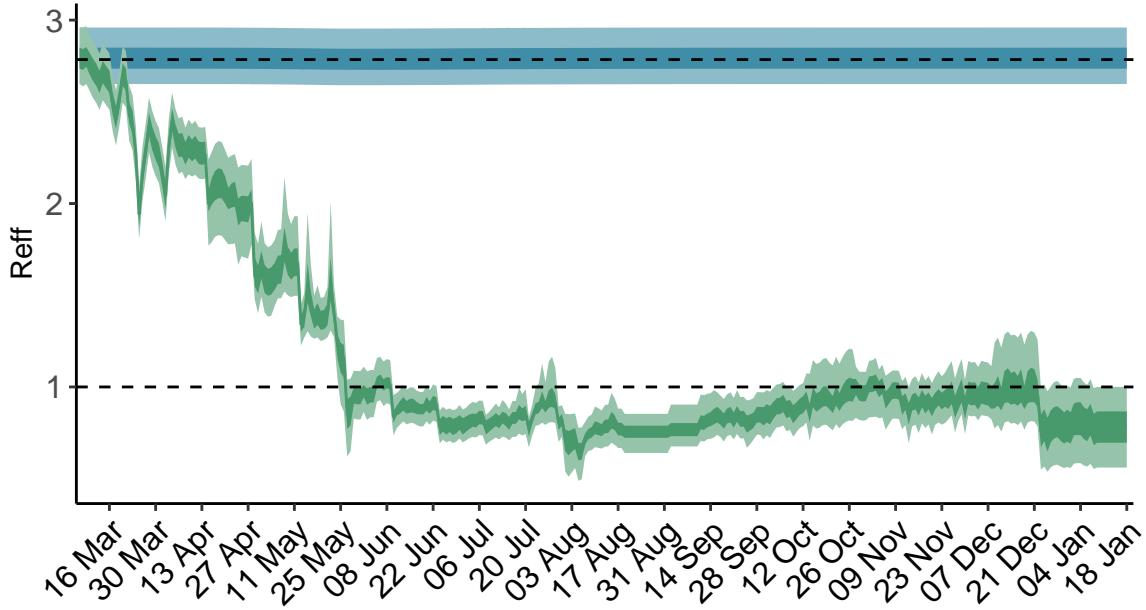


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

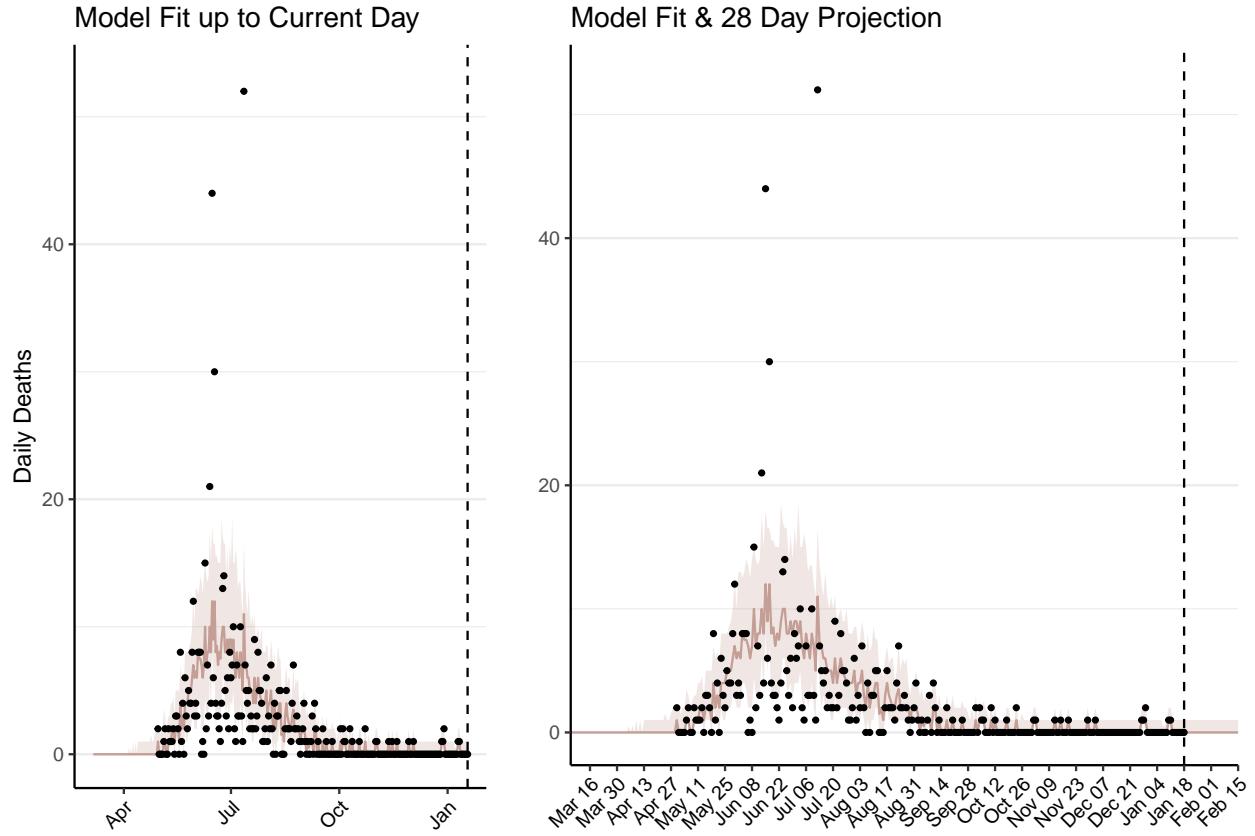


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 5 (95% CI: 5-6) patients requiring treatment with high-pressure oxygen at the current date to 3 (95% CI: 2-4) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 2 (95% CI: 2-3) patients requiring treatment with mechanical ventilation at the current date to 1 (95% CI: 1-1) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

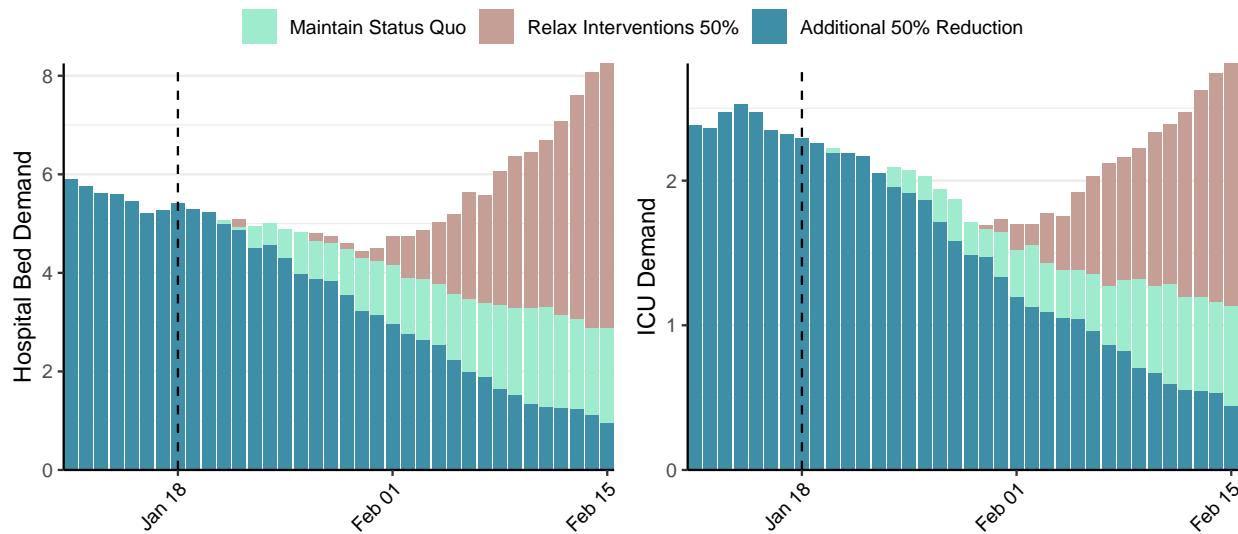


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 50 (95% CI: 42-58) at the current date to 3 (95% CI: 2-3) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 50 (95% CI: 42-58) at the current date to 163 (95% CI: 116-210) by 2021-02-15.

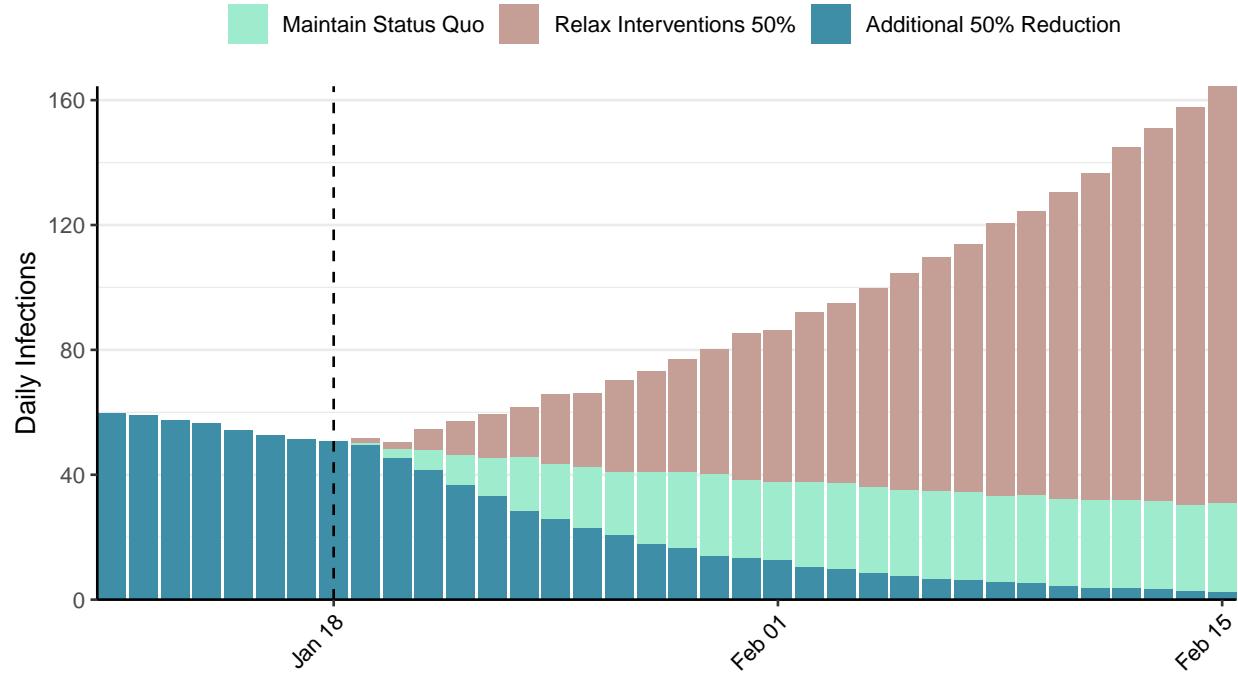


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](#) - <https://covidsim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

Situation Report for COVID-19: South Africa, 2021-01-18

[Download the report for South Africa, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.72 (95% CI: 0.63-0.85)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. South Africa is not shown in the following plot as only 0 deaths have been reported to date**

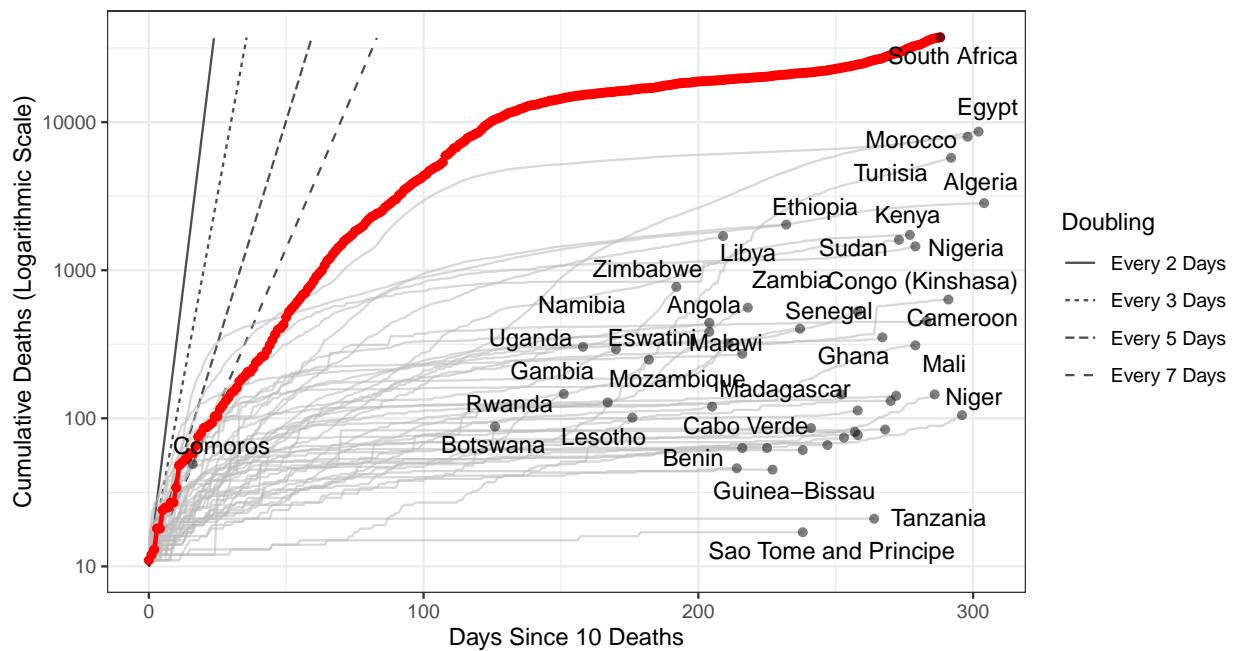


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 3,412,422 (95% CI: 3,305,863-3,518,980) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

Plot on right zoomed in on reported cases

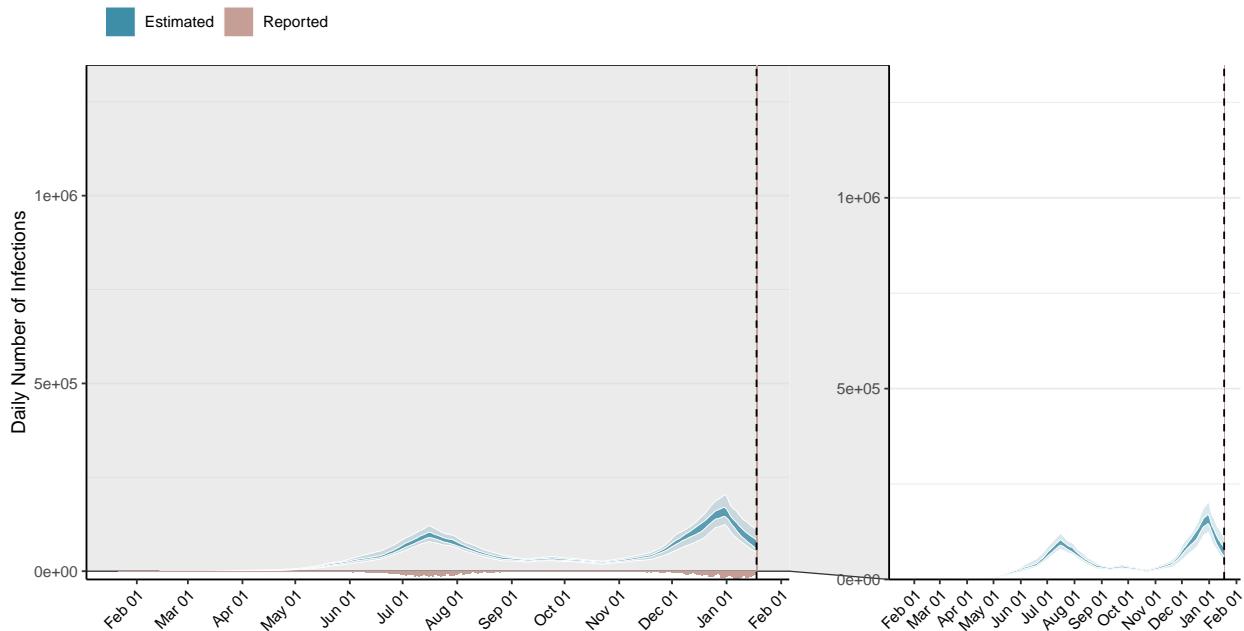


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

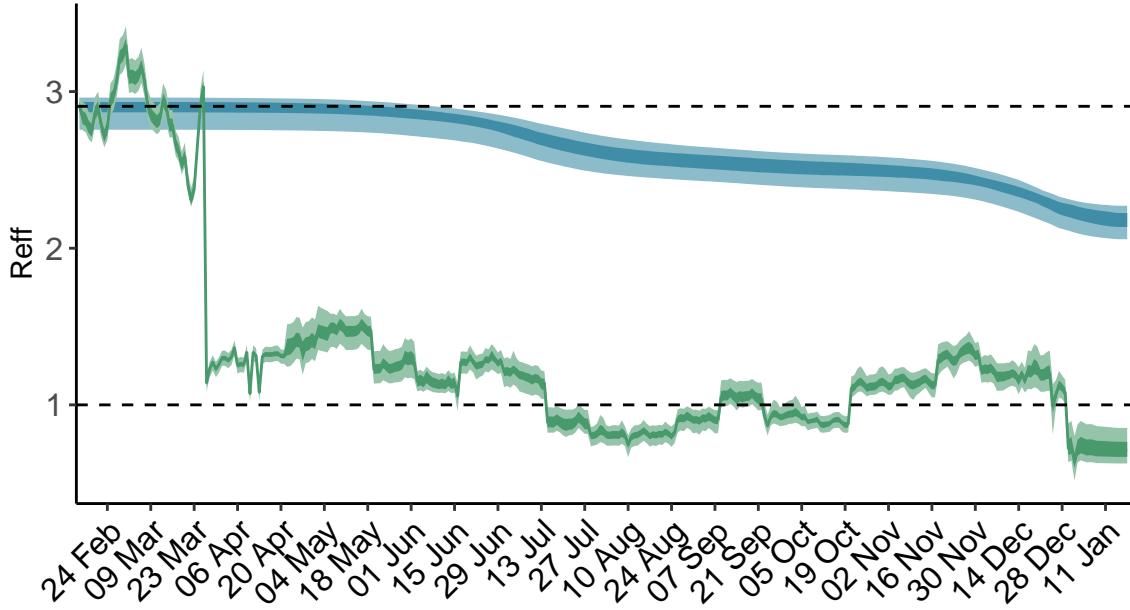


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. South Africa is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

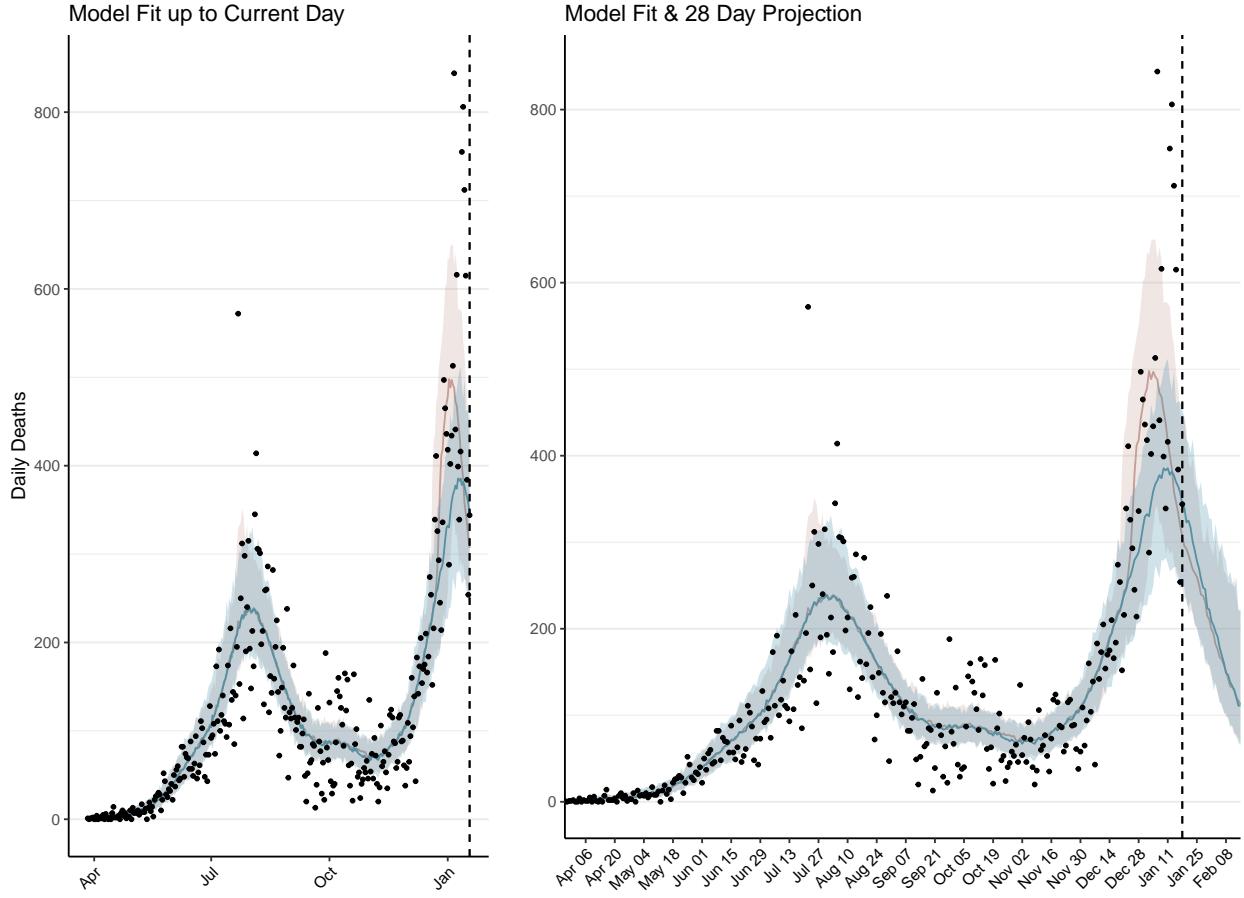


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 12,686 (95% CI: 12,272-13,099) patients requiring treatment with high-pressure oxygen at the current date to 4,248 (95% CI: 3,881-4,616) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 4,212 (95% CI: 4,121-4,304) patients requiring treatment with mechanical ventilation at the current date to 1,903 (95% CI: 1,763-2,043) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B.** These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.

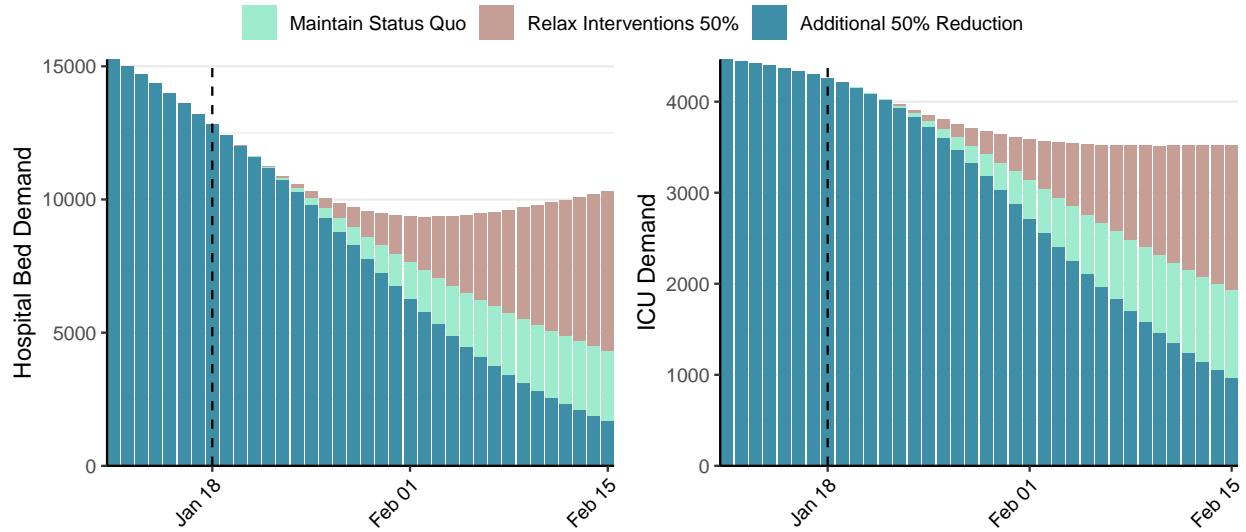


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 72,439 (95% CI: 68,582-76,295) at the current date to 2,418 (95% CI: 2,154-2,683) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 72,439 (95% CI: 68,582-76,295) at the current date to 100,959 (95% CI: 88,691-113,227) by 2021-02-15.

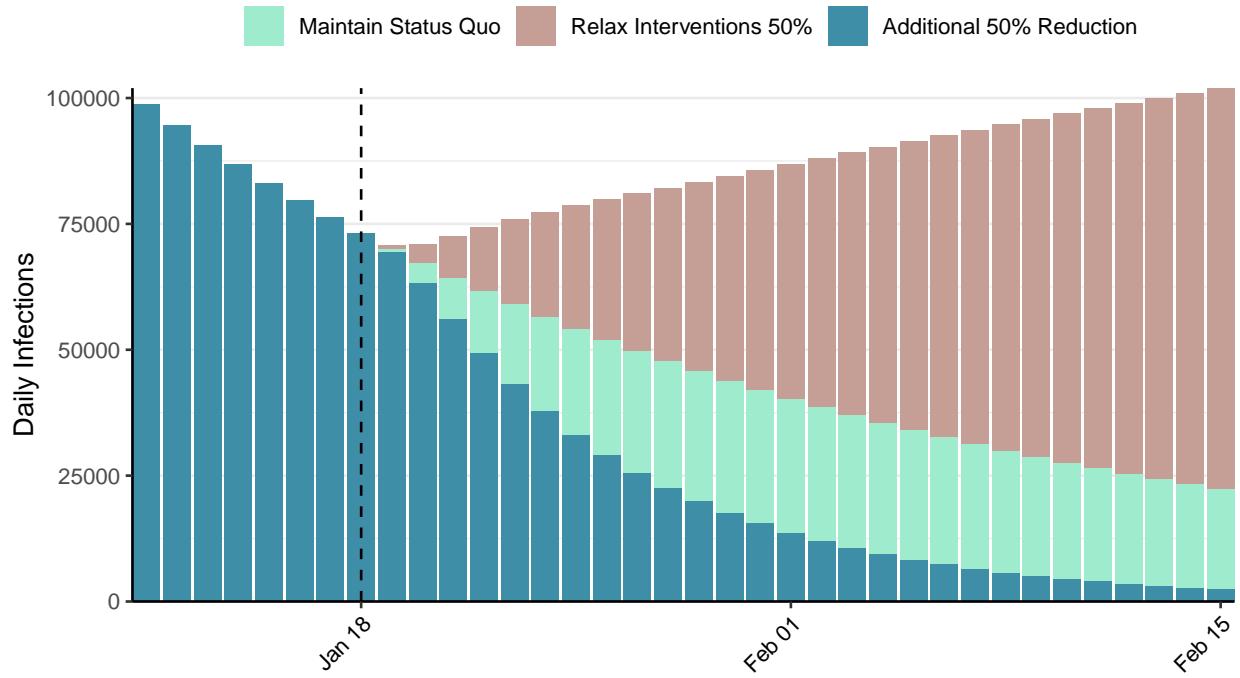


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Zambia, 2021-01-18

[Download the report for Zambia, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	1.57 (95% CI: 1.39-1.72)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Zambia is not shown in the following plot as only 0 deaths have been reported to date**

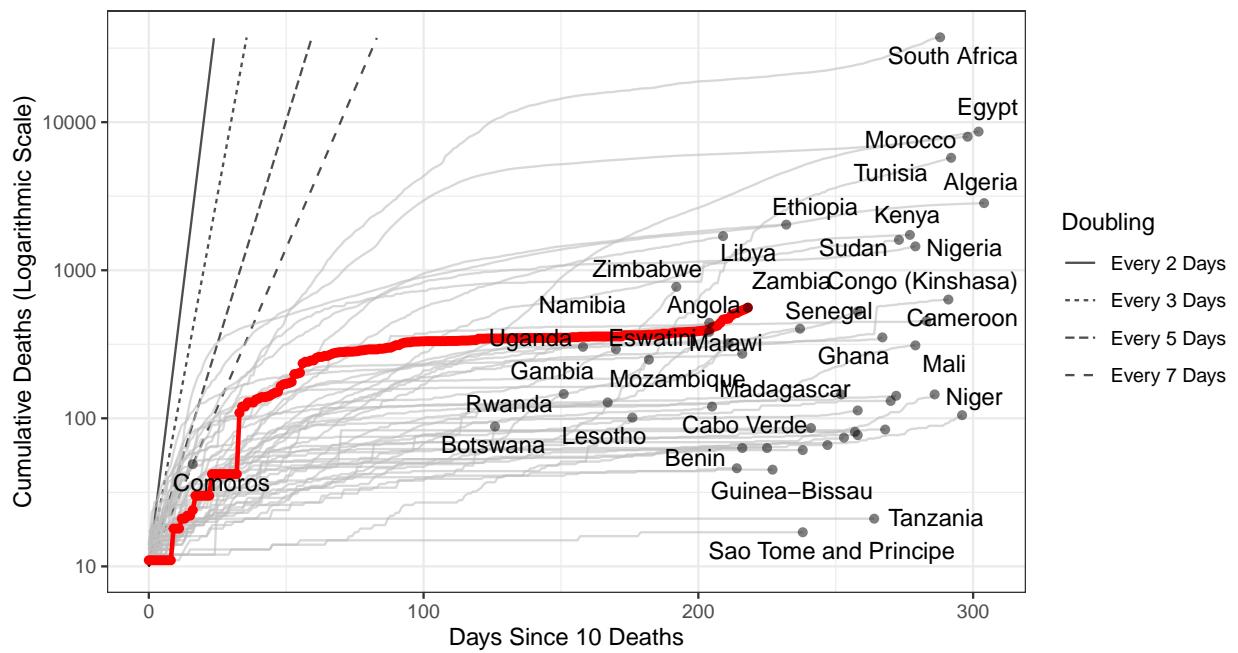


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 386,642 (95% CI: 364,287-408,997) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match).

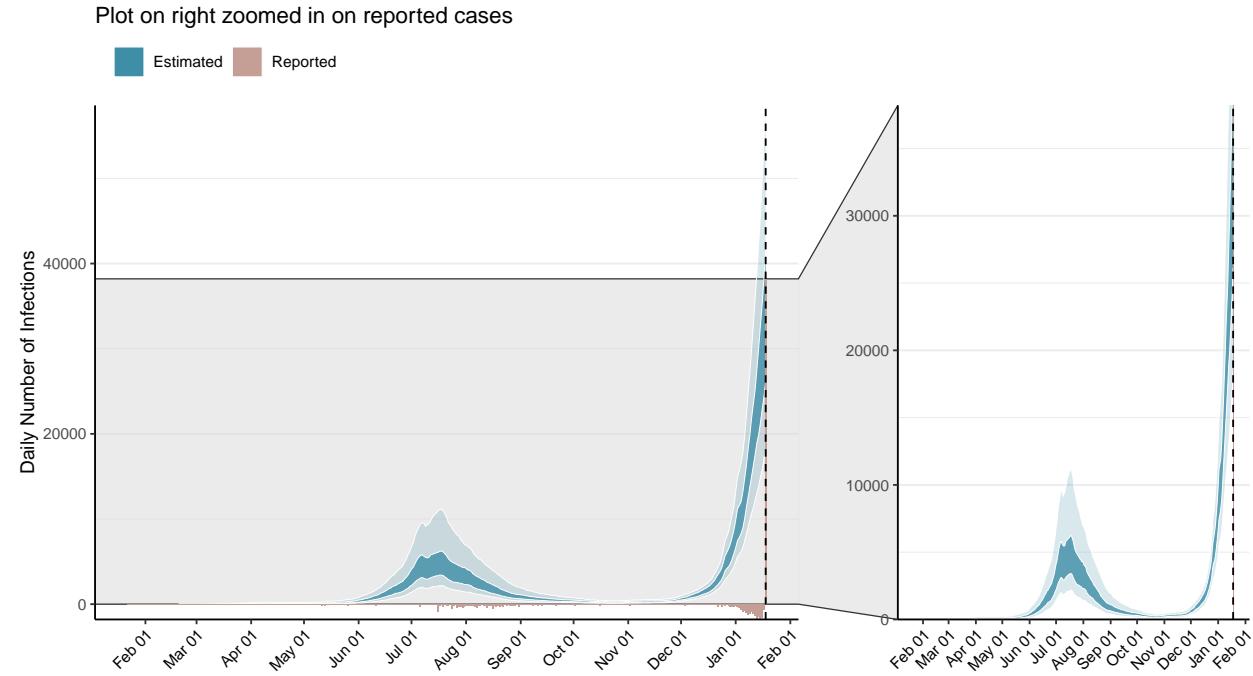


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

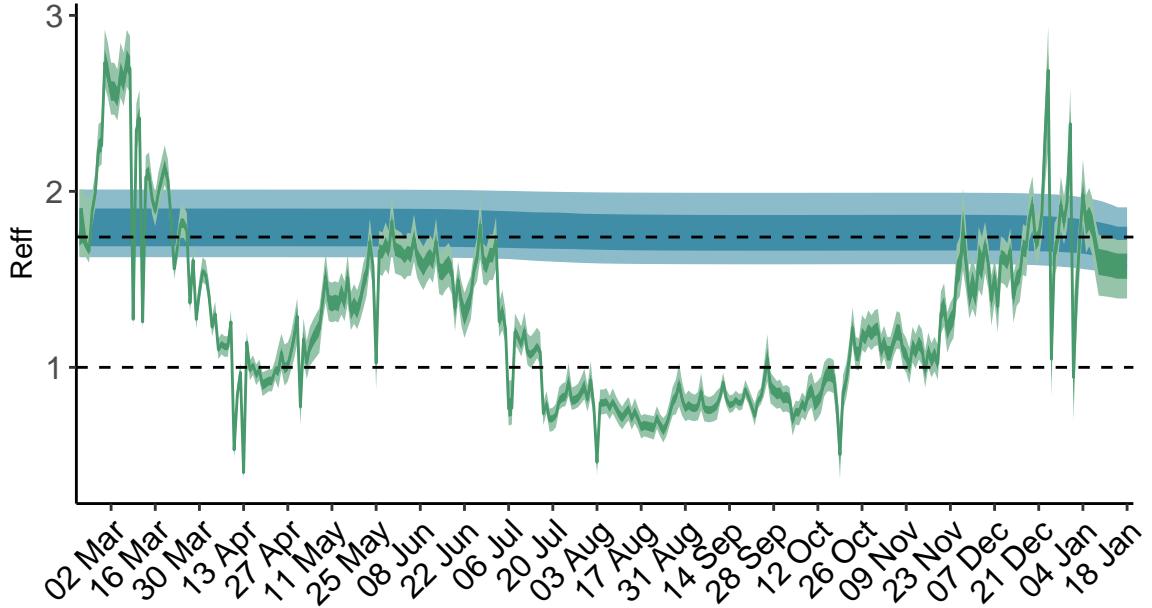


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days. **N.B. Zambia is forecast to be close to or surpassing our best estimates for healthcare capacity in the next 28 days.** Estimates of deaths in the next 28 days may be inaccurate due to our working assumptions for mortality in individuals who do not receive appropriate treatment. [See our methods for more information.](#)

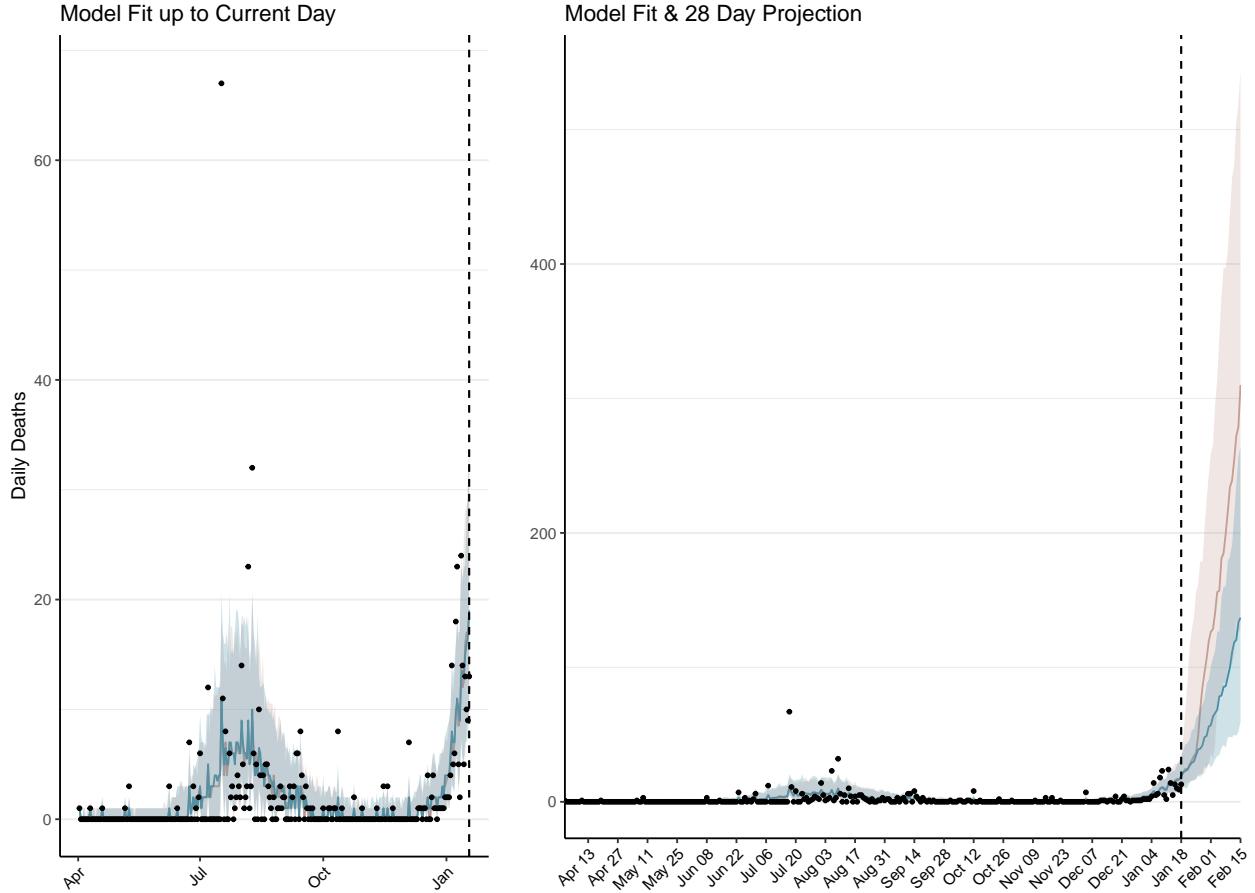


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days. The forecasted deaths in blue assumes healthcare capacity has been surged to ensure sufficient supply of ICU and hospital beds. The red curve assumes no surging in healthcare capacity and subsequently projects increased deaths.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1,139 (95% CI: 1,074-1,204) patients requiring treatment with high-pressure oxygen at the current date to 7,595 (95% CI: 7,048-8,141) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 383 (95% CI: 359-406) patients requiring treatment with mechanical ventilation at the current date to 1,000 (95% CI: 965-1,035) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

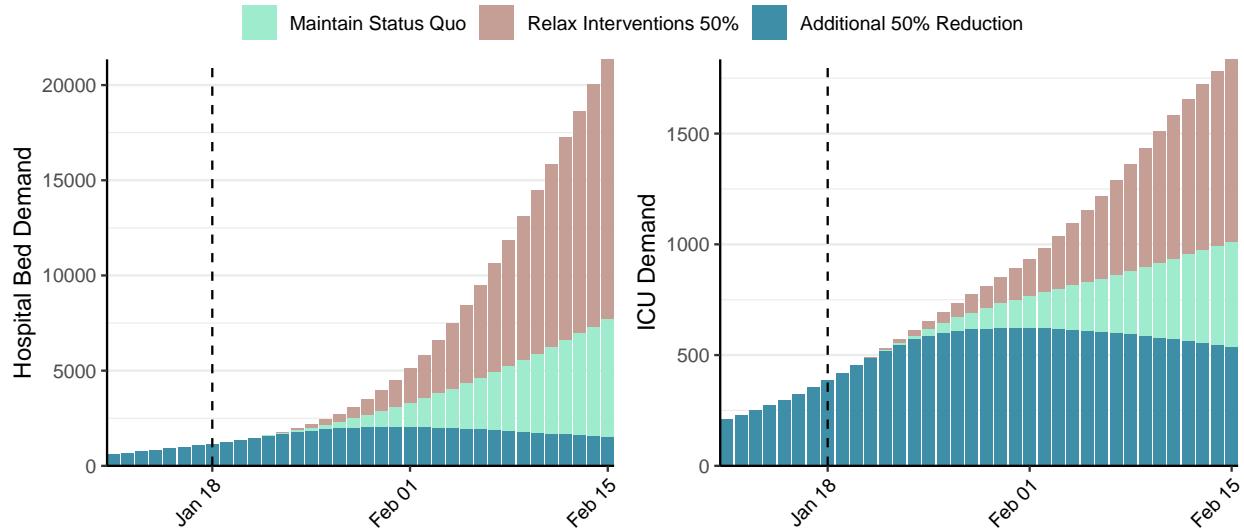


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 33,843 (95% CI: 31,641-36,045) at the current date to 13,933 (95% CI: 12,716-15,150) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 33,843 (95% CI: 31,641-36,045) at the current date to 531,560 (95% CI: 514,299-548,821) by 2021-02-15.

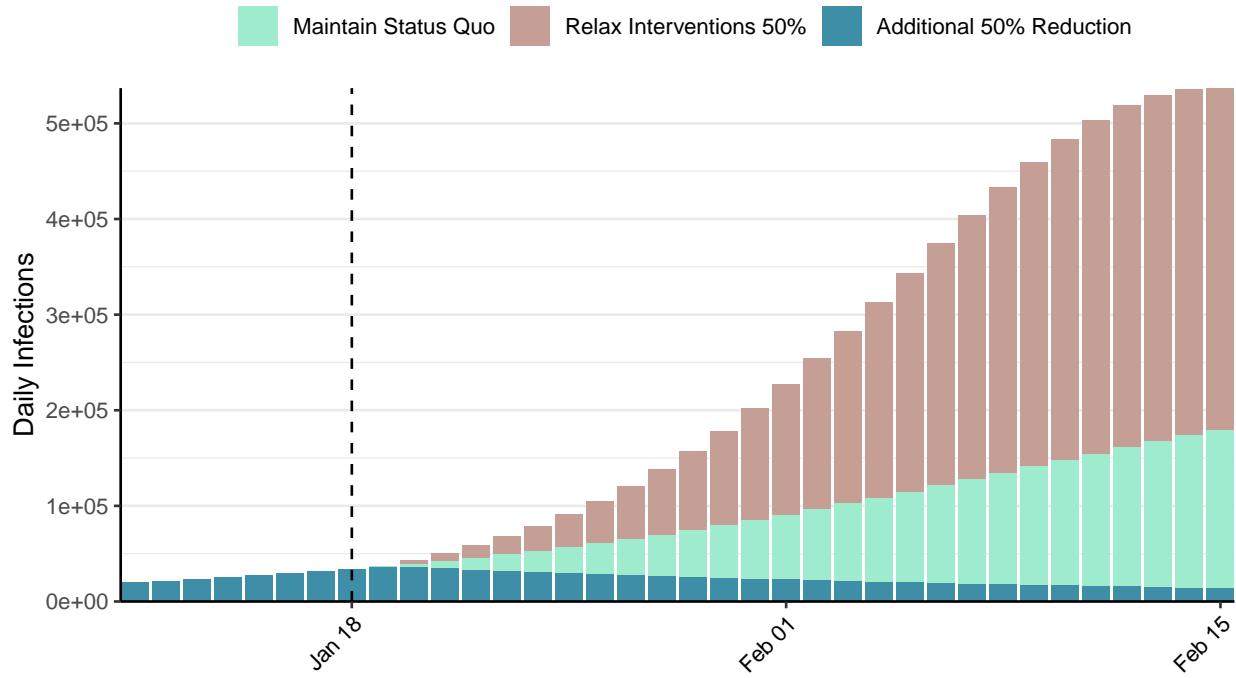


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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Situation Report for COVID-19: Zimbabwe, 2021-01-18

[Download the report for Zimbabwe, 2021-01-18 here.](#) This report uses data from the European Centre for Disease Control. These data are updated daily and whilst there may be a short delay, they are generally consistent with Ministry reports. These data are then used to back-calculate an ‘inferred number of COVID-19 infections’ using mathematical modelling techniques (see [Report 12](#) for further details) to estimate the number of people that have been infected and to make short-term projections for future healthcare needs.

Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
0	0	0	0	0.89 (95% CI: 0.61-1.16)

The figure below shows the cumulative reported deaths as a function of the time since the 10th death was reported. Dashed lines show the expected trajectory for different doubling times of the epidemic. For example, with a doubling time of 3 days, if there are currently a total of 20 deaths reported, we would expect there to be 40 deaths in total reported in 3 days-time, 80 deaths in 6 days-time, 160 deaths in 9 days-time etc. For most epidemics, in the absence of interventions, we expect a doubling time of 3-4 days for this disease. **N.B. Zimbabwe is not shown in the following plot as only 0 deaths have been reported to date**

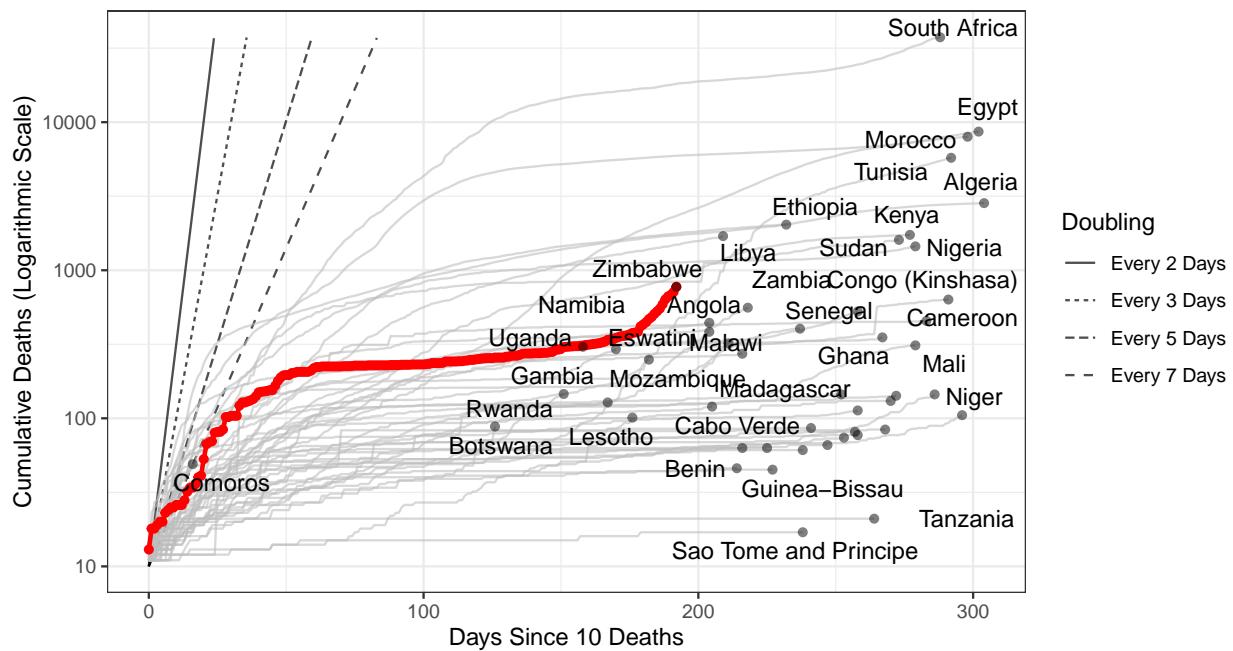


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

COVID-19 Transmission Modelling

The figure below shows the estimated number of people infected over the past 4 weeks. The bar charts show, for comparison, the number of reported cases. We estimate that there has been a total of 531,408 (95% CI: 502,142–560,675) infections over the past 4 weeks. The right-hand plot shows these data on a different scale as the estimated infections are likely to be much larger than the reported cases. **Importantly**, the estimated infections includes both asymptomatic and mild cases that would not necessarily be identified through surveillance. Consequently, the estimated infections are likely to be significantly higher than the reported cases in all countries (see our [FAQ](#) for further explanation of these differences and why the reported cases and estimated infections are unlikely to match). **N.B. Zimbabwe has revised their historic reported cases and thus have reported negative cases.**

Plot on right zoomed in on reported cases

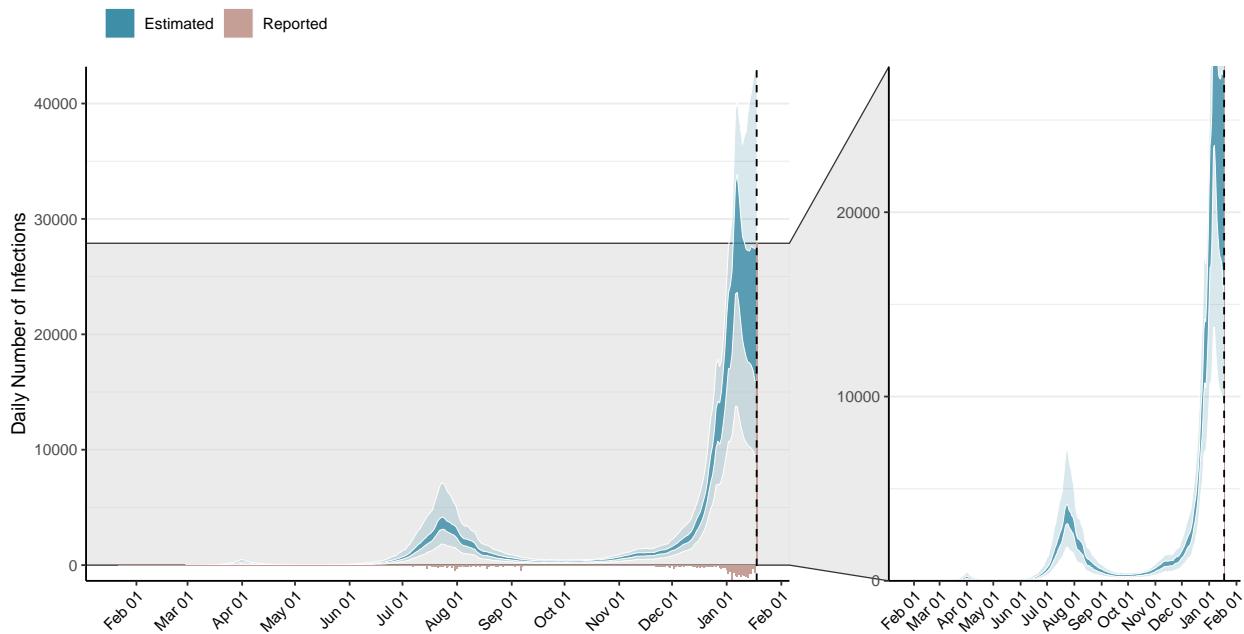


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

By fitting to the time series of deaths, we are able to estimate a time-varying reproduction number, R_{eff} . R_{eff} is the average number of secondary infections caused by a single infected person at a given time. If R_{eff} is above 1, the rate of transmission is increasing and the number of new infections is increasing. R_{eff} is assumed to change in relation to mobility fall in proportion. When fitting our model we assume that 100% of COVID-19 related deaths have been reported (please see our [FAQ](#) section for more information about this assumption). Additionally, we assume that infection with COVID-19 leads to protective immunity that does not wane within the time scales considered in these analyses.

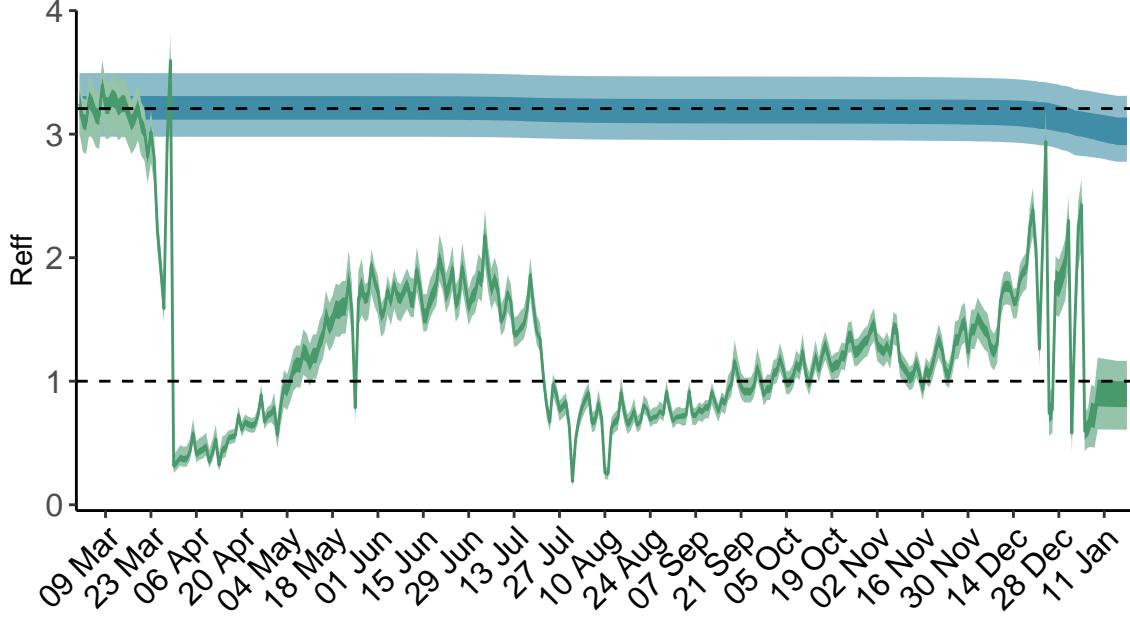


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections are not increasing. $R_{eff} > 1$ indicates a growing epidemic in which new infections are increasing over time. Dark green shows the 50% CI and light green shows the 95% CI. The curve in blue shows the predicted decrease in R_{eff} due to increasing immunity in the population resulting from people being infected by COVID-19. Dark blue shows the 50% CI and light blue shows the 95% CI. Individuals infected with COVID-19 are assumed to remain immune within our analysis. The upper horizontal dashed line shows the value of R_{eff} at the beginning of the epidemic, highlighting the impact of immunity on transmission.

Using the model fit, we can forecast the expected trajectory for cumulative deaths assuming the transmission level, represented by the final Rt value stays the same over the next 28 days.

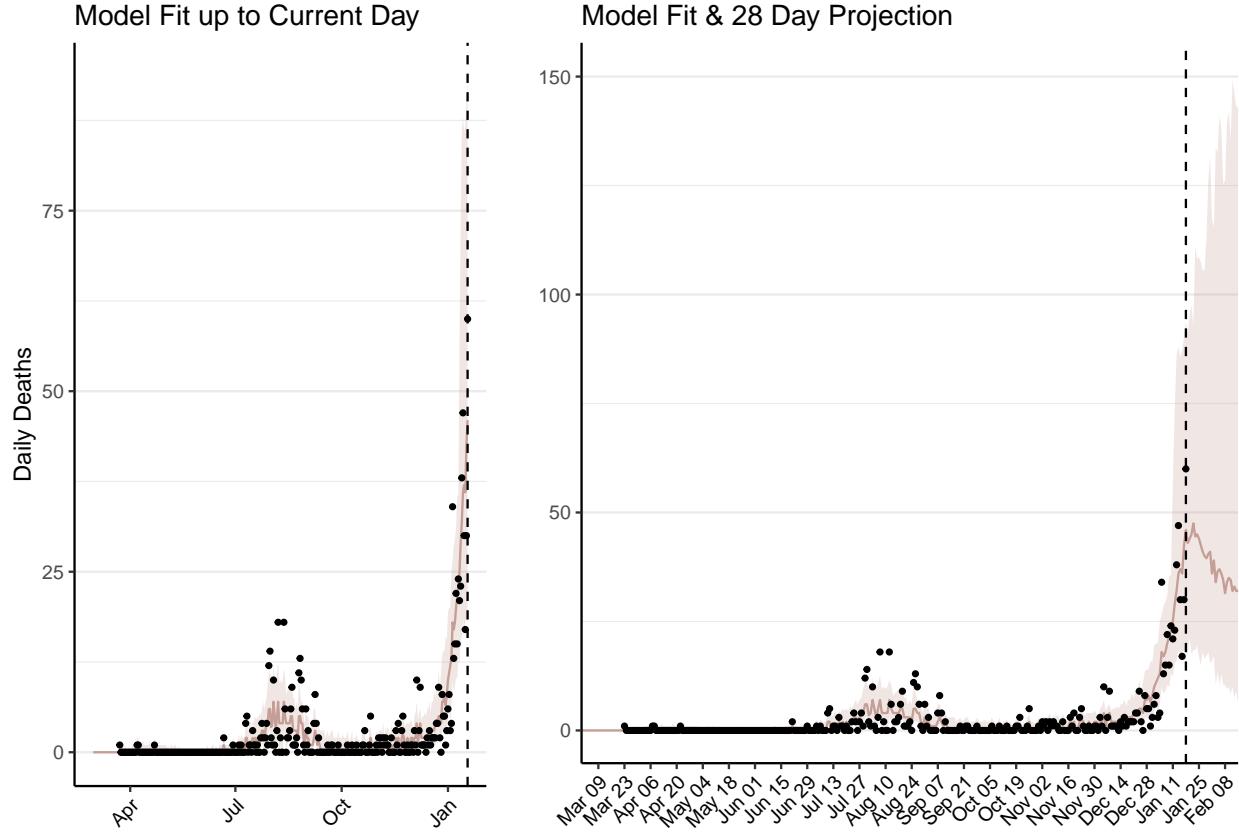


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the next 28 days.

Short-term Epidemic Scenarios

We make the following short-term projections of healthcare demand and new infections under the following three scenarios:

- **Scenario 1.** The epidemic continues to grow at the current rate.
- **Scenario 2.** Countries will further scale up interventions (either increasing current strategies or implementing new interventions) leading to a further 50% reduction in transmission.
- **Scenario 3.** Countries will relax current interventions by 50%

N.B. These scenarios currently assume that the impact of mobility on transmission will remain the same in the future as it has in the past. We are working to extend methods to estimate the impact of increases in mobility on transmission as lockdown and interventions are reversed. Consequently, projection are likely to represent an upper estimate of the healthcare demand and case load for each scenario

We estimate that over the next 4 weeks demand for hospital beds will change from 1,701 (95% CI: 1,604-1,797) patients requiring treatment with high-pressure oxygen at the current date to 1,443 (95% CI: 1,242-1,644) hospital beds being required on 2021-02-15 if no further interventions are introduced (Scenario 1). Similarly, we estimate that over the next 4 weeks demand for critical care (ICU) beds will change from 541 (95% CI: 520-561) patients requiring treatment with mechanical ventilation at the current date to 449 (95% CI: 413-484) by 2021-02-15. These projections assume that approximately 5% of all infections will require treatment with high-pressure oxygen and that approximately 30% of hospitalised cases will require treatment with mechanical ventilation (based on analysis of ongoing epidemics in Europe). **N.B. These scenarios are unlikely to show significant differences for the first week since there is a delay of approximately 10 days between infection and hospital admission. Consequently, the effectiveness of a change in policy is likely to be better captured by hospital admission data approximately 2 weeks after the policy change is implemented.**

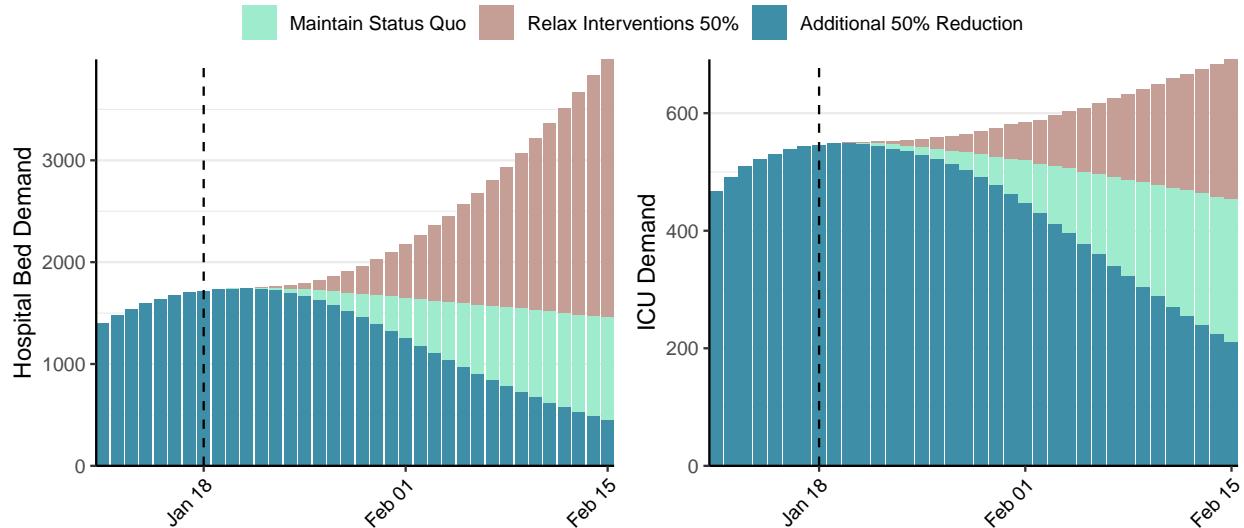


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

The impact of each scenario has a more immediate effect on the daily number of infections. The figure below shows the impact of each scenario on the estimated daily incidence of new infections. If interventions are scaled up (Scenario 2), the daily number of infections will change from 21,690 (95% CI: 19,868-23,511) at the current date to 1,554 (95% CI: 1,291-1,817) by 2021-02-15. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 21,690 (95% CI: 19,868-23,511) at the current date to 77,322 (95% CI: 64,788-89,856) by 2021-02-15.

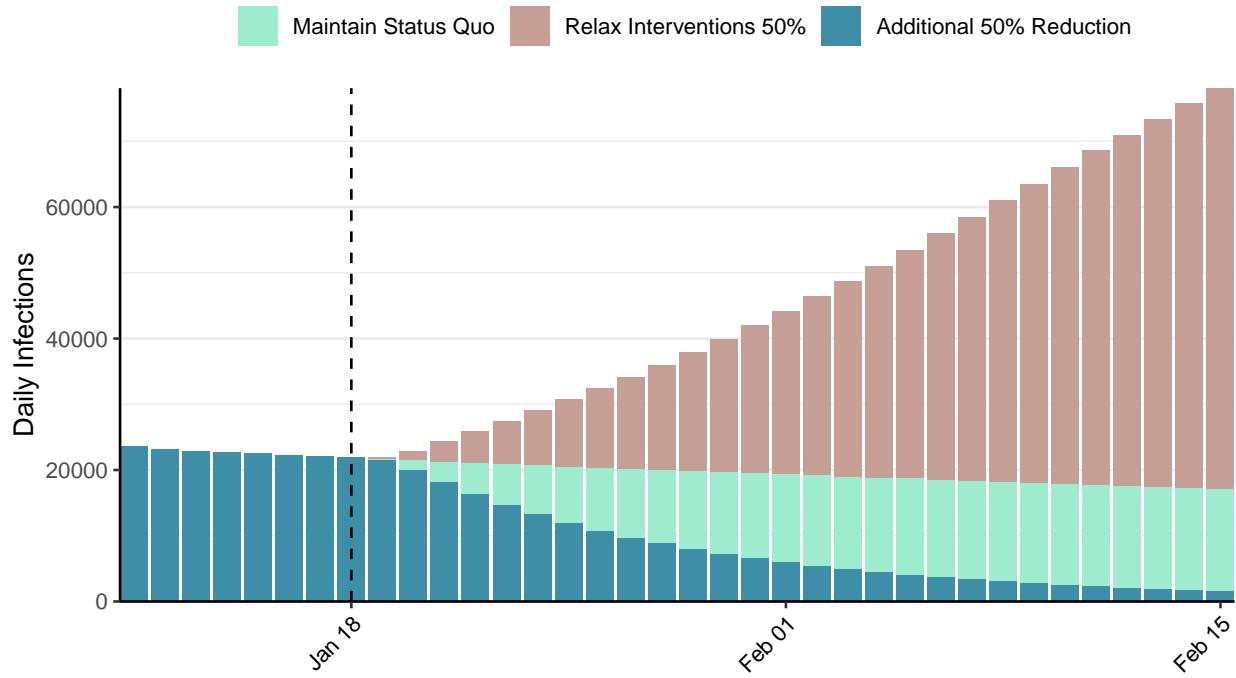


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for Scenario 3 (relaxing interventions by 50%) are shown in red. Current date shown with dashed line.

To explore different scenarios, we recommend using our [COVID-19 Scenario Analysis Tool](https://covid19sim.org/) - <https://covid19sim.org/>, which can be used to simulate different intervention scenarios and explore the long term impact on healthcare demand.

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