

Situation Report for COVID-19: Afghanistan, 2021-01-24

[Download the report for Afghanistan, 2021-01-24 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}
77	77	7	7	0.88 (95% CI: 0.72-1.07)

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. Afghanistan is not shown in the following plot as only 7 deaths have been reported to date**

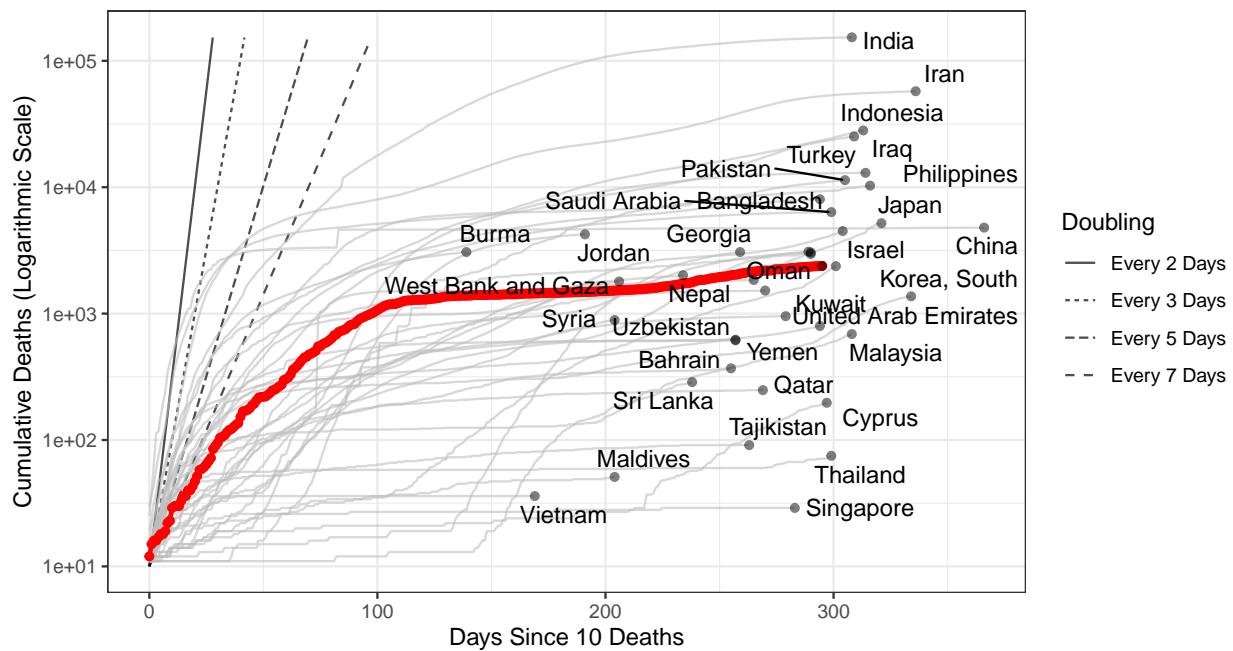


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 103,044 (95% CI: 98,956-107,132) 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

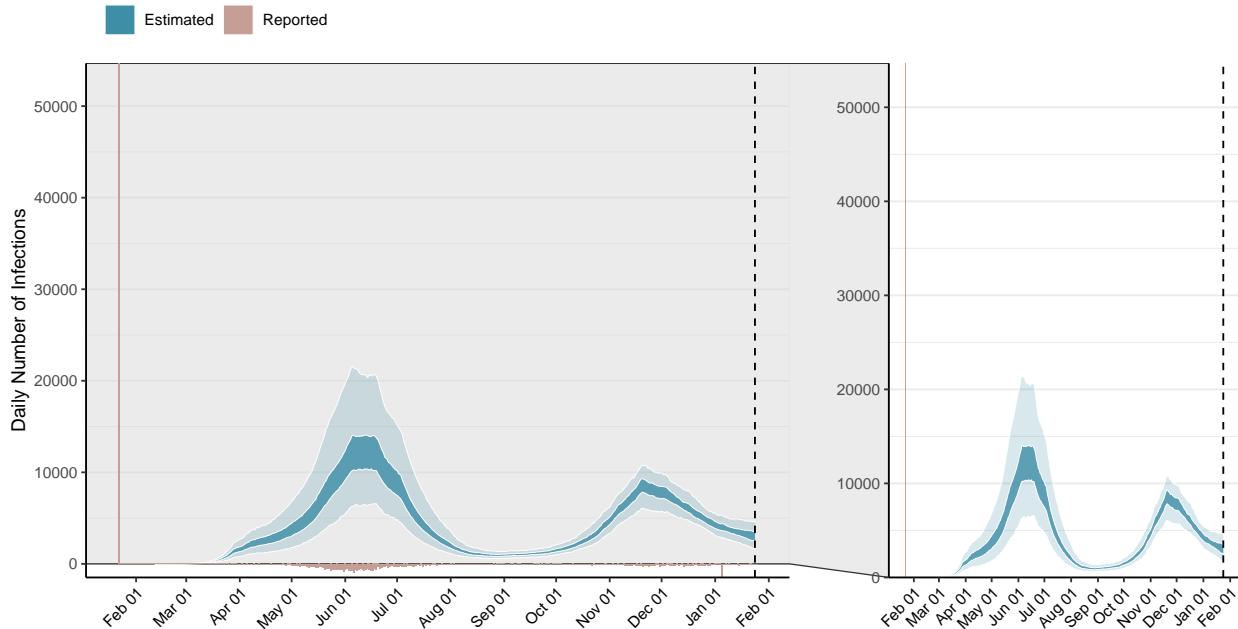


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

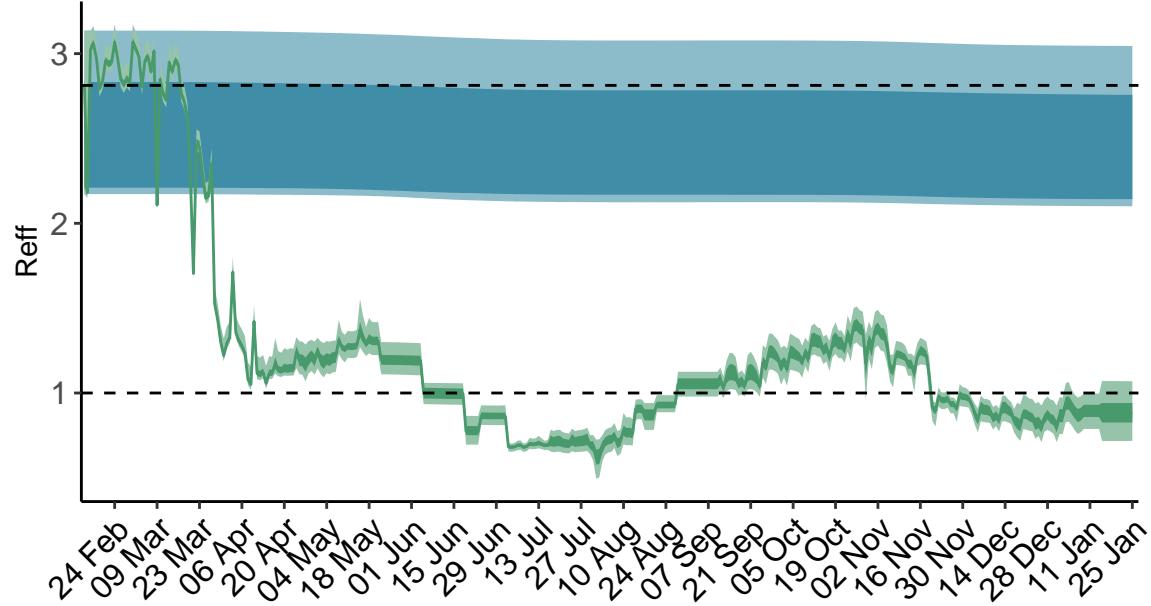


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

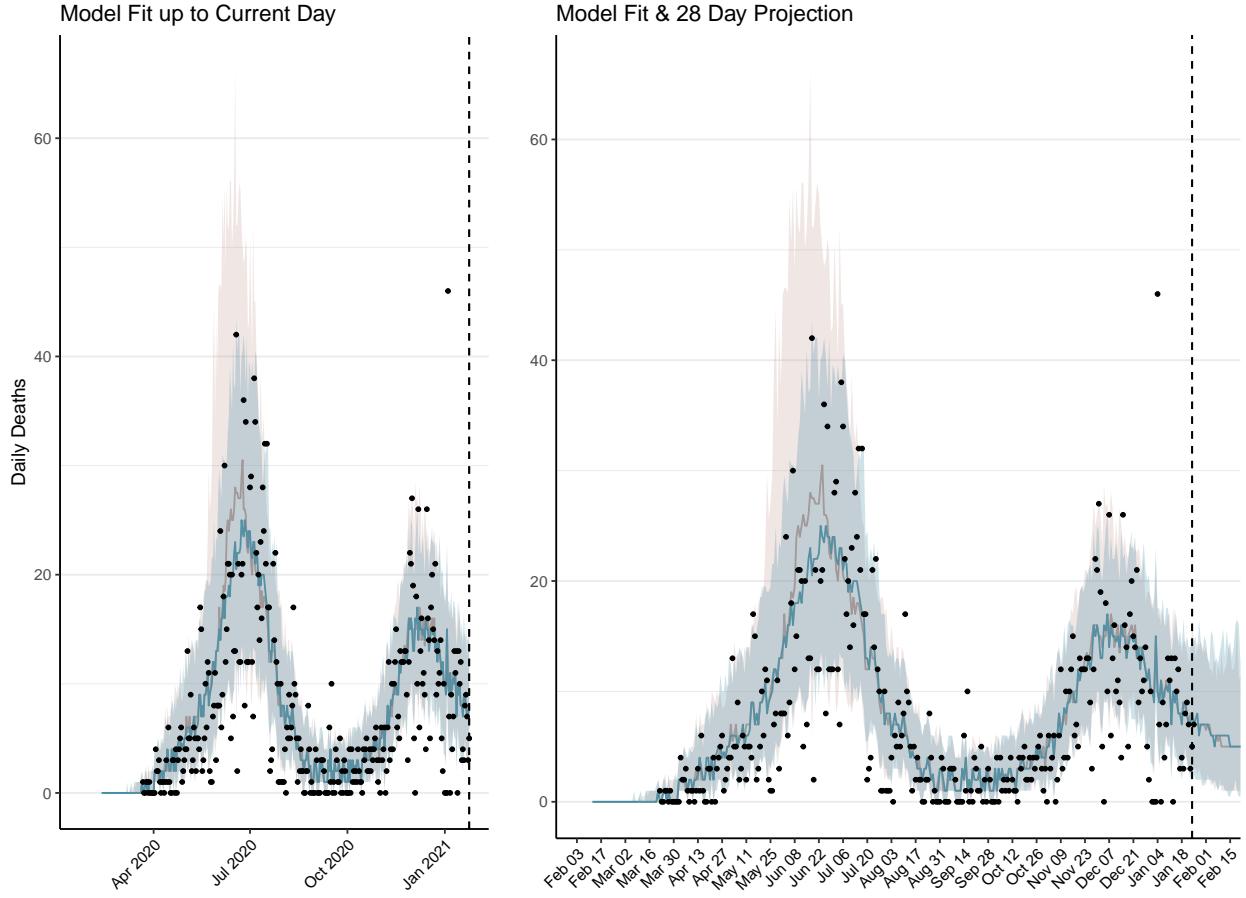


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 296 (95% CI: 283-309) patients requiring treatment with high-pressure oxygen at the current date to 203 (95% CI: 182-224) hospital beds being required on 2021-02-21 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: 118-128) patients requiring treatment with mechanical ventilation at the current date to 82 (95% CI: 74-90) by 2021-02-21. 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.**

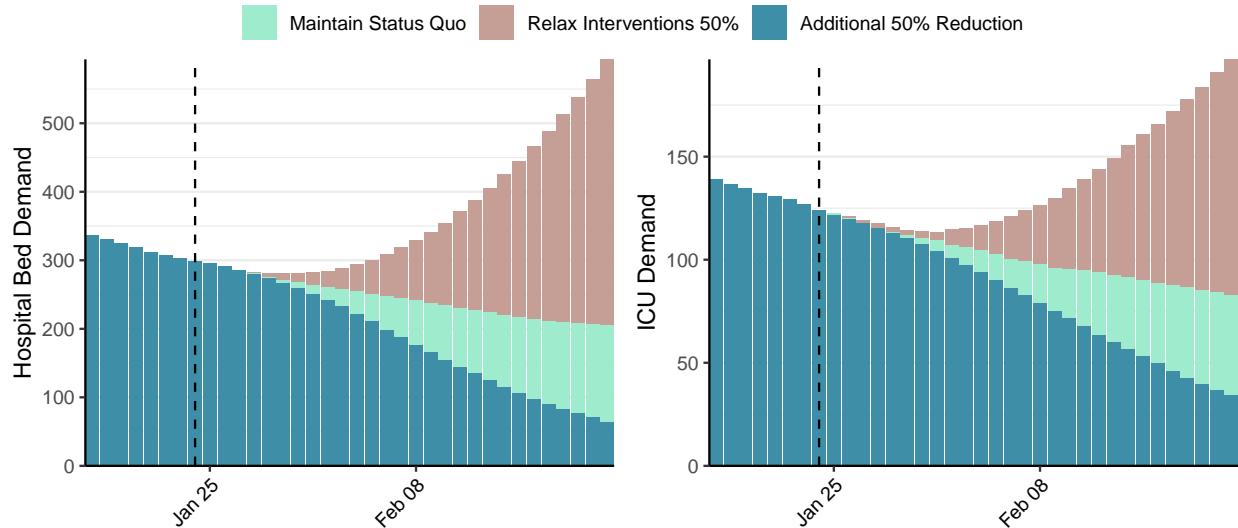


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 2,969 (95% CI: 2,786-3,153) at the current date to 187 (95% CI: 165-209) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,969 (95% CI: 2,786-3,153) at the current date to 11,866 (95% CI: 10,027-13,705) by 2021-02-21.

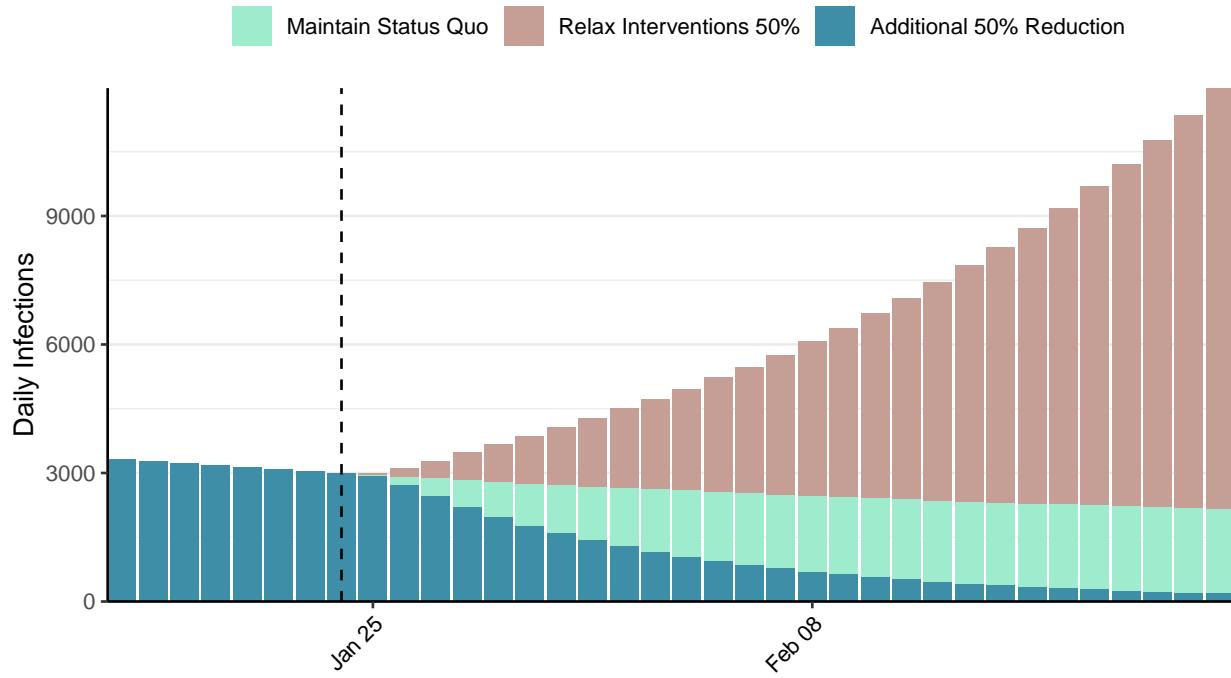


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Angola, 2021-01-24 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}
77	77	2	2	1.07 (95% CI: 0.84-1.31)

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. Angola is not shown in the following plot as only 2 deaths have been reported to date**

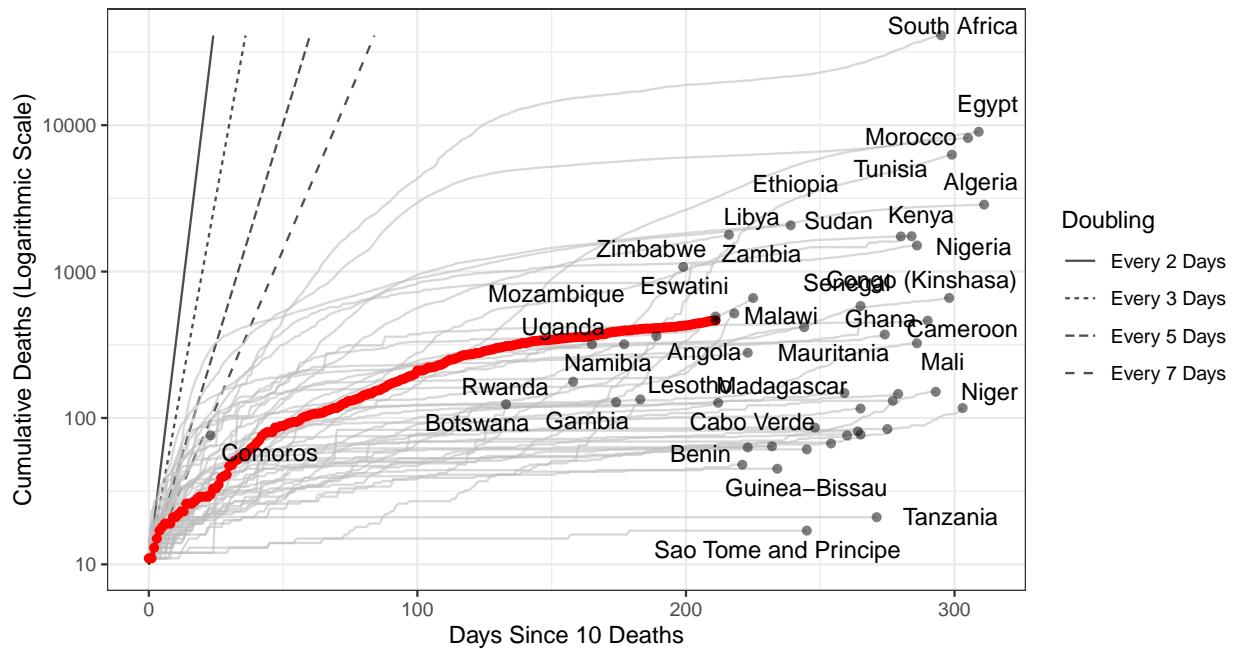


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 64,907 (95% CI: 59,600-70,213) 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

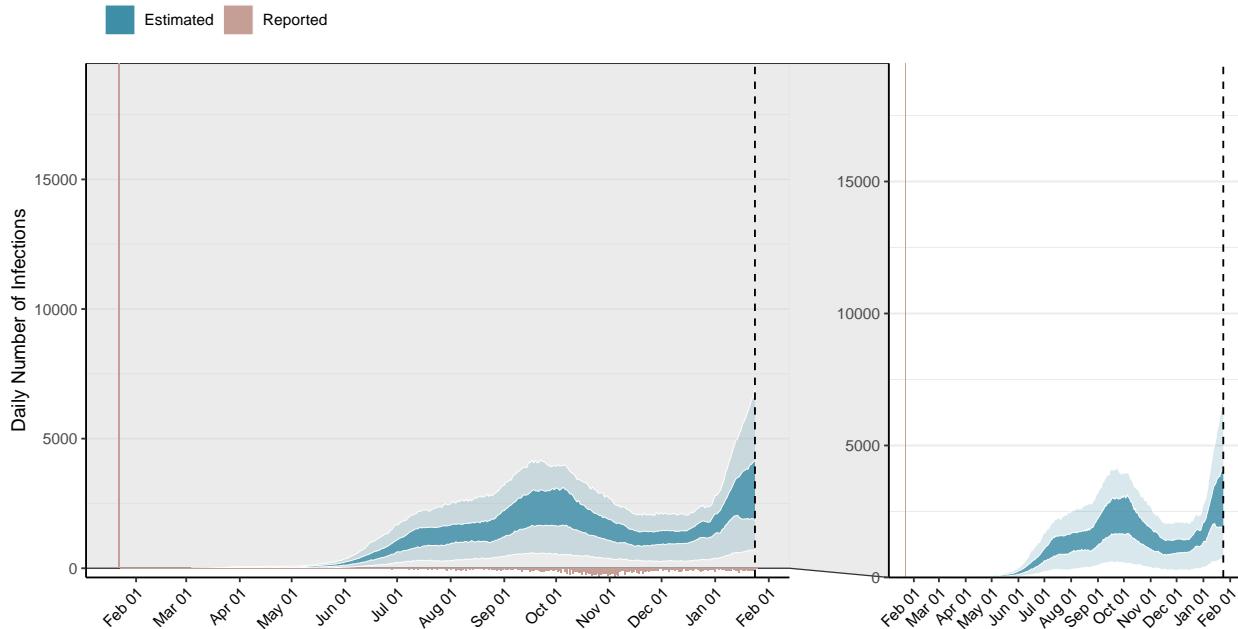


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

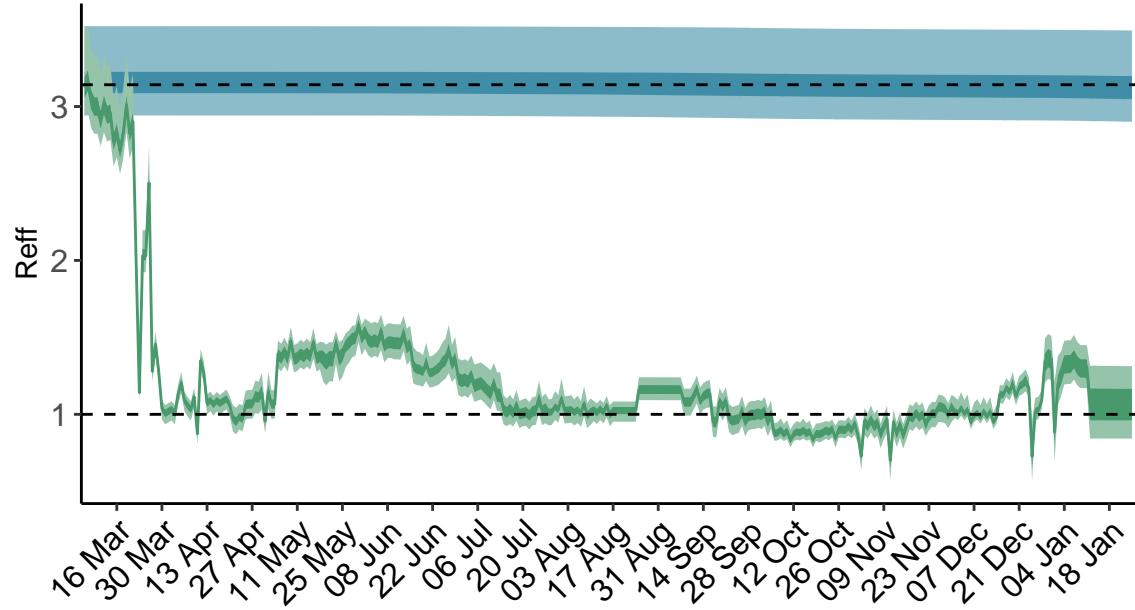


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

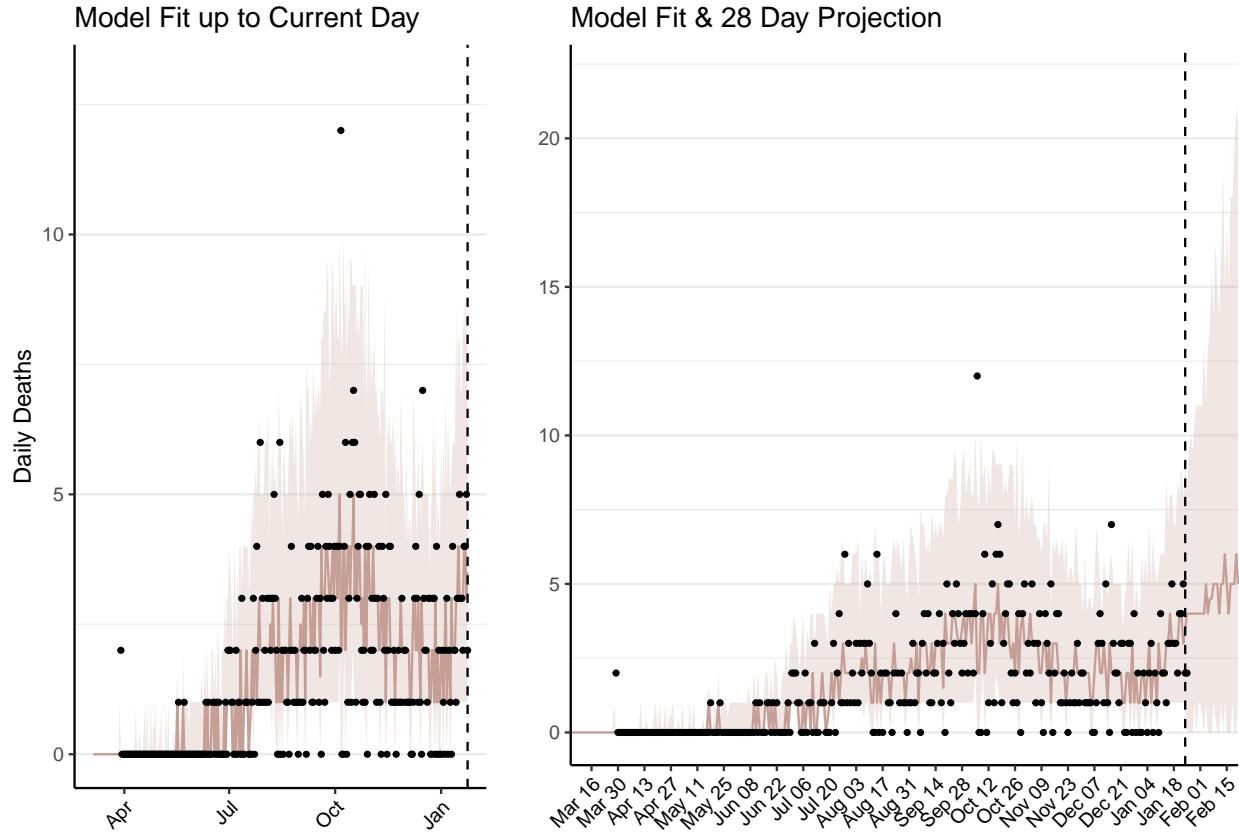


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 182 (95% CI: 167-197) patients requiring treatment with high-pressure oxygen at the current date to 312 (95% CI: 262-362) hospital beds being required on 2021-02-21 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: 62-73) patients requiring treatment with mechanical ventilation at the current date to 118 (95% CI: 100-136) by 2021-02-21. 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.**

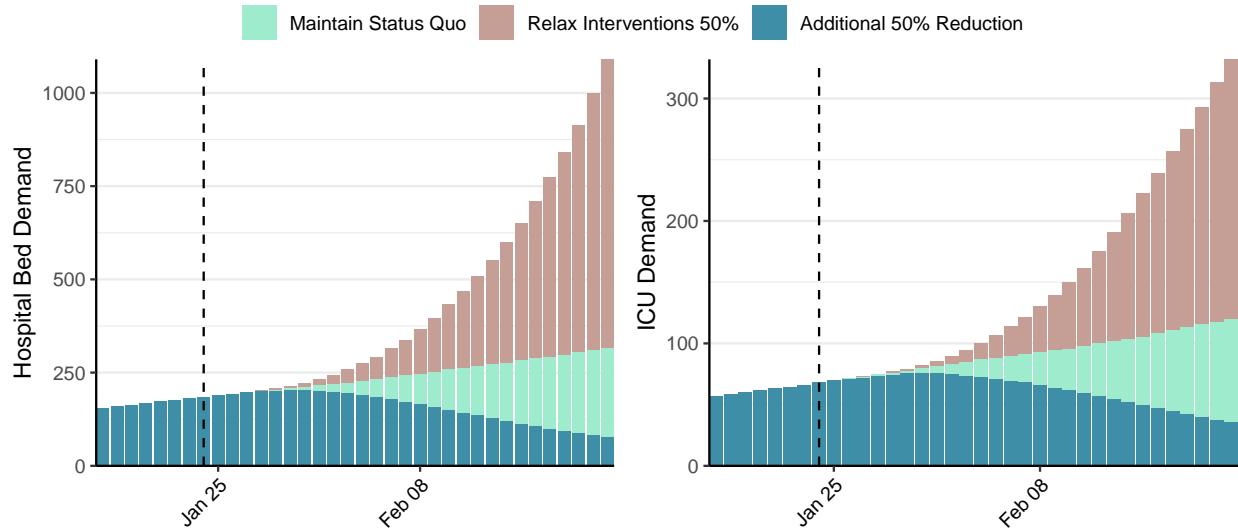


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 3,074 (95% CI: 2,747-3,401) at the current date to 404 (95% CI: 331-476) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,074 (95% CI: 2,747-3,401) at the current date to 34,026 (95% CI: 27,102-40,949) by 2021-02-21.

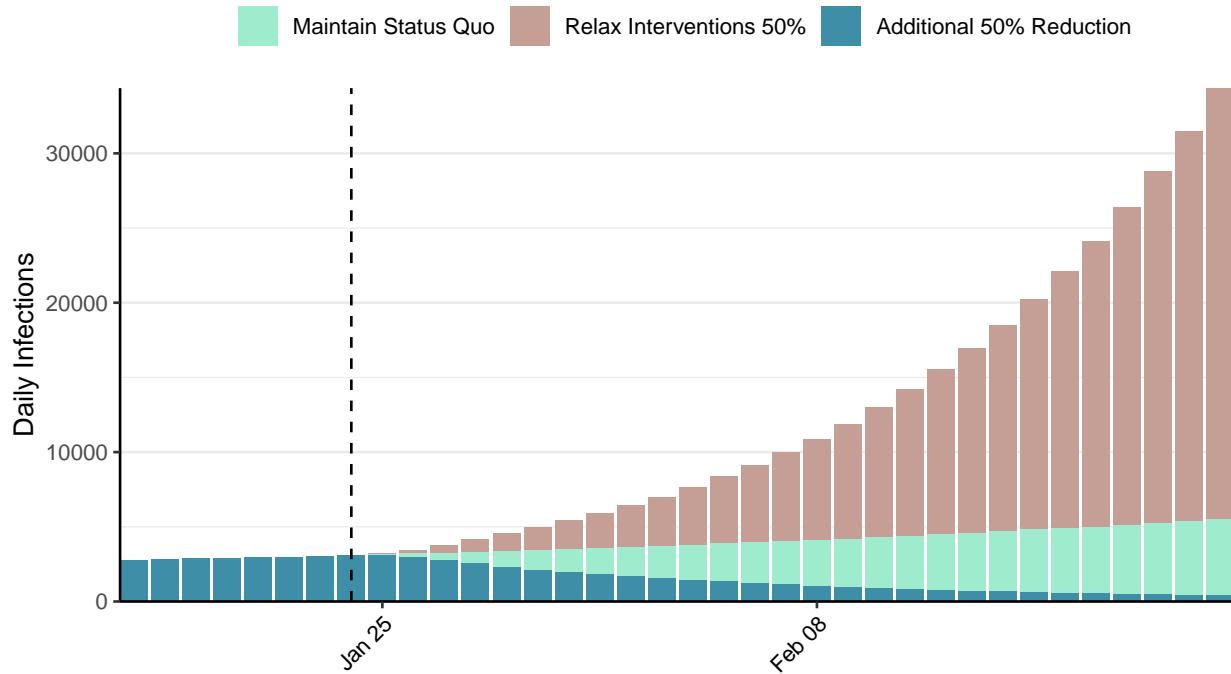


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

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Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
538	538	9	9	0.98 (95% CI: 0.77-1.17)

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. Albania is not shown in the following plot as only 9 deaths have been reported to date**

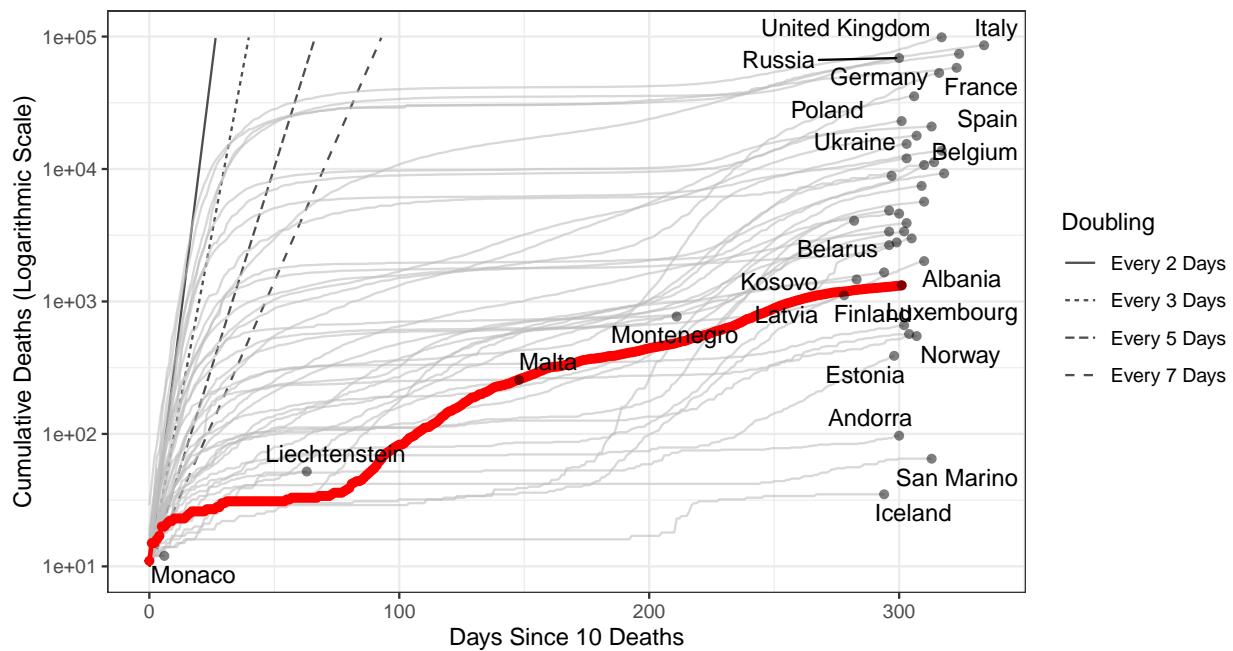


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 35,723 (95% CI: 33,970-37,477) 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

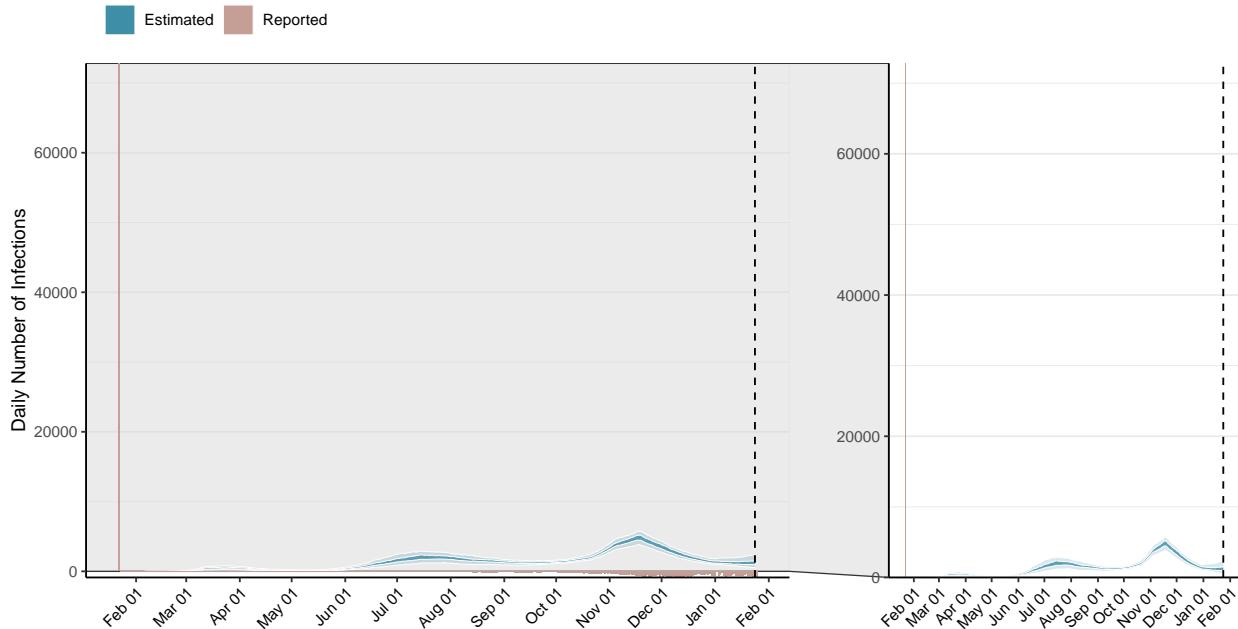


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

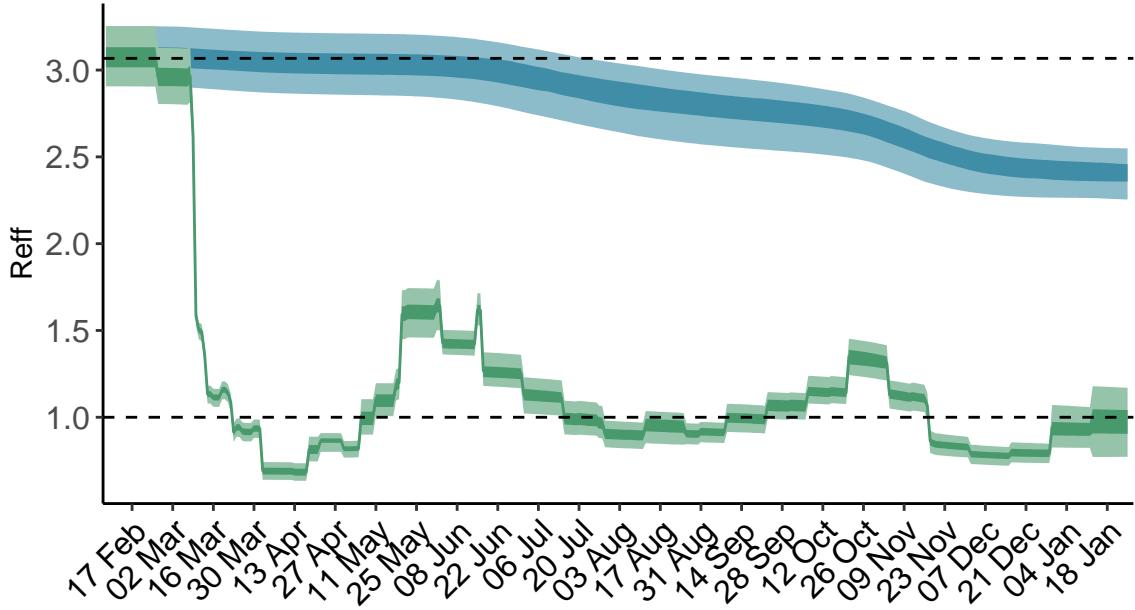


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

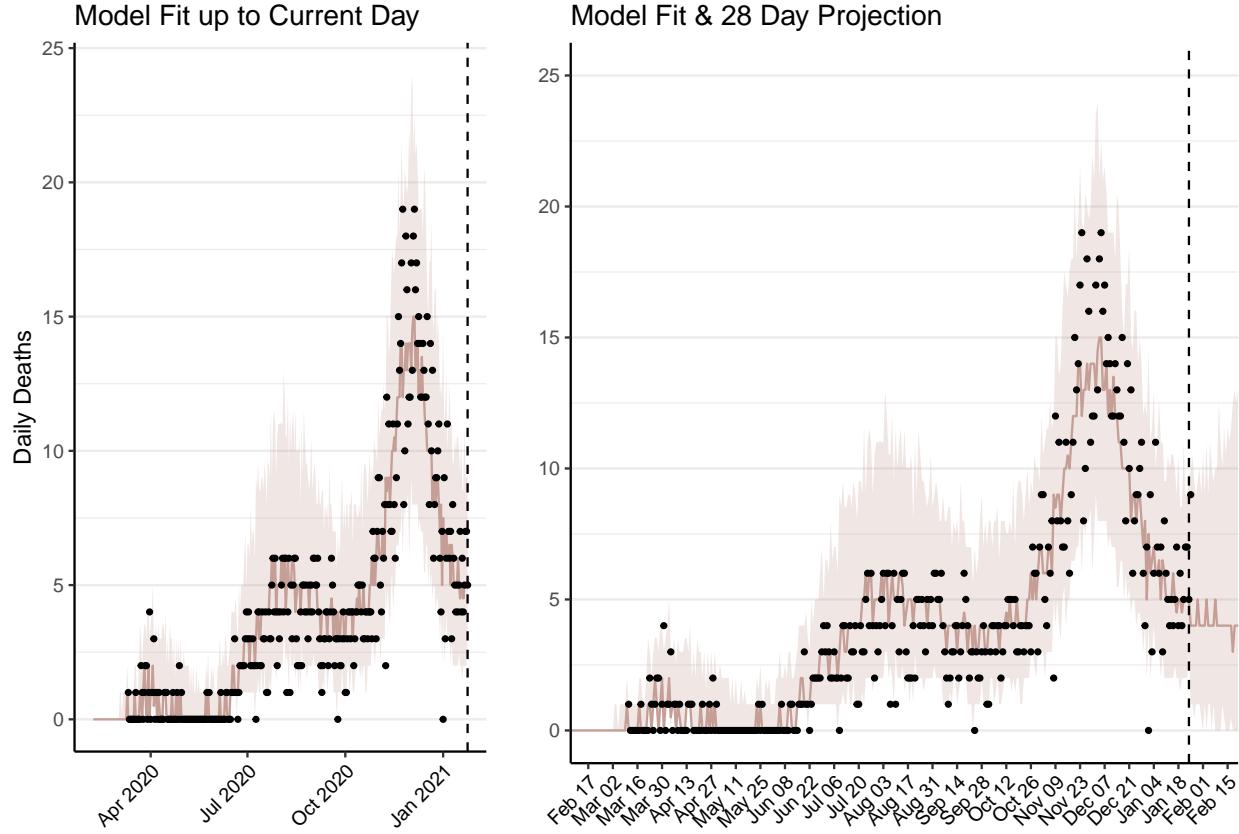


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 167 (95% CI: 157-176) patients requiring treatment with high-pressure oxygen at the current date to 167 (95% CI: 146-188) hospital beds being required on 2021-02-21 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 66 (95% CI: 62-70) patients requiring treatment with mechanical ventilation at the current date to 67 (95% CI: 59-75) by 2021-02-21. 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.**

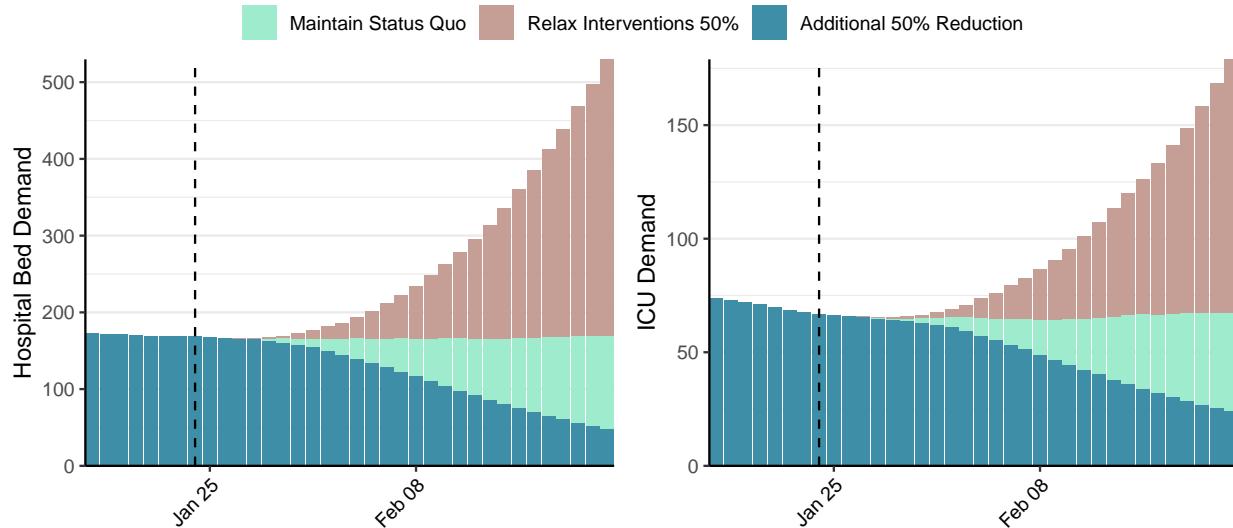


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 1,234 (95% CI: 1,137-1,332) at the current date to 113 (95% CI: 97-128) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,234 (95% CI: 1,137-1,332) at the current date to 7,347 (95% CI: 6,263-8,431) by 2021-02-21.

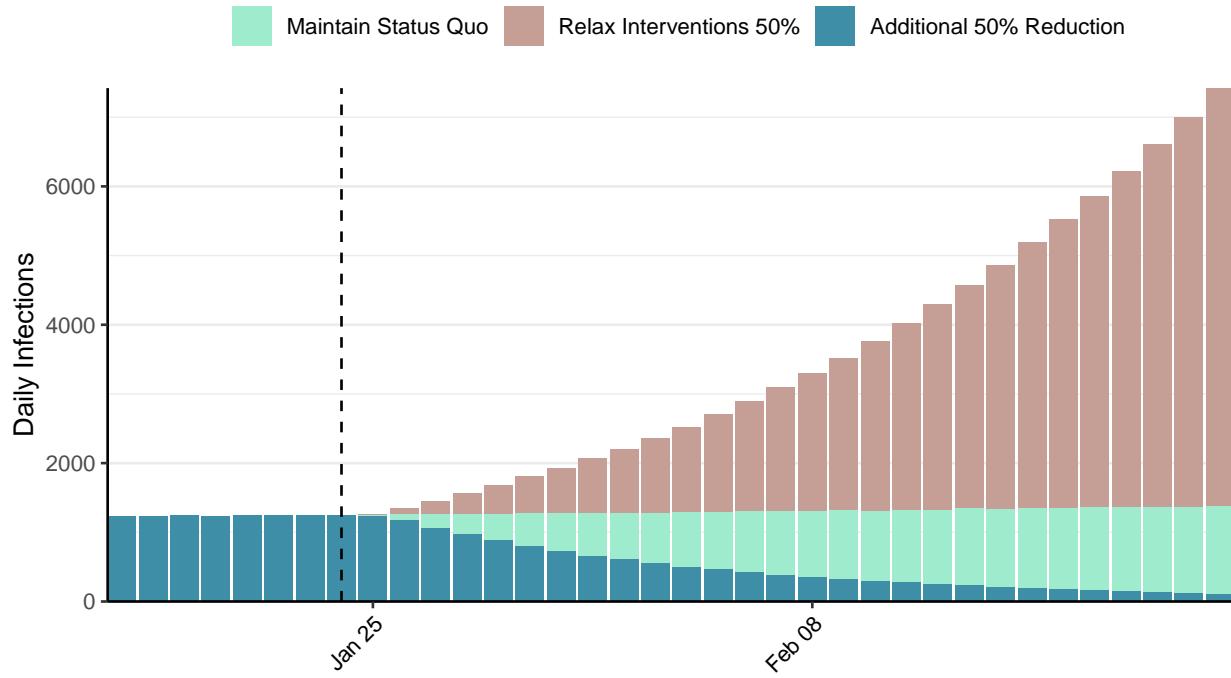


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

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Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
7,578	7,578	207	207	0.98 (95% CI: 0.77-1.25)

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.

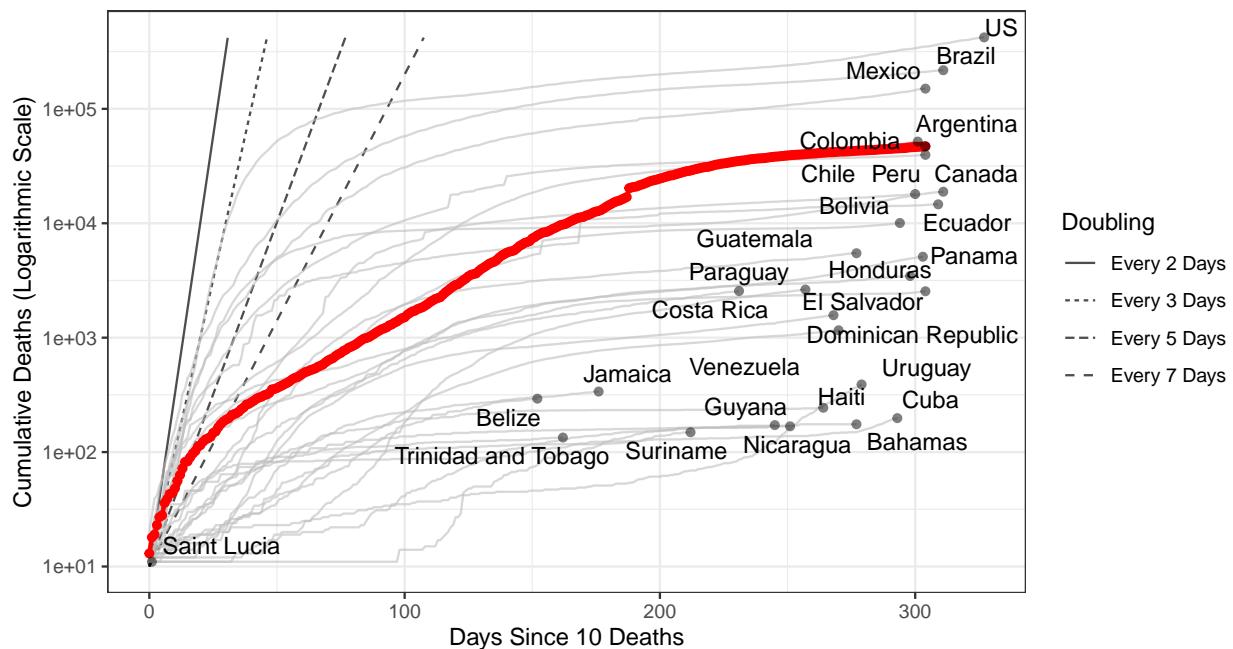


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 1,190,046 (95% CI: 1,086,494–1,293,597) 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

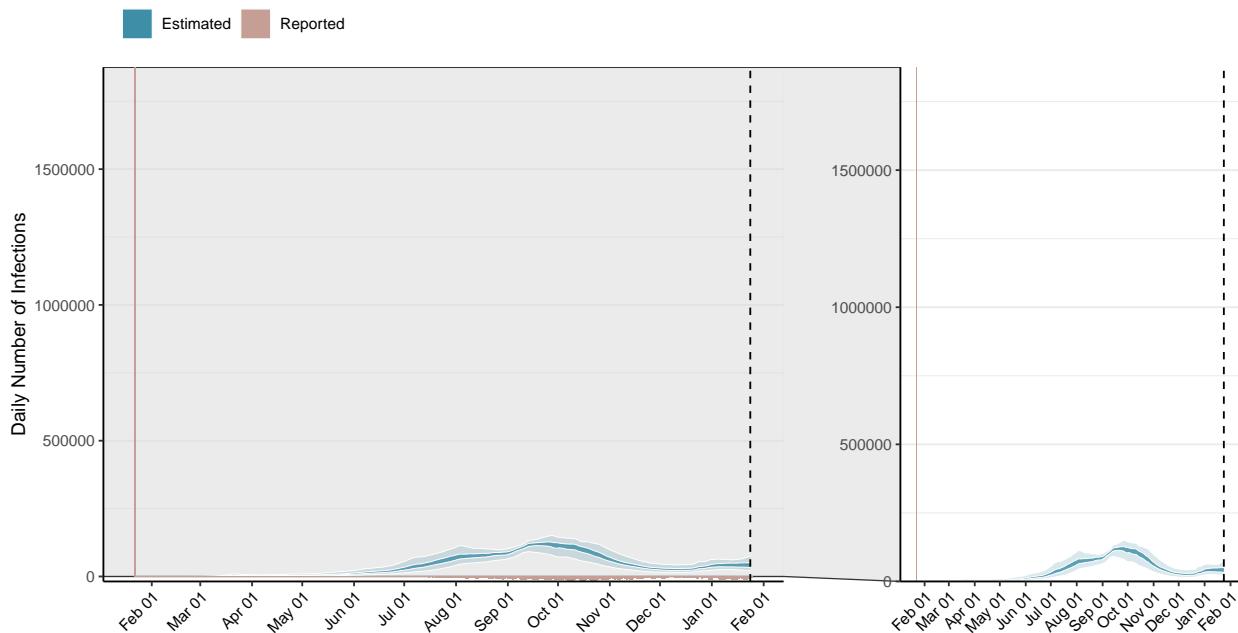


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

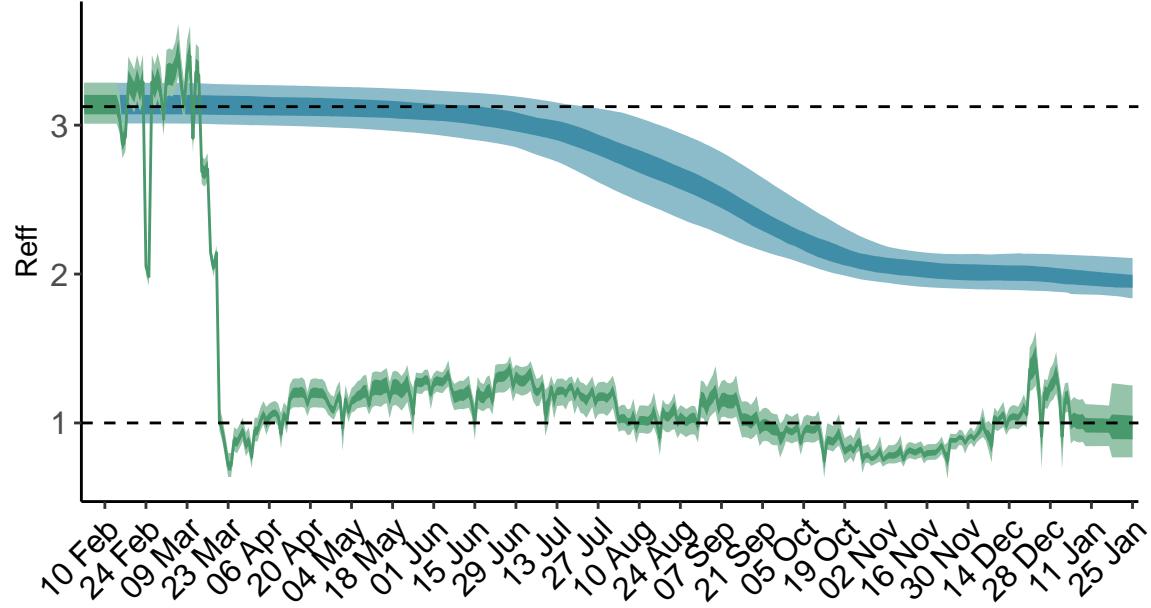


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

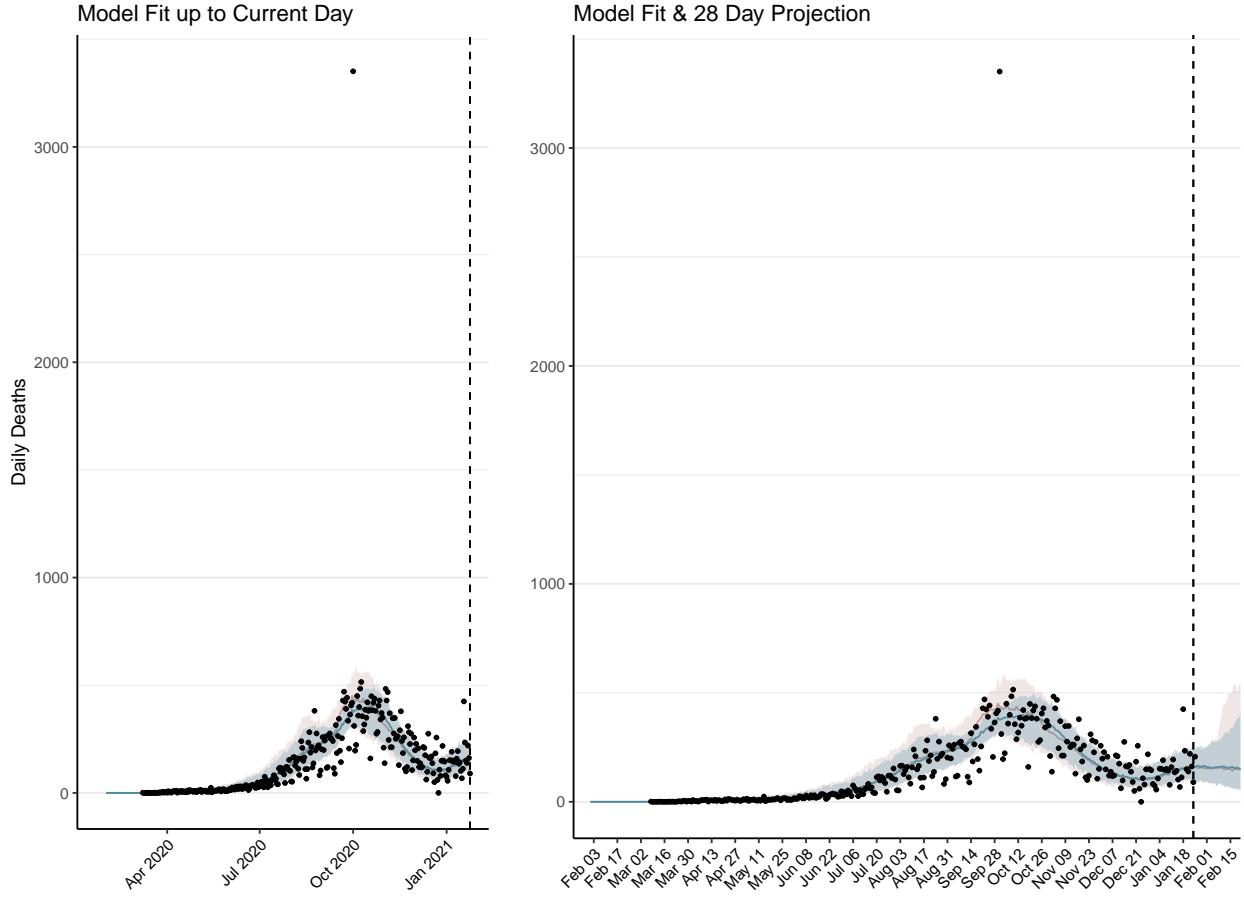


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 5,569 (95% CI: 5,080-6,058) patients requiring treatment with high-pressure oxygen at the current date to 5,967 (95% CI: 5,253-6,682) hospital beds being required on 2021-02-21 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 1,864 (95% CI: 1,764-1,965) patients requiring treatment with mechanical ventilation at the current date to 1,967 (95% CI: 1,783-2,152) by 2021-02-21. 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.**

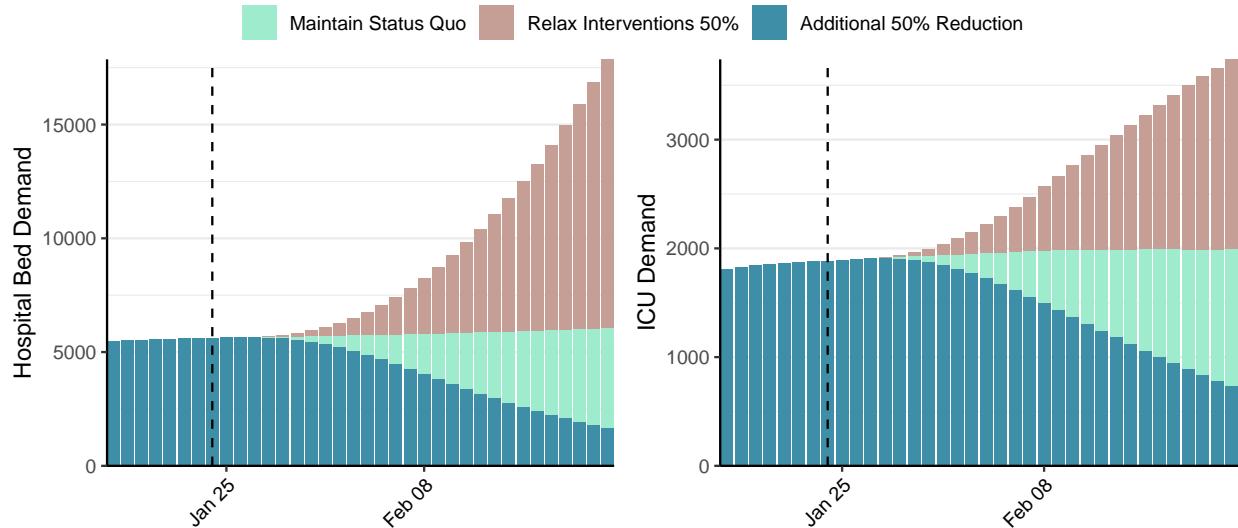


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 43,245 (95% CI: 39,575-46,914) at the current date to 4,068 (95% CI: 3,496-4,640) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 43,245 (95% CI: 39,575-46,914) at the current date to 220,130 (95% CI: 191,318-248,941) by 2021-02-21.

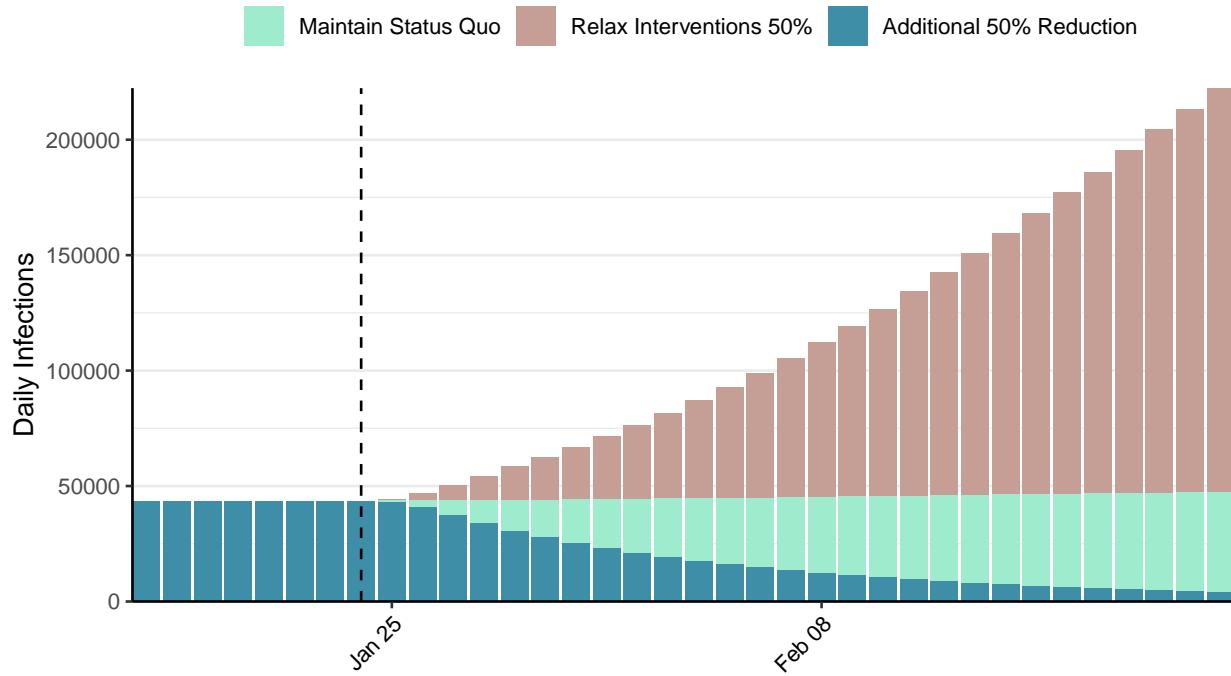


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Armenia, 2021-01-24 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}
58	58	8	8	0.73 (95% CI: 0.5-0.98)

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. Armenia is not shown in the following plot as only 8 deaths have been reported to date**

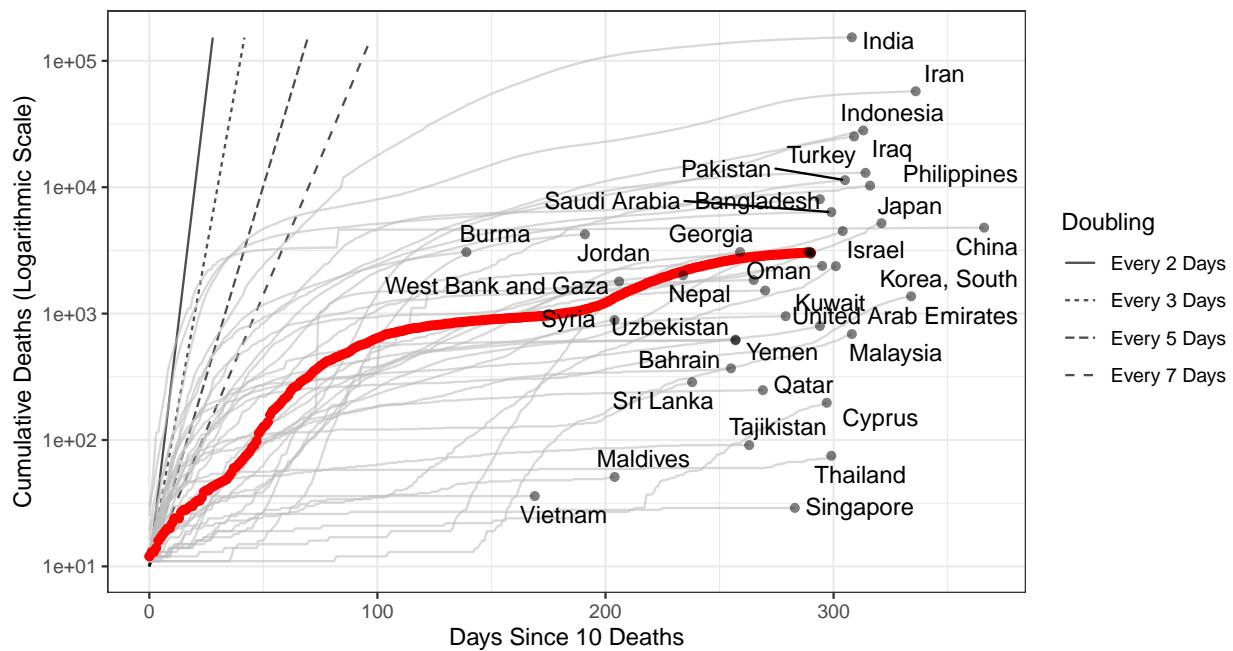


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 35,587 (95% CI: 33,846-37,328) 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).

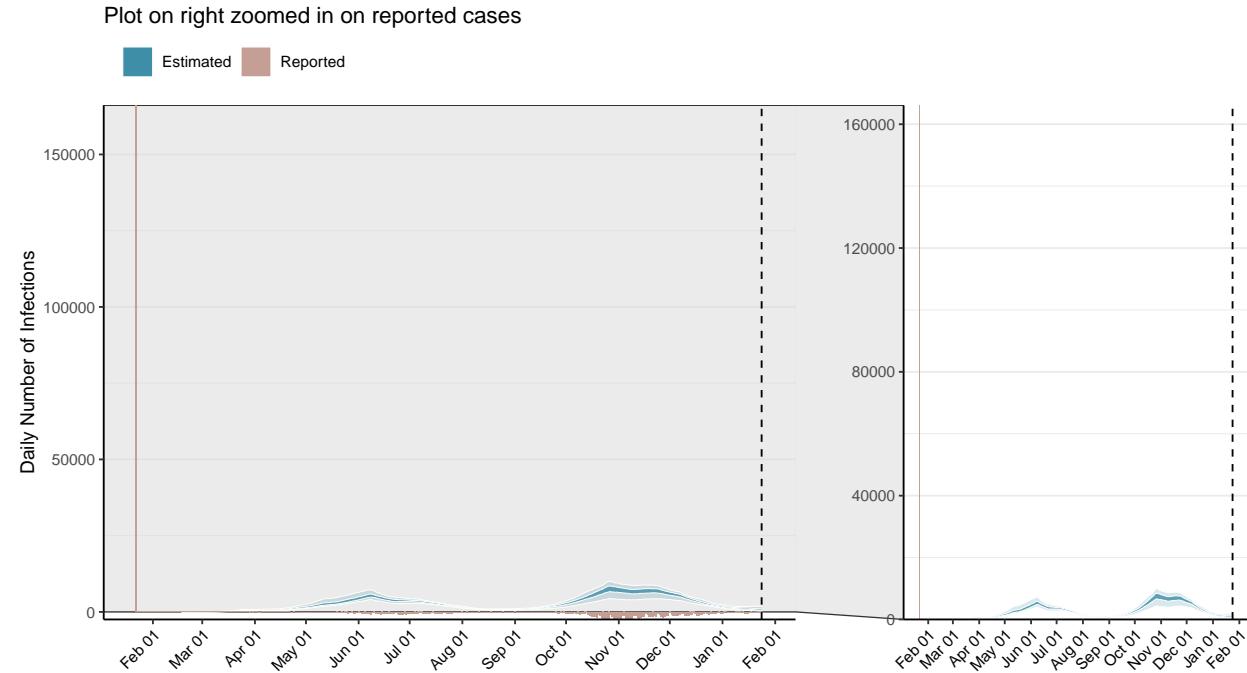


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

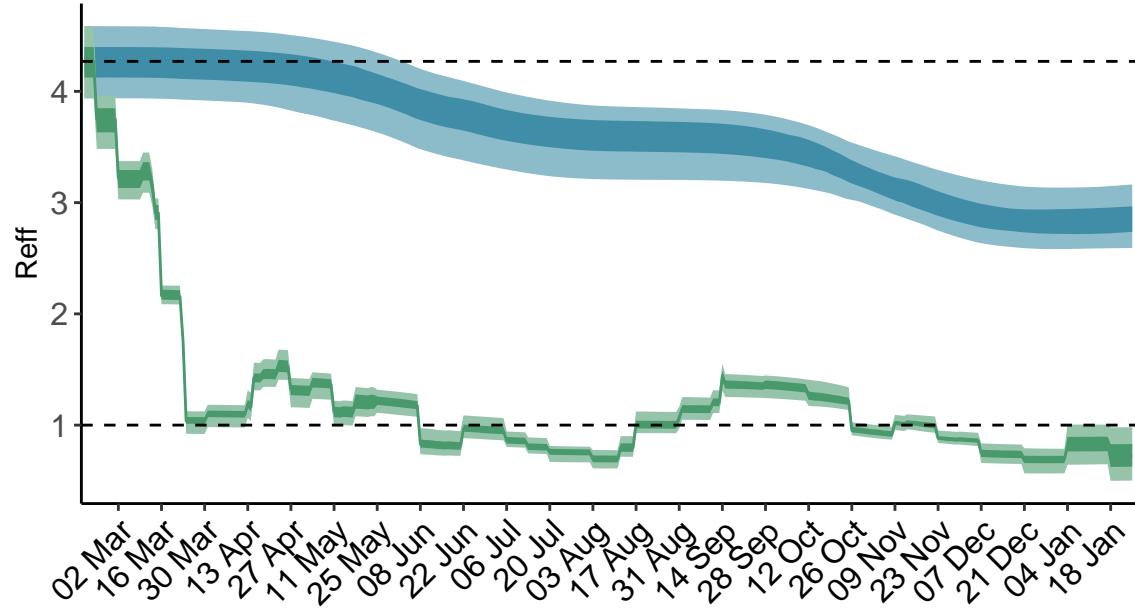


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

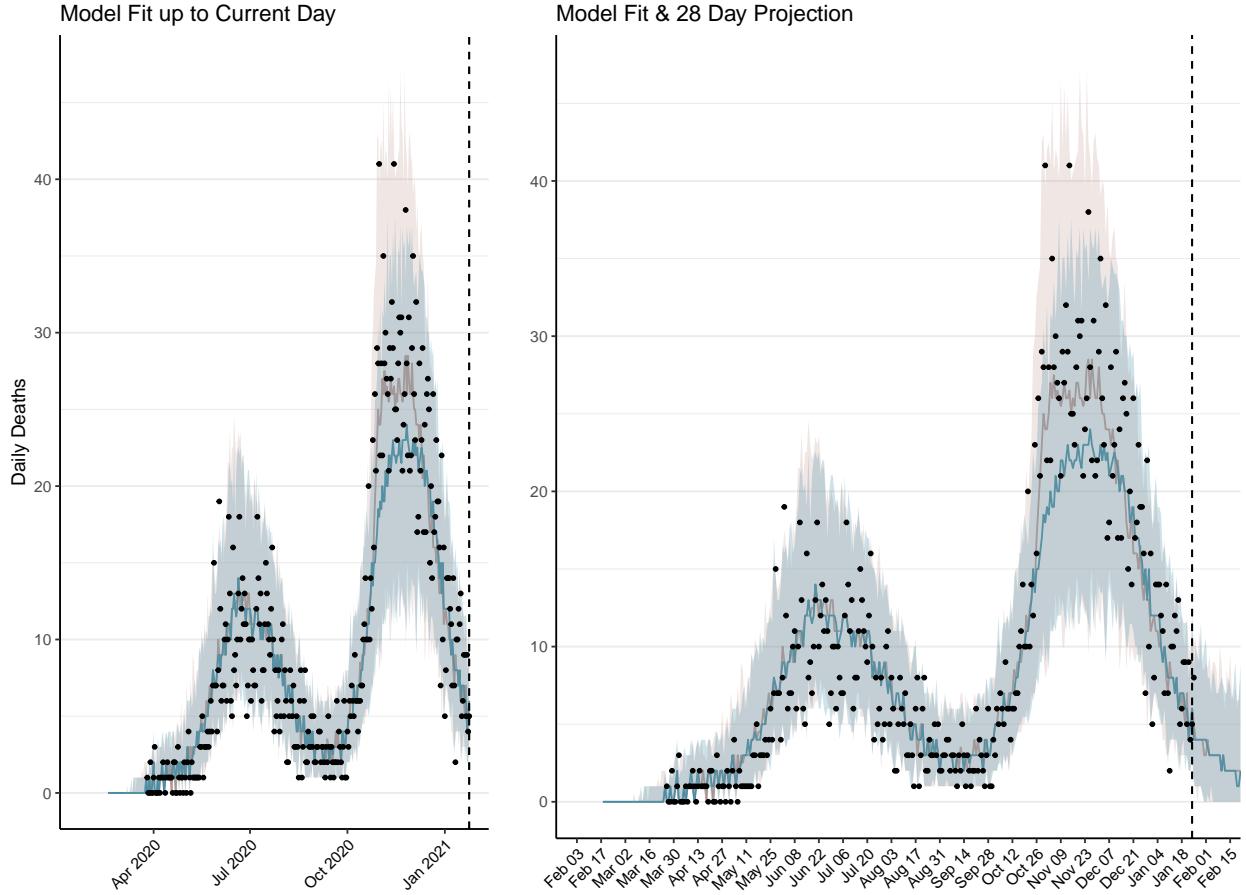


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 161 (95% CI: 152-170) patients requiring treatment with high-pressure oxygen at the current date to 68 (95% CI: 56-79) hospital beds being required on 2021-02-21 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 69 (95% CI: 65-72) patients requiring treatment with mechanical ventilation at the current date to 29 (95% CI: 25-34) by 2021-02-21. 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.**

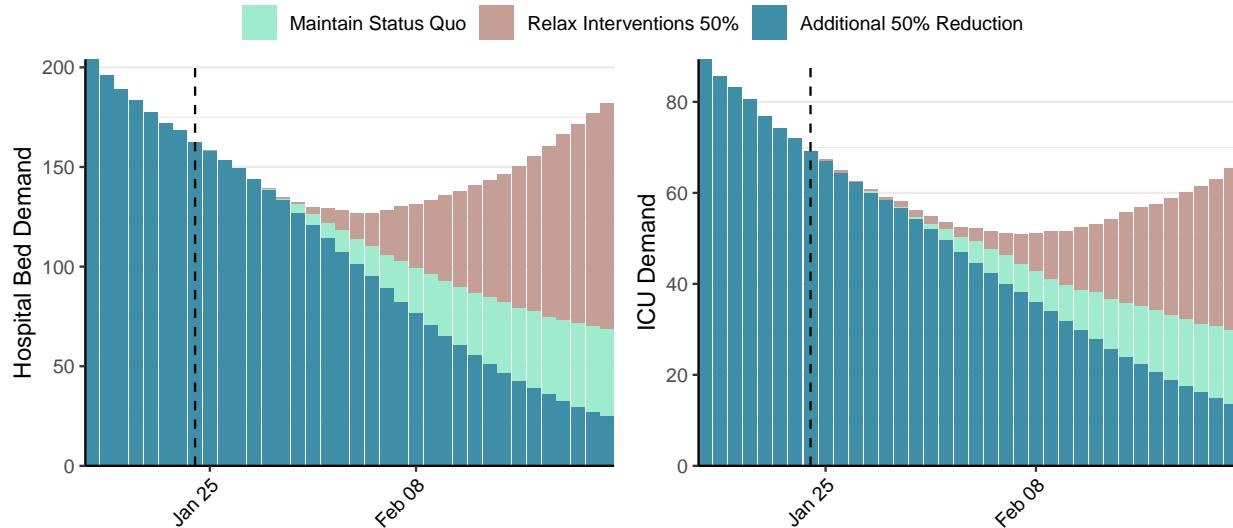


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 810 (95% CI: 732-888) at the current date to 36 (95% CI: 28-45) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 810 (95% CI: 732-888) at the current date to 1,943 (95% CI: 1,442-2,444) by 2021-02-21.

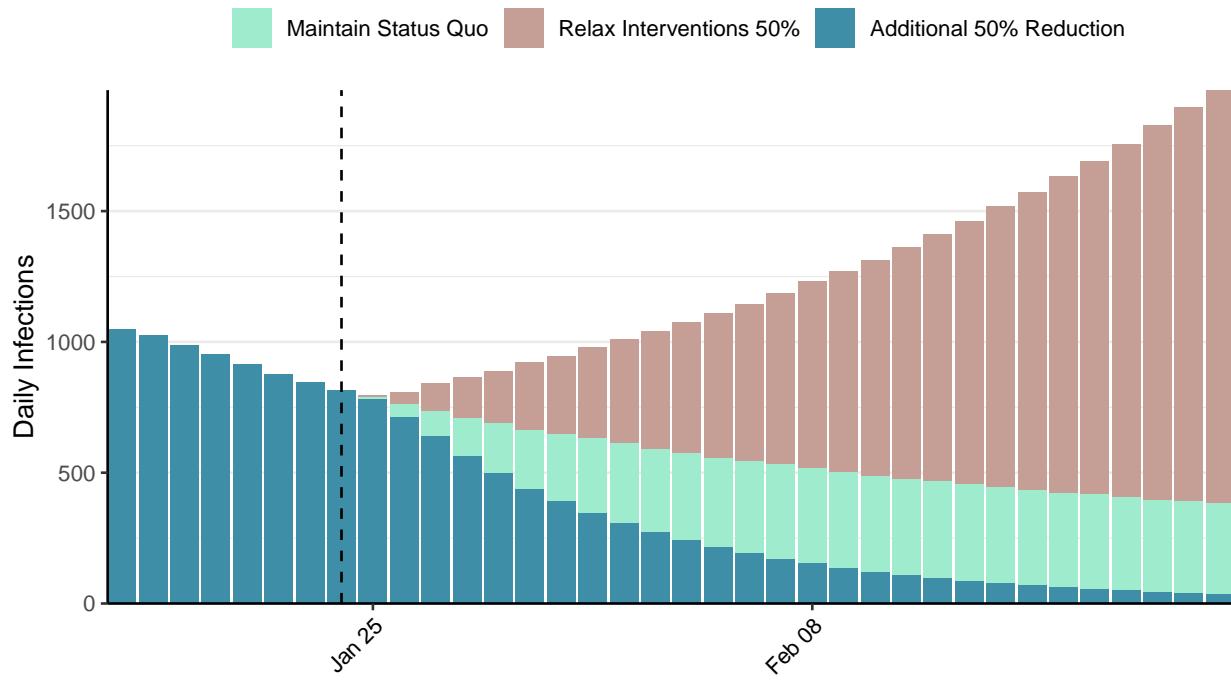


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Azerbaijan, 2021-01-24 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}
57	57	11	11	0.67 (95% CI: 0.55-0.8)

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.

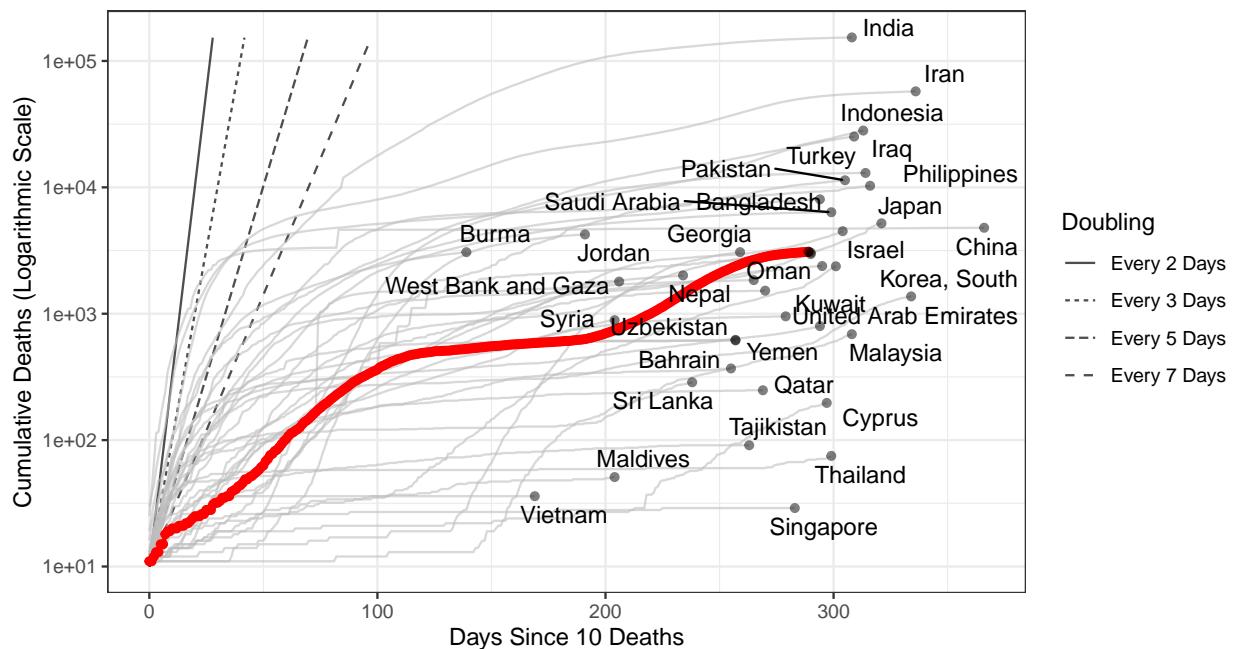


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 104,959 (95% CI: 100,160-109,759) 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).

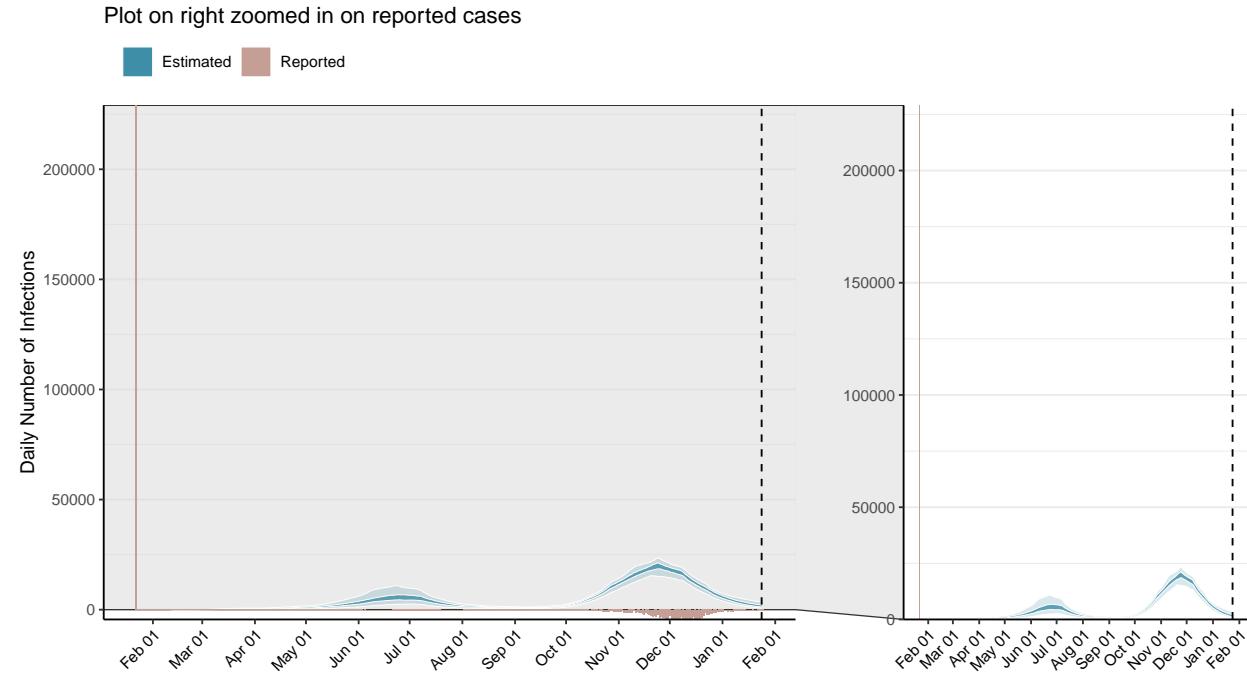


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

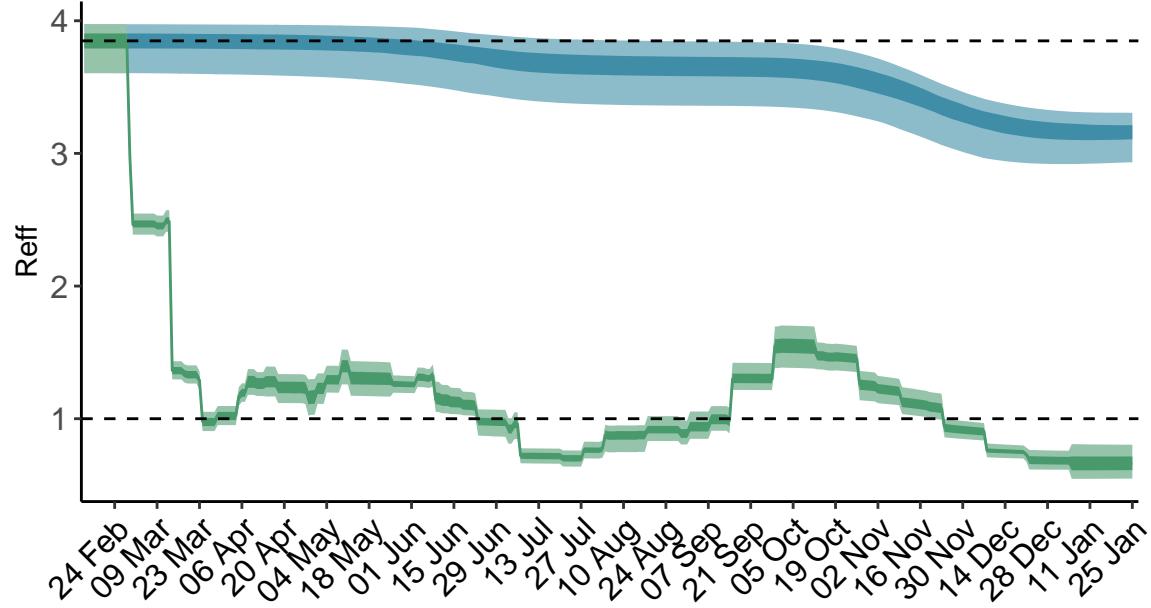


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

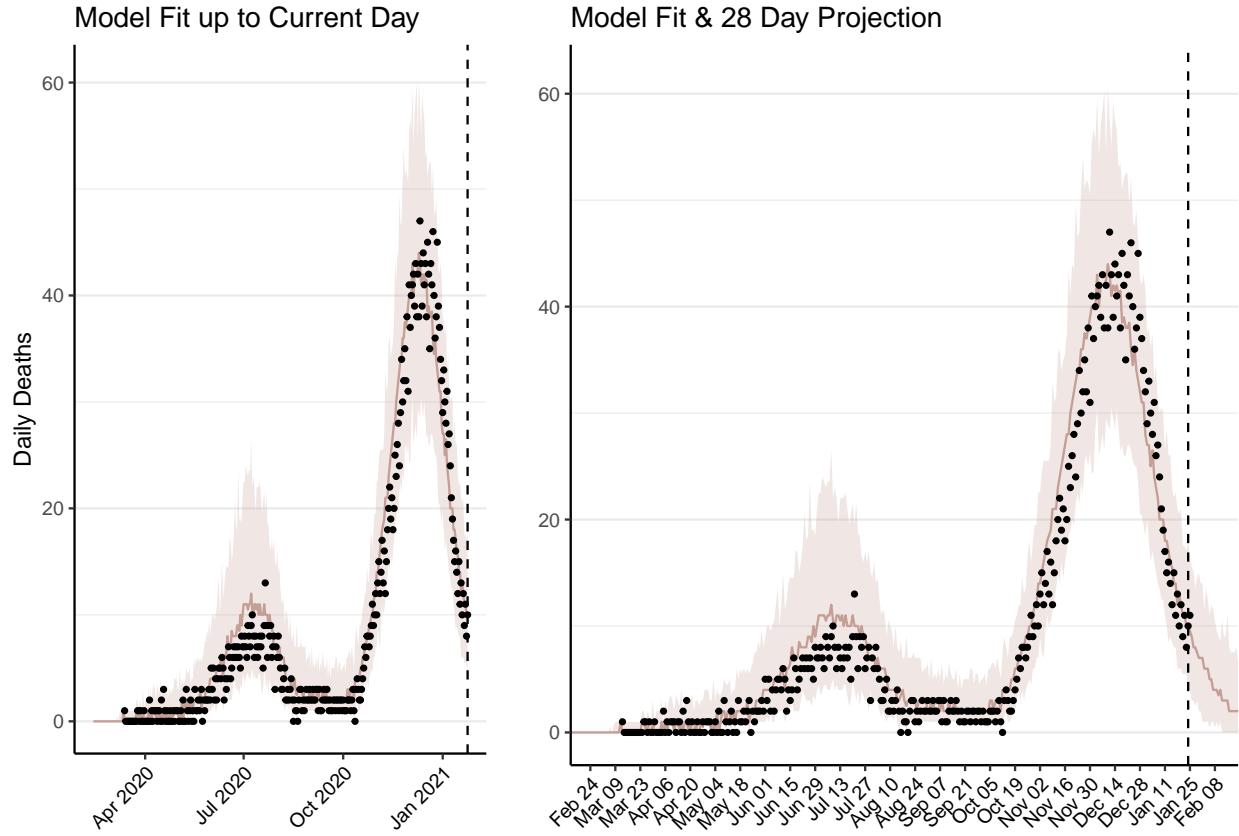


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 333 (95% CI: 316-350) patients requiring treatment with high-pressure oxygen at the current date to 82 (95% CI: 72-92) hospital beds being required on 2021-02-21 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 160 (95% CI: 152-167) patients requiring treatment with mechanical ventilation at the current date to 39 (95% CI: 35-43) by 2021-02-21. 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.**

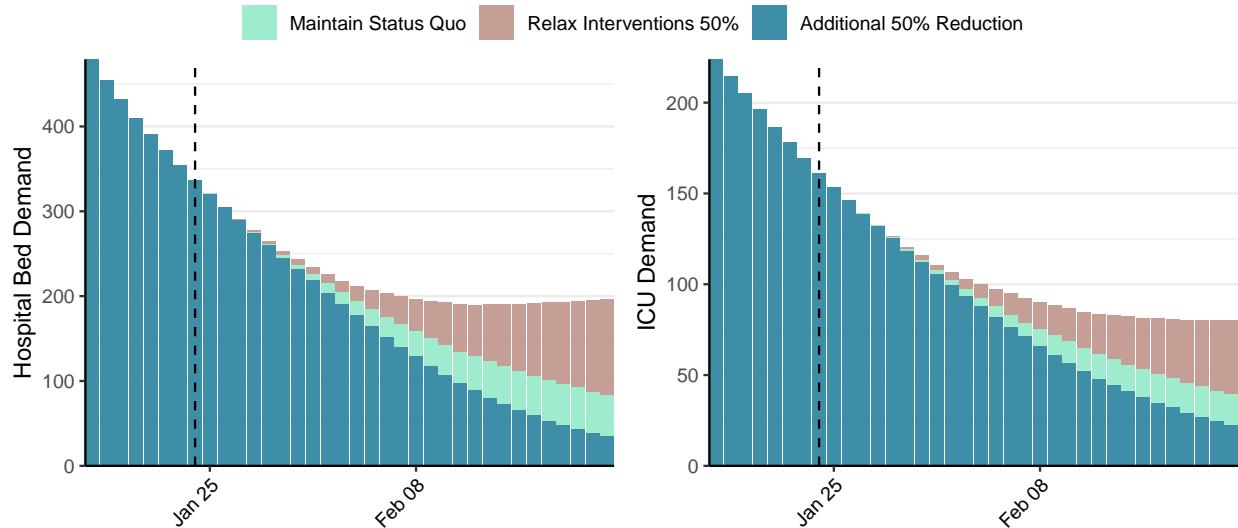


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 1,698 (95% CI: 1,552-1,843) at the current date to 48 (95% CI: 40-55) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,698 (95% CI: 1,552-1,843) at the current date to 2,146 (95% CI: 1,768-2,525) by 2021-02-21.

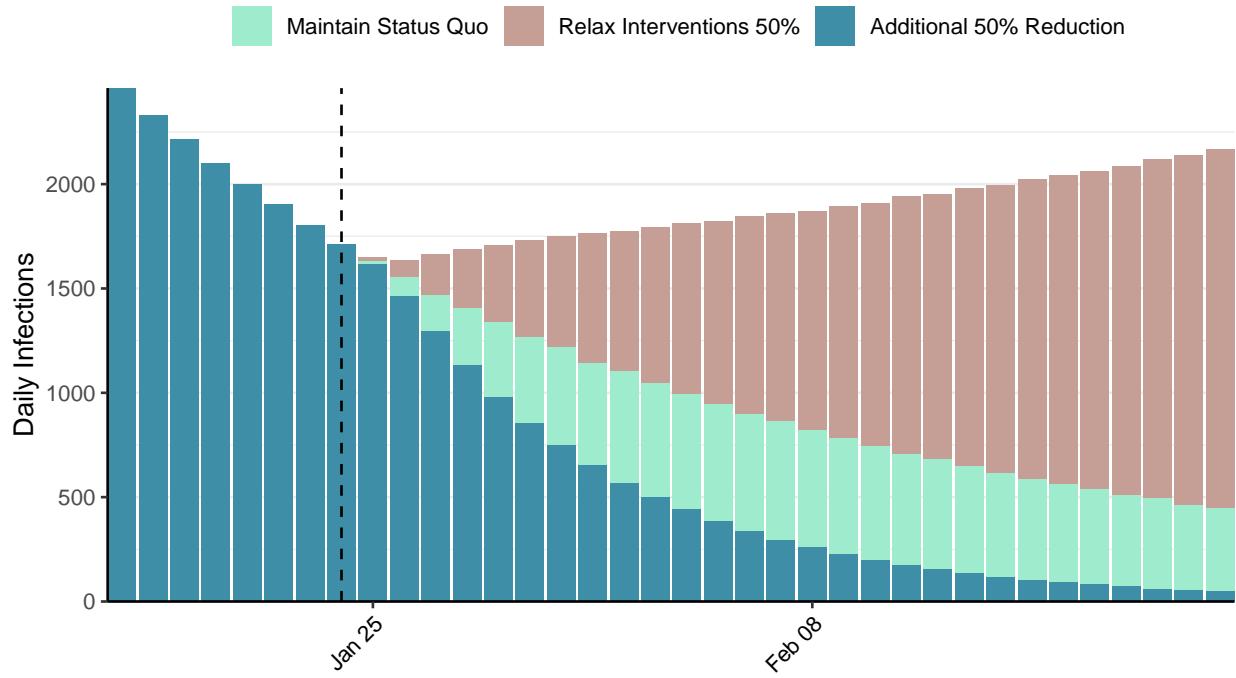


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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: Burundi, 2021-01-24

[Download the report for Burundi, 2021-01-24 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}
7	7	0	0	0.82 (95% CI: 0.54-1.11)

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. Burundi is not shown in the following plot as only 0 deaths have been reported to date**

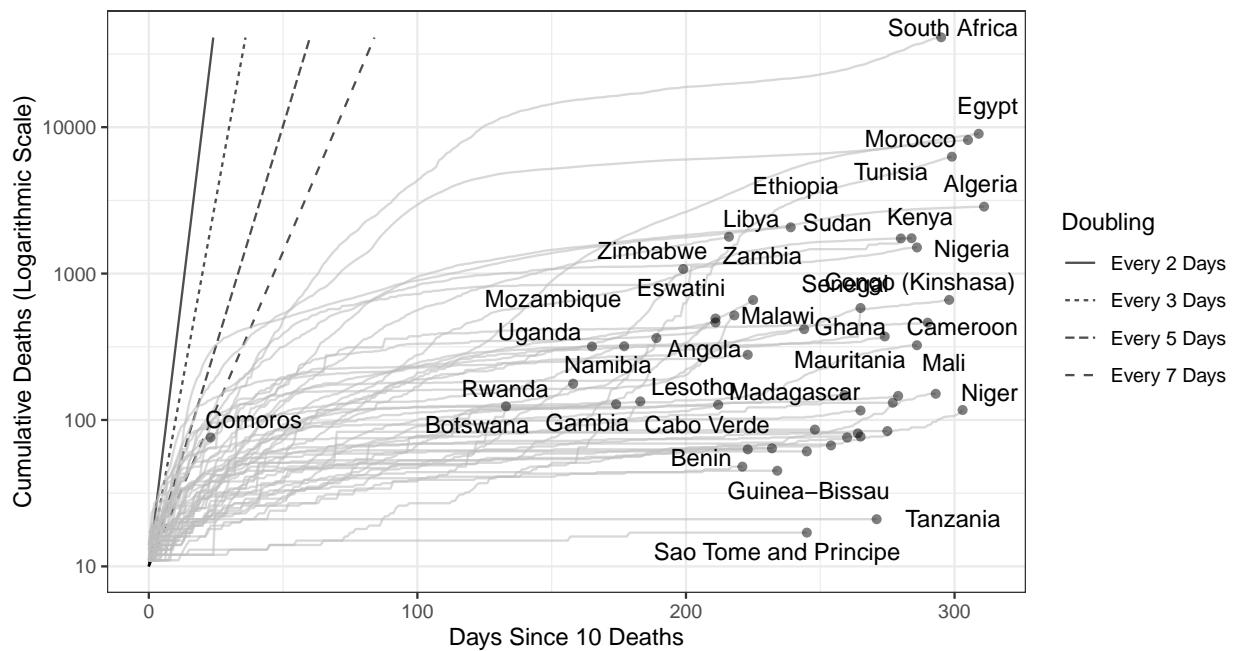


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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: -1-2) 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).

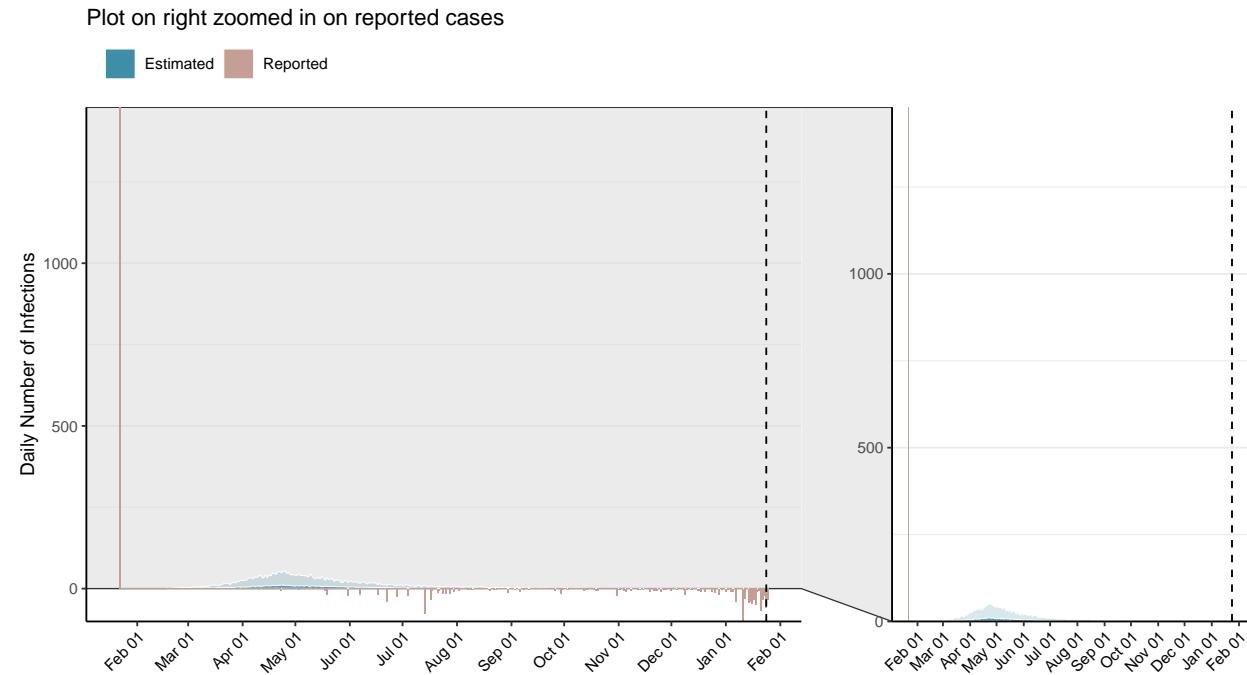


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

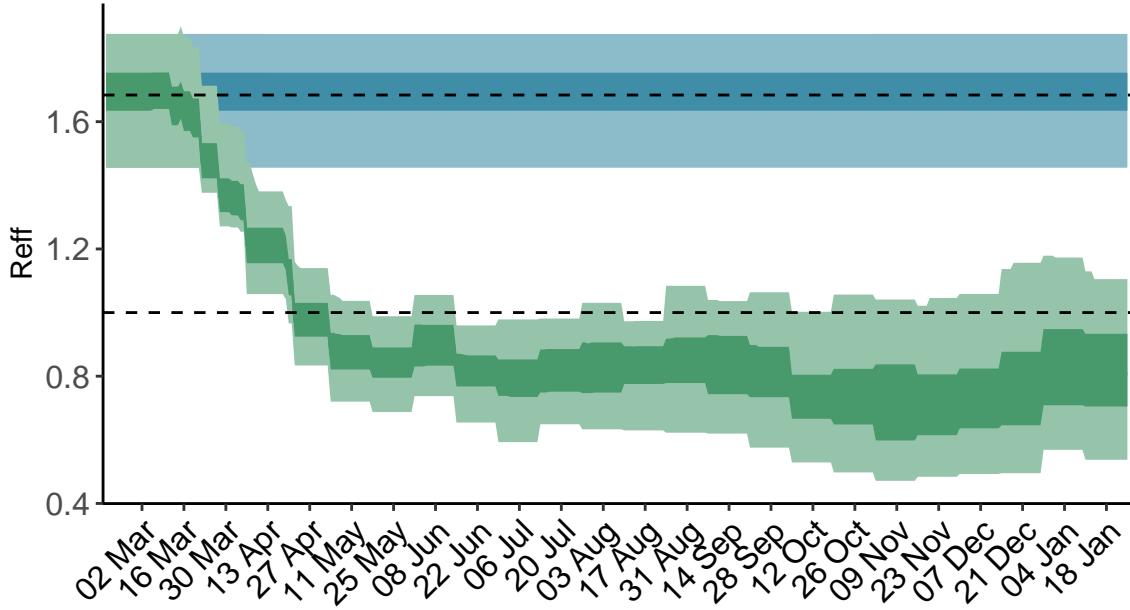


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

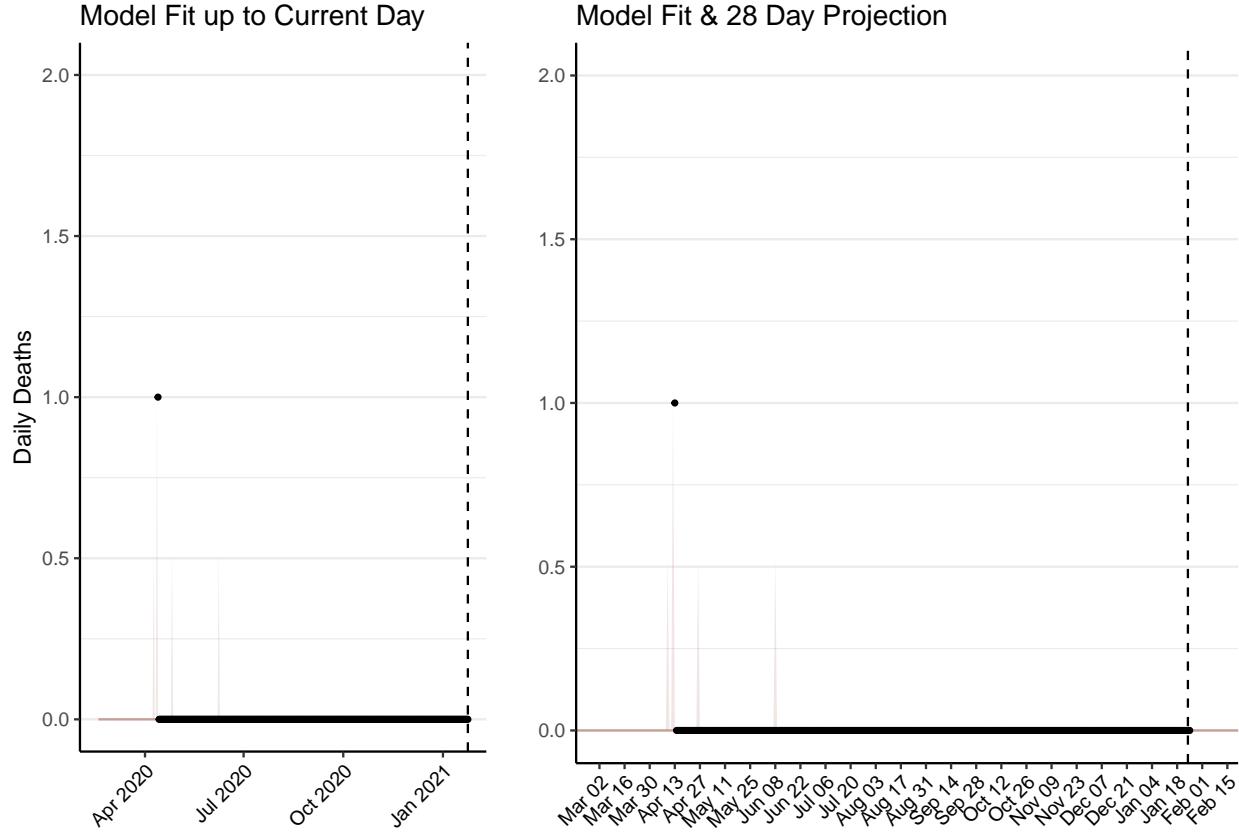


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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: NaN-NaN) hospital beds being required on 2021-02-21 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 2021-02-21. 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.**

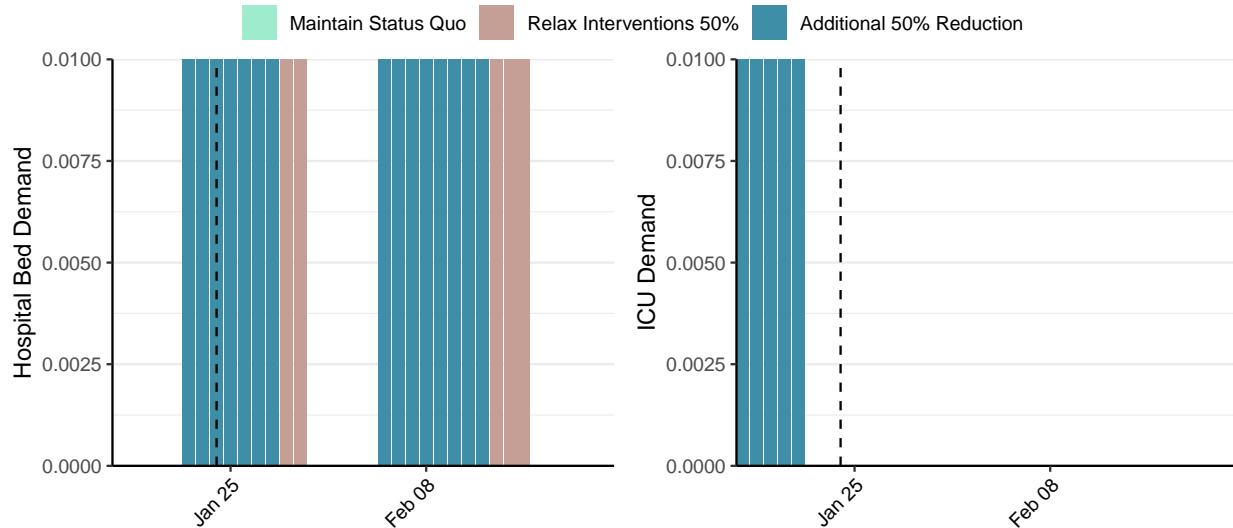


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 2021-02-21. 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 2021-02-21.

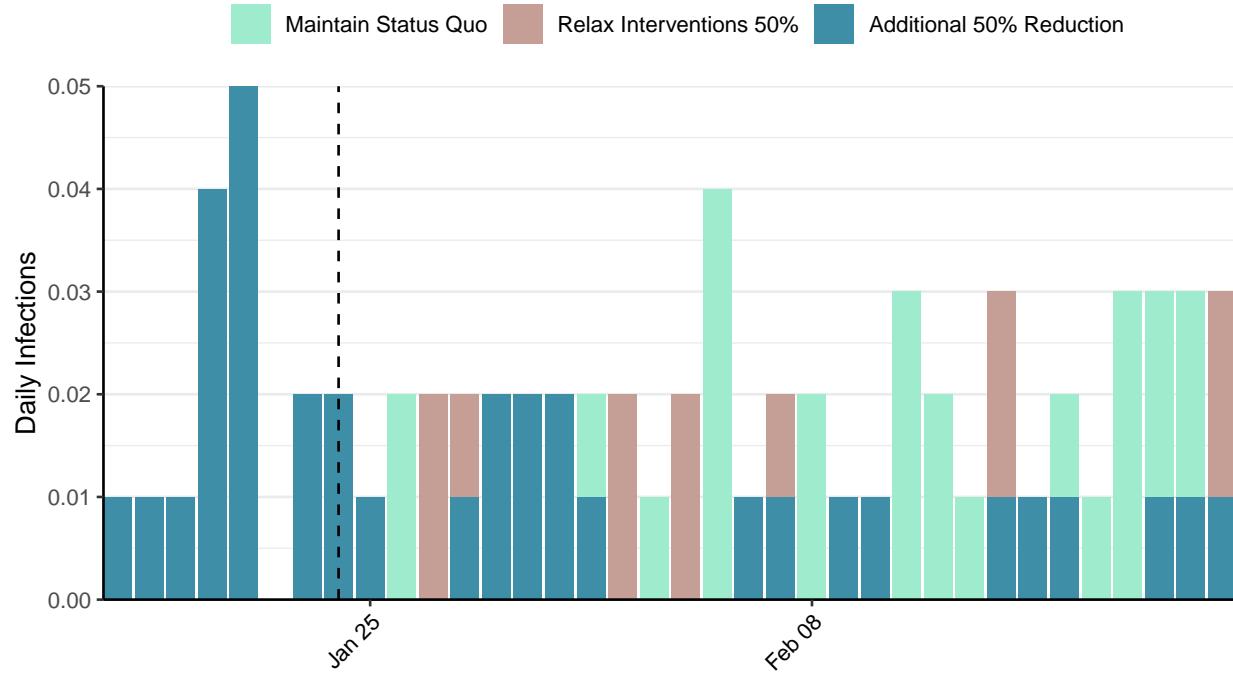


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Benin, 2021-01-24 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	1.3 (95% CI: 1.02-1.75)

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. Benin is not shown in the following plot as only 0 deaths have been reported to date**

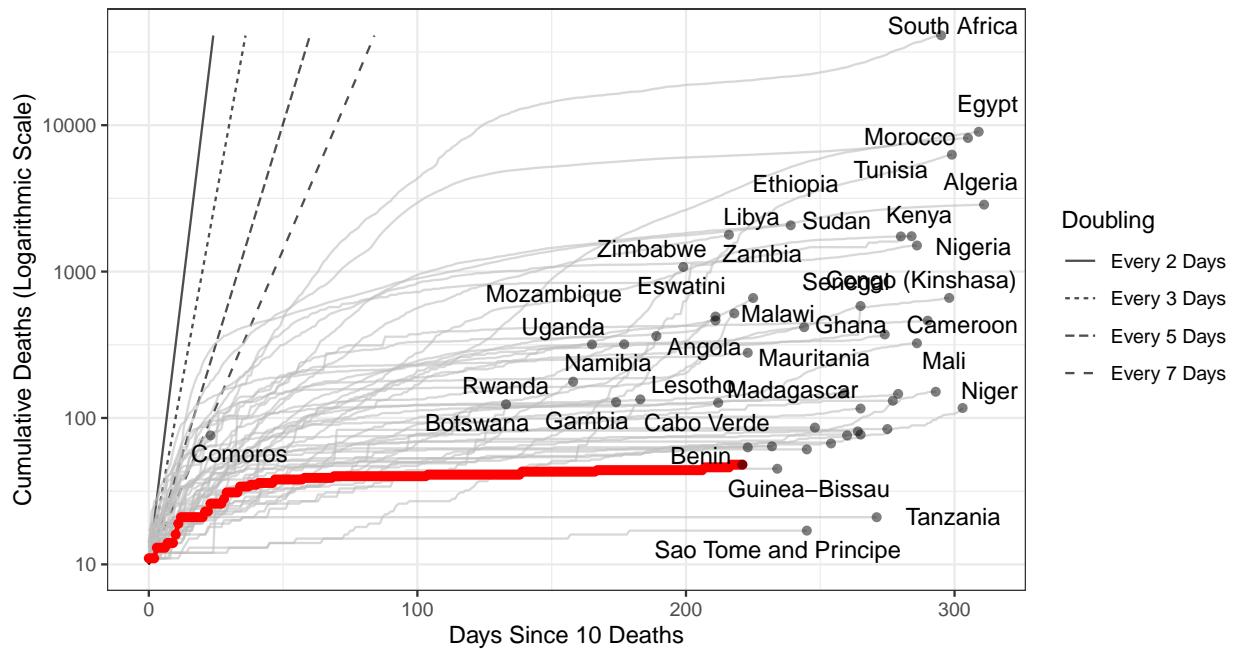


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 3,821 (95% CI: 3,222-4,420) 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.**

Plot on right zoomed in on reported cases

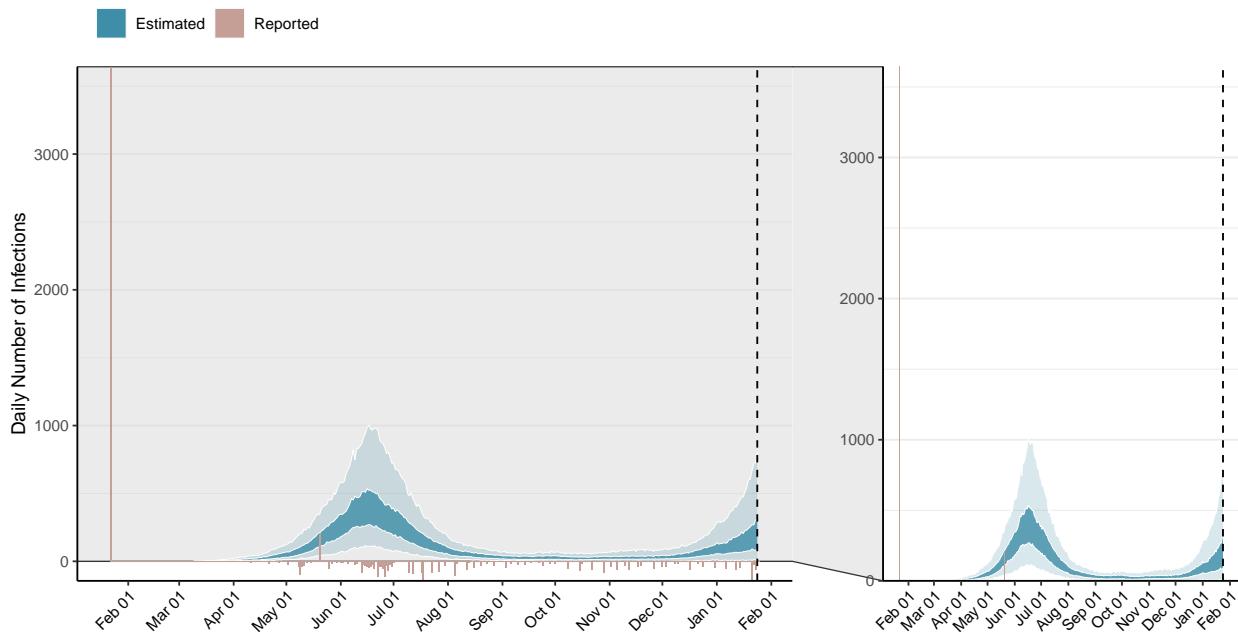


Figure 2: Daily number of infections estimated by fitting to the current total of deaths. Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

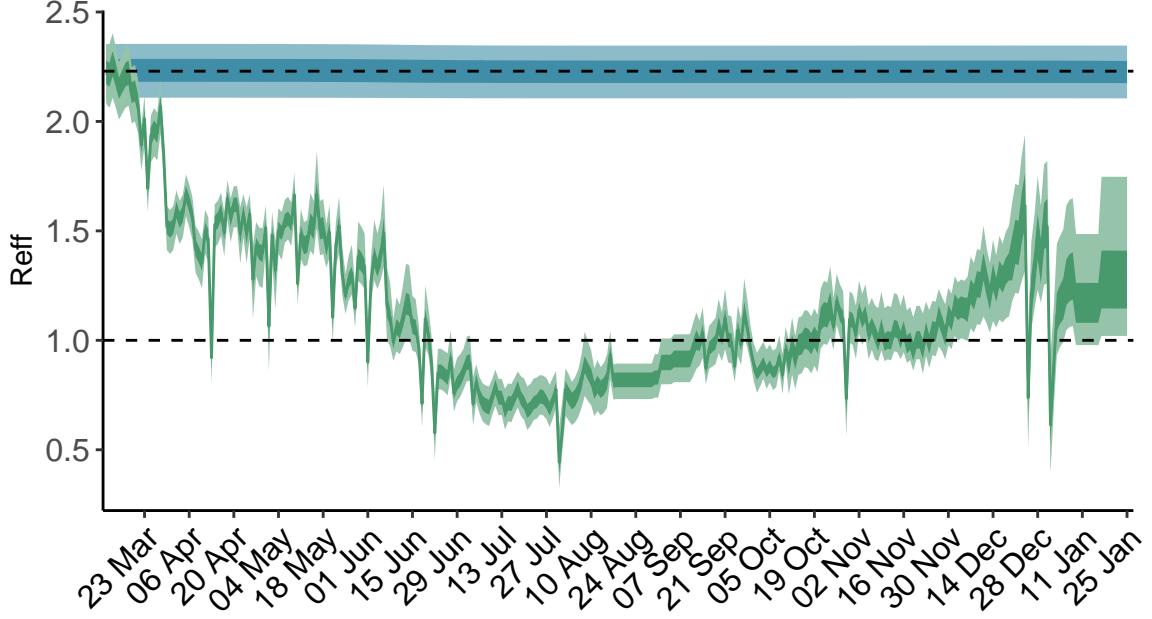


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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. Benin 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.](#)

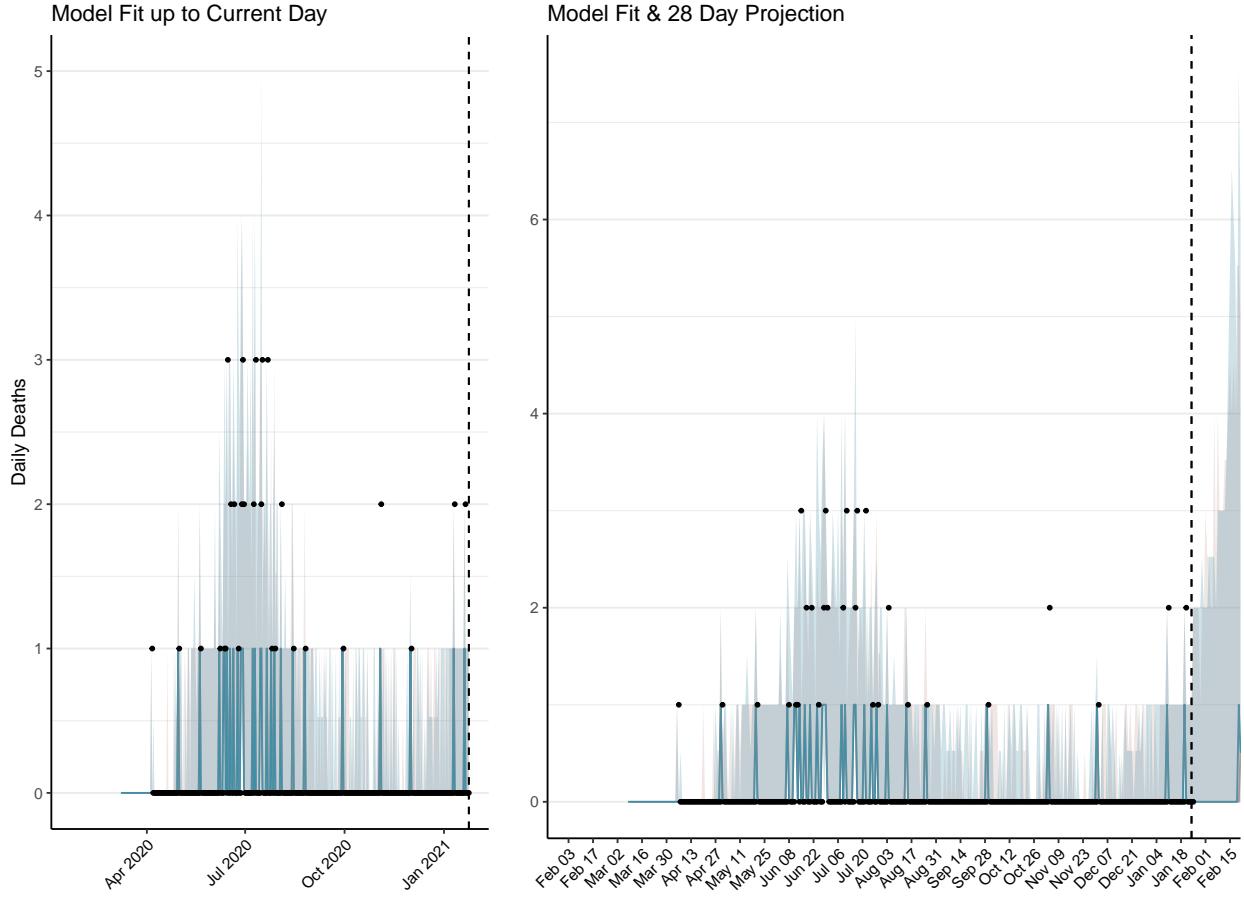


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 (95% CI: 10-14) patients requiring treatment with high-pressure oxygen at the current date to 54 (95% CI: 37-72) hospital beds being required on 2021-02-21 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 18 (95% CI: 13-24) by 2021-02-21. 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.**

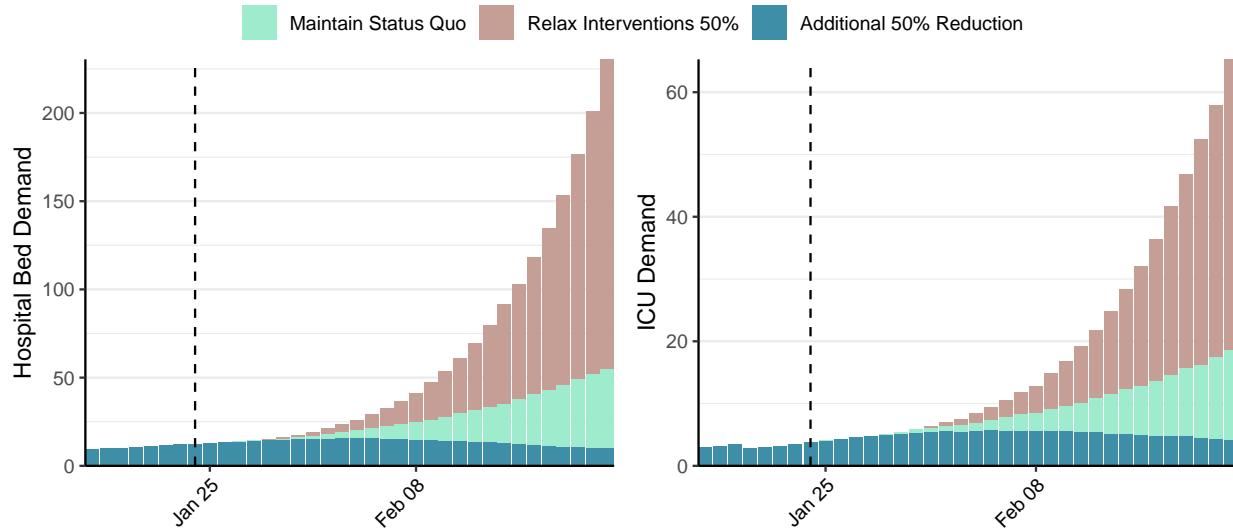


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 228 (95% CI: 183-273) at the current date to 73 (95% CI: 47-99) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 228 (95% CI: 183-273) at the current date to 9,368 (95% CI: 5,586-13,149) by 2021-02-21.

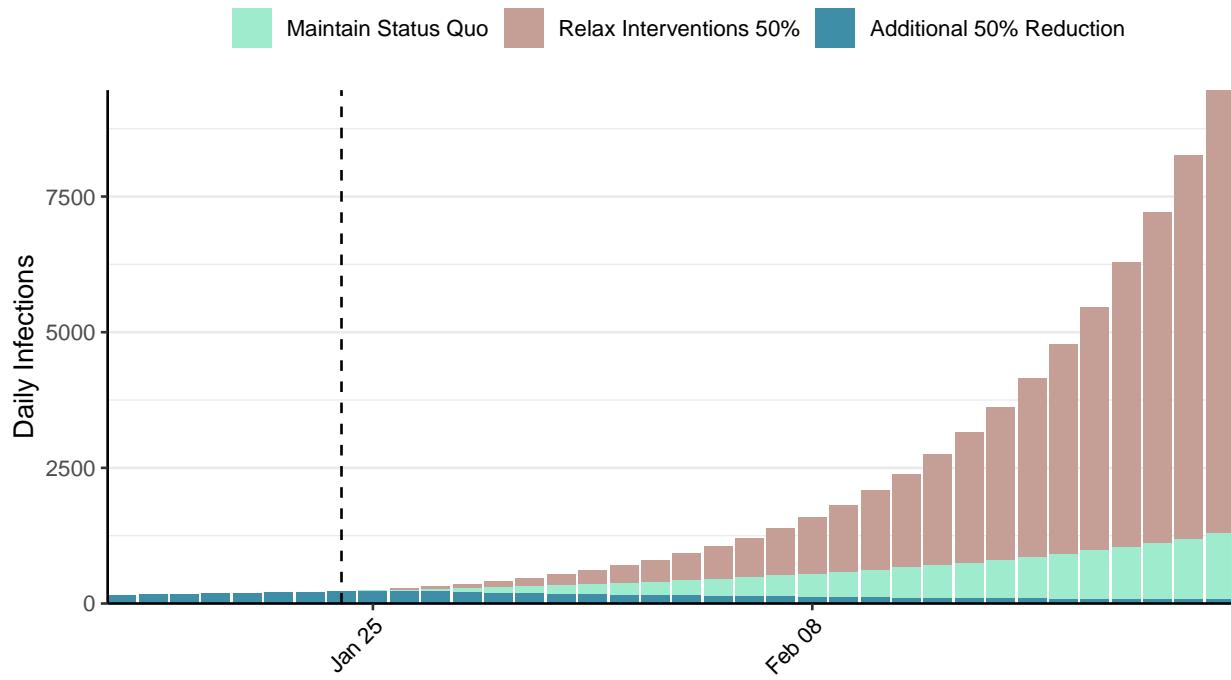


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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: Burkina Faso, 2021-01-24

[Download the report for Burkina Faso, 2021-01-24 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}
65	65	5	5	1.13 (95% CI: 0.93-1.34)

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. Burkina Faso is not shown in the following plot as only 5 deaths have been reported to date**

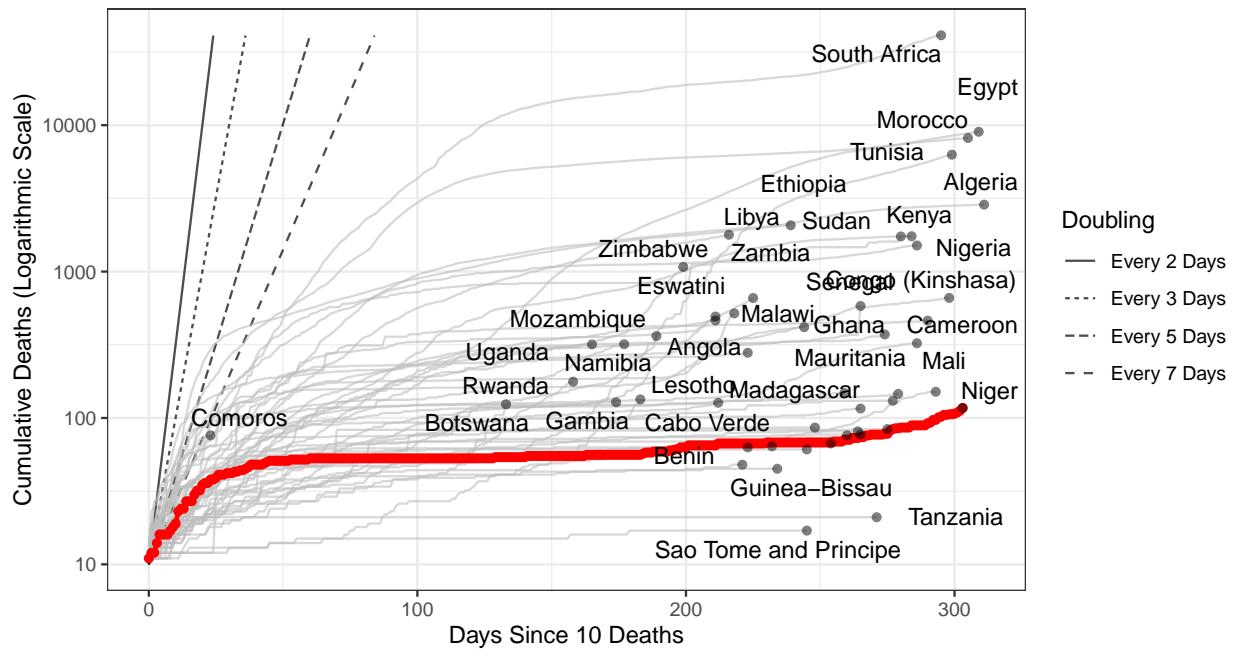


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 55,860 (95% CI: 51,088-60,632) 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

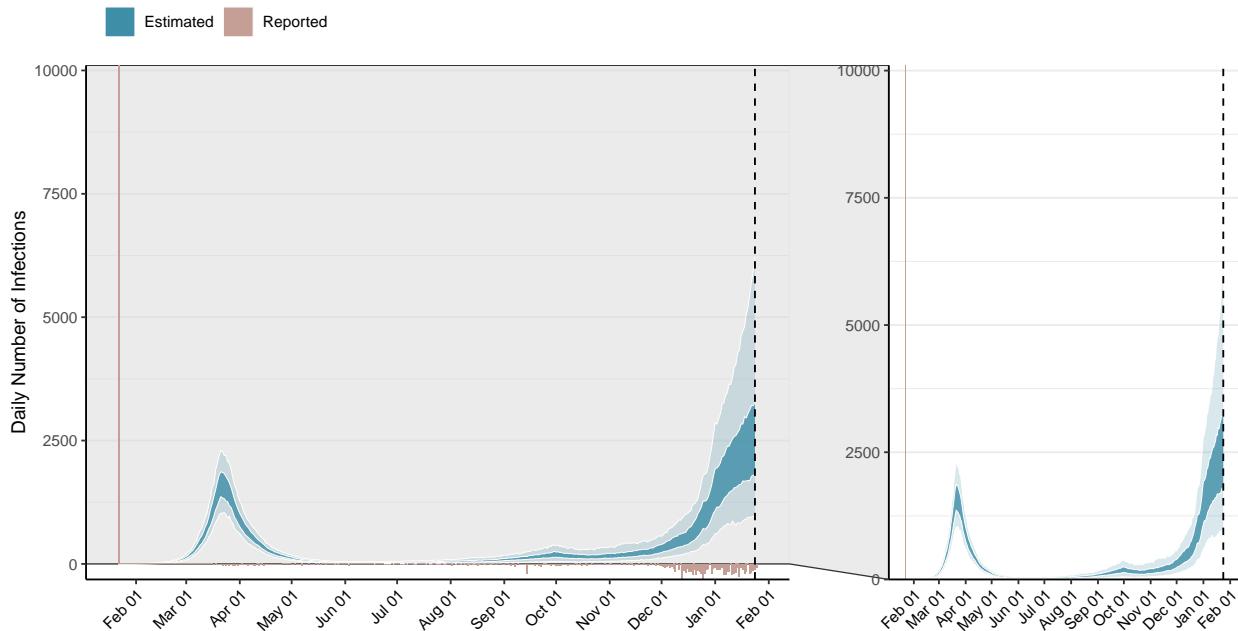


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

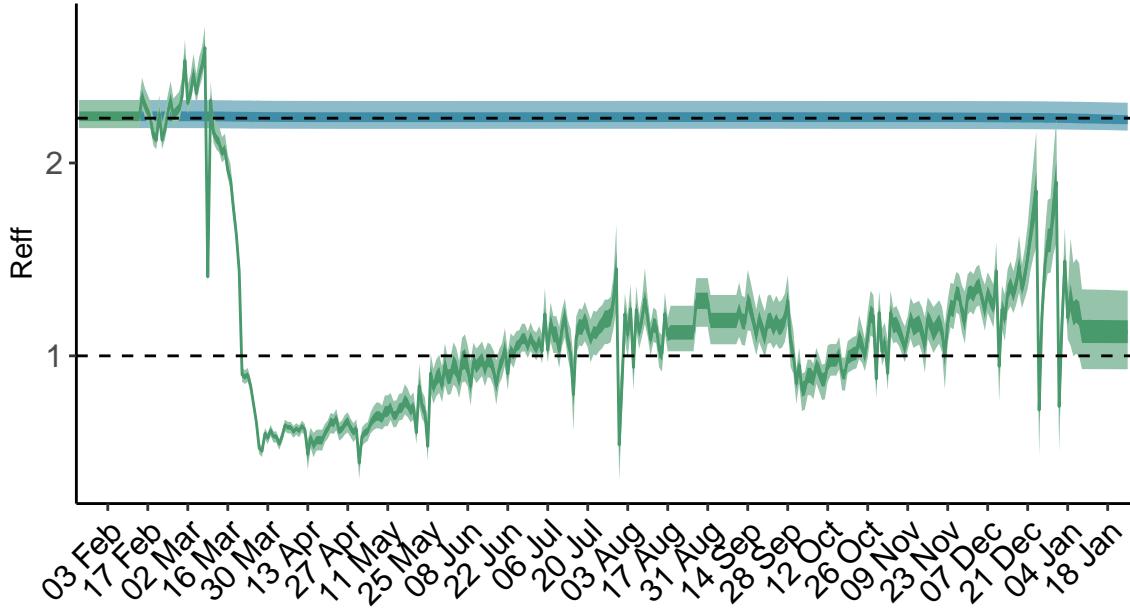


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

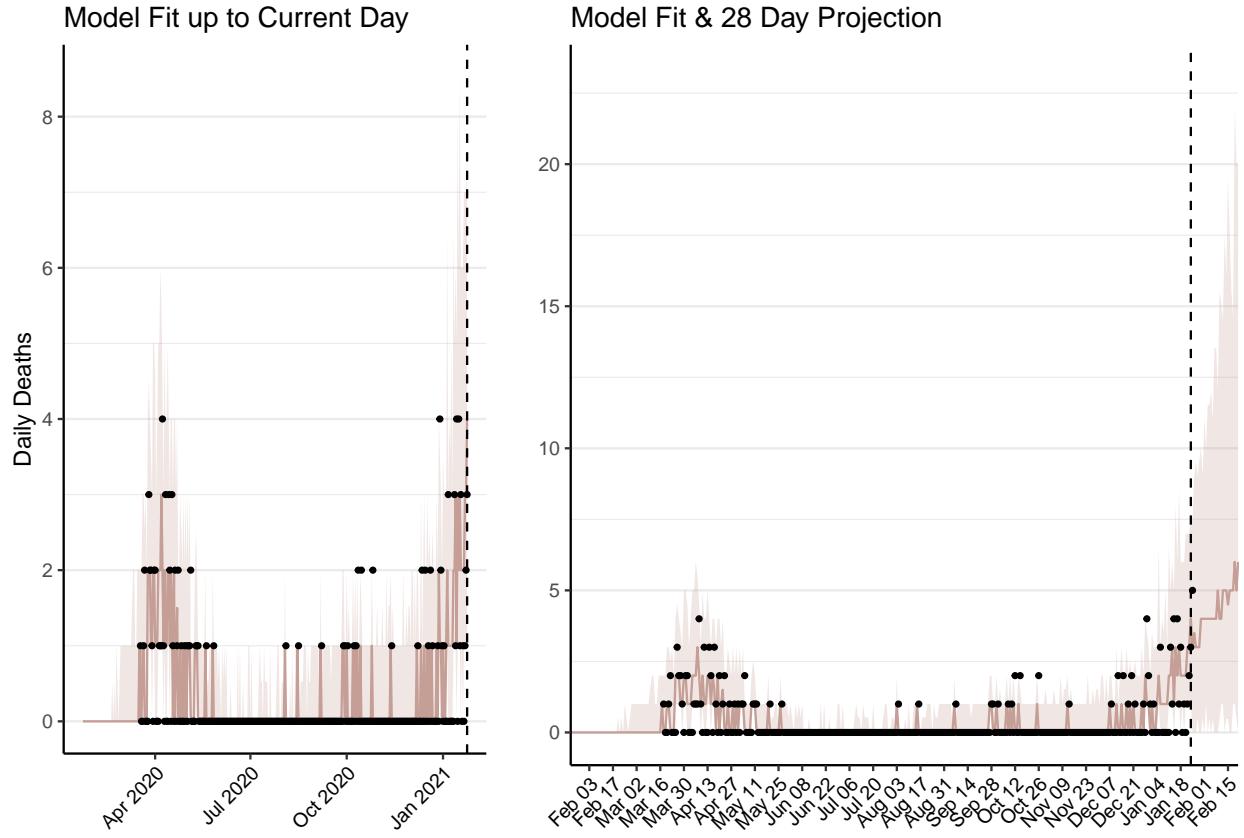


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 156 (95% CI: 142-170) patients requiring treatment with high-pressure oxygen at the current date to 302 (95% CI: 254-350) hospital beds being required on 2021-02-21 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: 54-64) patients requiring treatment with mechanical ventilation at the current date to 113 (95% CI: 97-128) by 2021-02-21. 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.**

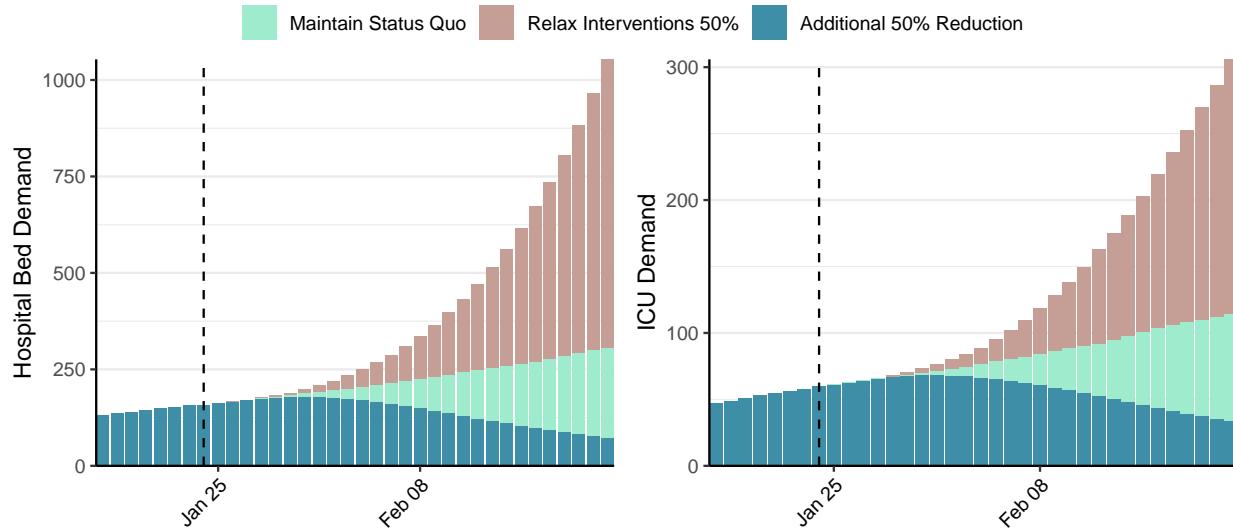


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 2,715 (95% CI: 2,431-3,000) at the current date to 383 (95% CI: 317-449) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,715 (95% CI: 2,431-3,000) at the current date to 33,012 (95% CI: 26,527-39,498) by 2021-02-21.

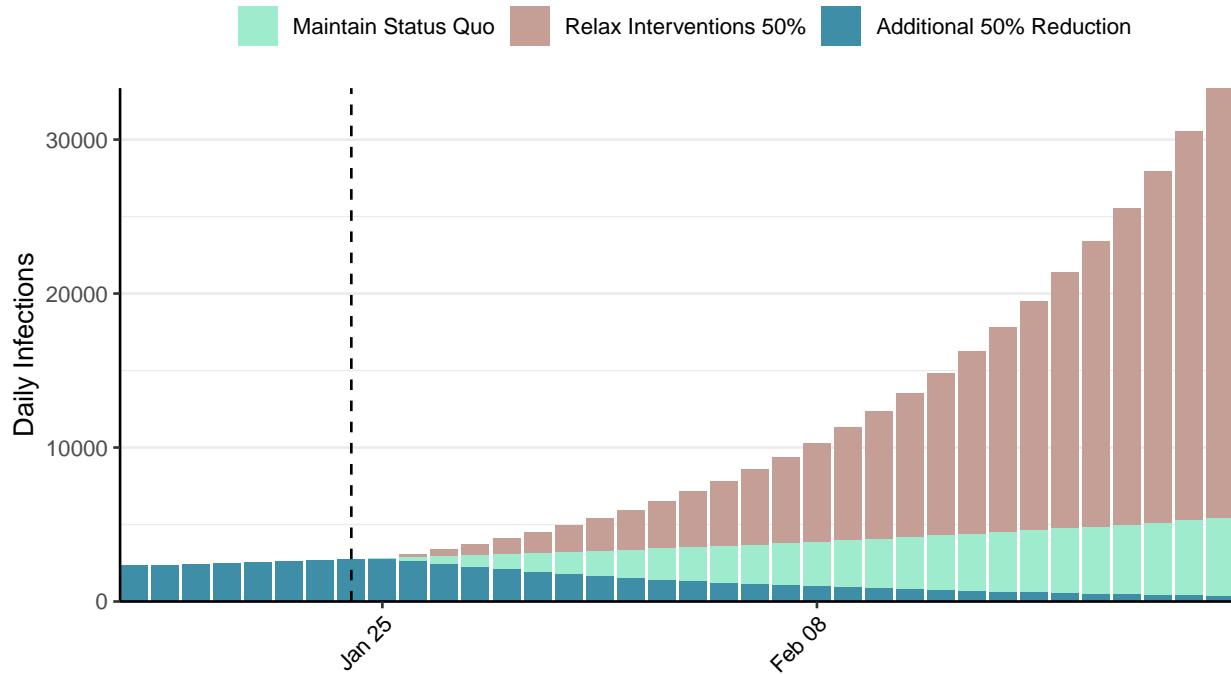


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Bangladesh, 2021-01-24 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}
602	602	18	18	0.82 (95% CI: 0.63-1.02)

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.

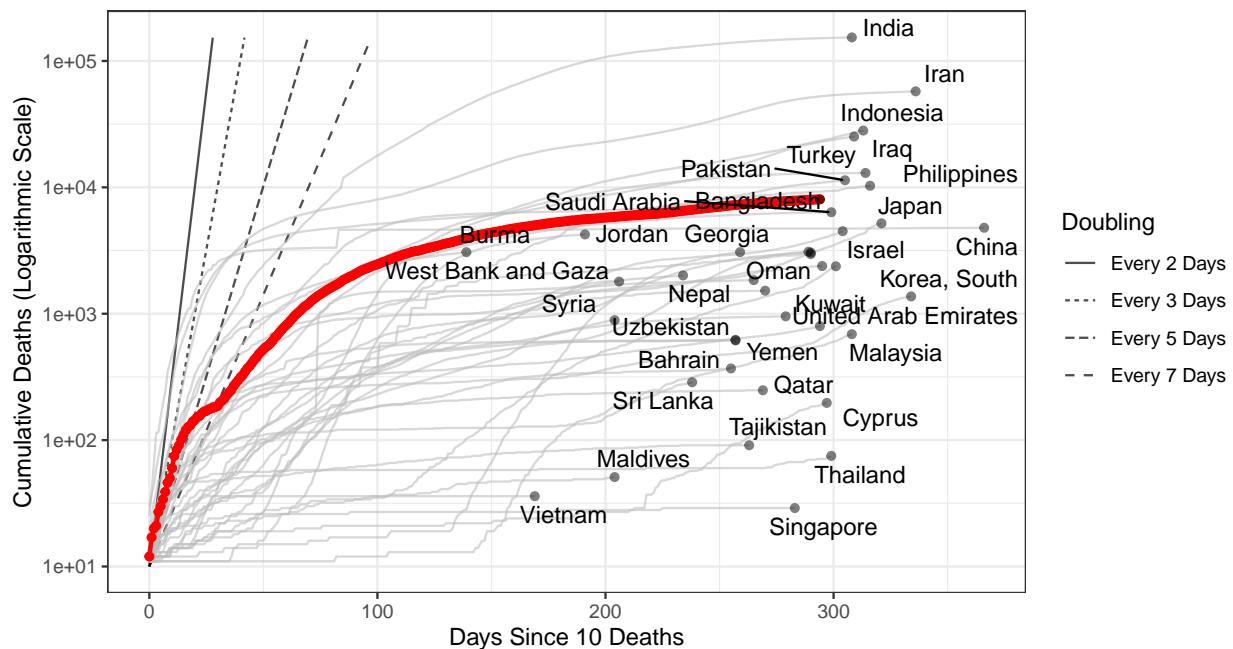


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 184,297 (95% CI: 174,462-194,131) 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

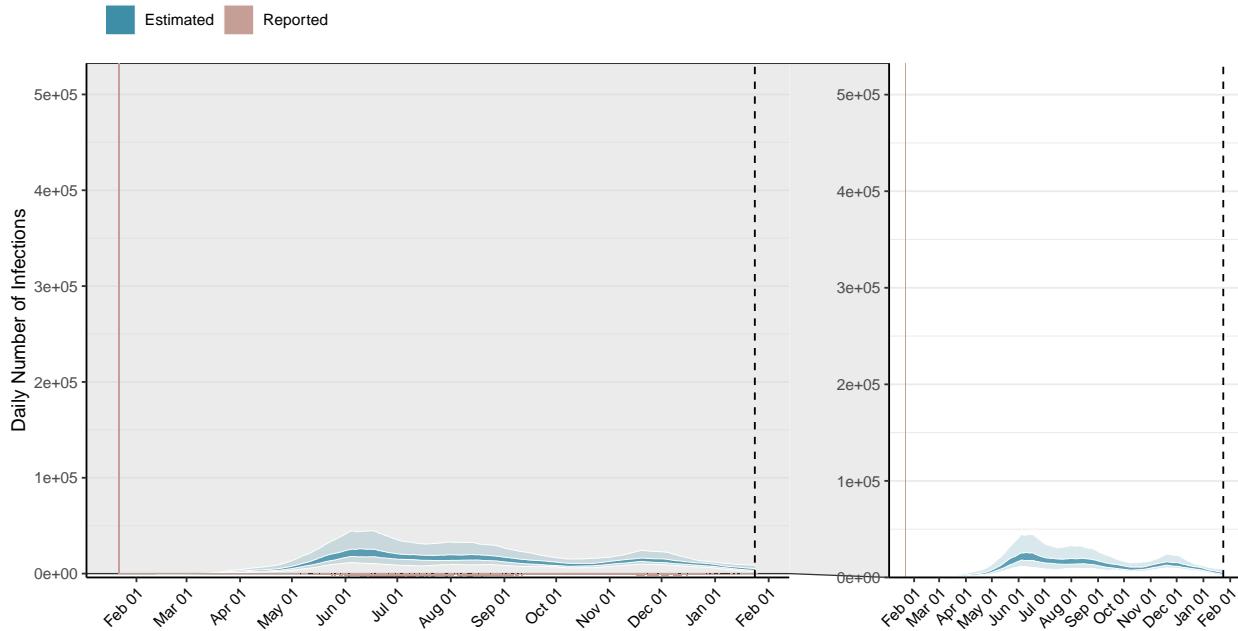


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

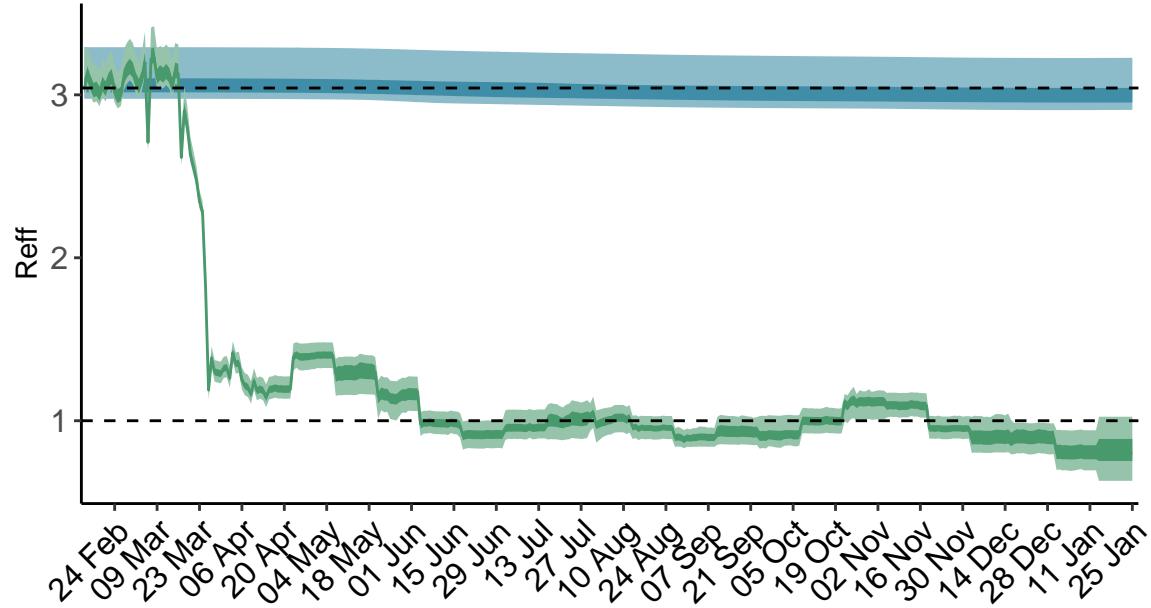


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

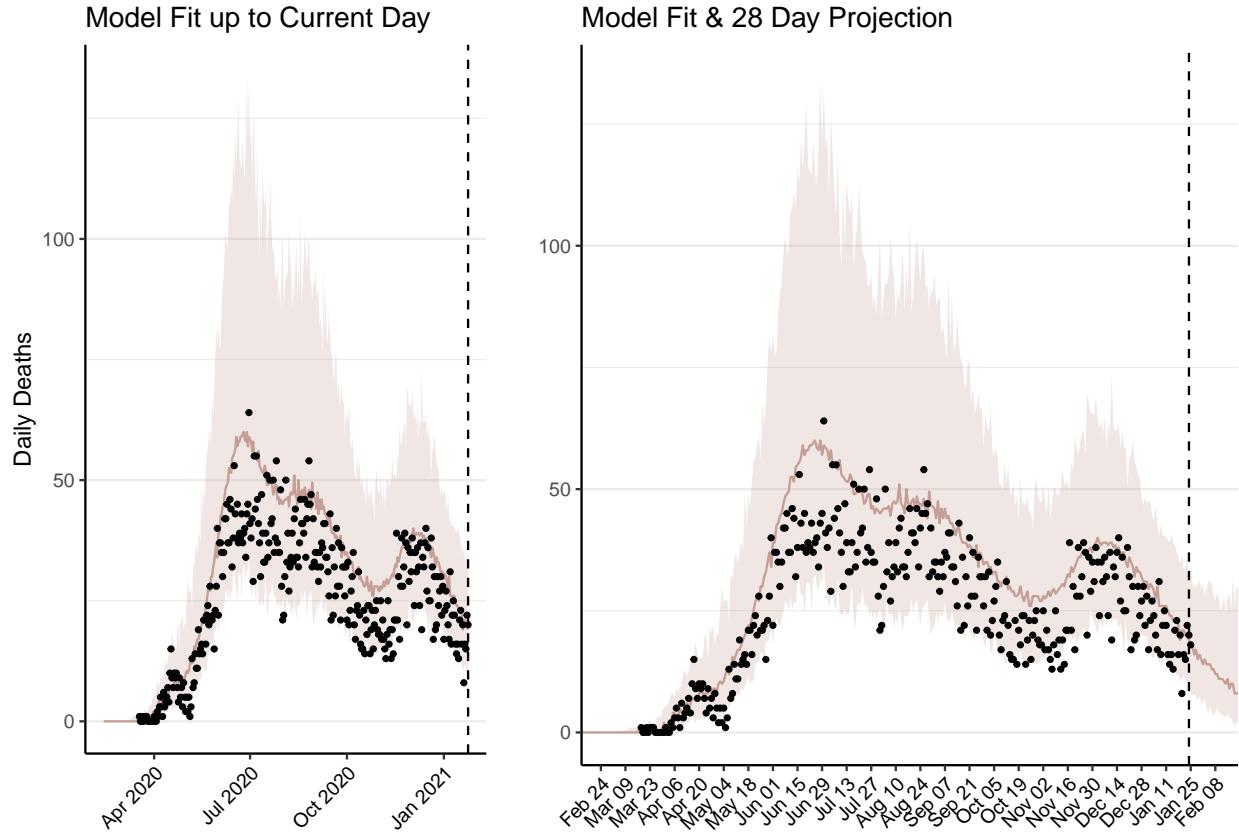


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 663 (95% CI: 624-701) patients requiring treatment with high-pressure oxygen at the current date to 358 (95% CI: 307-409) hospital beds being required on 2021-02-21 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 273 (95% CI: 259-287) patients requiring treatment with mechanical ventilation at the current date to 147 (95% CI: 128-166) by 2021-02-21. 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.**

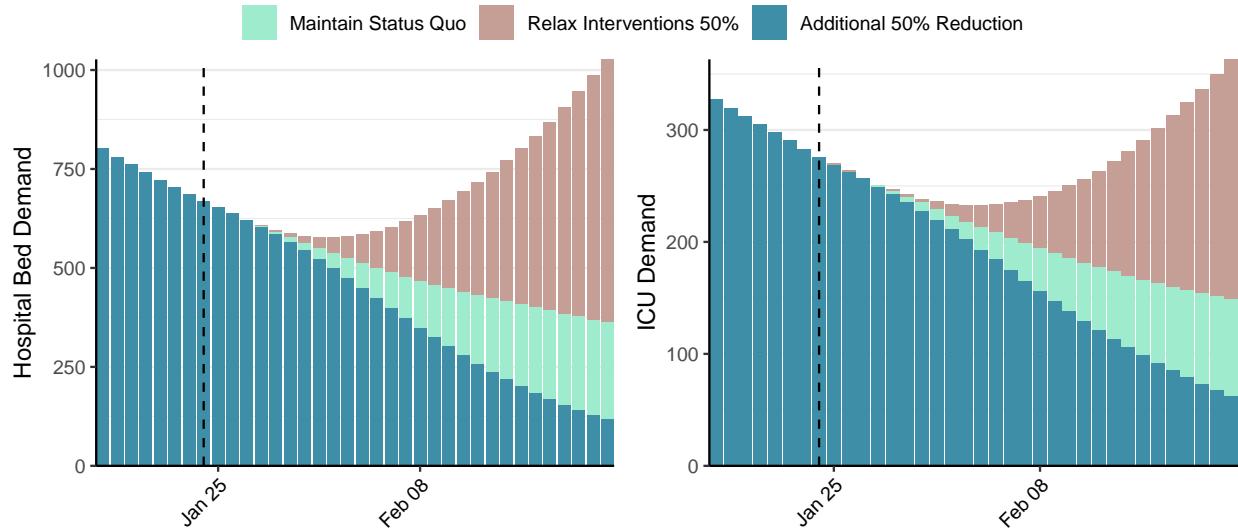


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 4,547 (95% CI: 4,165-4,930) at the current date to 244 (95% CI: 202-285) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 4,547 (95% CI: 4,165-4,930) at the current date to 14,914 (95% CI: 11,650-18,178) by 2021-02-21.

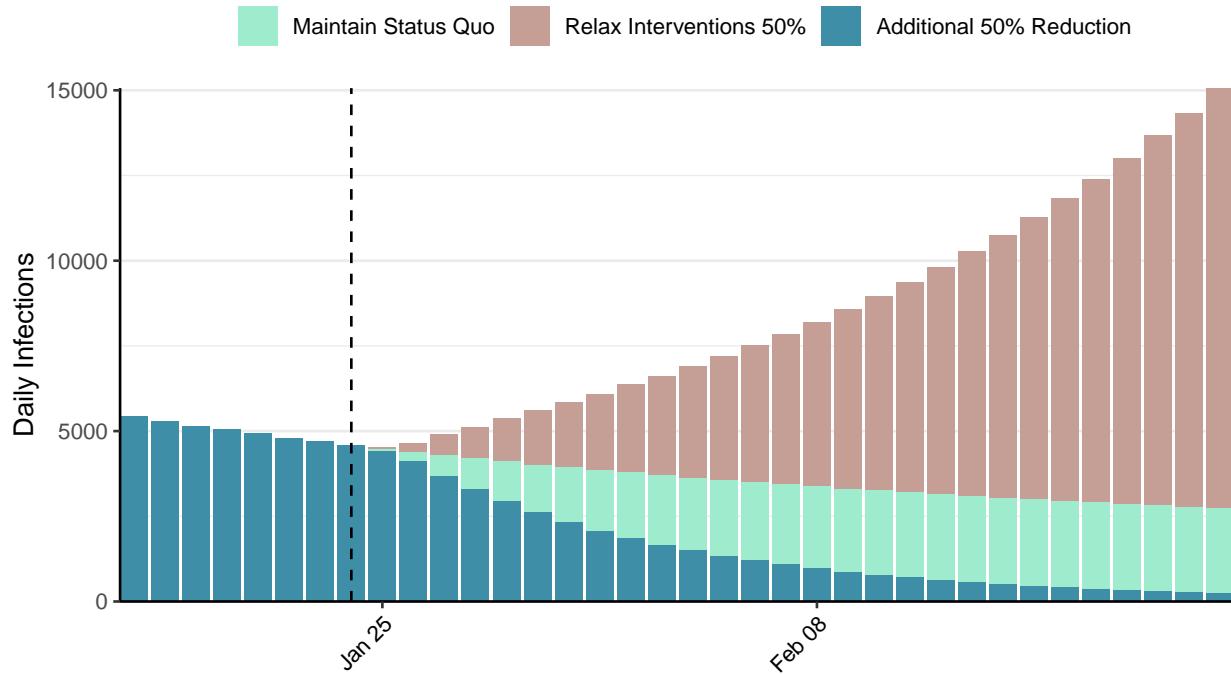


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Bulgaria, 2021-01-24 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}
772	772	60	60	0.72 (95% CI: 0.57-0.84)

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.

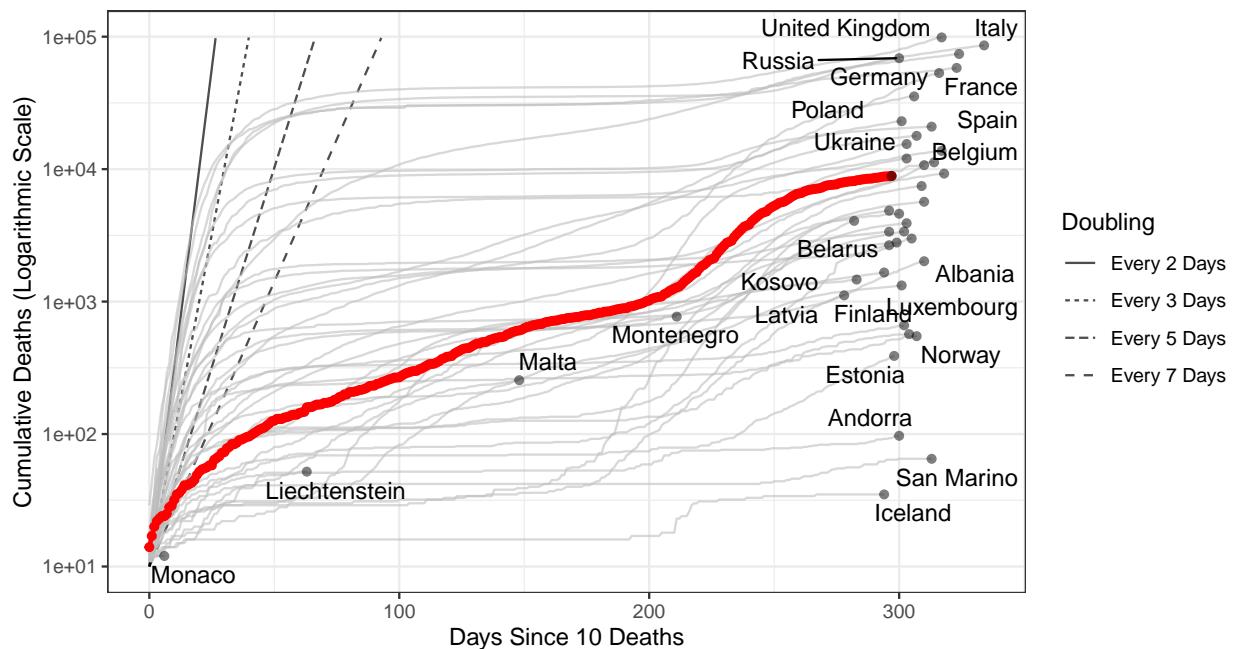


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 169,201 (95% CI: 161,715-176,687) 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).

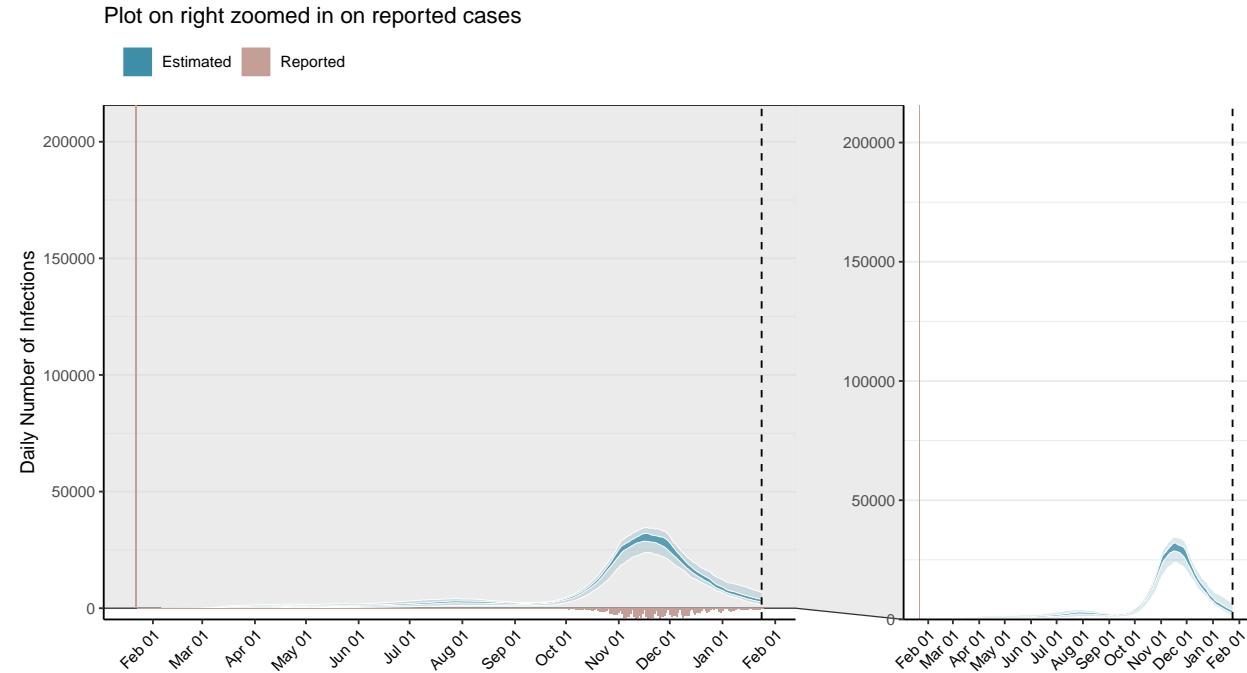


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

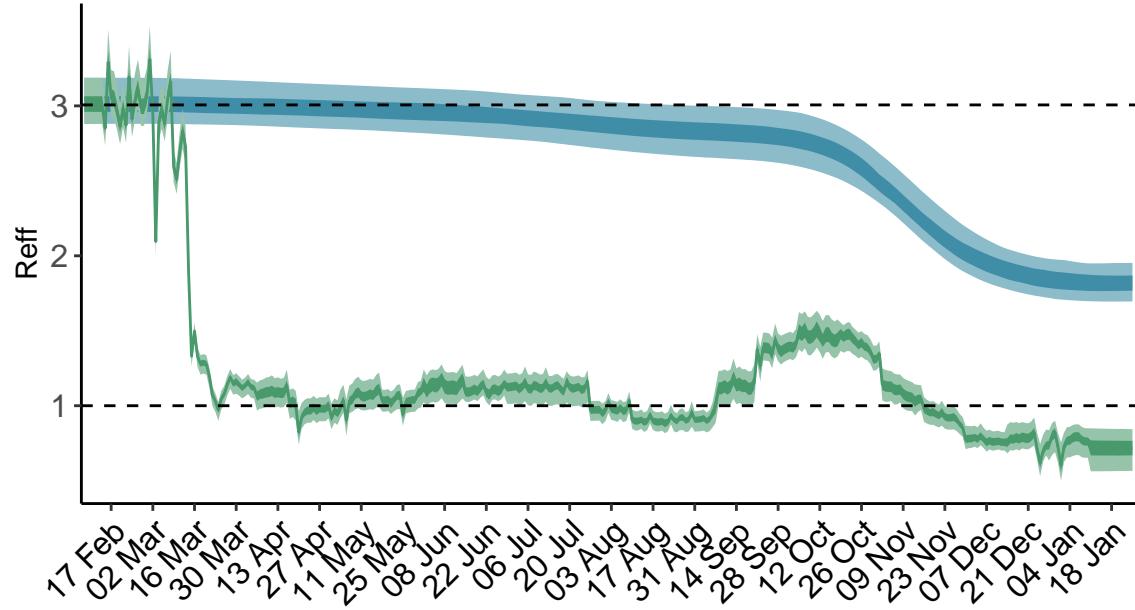


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

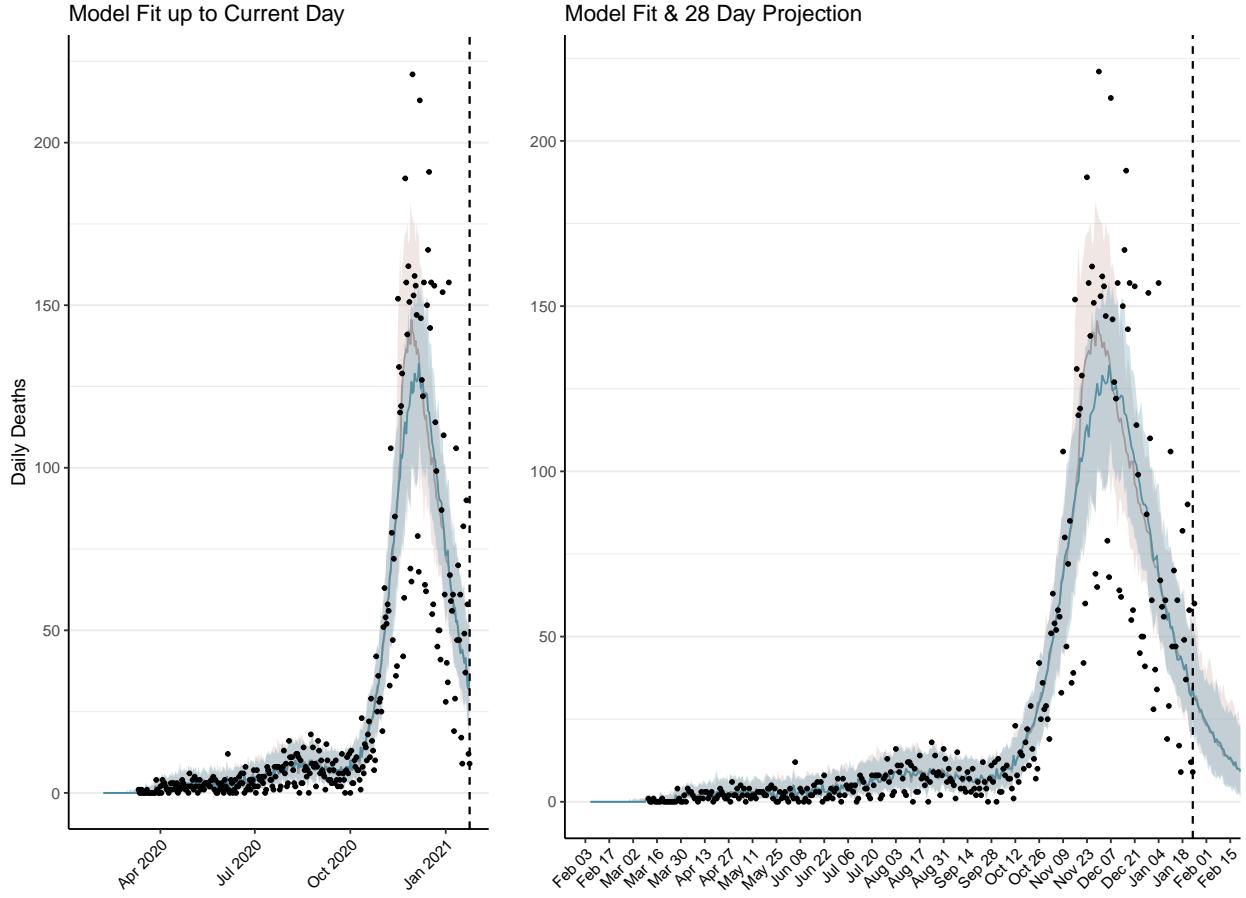


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 1,016 (95% CI: 968-1,064) patients requiring treatment with high-pressure oxygen at the current date to 317 (95% CI: 285-349) hospital beds being required on 2021-02-21 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 419 (95% CI: 402-437) patients requiring treatment with mechanical ventilation at the current date to 135 (95% CI: 123-148) by 2021-02-21. 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.**

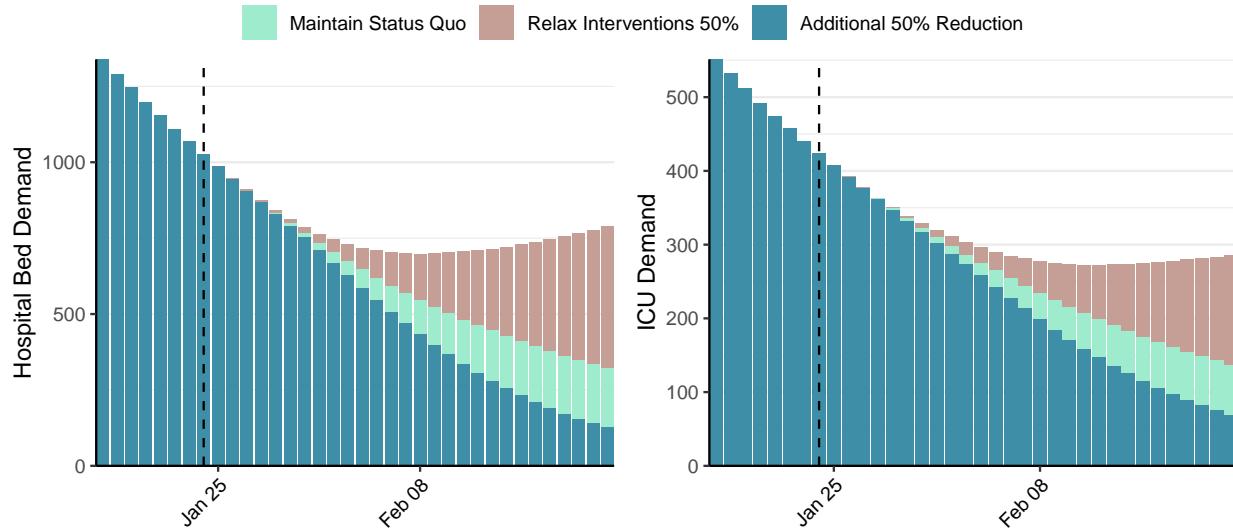


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 3,249 (95% CI: 3,018-3,480) at the current date to 110 (95% CI: 96-124) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,249 (95% CI: 3,018-3,480) at the current date to 4,976 (95% CI: 4,290-5,661) by 2021-02-21.

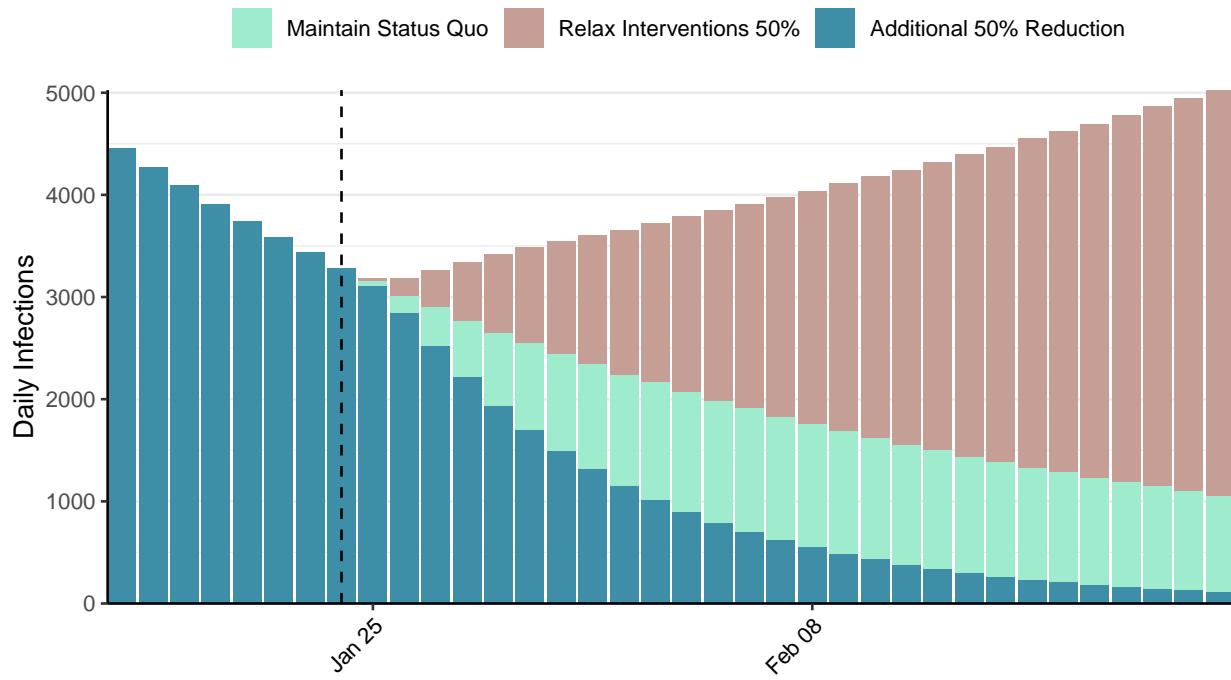


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Bosnia and Herzegovina, 2021-01-24 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}
723	723	38	38	0.76 (95% CI: 0.61-0.89)

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.

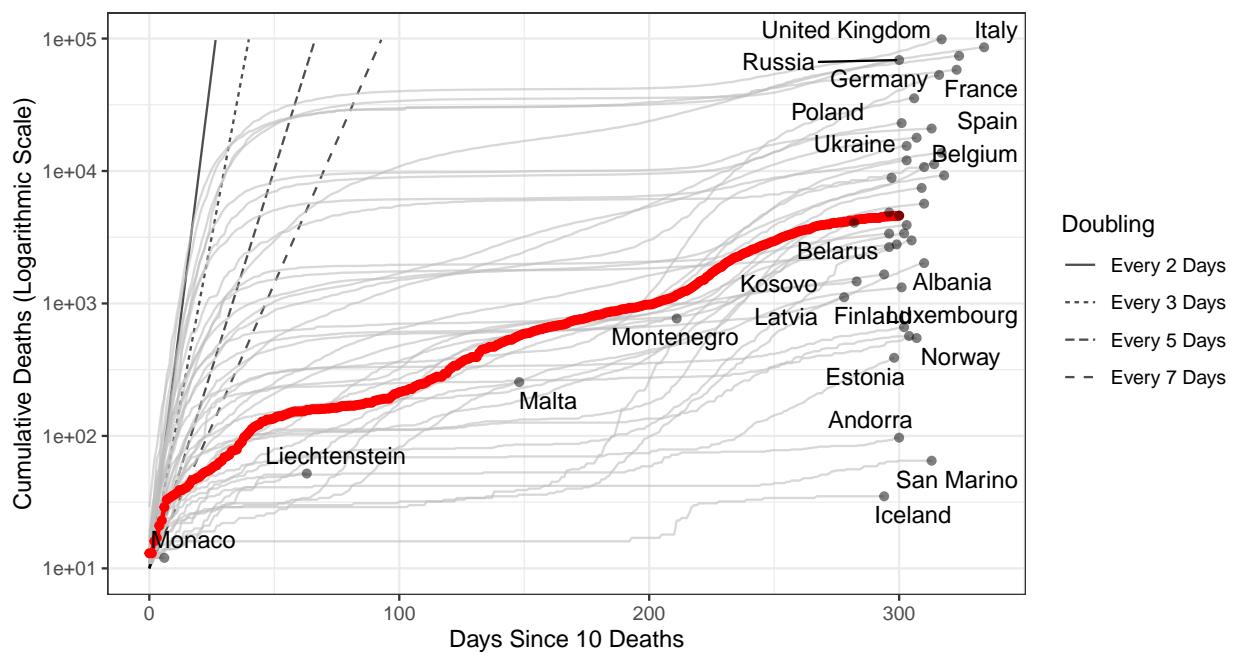


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 87,528 (95% CI: 84,787-90,269) 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).

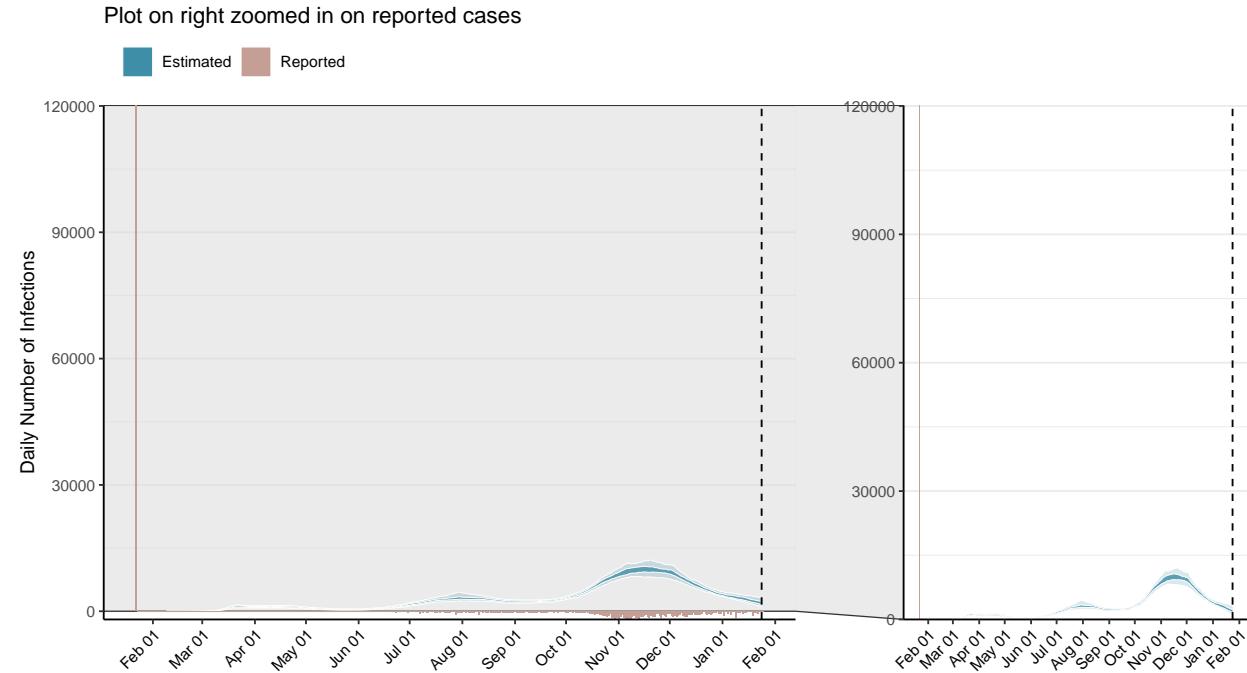


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

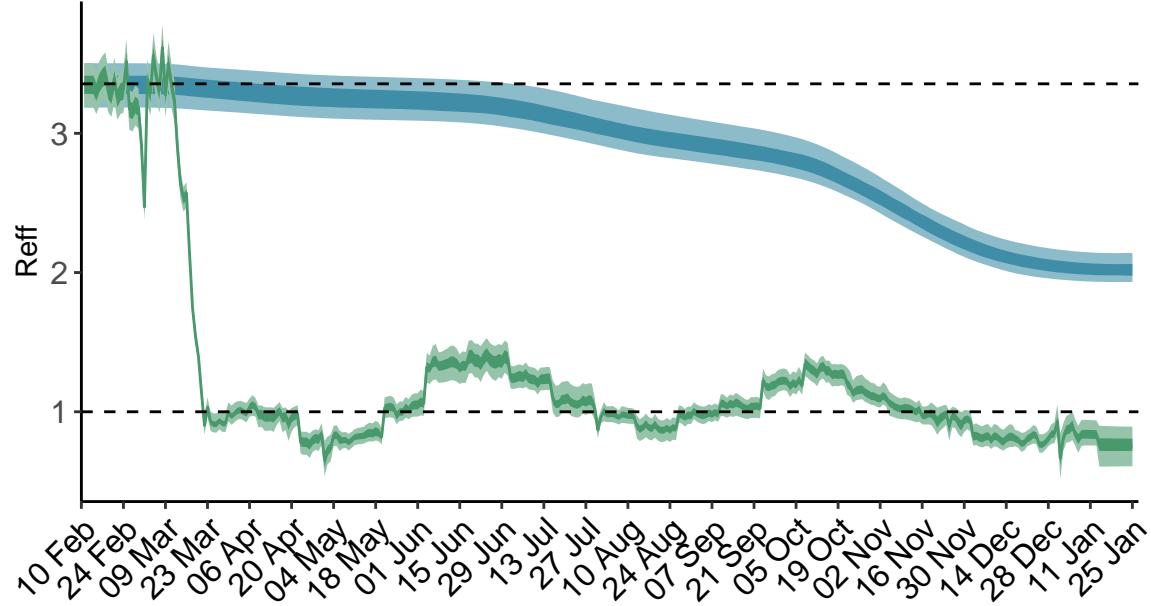


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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. 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.](#)

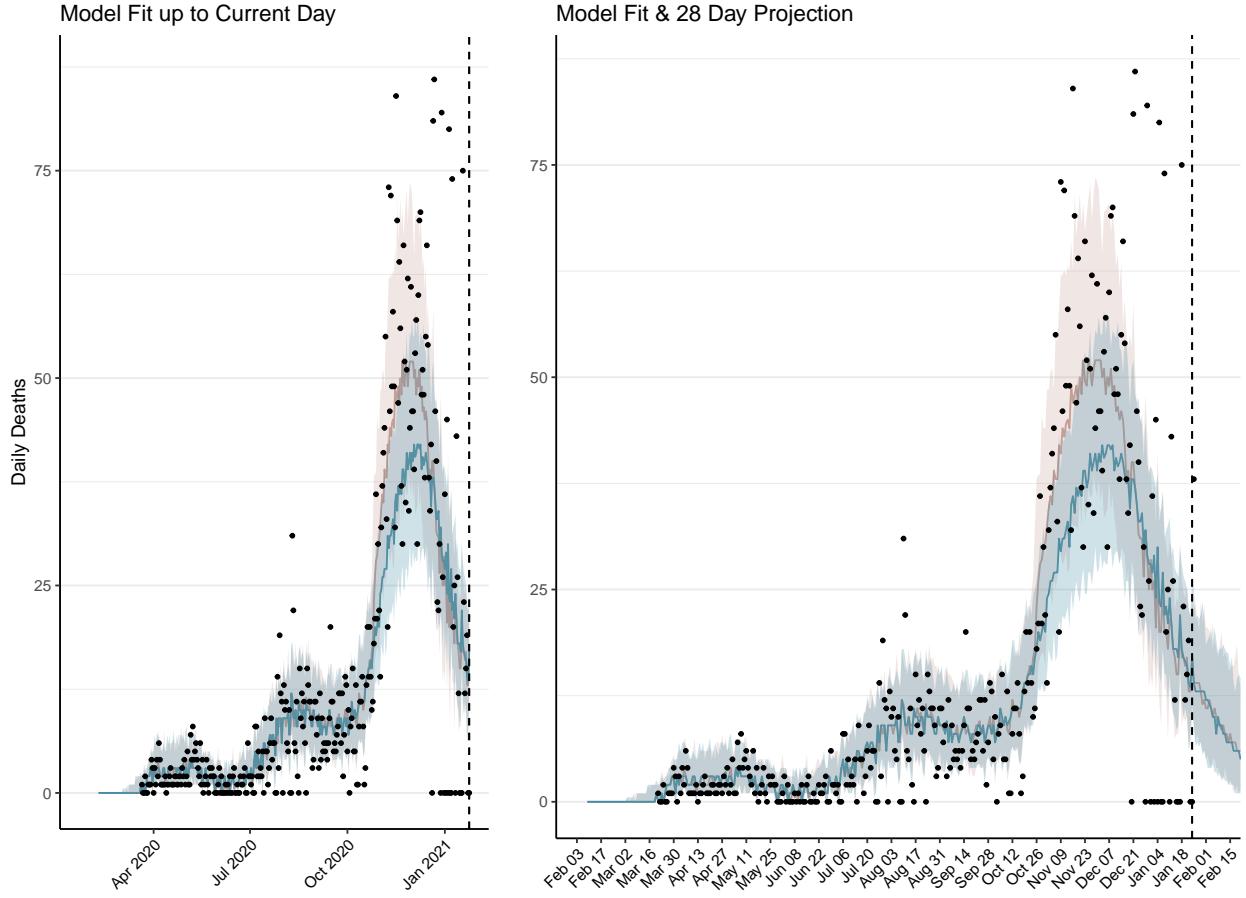


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 499 (95% CI: 481-517) patients requiring treatment with high-pressure oxygen at the current date to 197 (95% CI: 178-216) hospital beds being required on 2021-02-21 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 196 (95% CI: 190-202) patients requiring treatment with mechanical ventilation at the current date to 86 (95% CI: 78-94) by 2021-02-21. 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.**

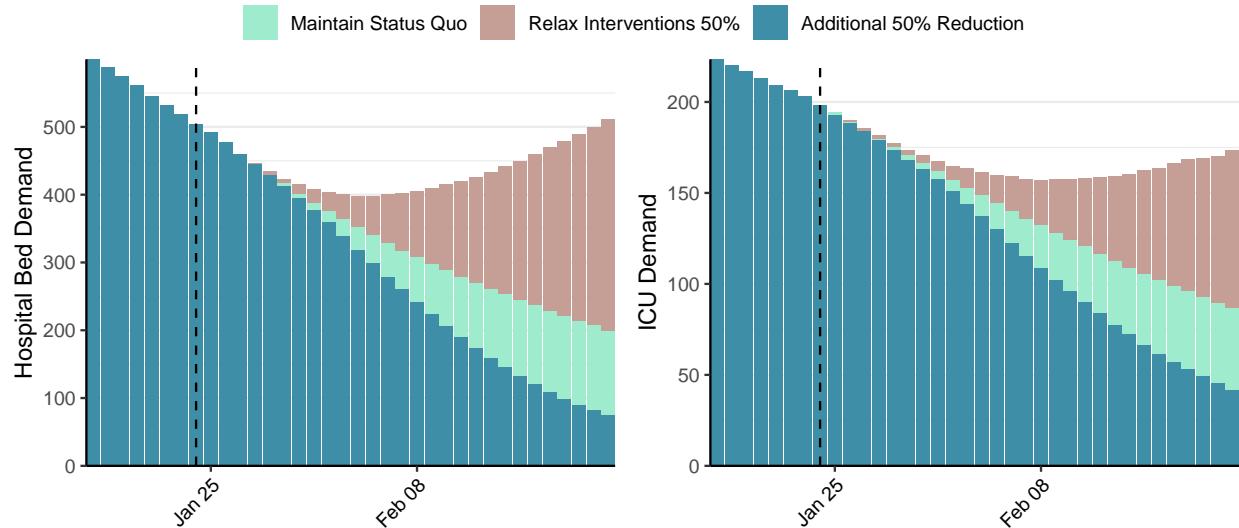


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 1,993 (95% CI: 1,879-2,108) at the current date to 80 (95% CI: 70-90) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,993 (95% CI: 1,879-2,108) at the current date to 3,768 (95% CI: 3,270-4,267) by 2021-02-21.

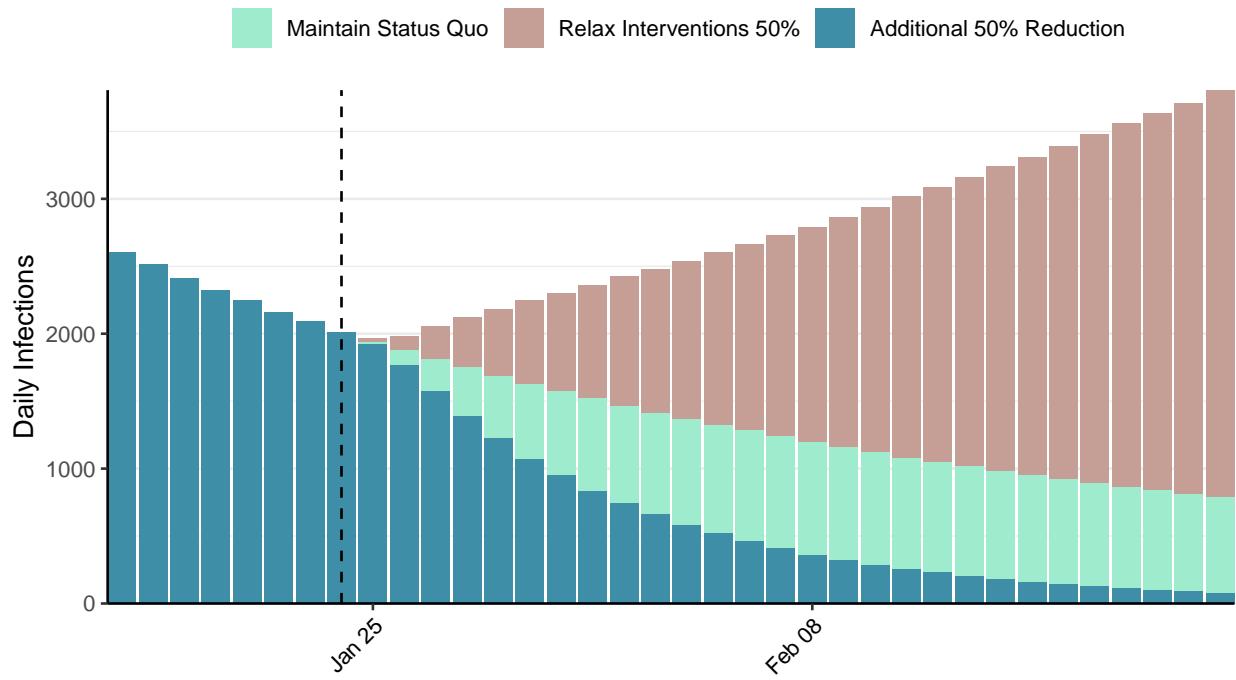


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Belarus, 2021-01-24 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}
1,024	1,024	9	9	1 (95% CI: 0.9-1.11)

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. Belarus is not shown in the following plot as only 9 deaths have been reported to date**

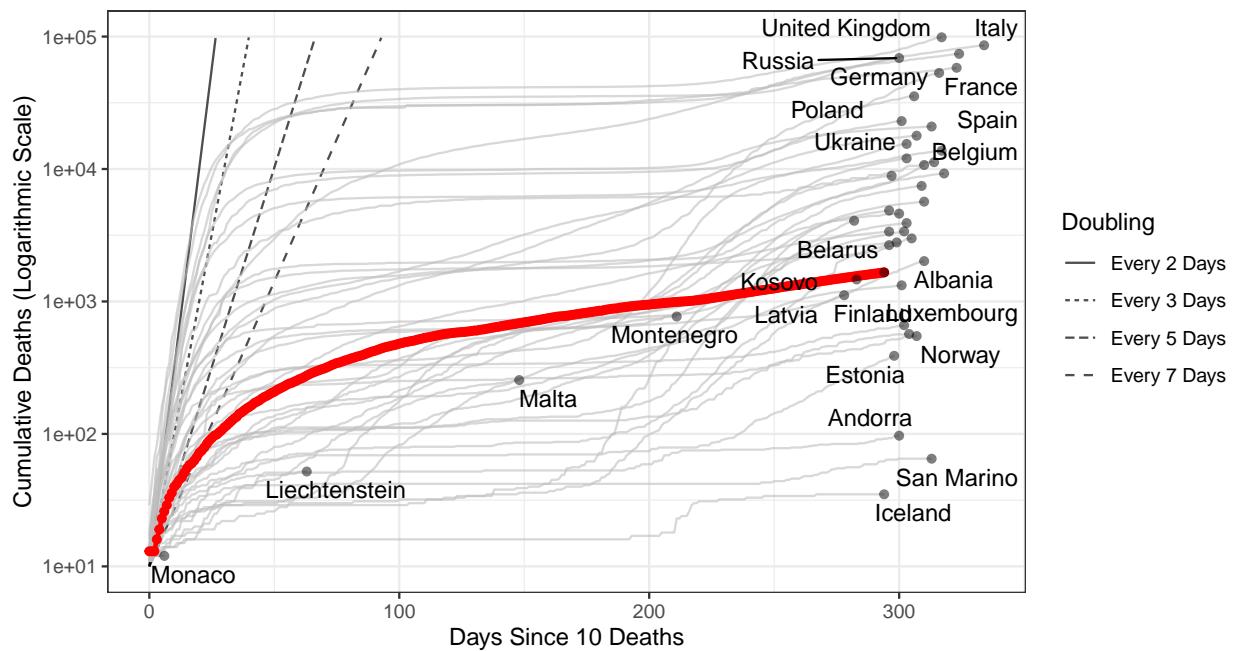


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 95,810 (95% CI: 92,669–98,950) 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).

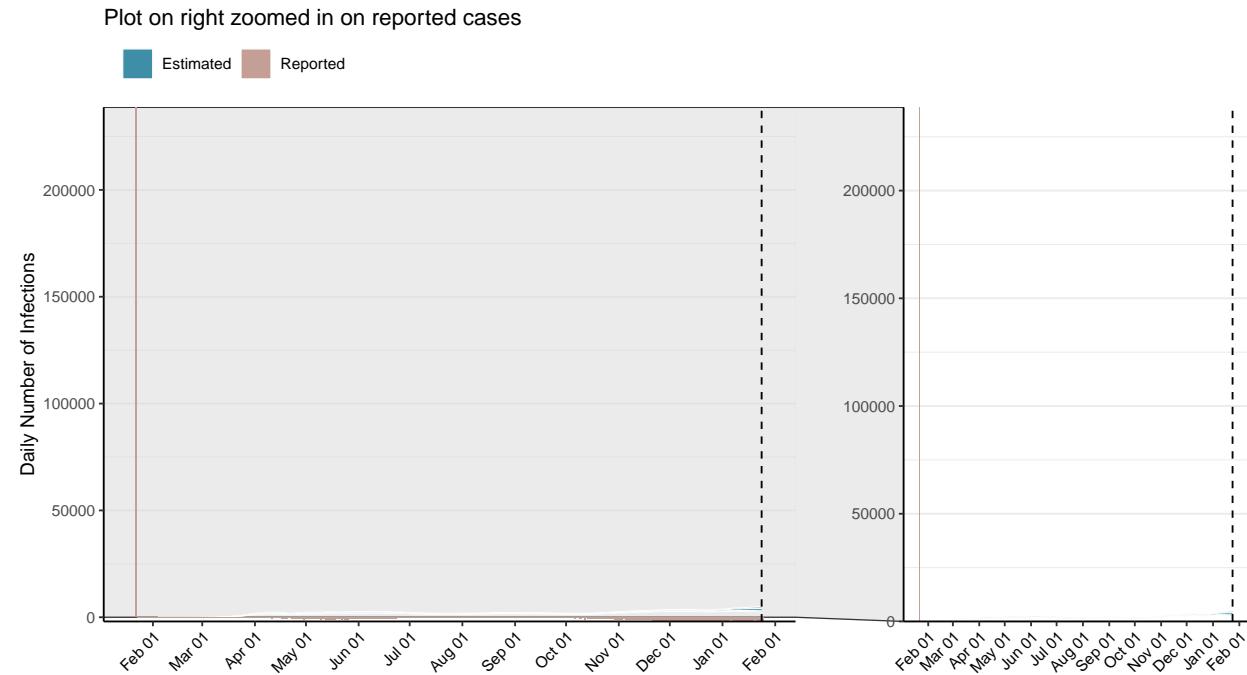


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

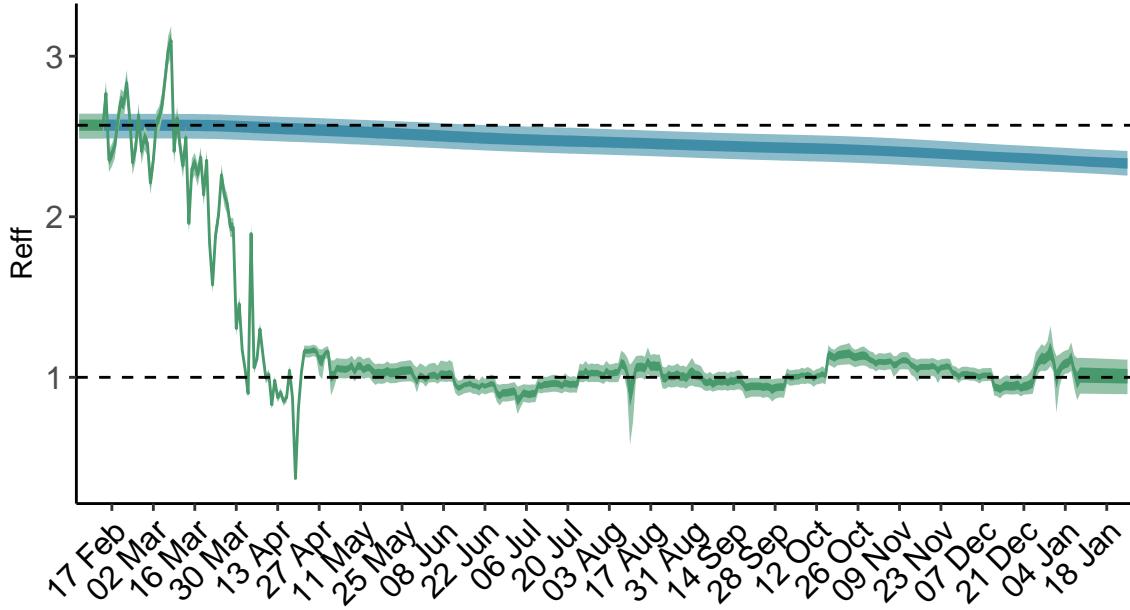


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

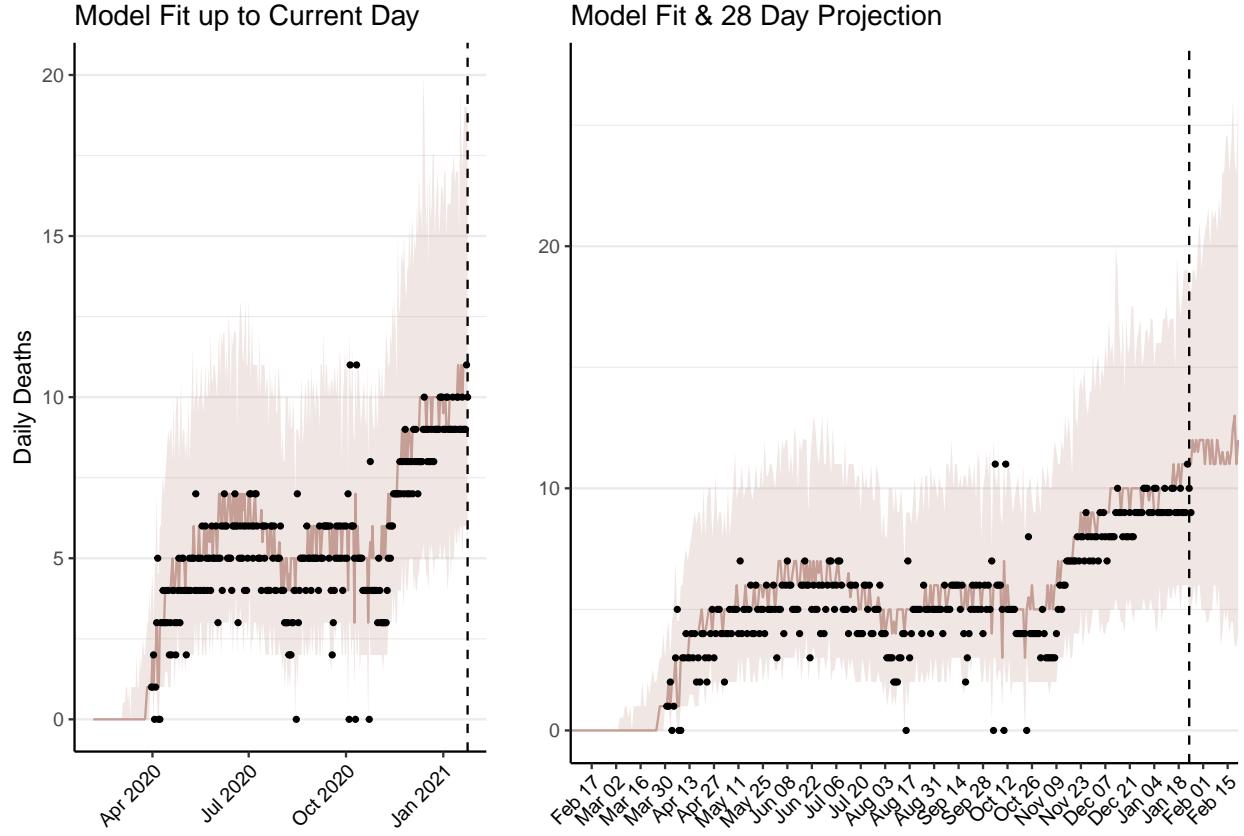


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 428 (95% CI: 412-443) patients requiring treatment with high-pressure oxygen at the current date to 465 (95% CI: 429-501) hospital beds being required on 2021-02-21 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: 153-165) patients requiring treatment with mechanical ventilation at the current date to 178 (95% CI: 164-191) by 2021-02-21. 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.**

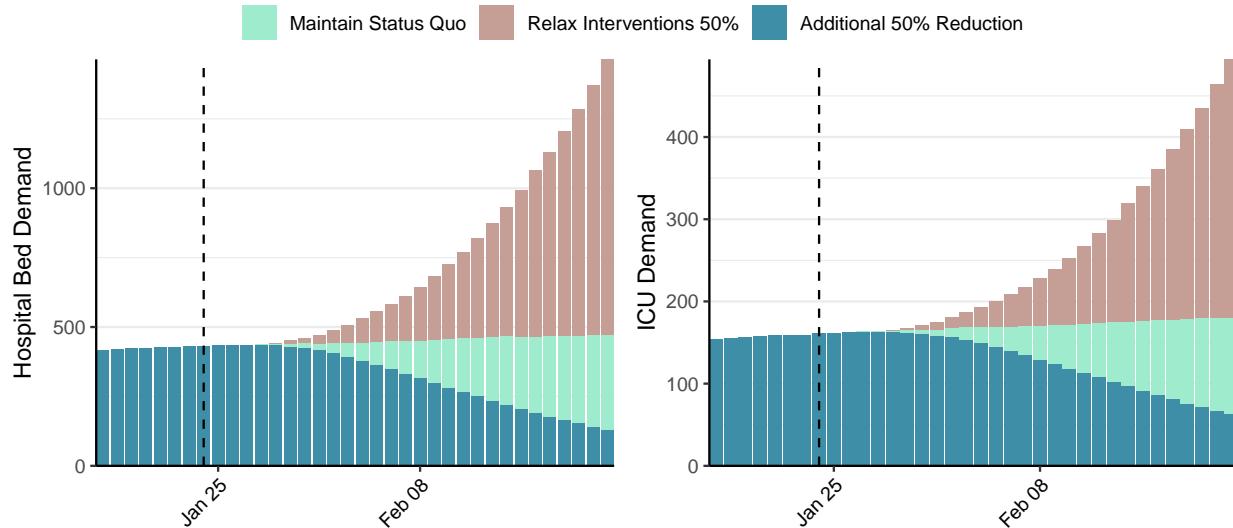


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 3,603 (95% CI: 3,429-3,777) at the current date to 324 (95% CI: 296-352) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,603 (95% CI: 3,429-3,777) at the current date to 21,354 (95% CI: 19,327-23,382) by 2021-02-21.

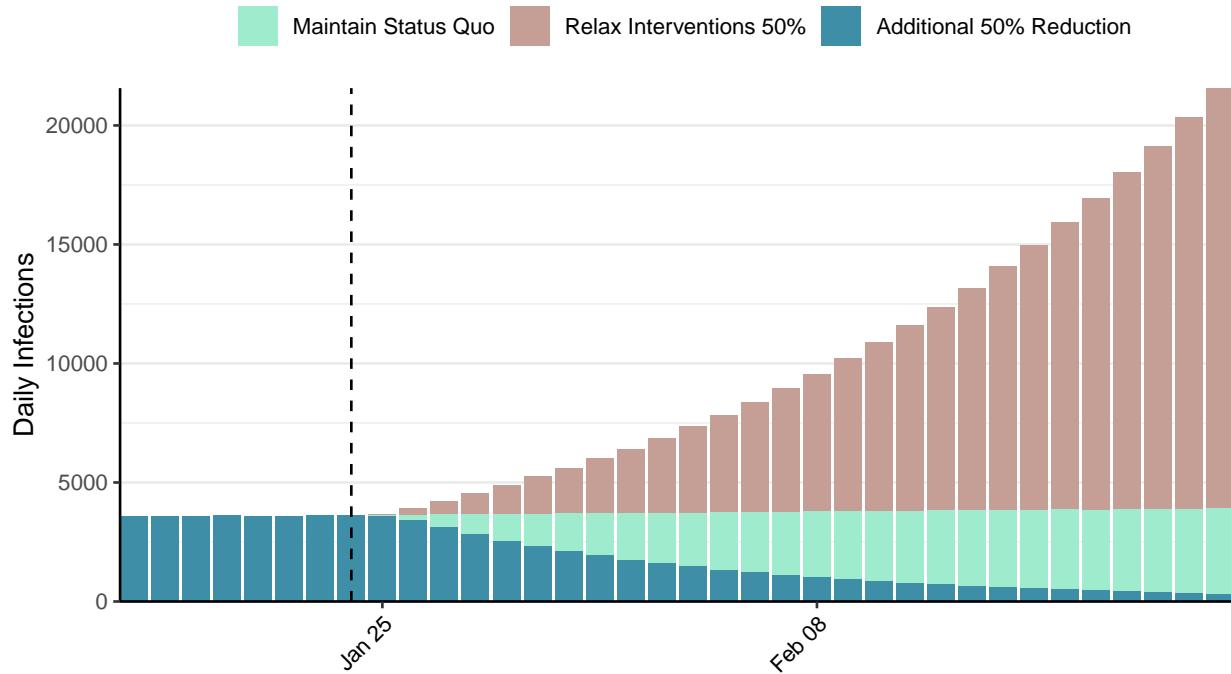


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

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Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
20	20	3	3	0.63 (95% CI: 0.5-0.79)

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 3 deaths have been reported to date**

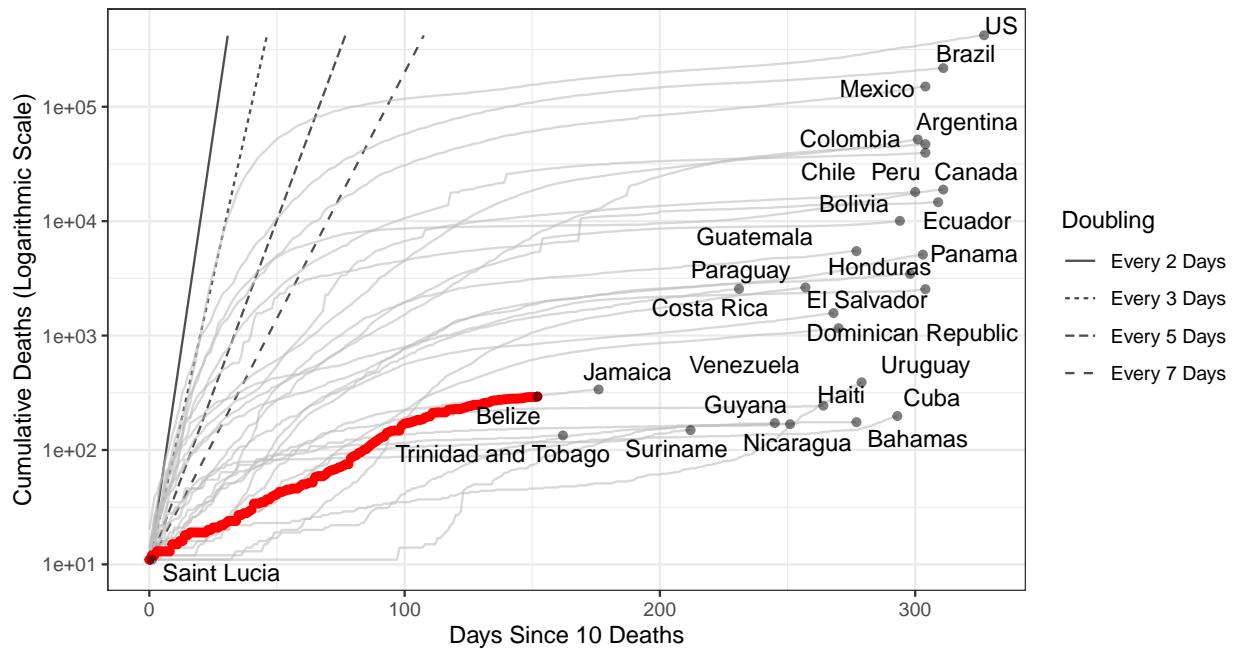


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 10,775 (95% CI: 10,209-11,341) 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).

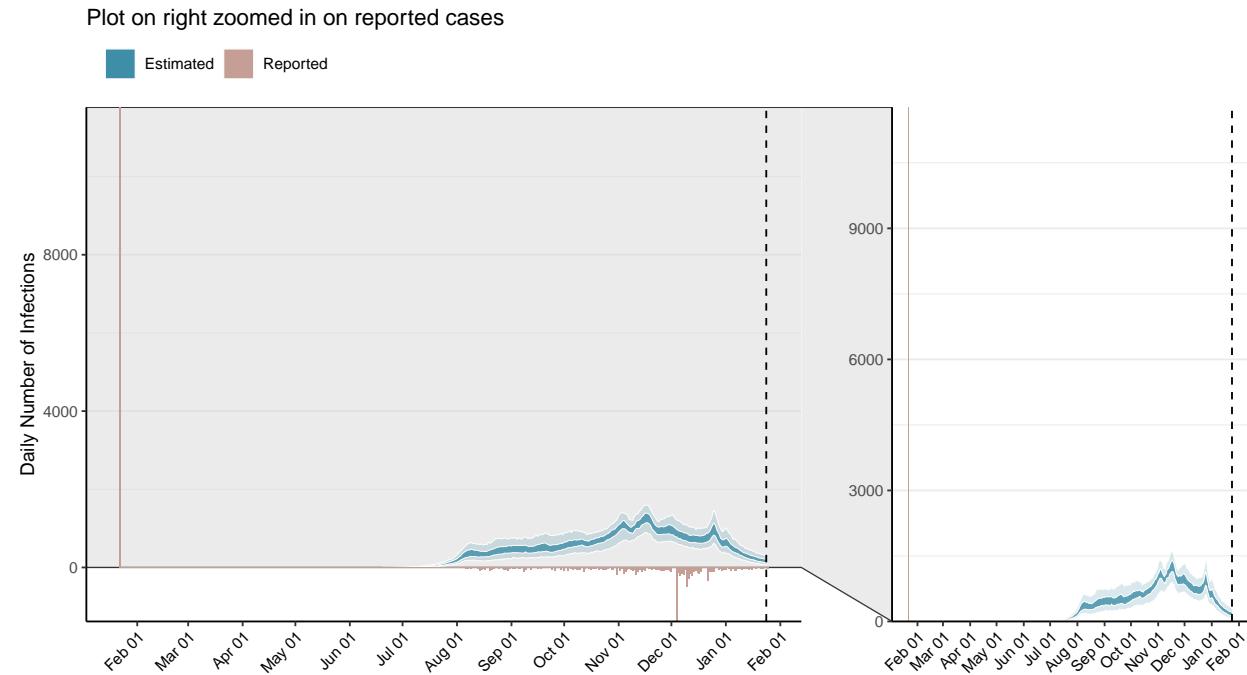


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

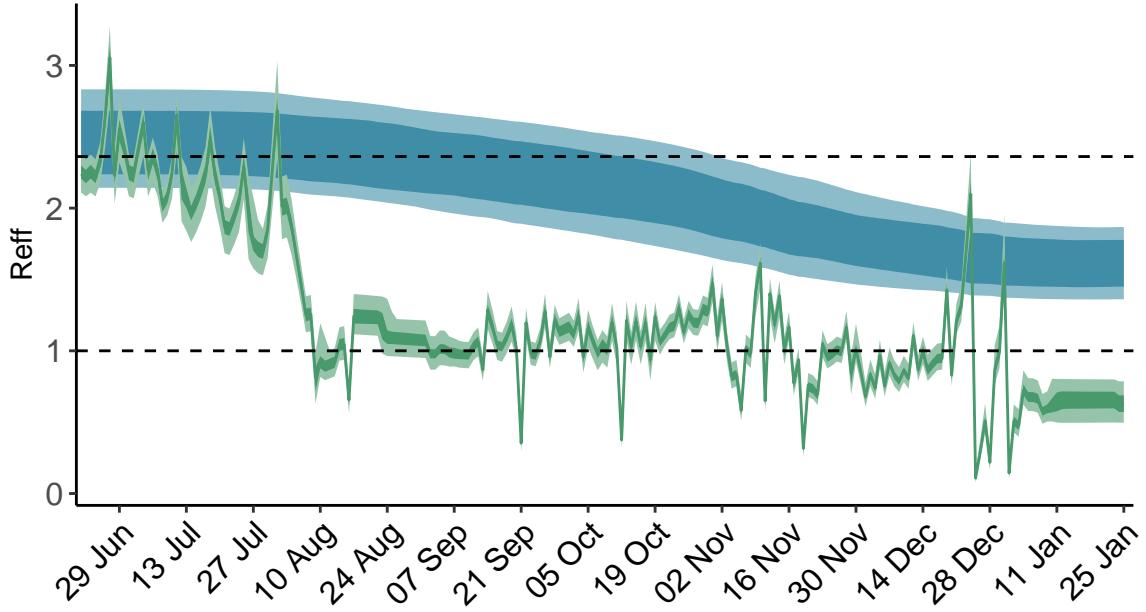


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

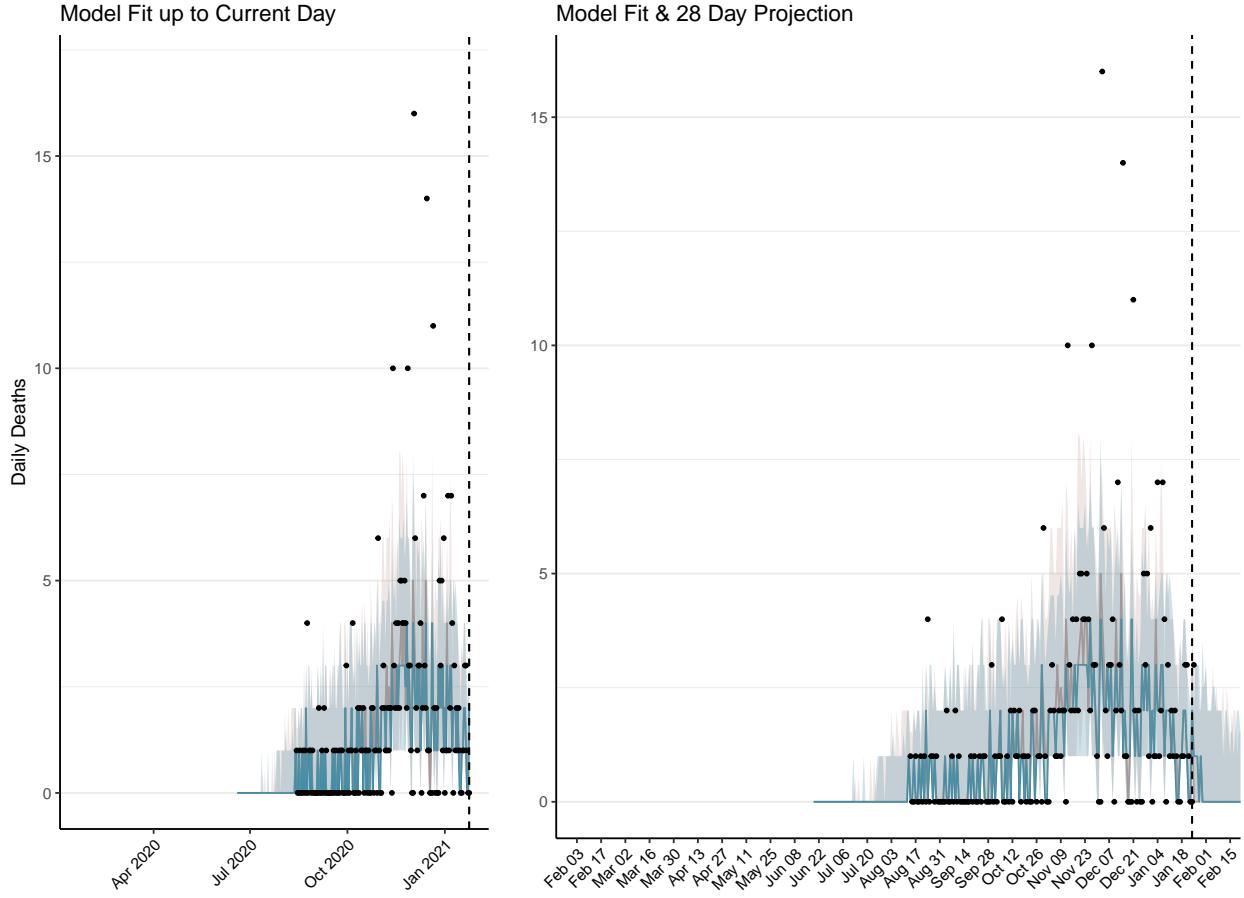


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 28 (95% CI: 26-30) patients requiring treatment with high-pressure oxygen at the current date to 8 (95% CI: 7-9) hospital beds being required on 2021-02-21 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 10 (95% CI: 10-11) patients requiring treatment with mechanical ventilation at the current date to 3 (95% CI: 3-4) by 2021-02-21. 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.**

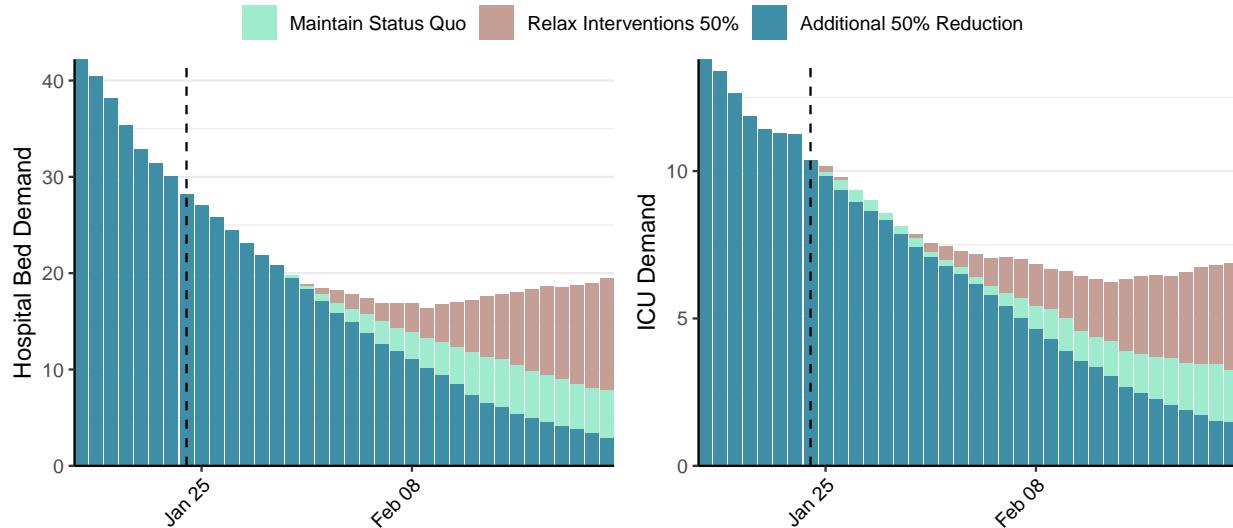


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 160 (95% CI: 148-173) at the current date to 5 (95% CI: 4-6) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 160 (95% CI: 148-173) at the current date to 286 (95% CI: 234-339) by 2021-02-21.

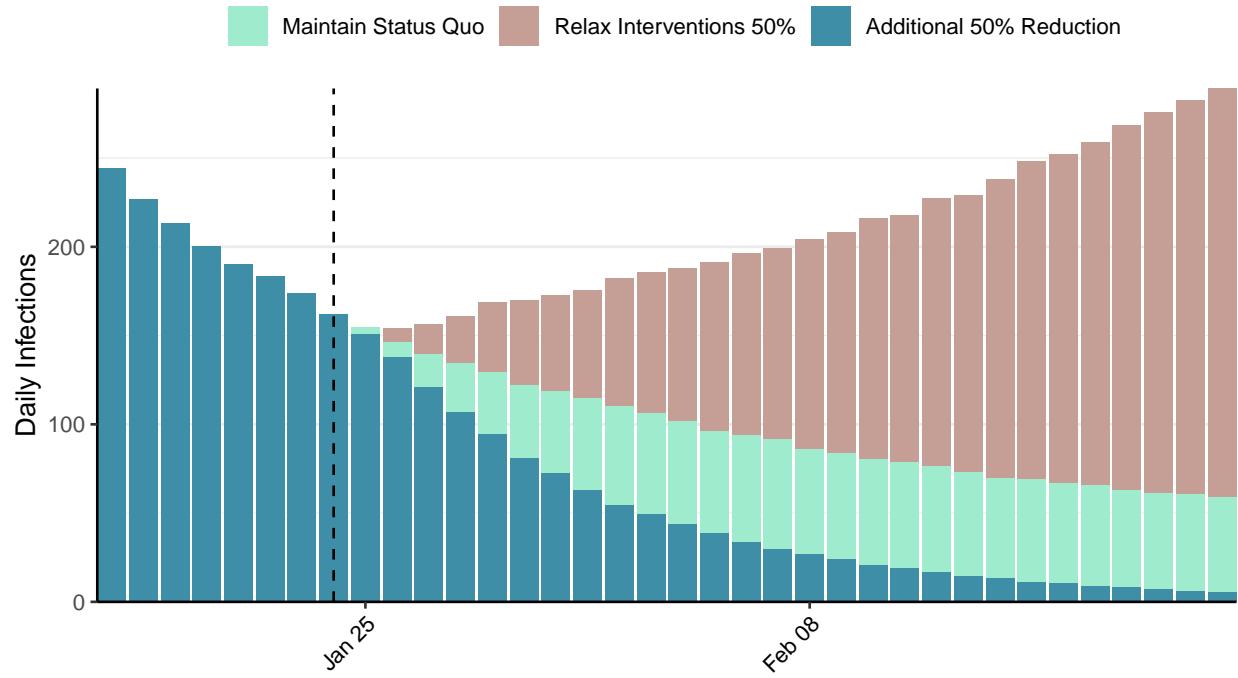


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Bolivia, 2021-01-24

[Download the report for Bolivia, 2021-01-24 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}
1,048	1,048	58	58	1.14 (95% CI: 0.97-1.27)

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.

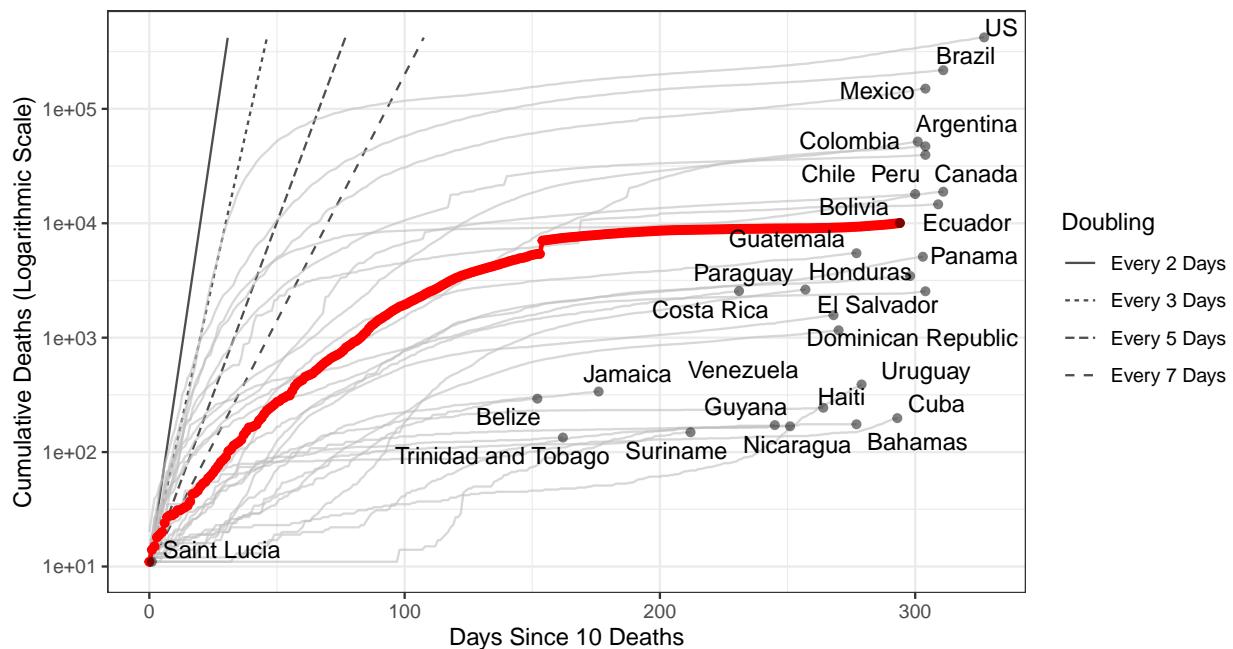


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 387,735 (95% CI: 372,838-402,632) 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).

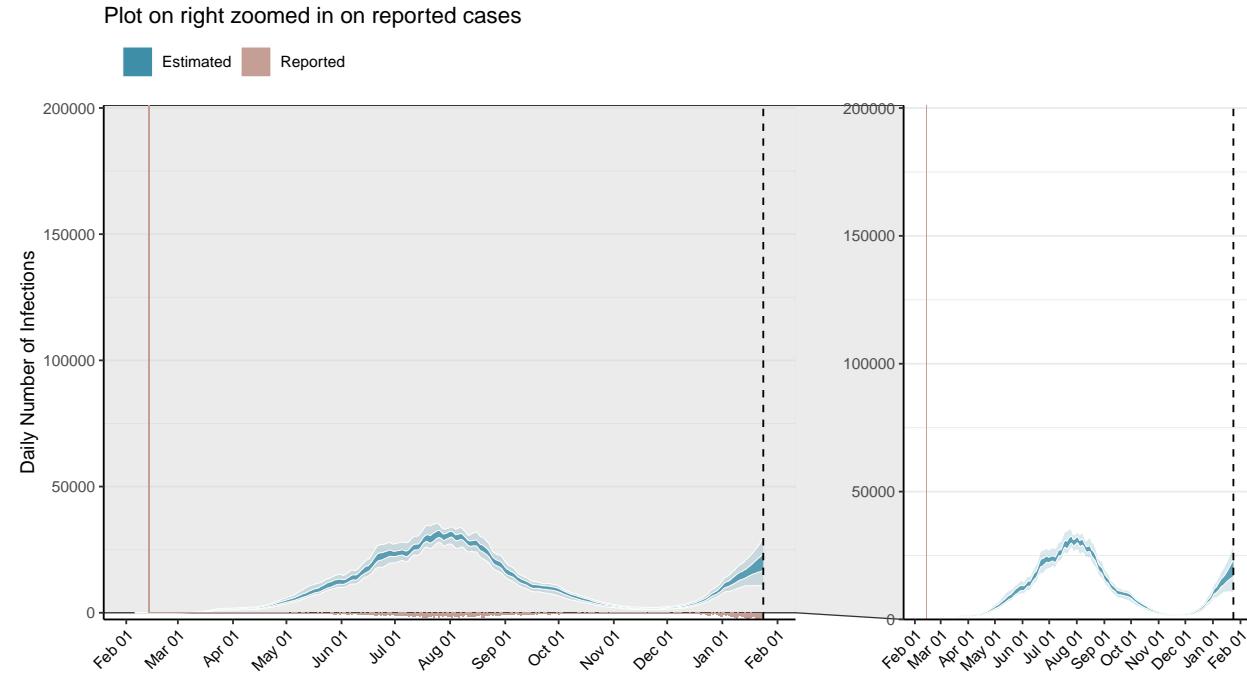


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

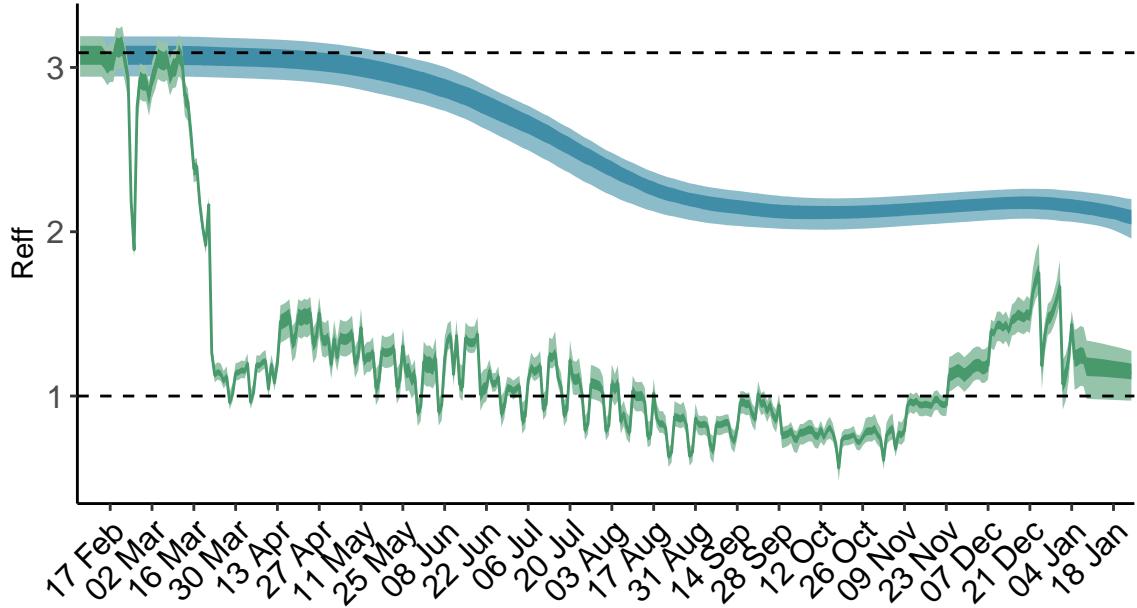


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

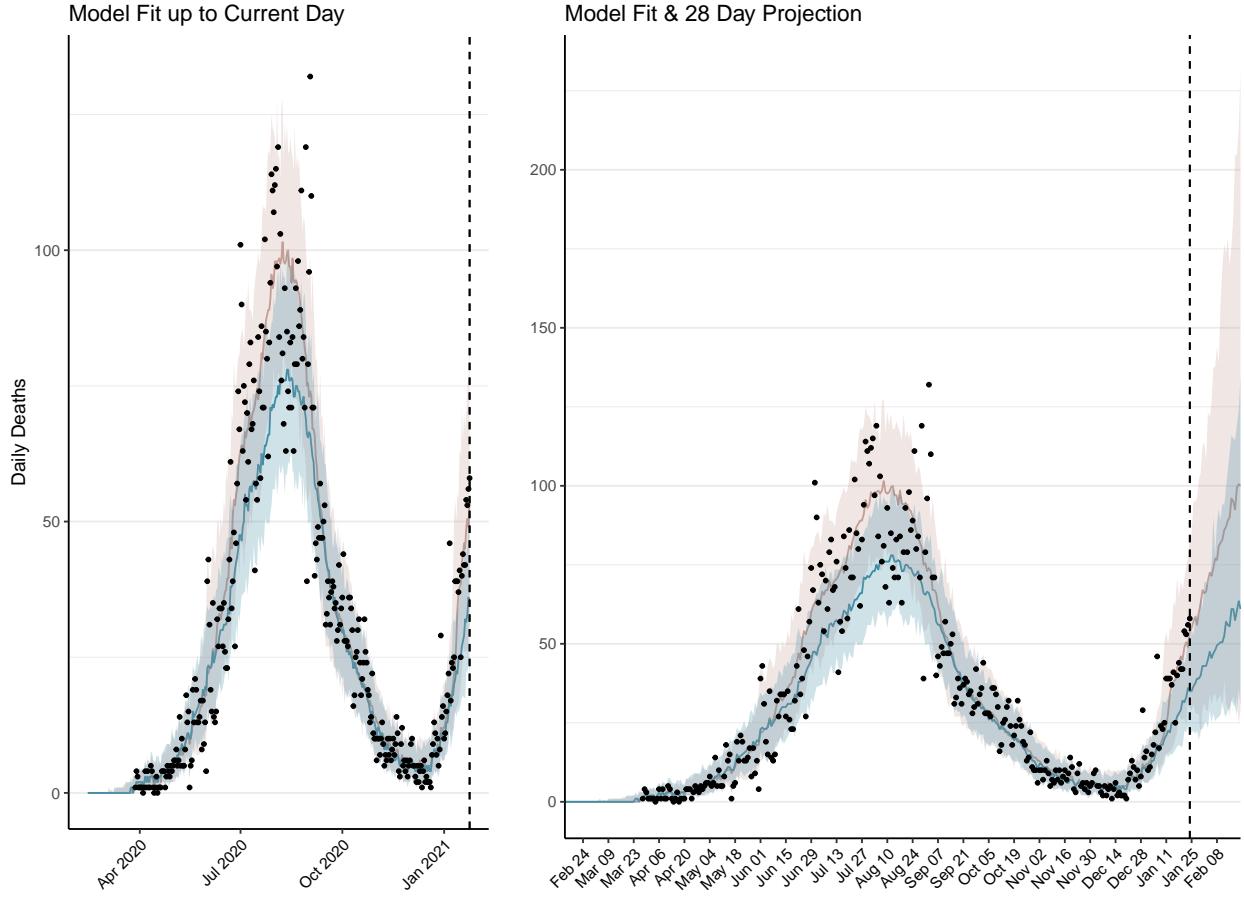


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 1,450 (95% CI: 1,390-1,509) patients requiring treatment with high-pressure oxygen at the current date to 2,699 (95% CI: 2,493-2,904) hospital beds being required on 2021-02-21 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 316 (95% CI: 309-323) patients requiring treatment with mechanical ventilation at the current date to 378 (95% CI: 365-391) by 2021-02-21. 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.**

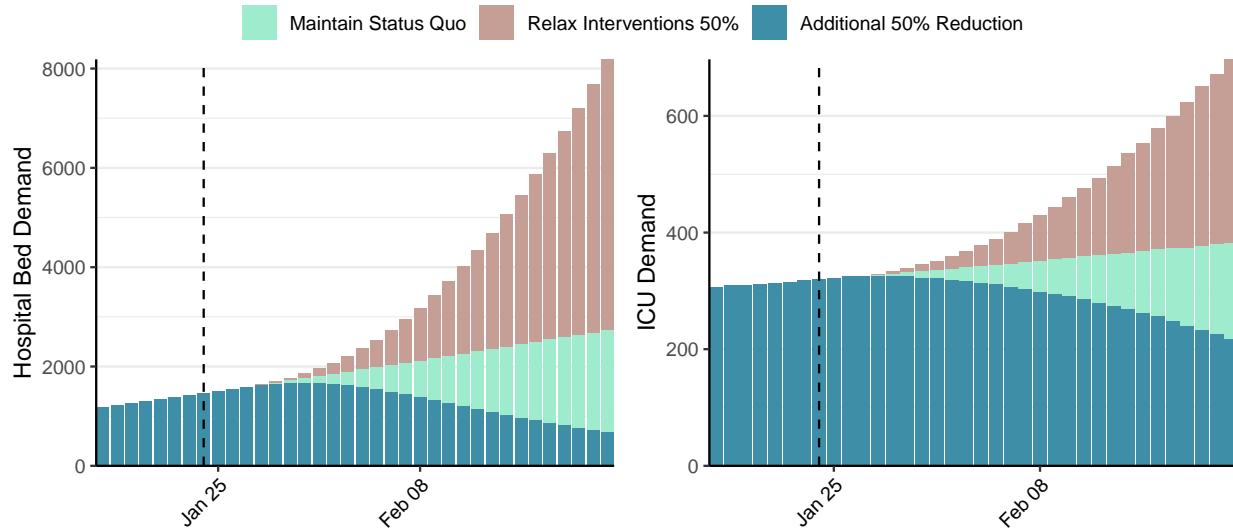


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 19,568 (95% CI: 18,534-20,601) at the current date to 2,737 (95% CI: 2,503-2,972) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 19,568 (95% CI: 18,534-20,601) at the current date to 127,998 (95% CI: 120,236-135,761) by 2021-02-21.

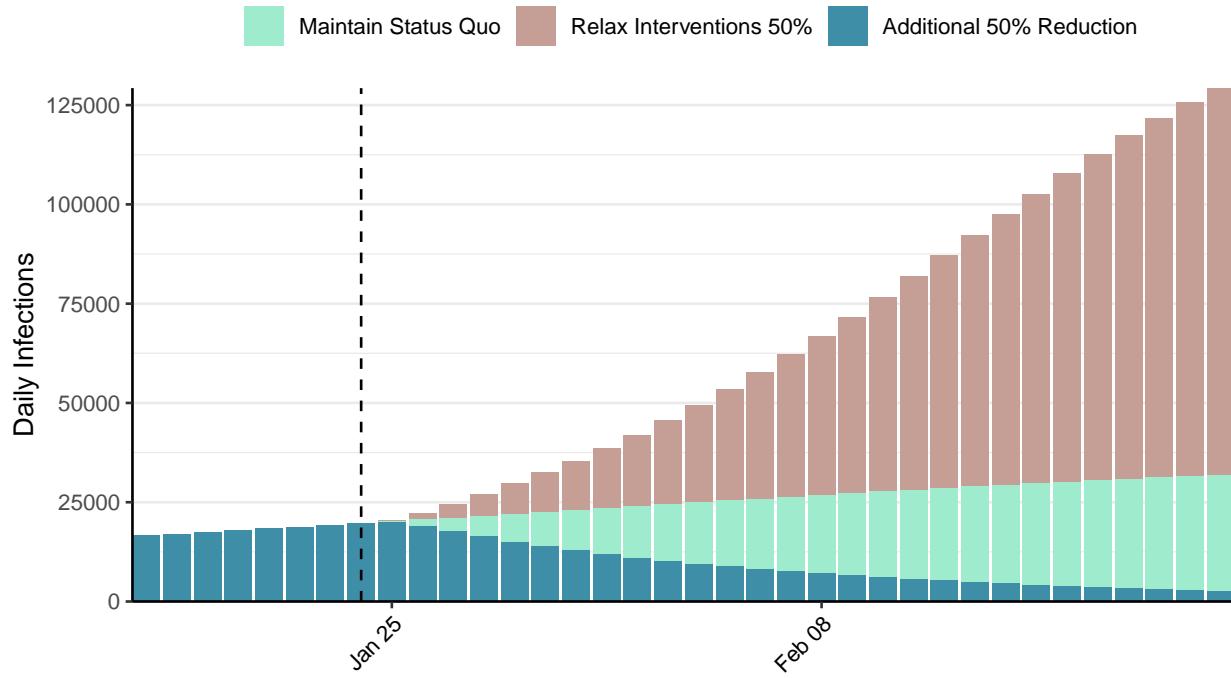


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Brazil, 2021-01-24 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}
26,816	26,816	627	627	0.95 (95% CI: 0.77-1.13)

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.

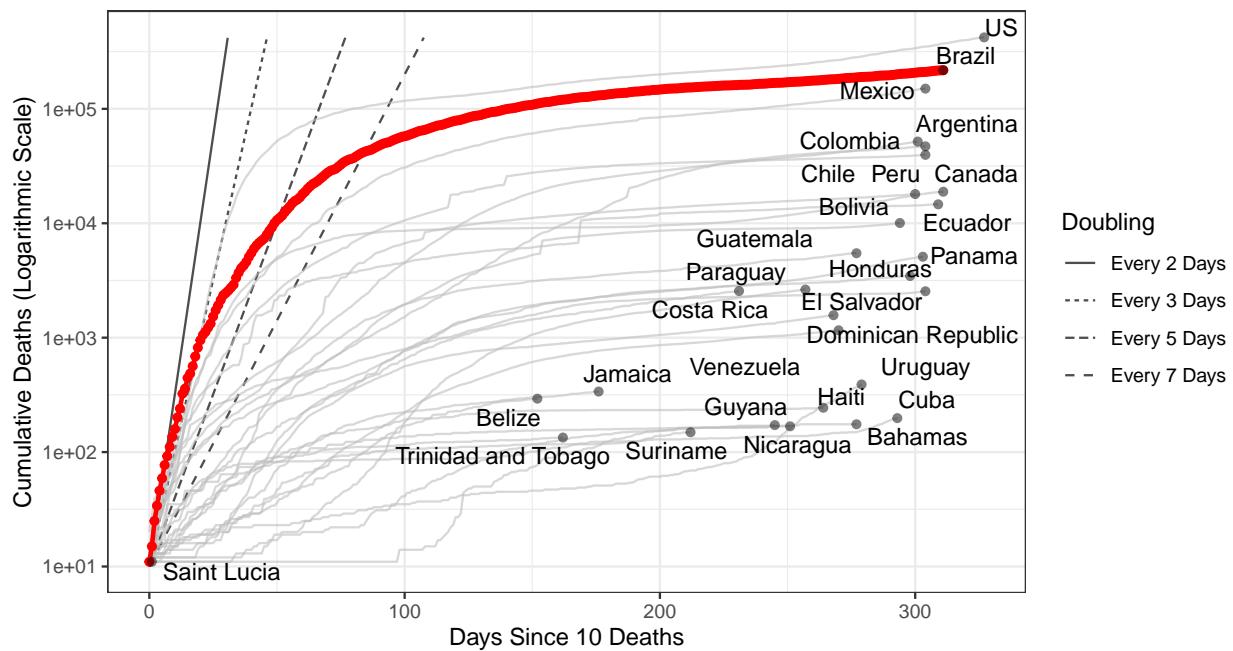


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 7,565,345 (95% CI: 7,217,028–7,913,661) 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

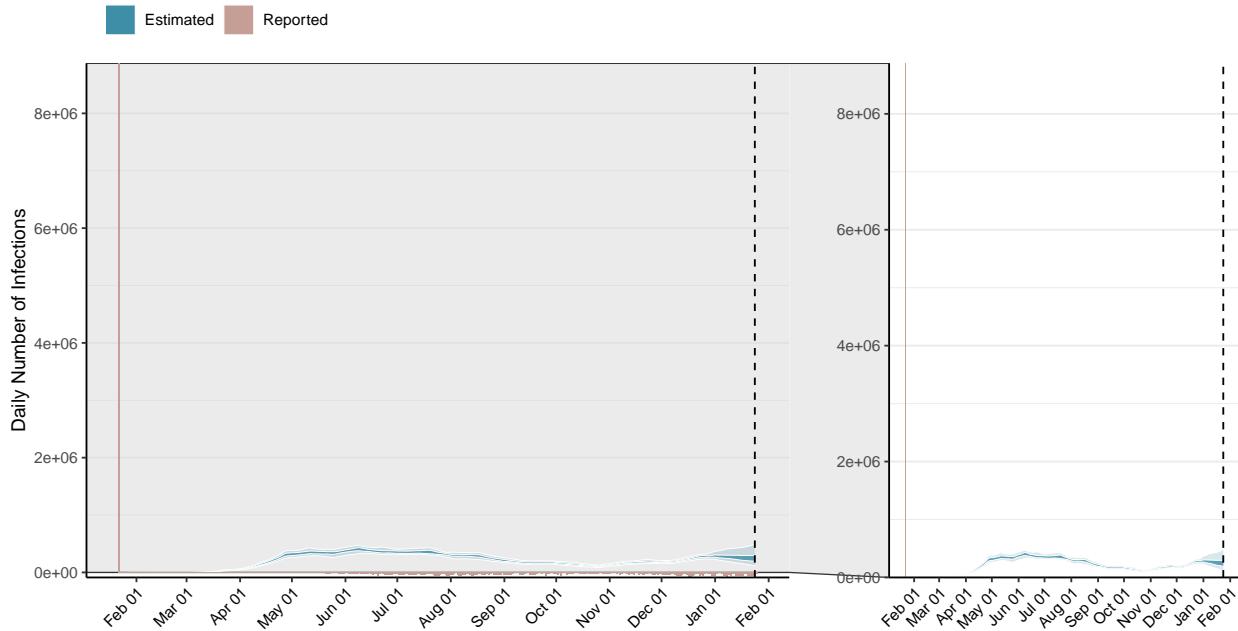


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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](#)

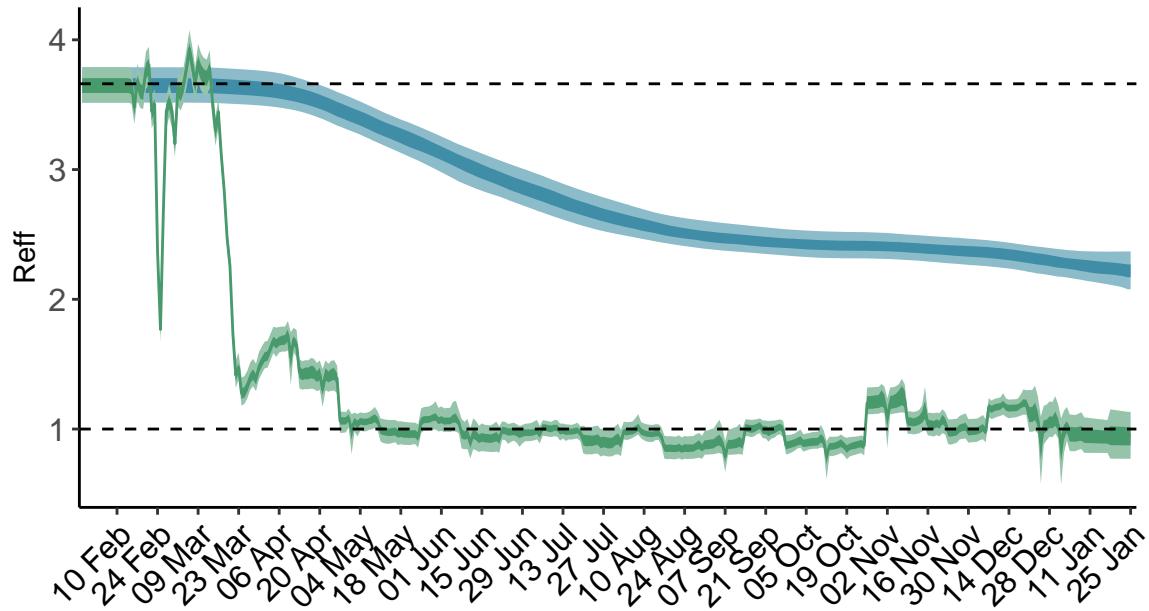


Figure 3: **Time-varying effective reproduction number, R_{eff} .** R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

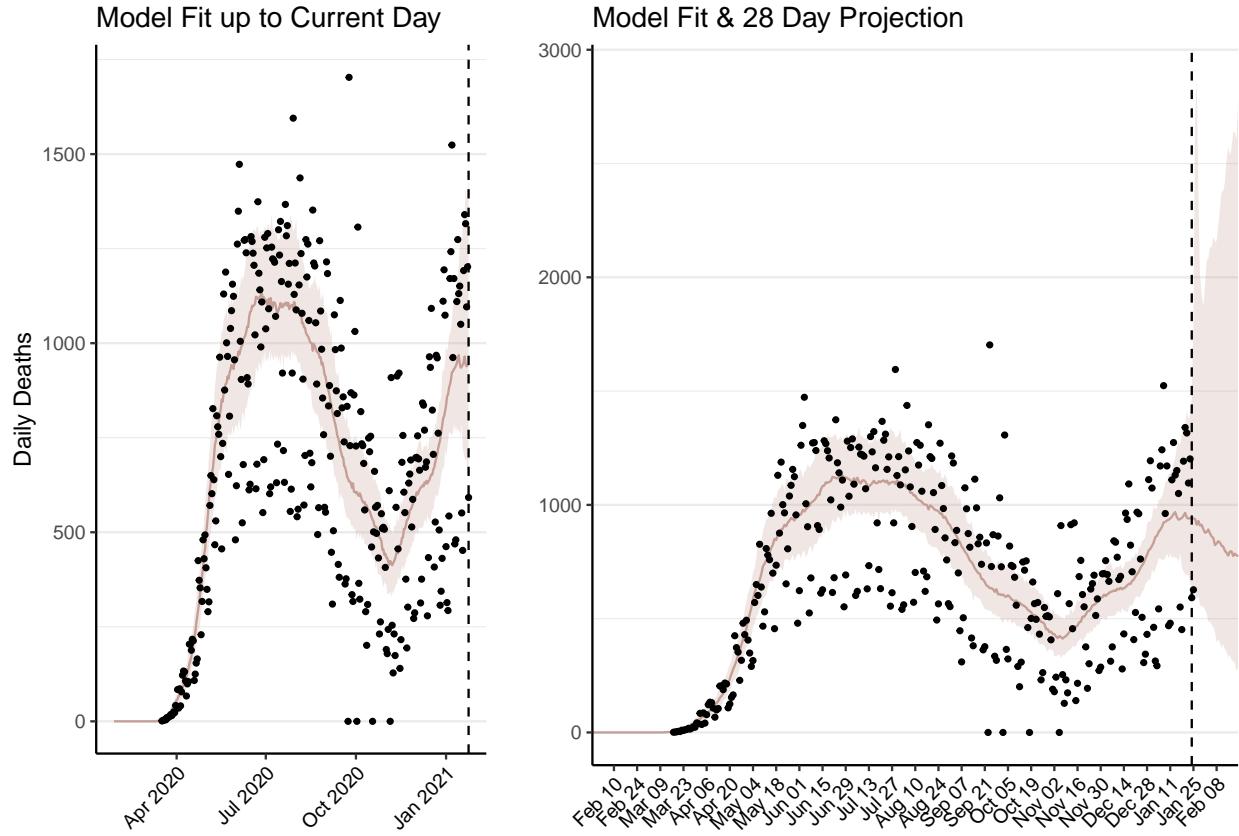


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 33,496 (95% CI: 31,762-35,231) patients requiring treatment with high-pressure oxygen at the current date to 30,706 (95% CI: 27,167-34,246) hospital beds being required on 2021-02-21 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 12,362 (95% CI: 11,793-12,931) patients requiring treatment with mechanical ventilation at the current date to 10,283 (95% CI: 9,477-11,090) by 2021-02-21. 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.

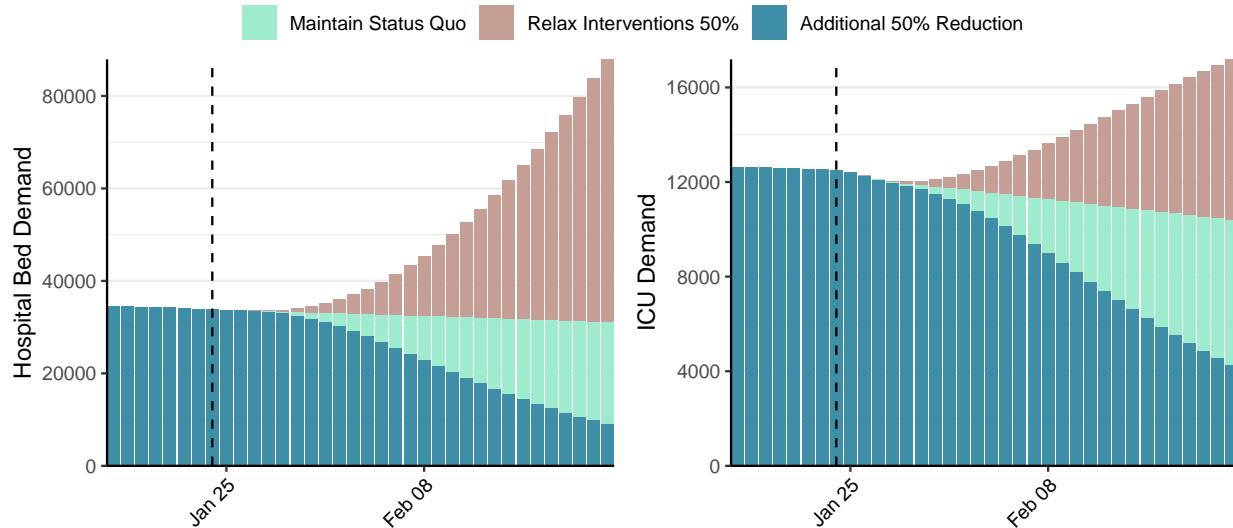


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 255,445 (95% CI: 236,051-274,840) at the current date to 20,996 (95% CI: 18,209-23,783) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 255,445 (95% CI: 236,051-274,840) at the current date to 1,023,948 (95% CI: 904,573-1,143,322) by 2021-02-21.

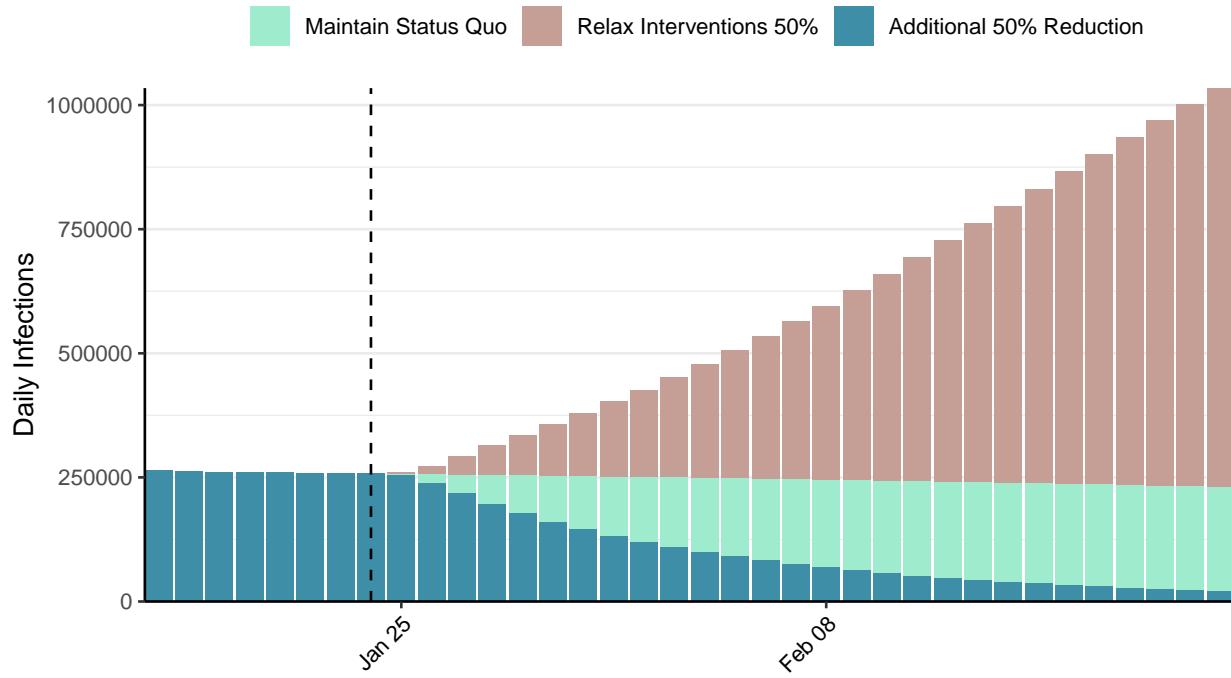


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Bhutan, 2021-01-24 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}
1	1	0	0	1.98 (95% CI: 1.37-2.78)

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**

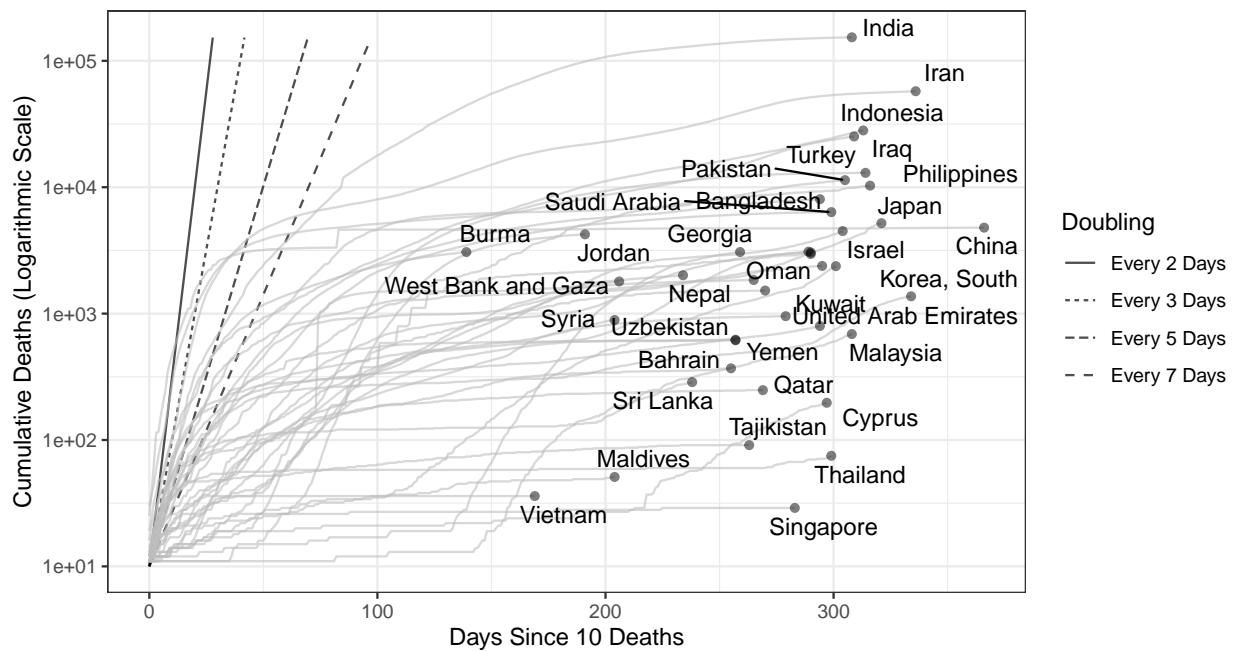


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 1,556 (95% CI: 1,164-1,948) 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

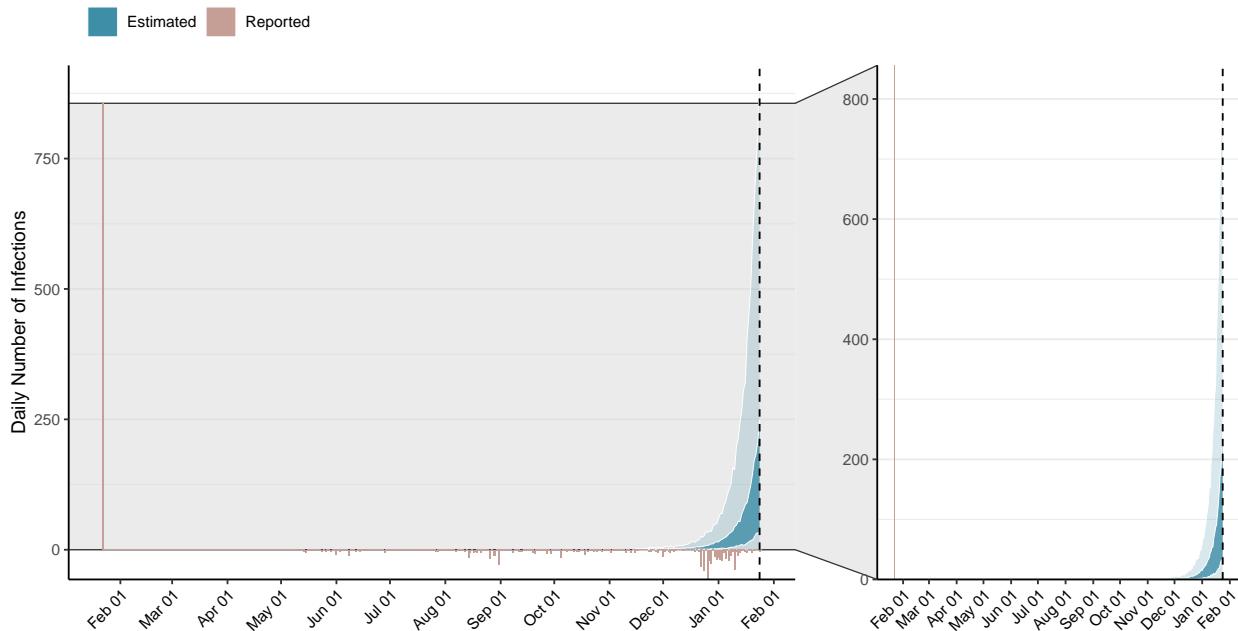


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

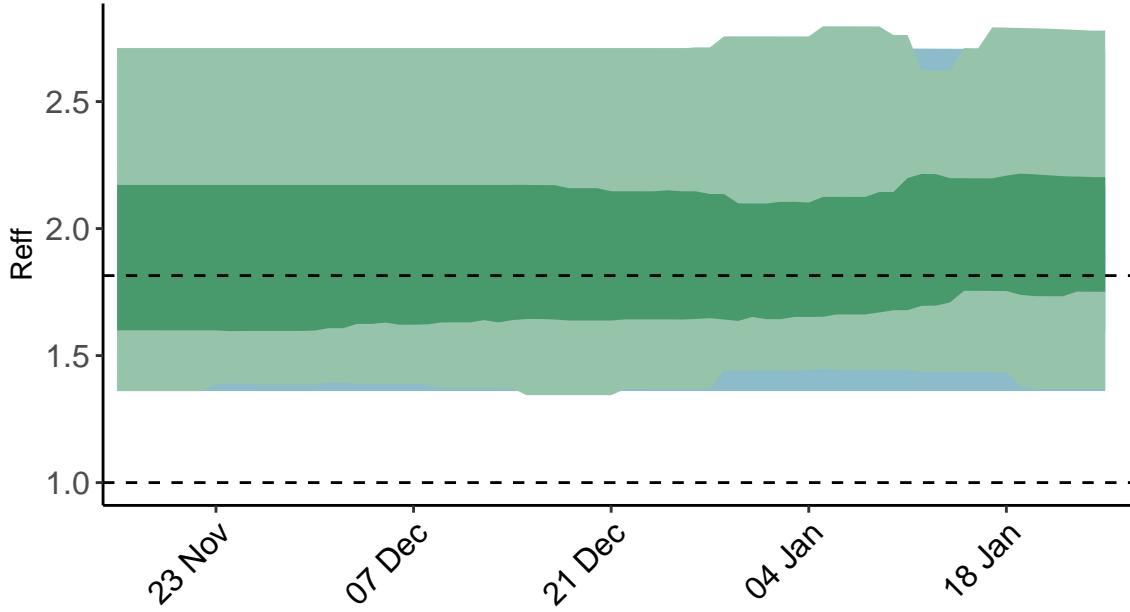


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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. 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.](#)

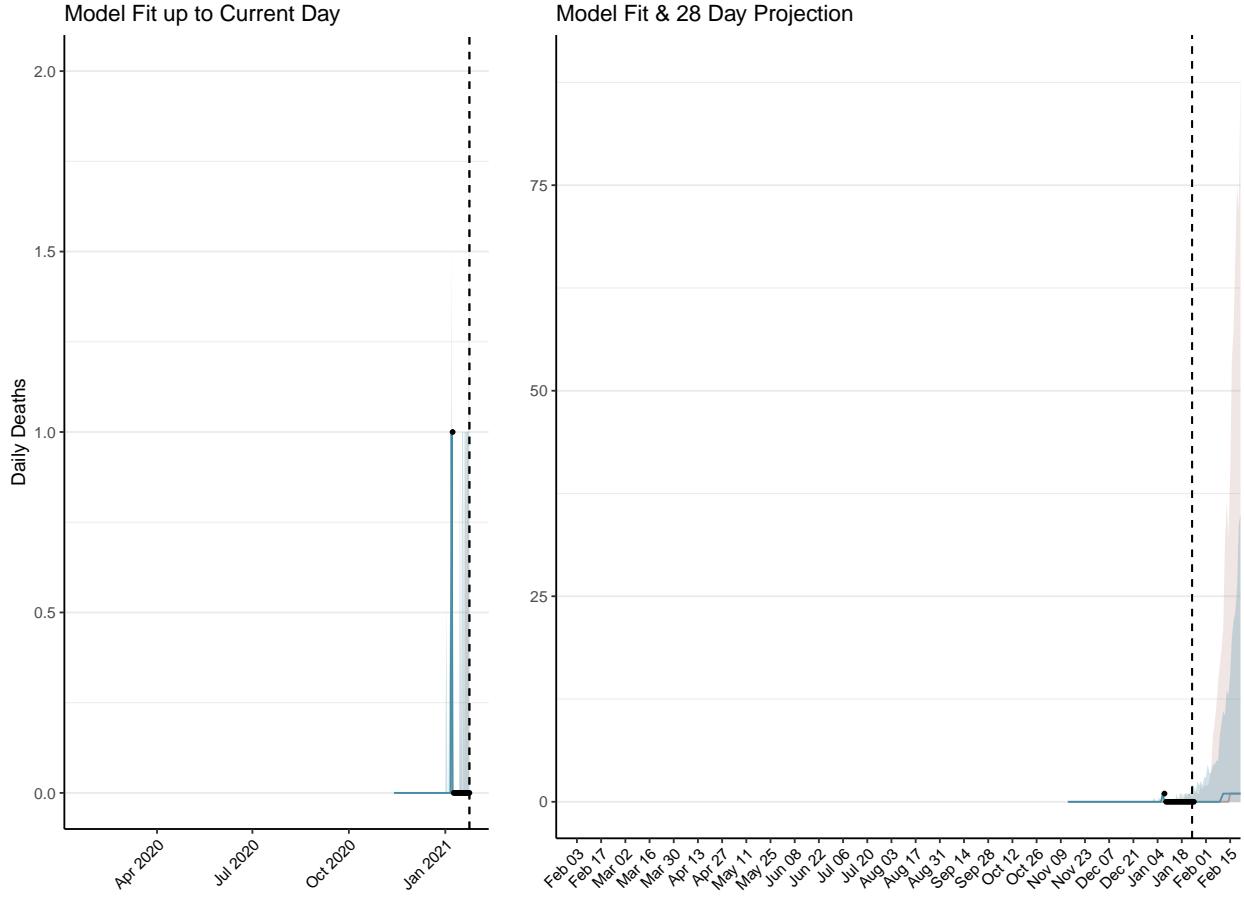


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 7 (95% CI: 5-9) patients requiring treatment with high-pressure oxygen at the current date to 242 (95% CI: 157-327) hospital beds being required on 2021-02-21 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 33 (95% CI: 25-40) by 2021-02-21. 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.**

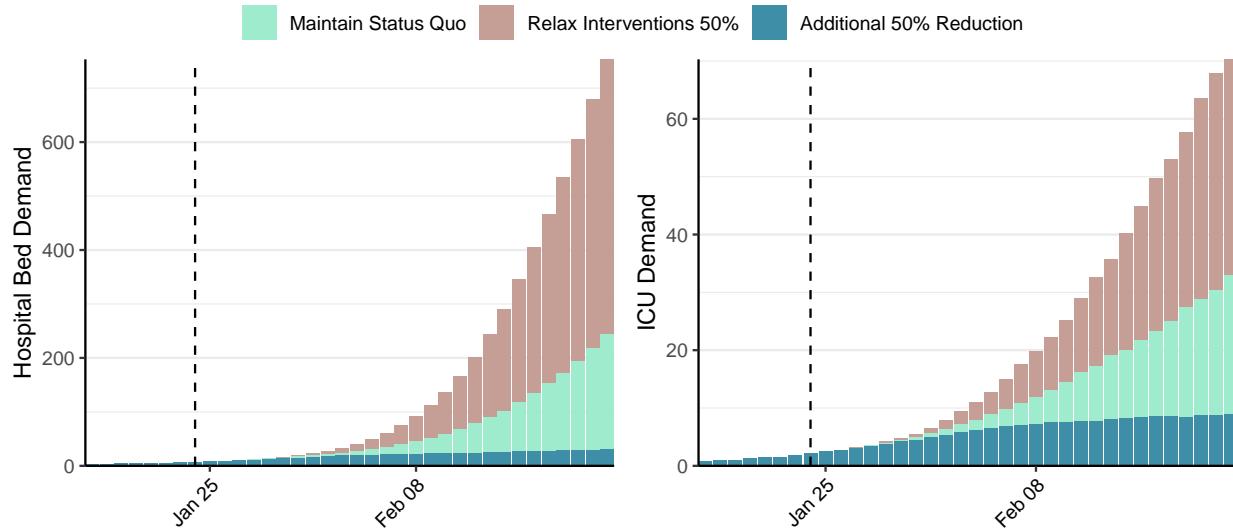


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 189 (95% CI: 140-239) at the current date to 355 (95% CI: 205-505) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 189 (95% CI: 140-239) at the current date to 14,360 (95% CI: 11,273-17,448) by 2021-02-21.

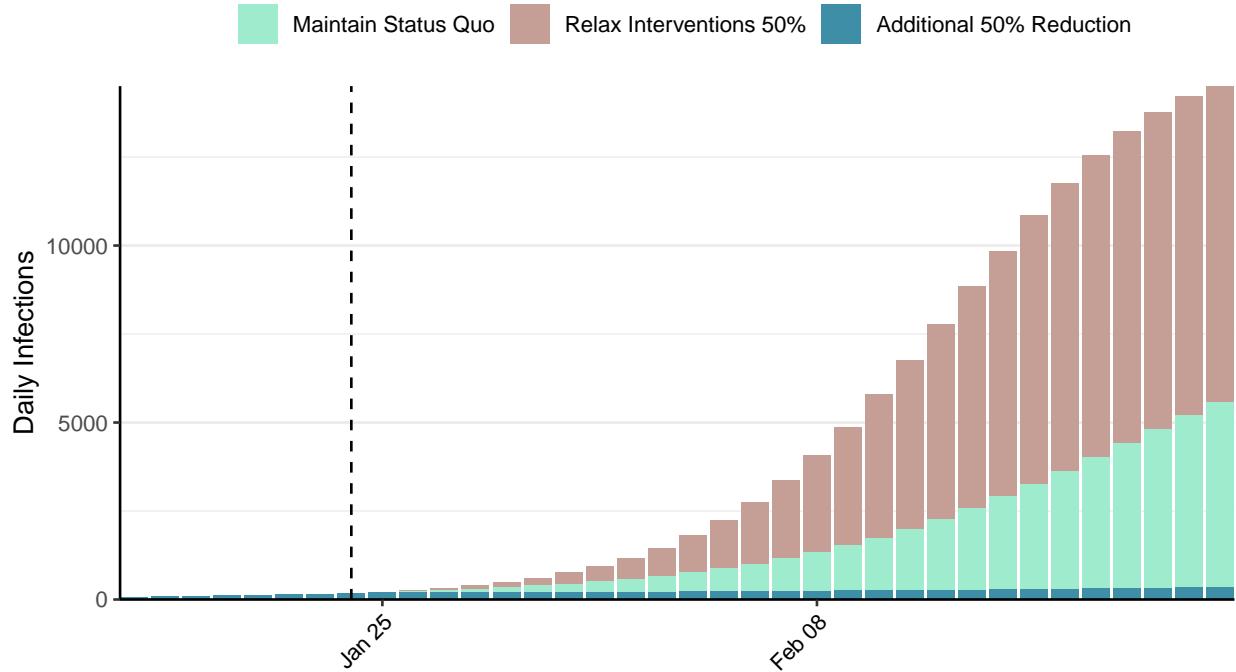


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Botswana, 2021-01-24 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}
1,004	1,004	19	19	1.57 (95% CI: 1.22-1.88)

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.

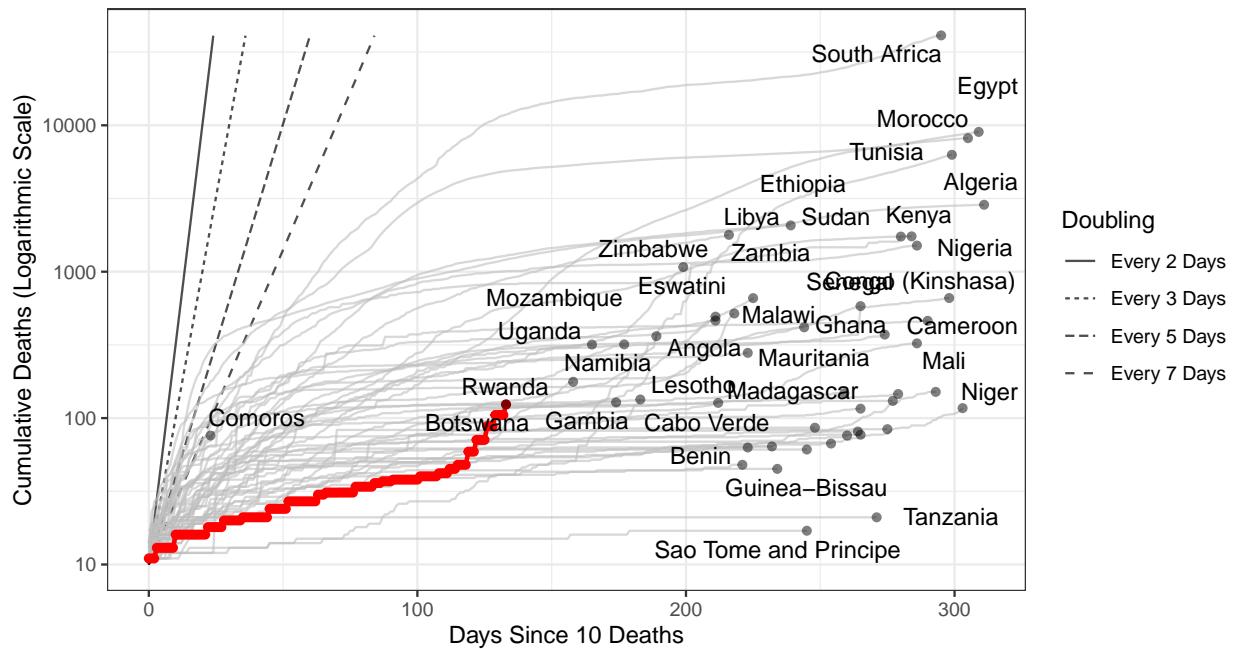


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 102,279 (95% CI: 91,494-113,064) 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).

Plot on right zoomed in on reported cases

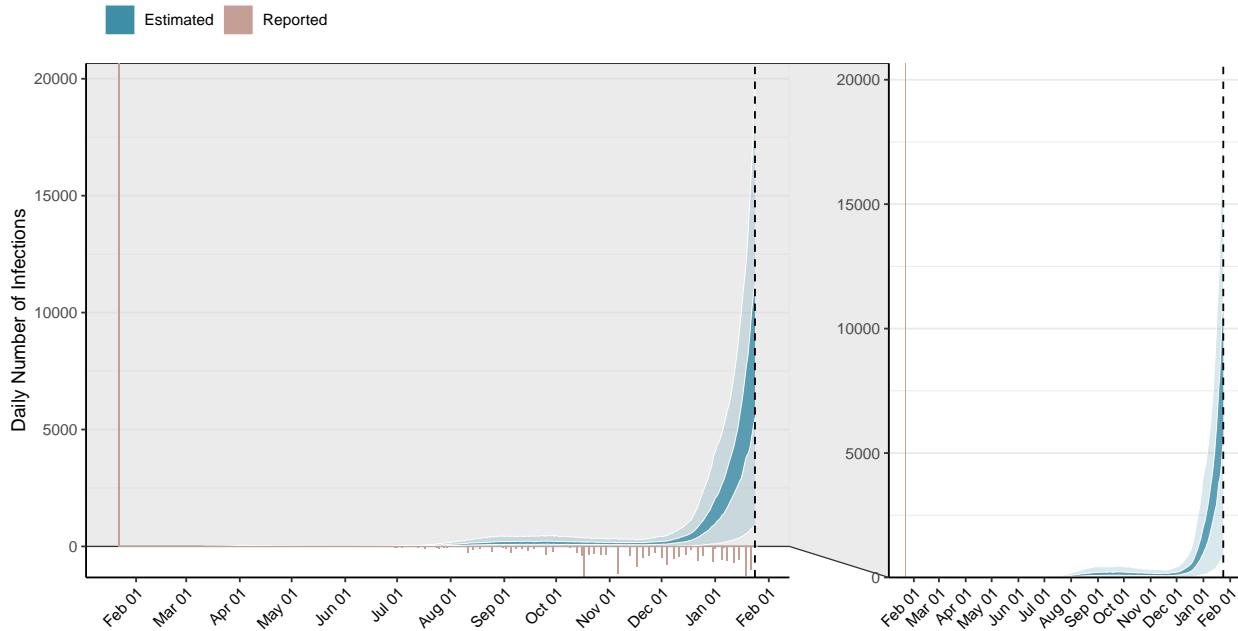


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

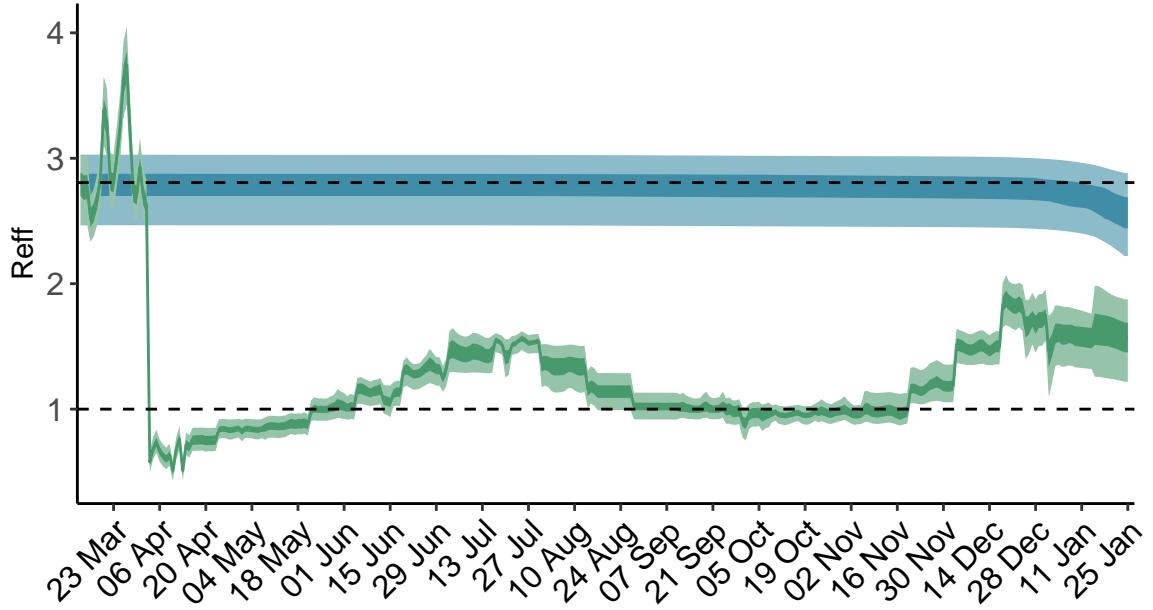


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

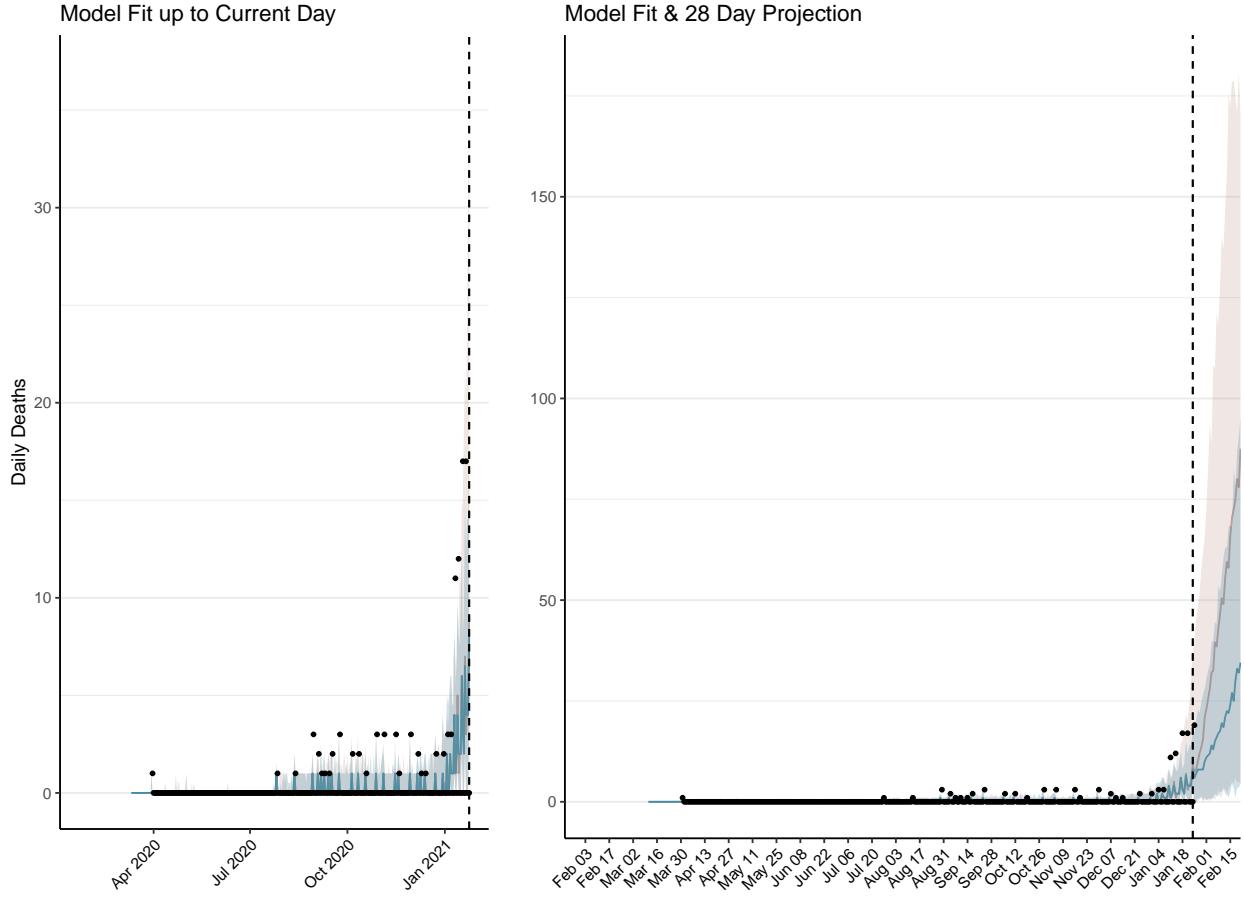


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 369 (95% CI: 329-409) patients requiring treatment with high-pressure oxygen at the current date to 2,008 (95% CI: 1,803-2,212) hospital beds being required on 2021-02-21 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 117 (95% CI: 106-127) patients requiring treatment with mechanical ventilation at the current date to 250 (95% CI: 236-263) by 2021-02-21. 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.**

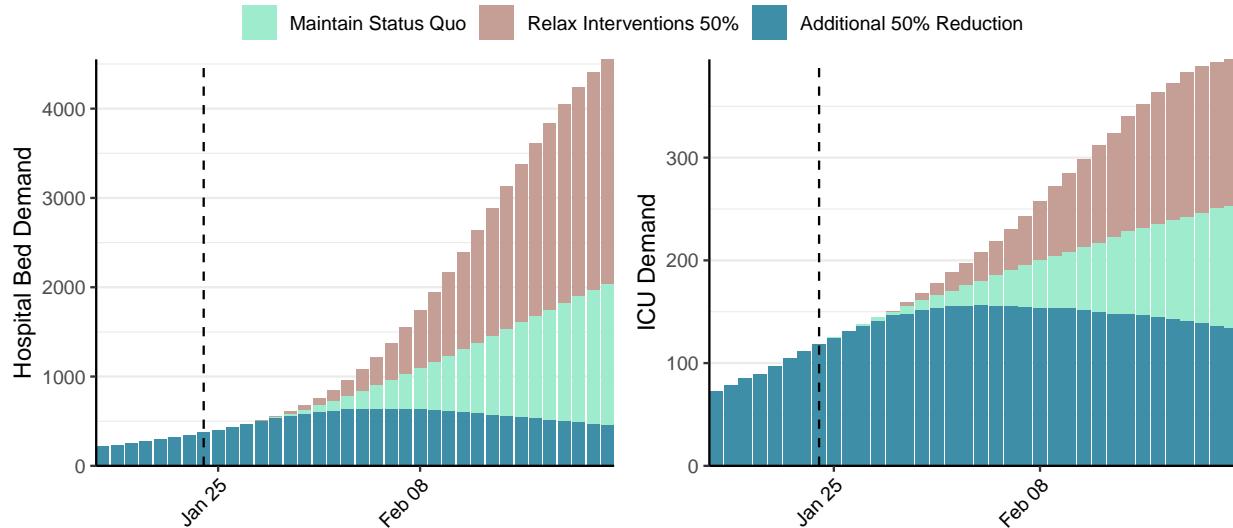


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 8,482 (95% CI: 7,522-9,443) at the current date to 3,206 (95% CI: 2,783-3,629) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 8,482 (95% CI: 7,522-9,443) at the current date to 56,864 (95% CI: 53,600-60,128) by 2021-02-21.

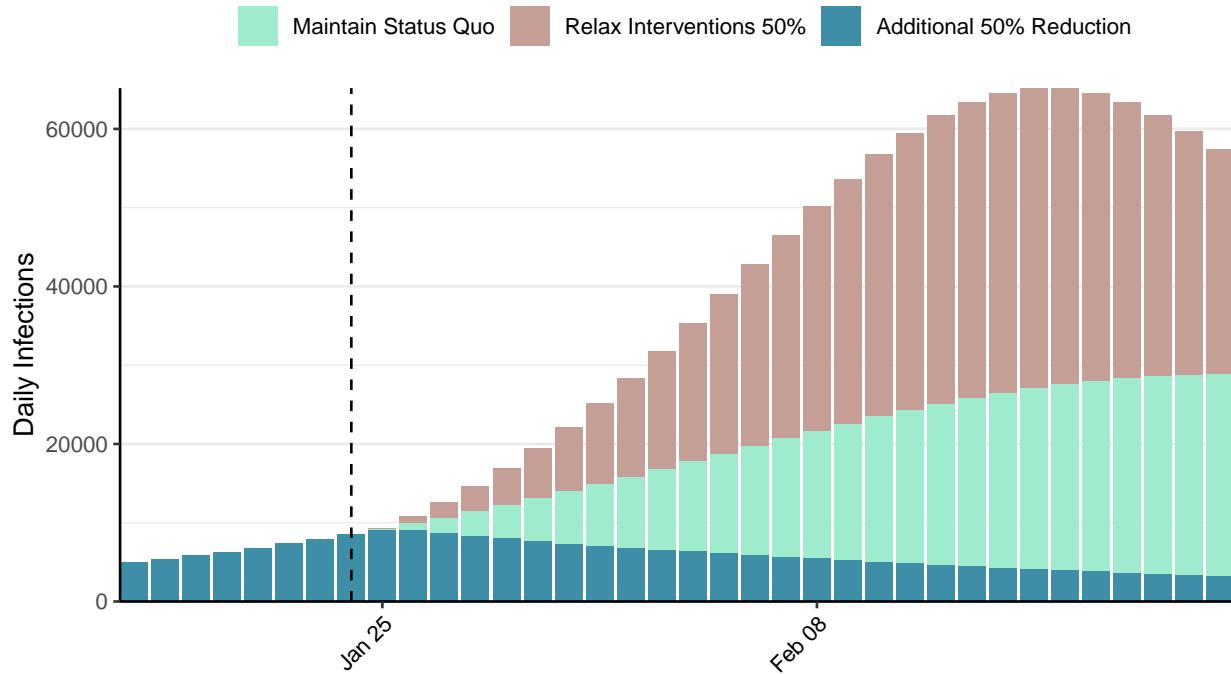


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Central African Republic, 2021-01-24

[Download the report for Central African Republic, 2021-01-24 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	0.73 (95% CI: 0.56-0.97)

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**

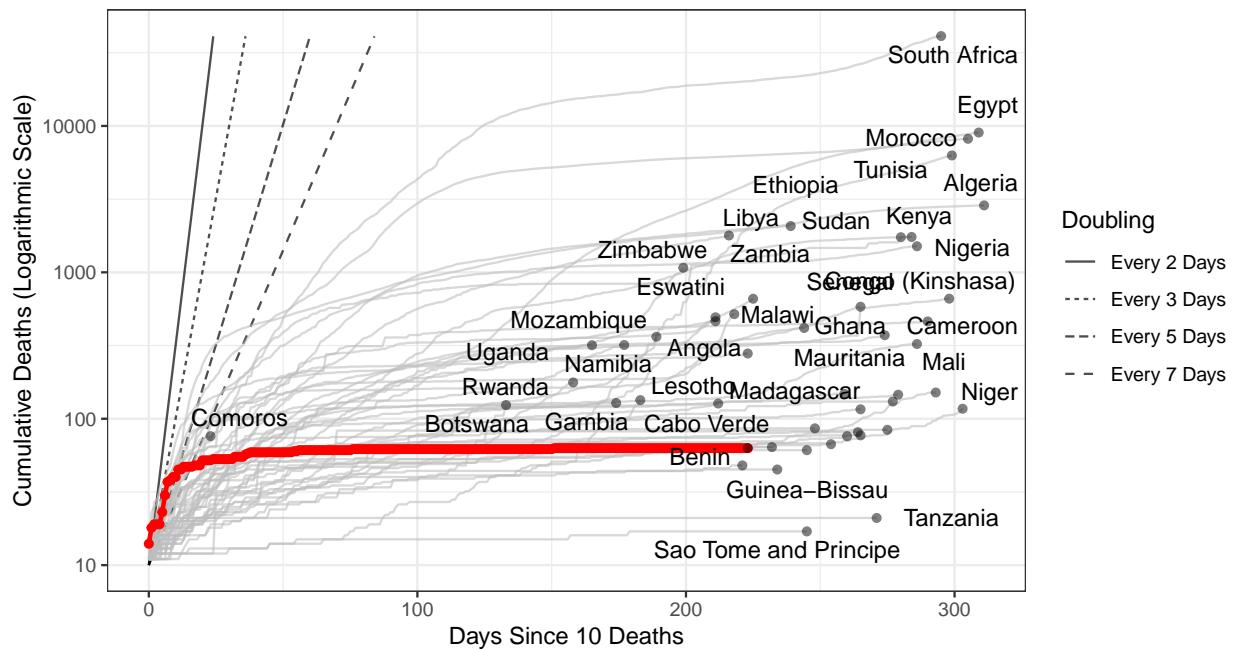


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 0 (95% CI: 0-1) 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).

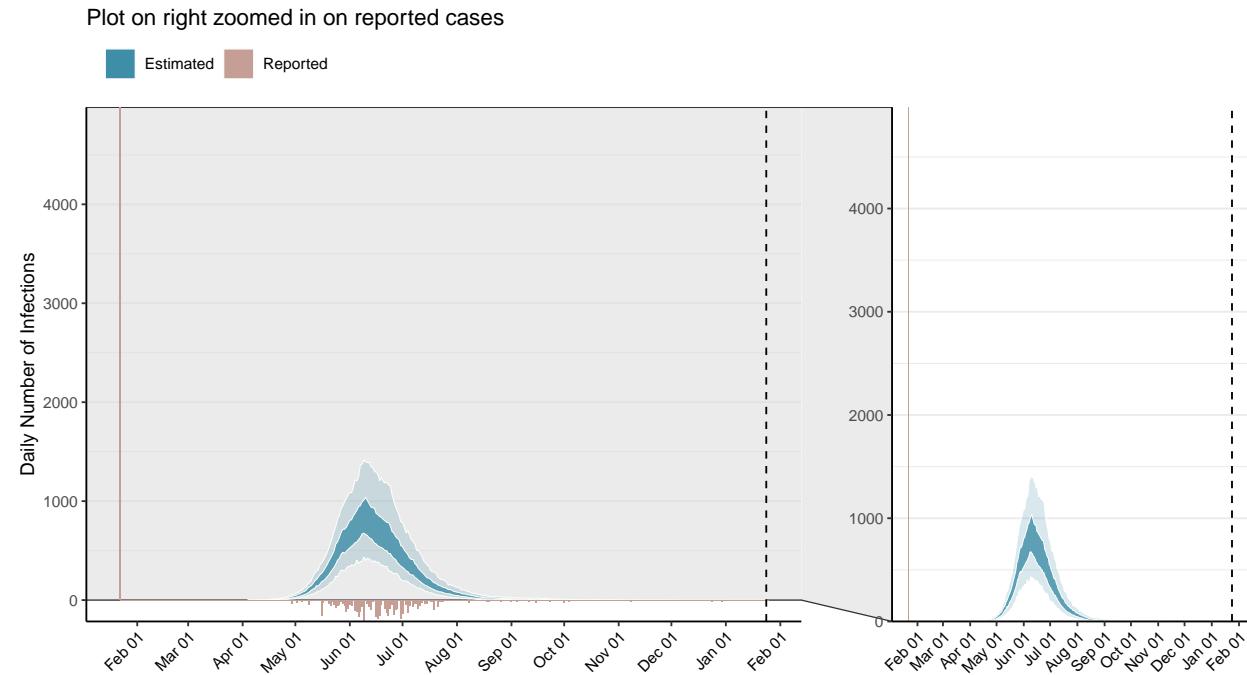


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

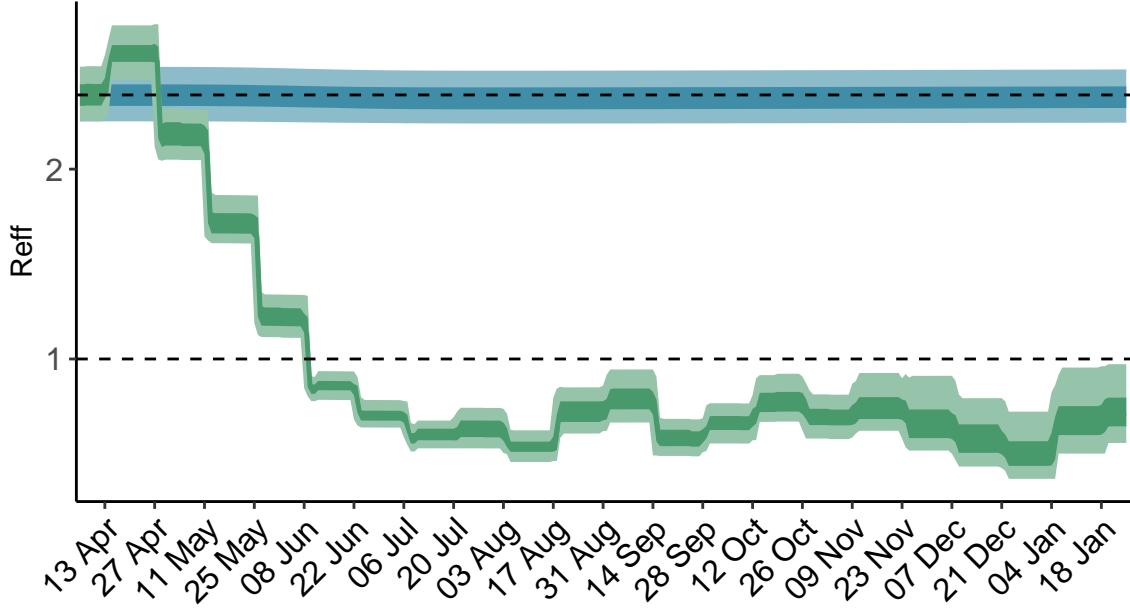


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

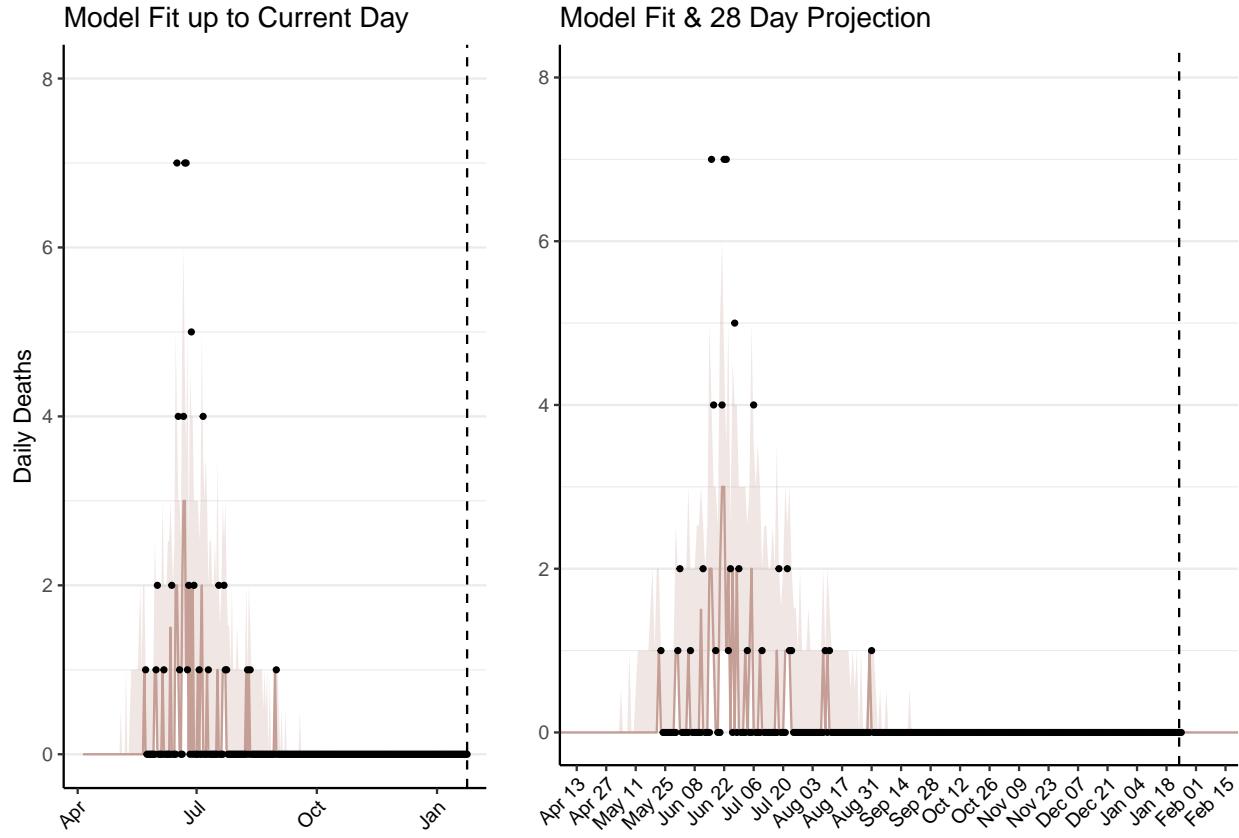


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 2021-02-21 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 2021-02-21. 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.**

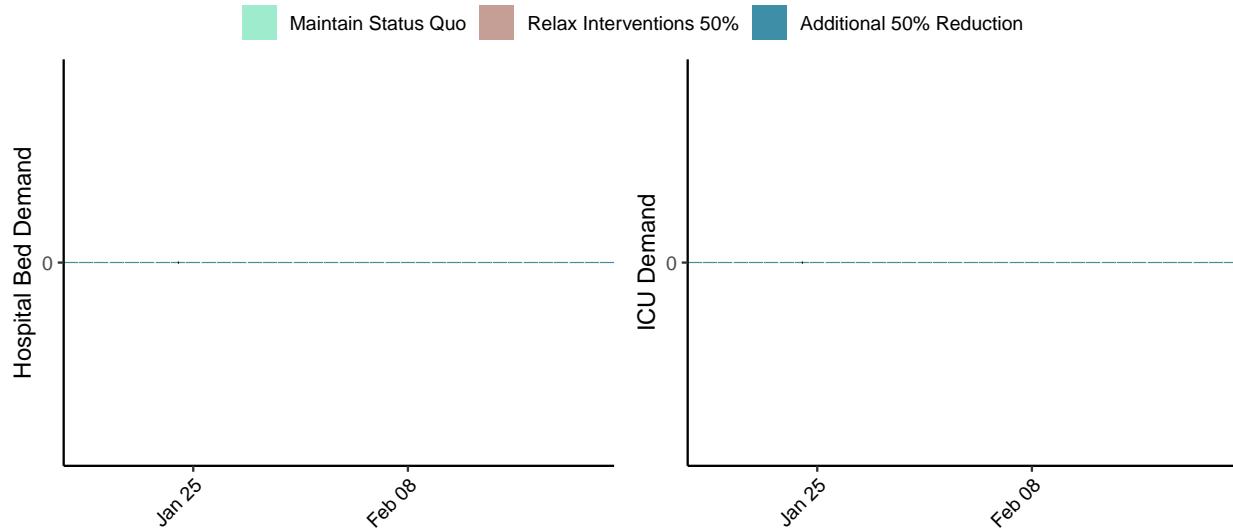


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 2021-02-21. 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 2021-02-21.

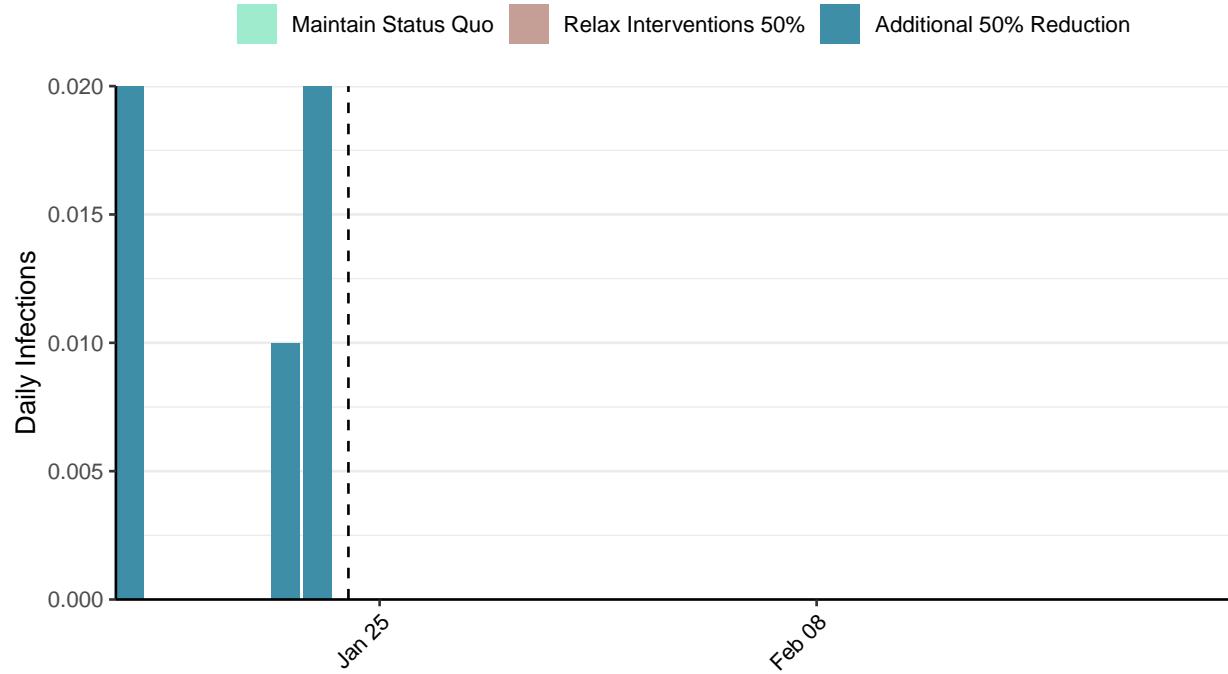


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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: Chile, 2021-01-24

[Download the report for Chile, 2021-01-24 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}
4,068	4,068	66	66	1.1 (95% CI: 0.9-1.35)

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.

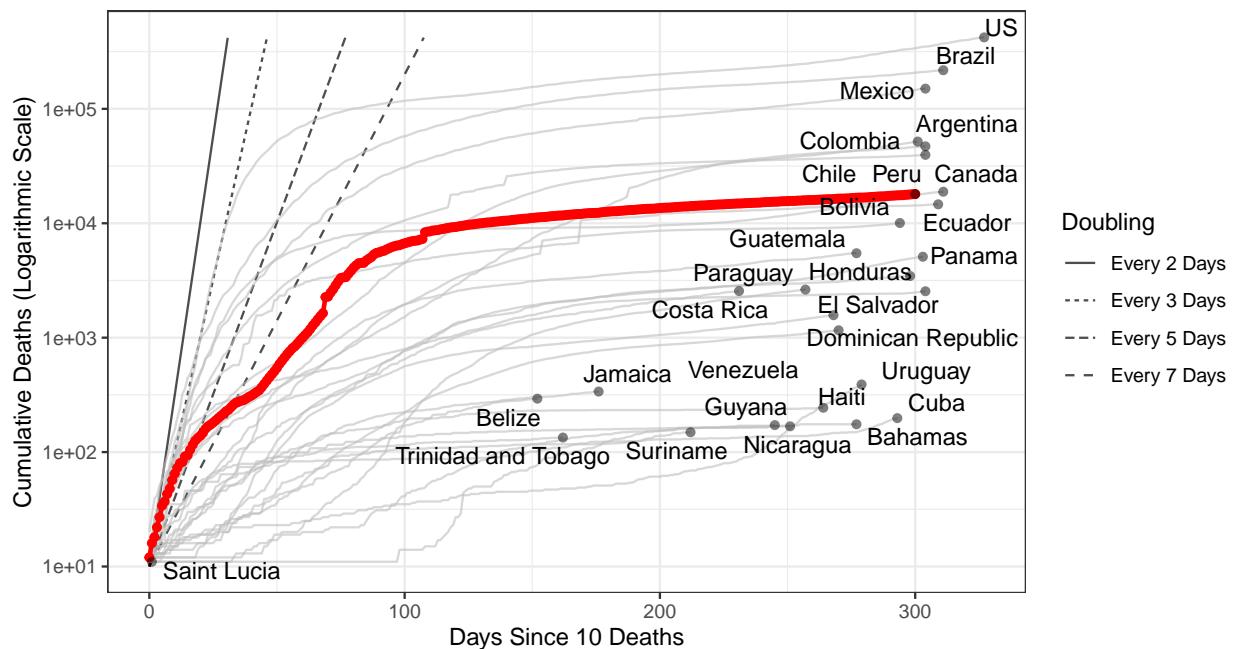


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 481,665 (95% CI: 458,393–504,937) 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

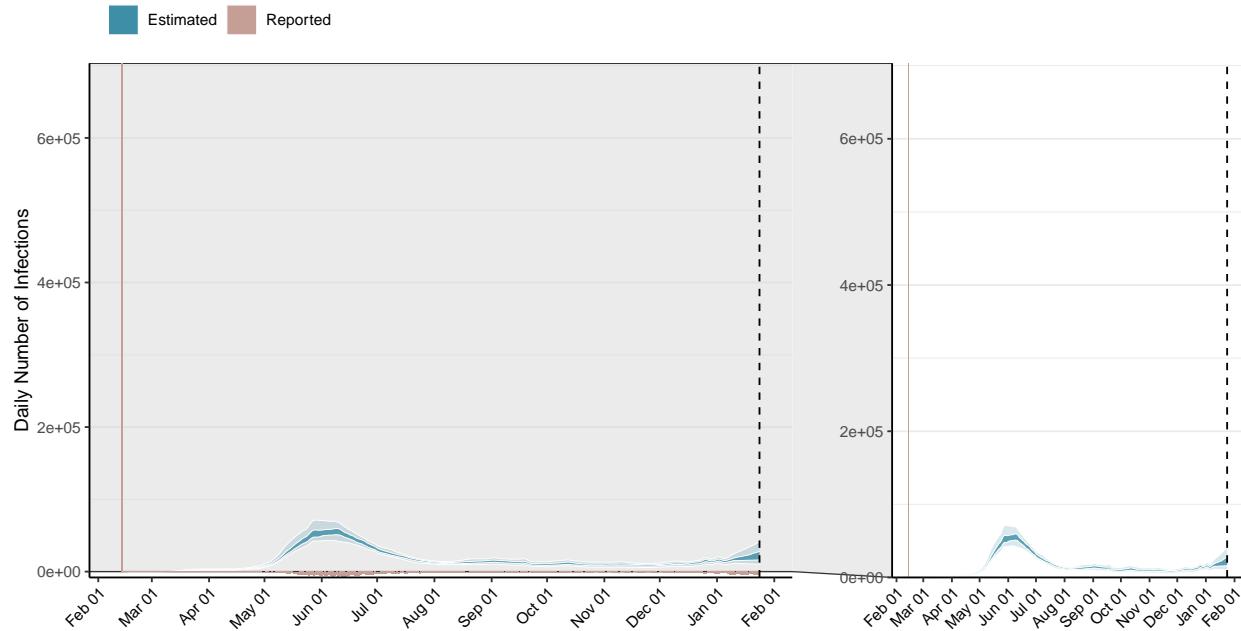


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

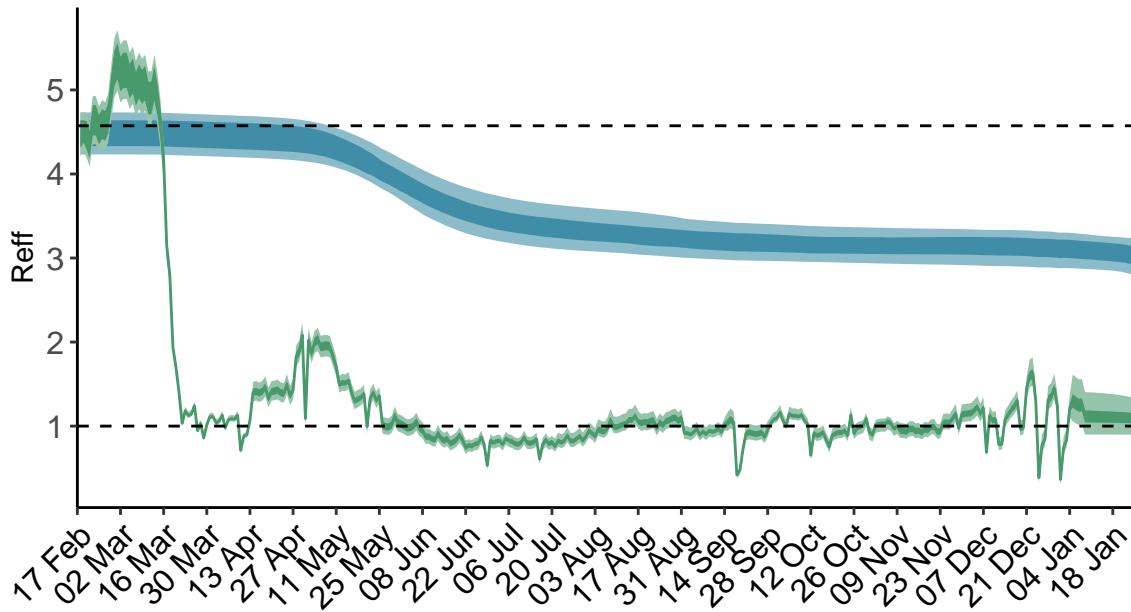


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

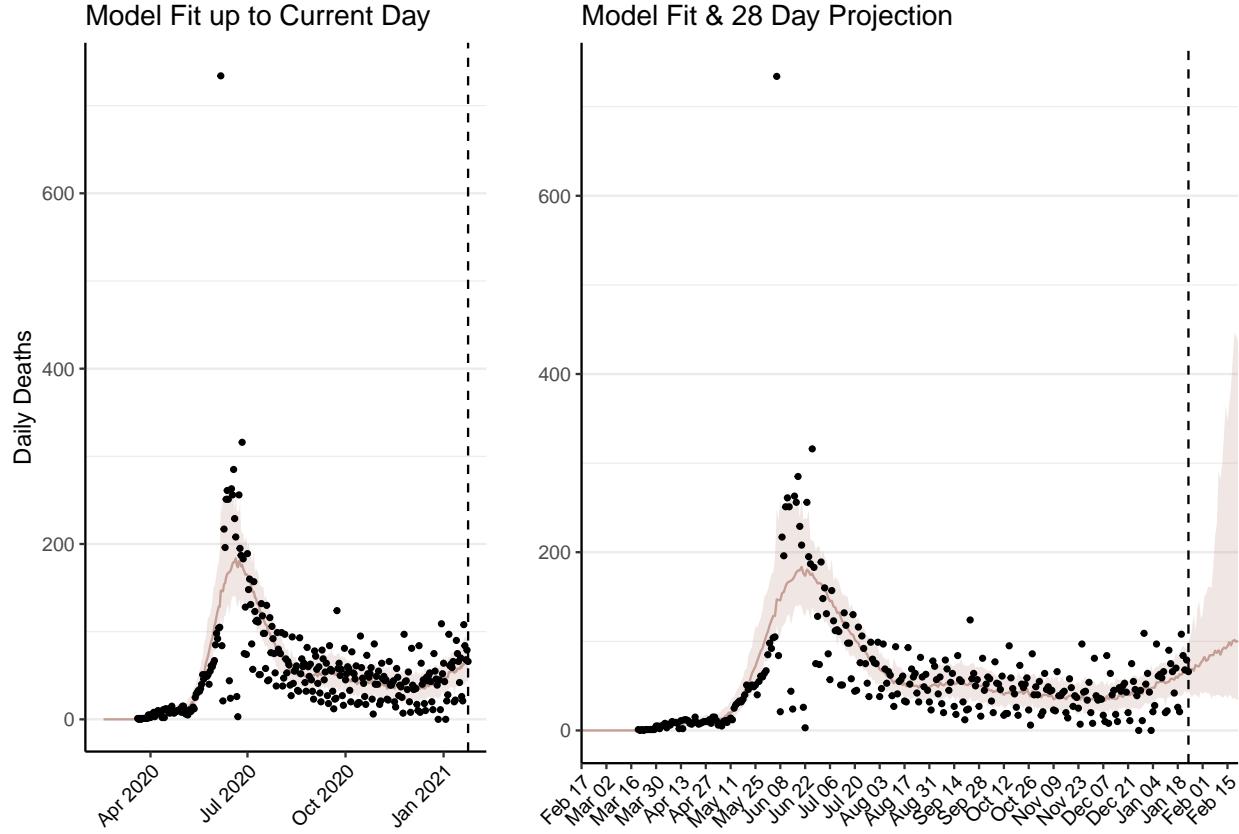


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 2,450 (95% CI: 2,320-2,580) patients requiring treatment with high-pressure oxygen at the current date to 4,383 (95% CI: 3,760-5,007) hospital beds being required on 2021-02-21 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 837 (95% CI: 796-878) patients requiring treatment with mechanical ventilation at the current date to 1,359 (95% CI: 1,231-1,488) by 2021-02-21. 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.**

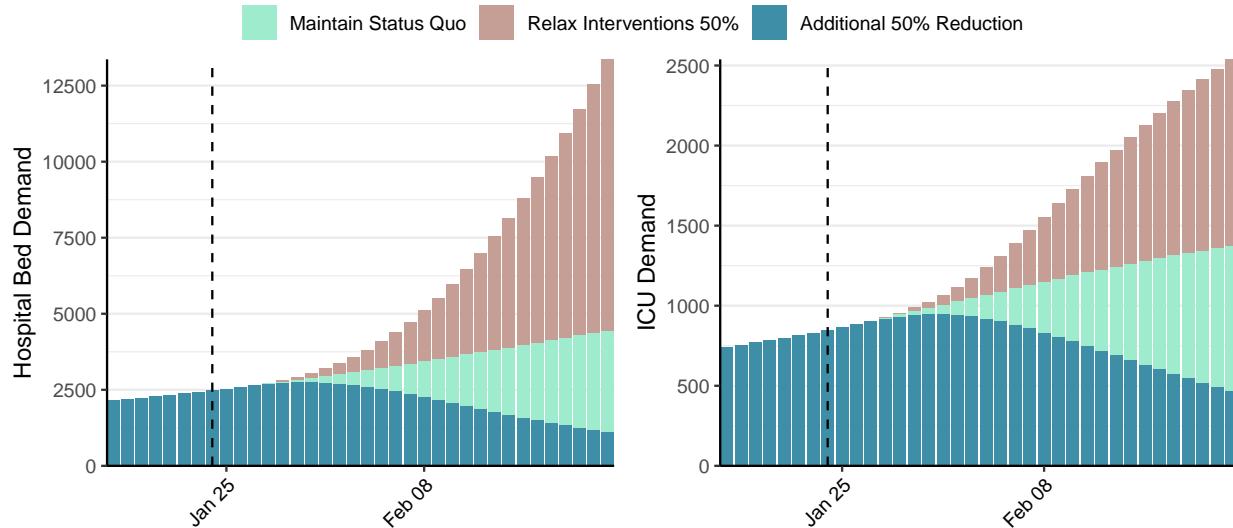


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 22,438 (95% CI: 20,549-24,328) at the current date to 3,107 (95% CI: 2,589-3,625) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 22,438 (95% CI: 20,549-24,328) at the current date to 152,253 (95% CI: 136,484-168,023) by 2021-02-21.

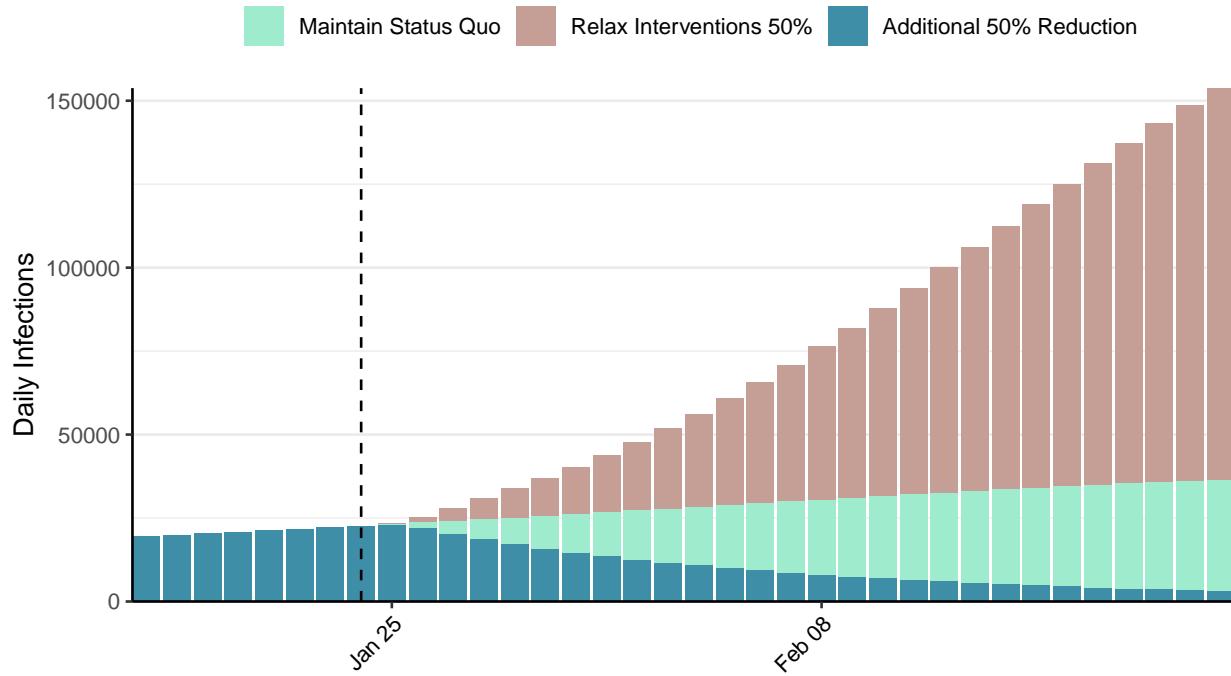


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for China, 2021-01-24 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}
155	155	3	3	1.28 (95% CI: 1.13-1.46)

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 3 deaths have been reported to date**

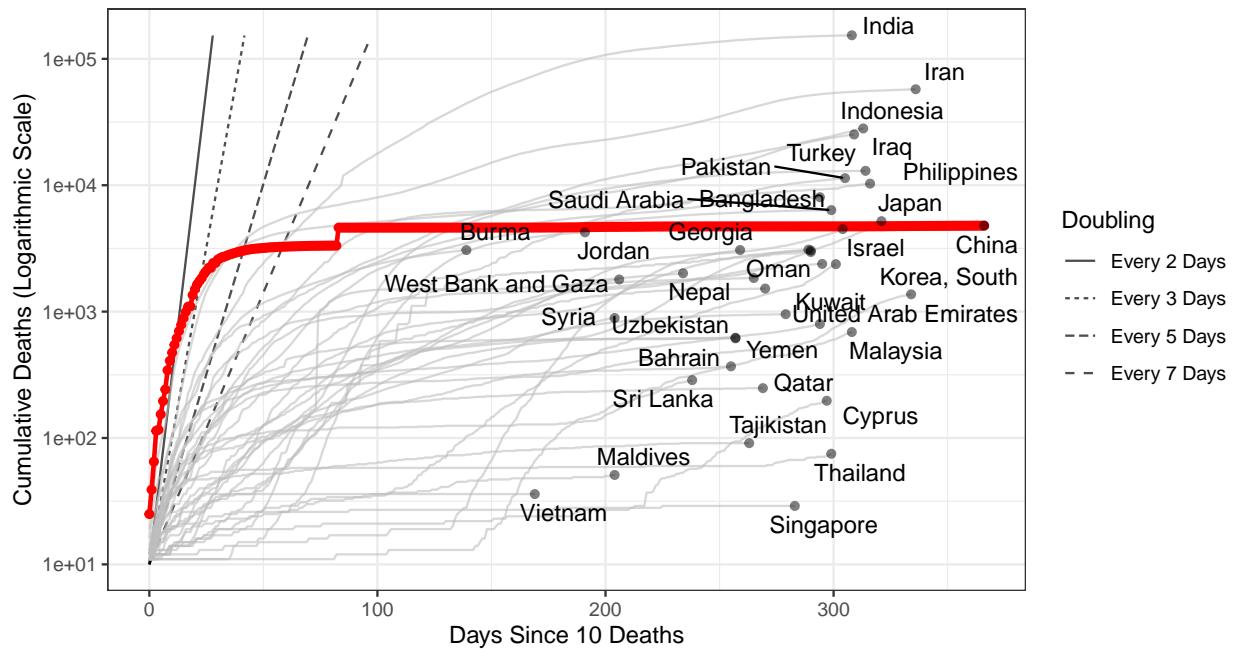


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 15,814 (95% CI: 14,568-17,060) 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

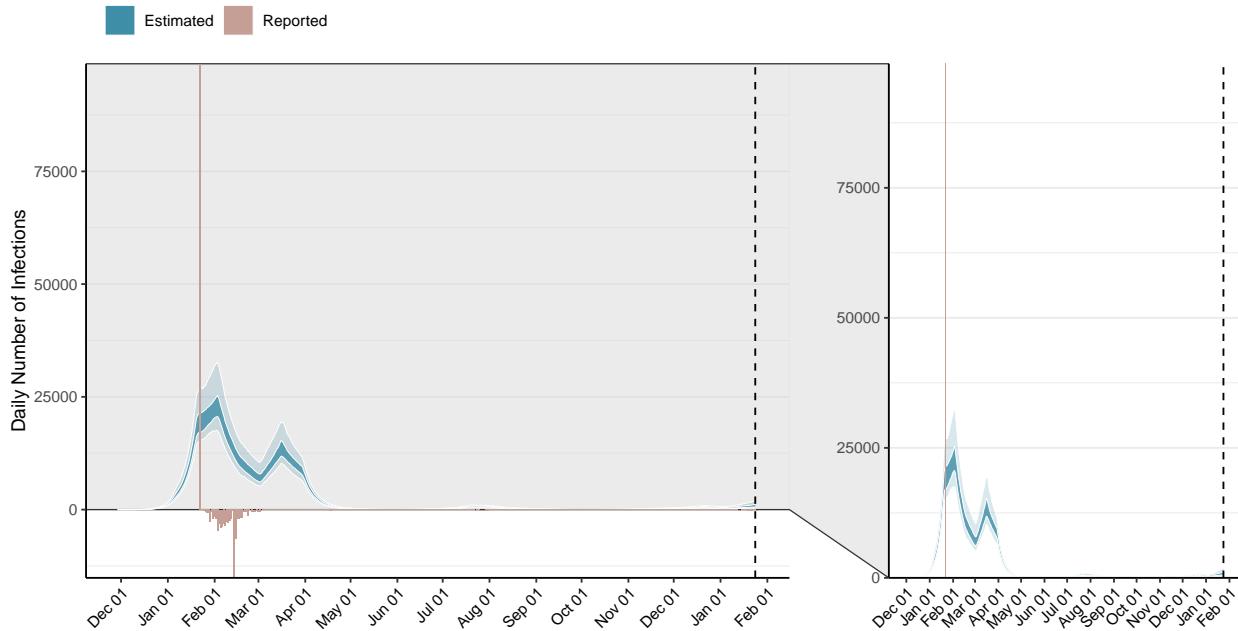


Figure 2: Daily number of infections estimated by fitting to the current total of deaths. Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

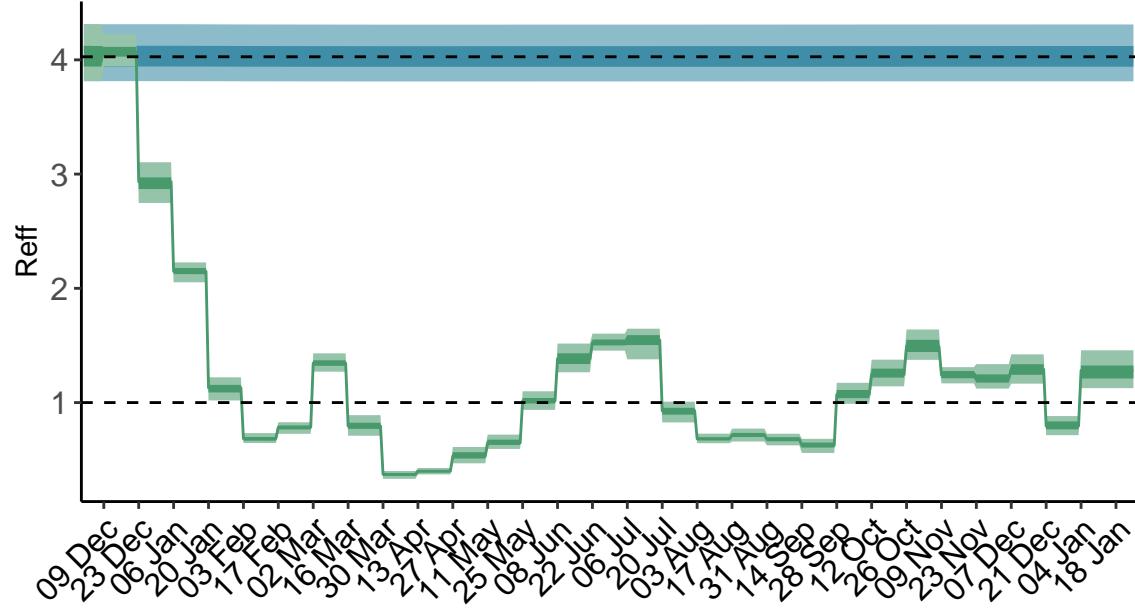


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

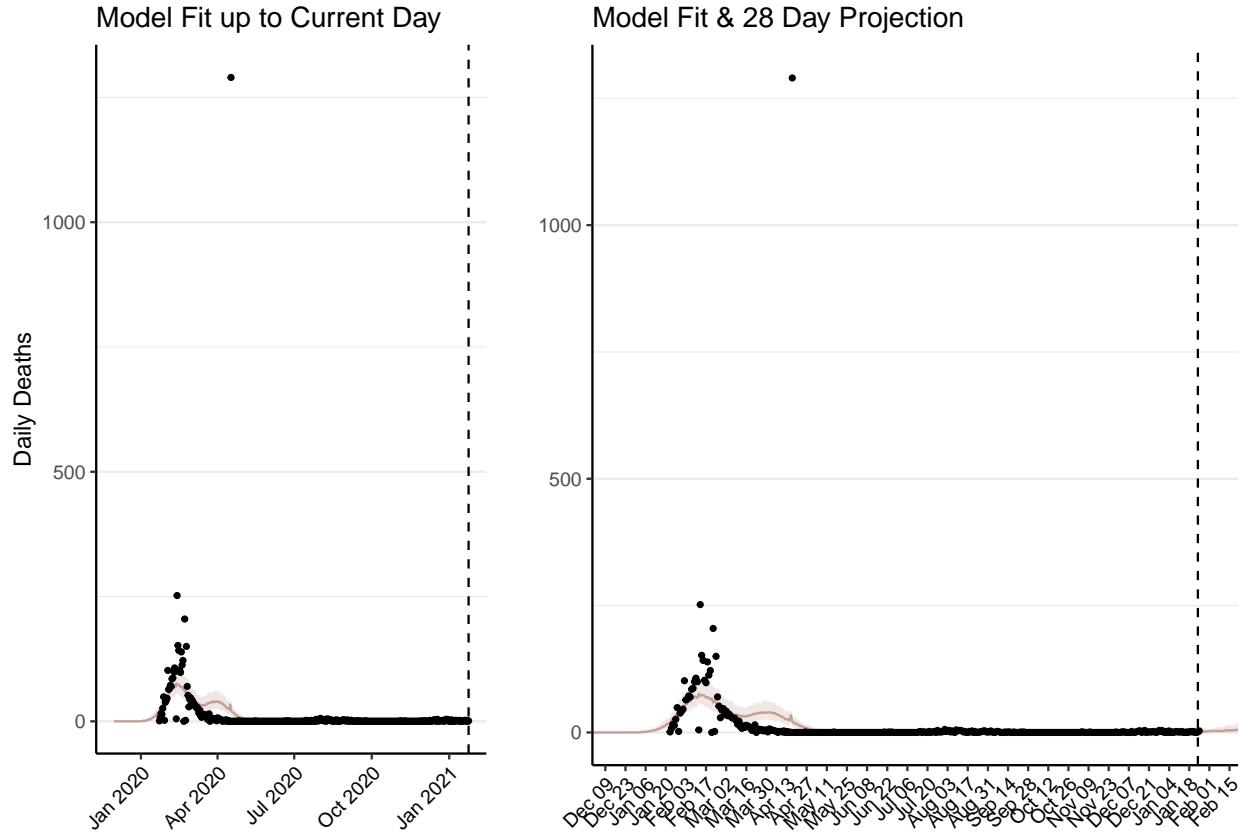


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 84 (95% CI: 77-91) patients requiring treatment with high-pressure oxygen at the current date to 274 (95% CI: 234-314) hospital beds being required on 2021-02-21 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 32 (95% CI: 30-35) patients requiring treatment with mechanical ventilation at the current date to 101 (95% CI: 87-115) by 2021-02-21. 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.**

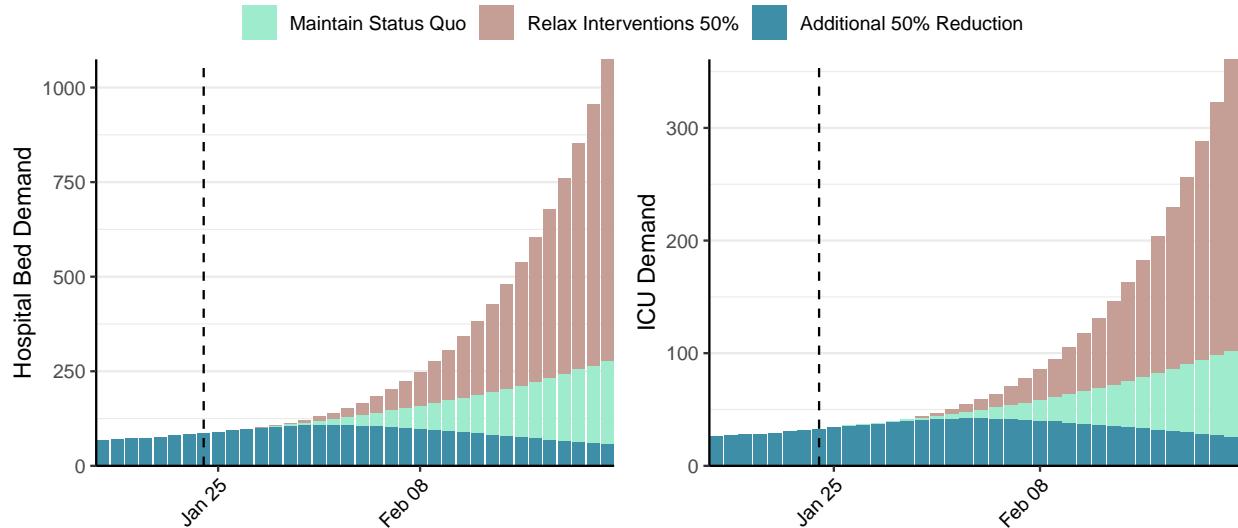


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 901 (95% CI: 811-991) at the current date to 200 (95% CI: 169-231) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 901 (95% CI: 811-991) at the current date to 21,559 (95% CI: 17,737-25,382) by 2021-02-21.

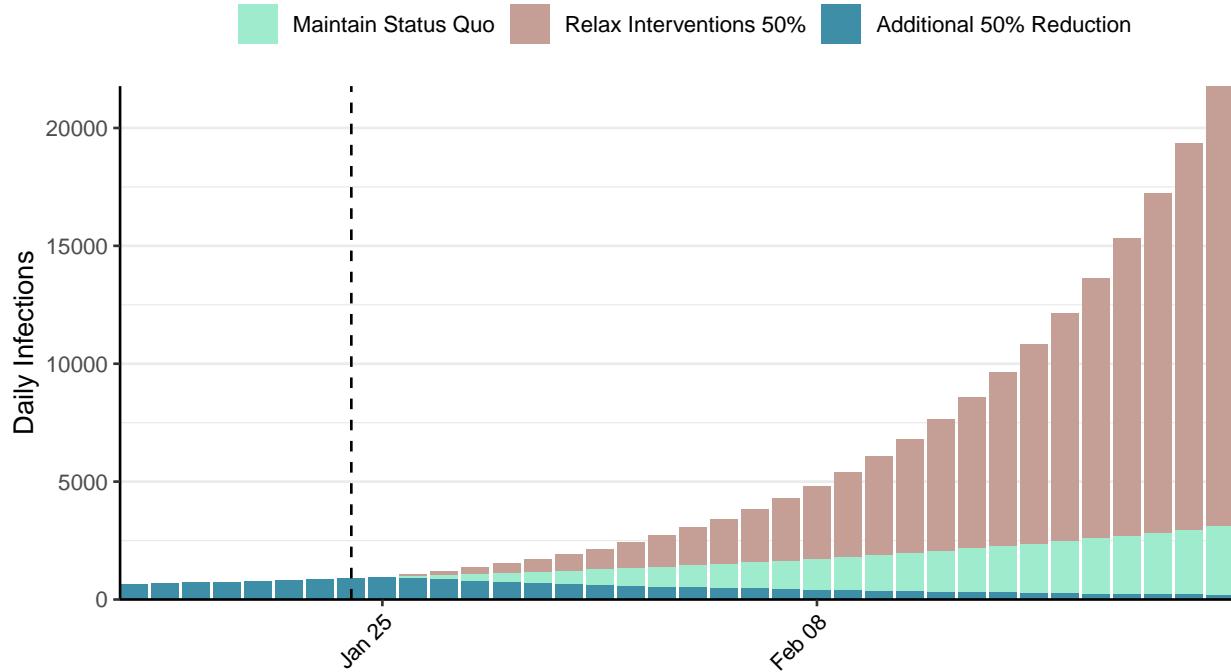


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Cote d'Ivoire, 2021-01-24 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}
246	246	0	0	1.37 (95% CI: 1.17-1.68)

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**

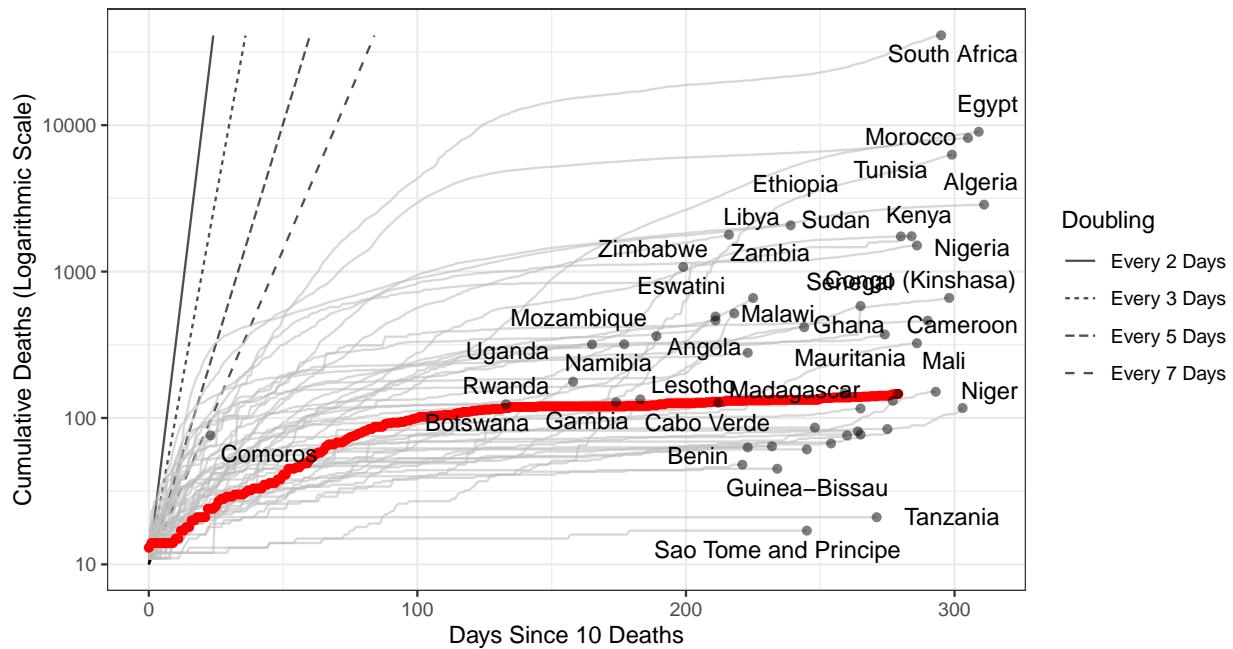


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 16,525 (95% CI: 15,283-17,767) 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

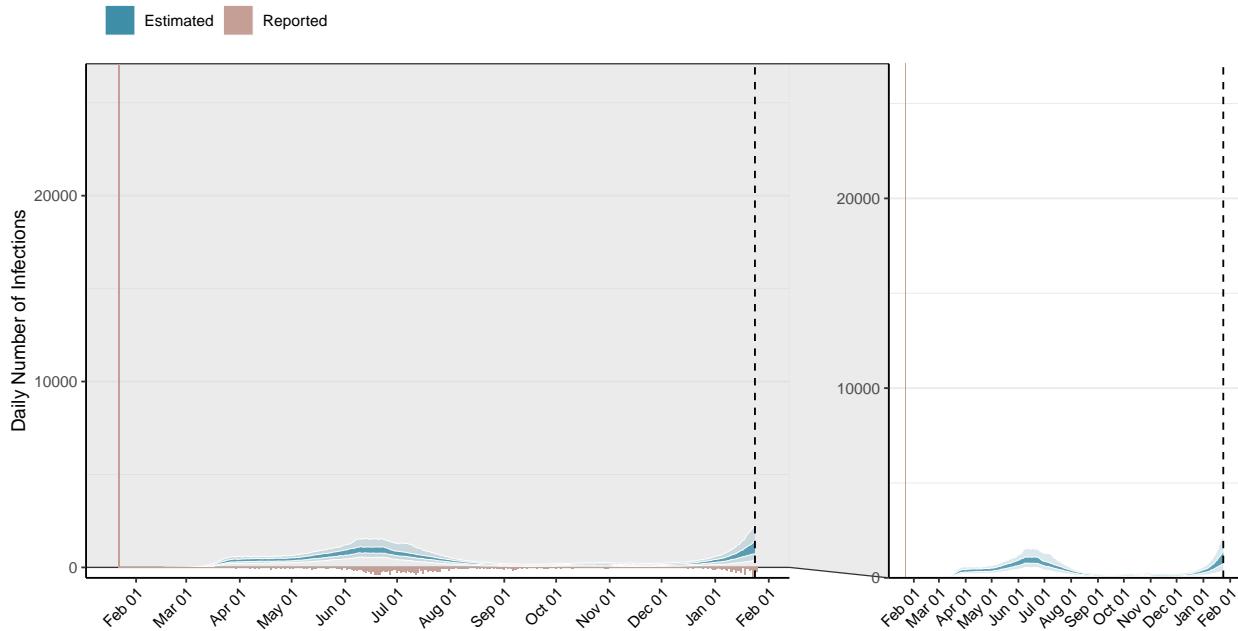


Figure 2: Daily number of infections estimated by fitting to the current total of deaths. Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

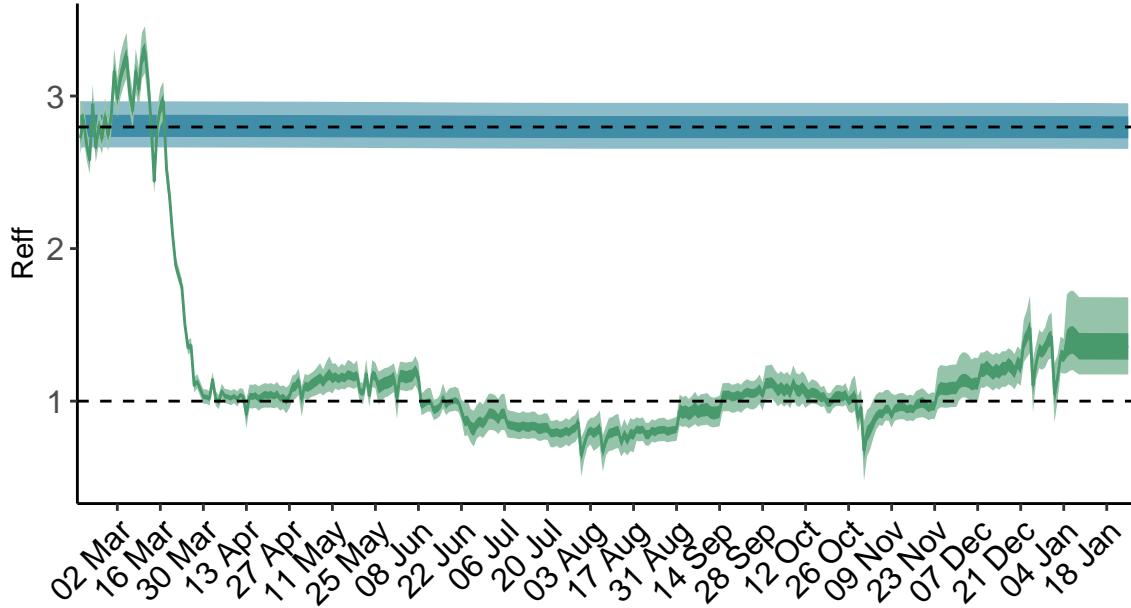


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

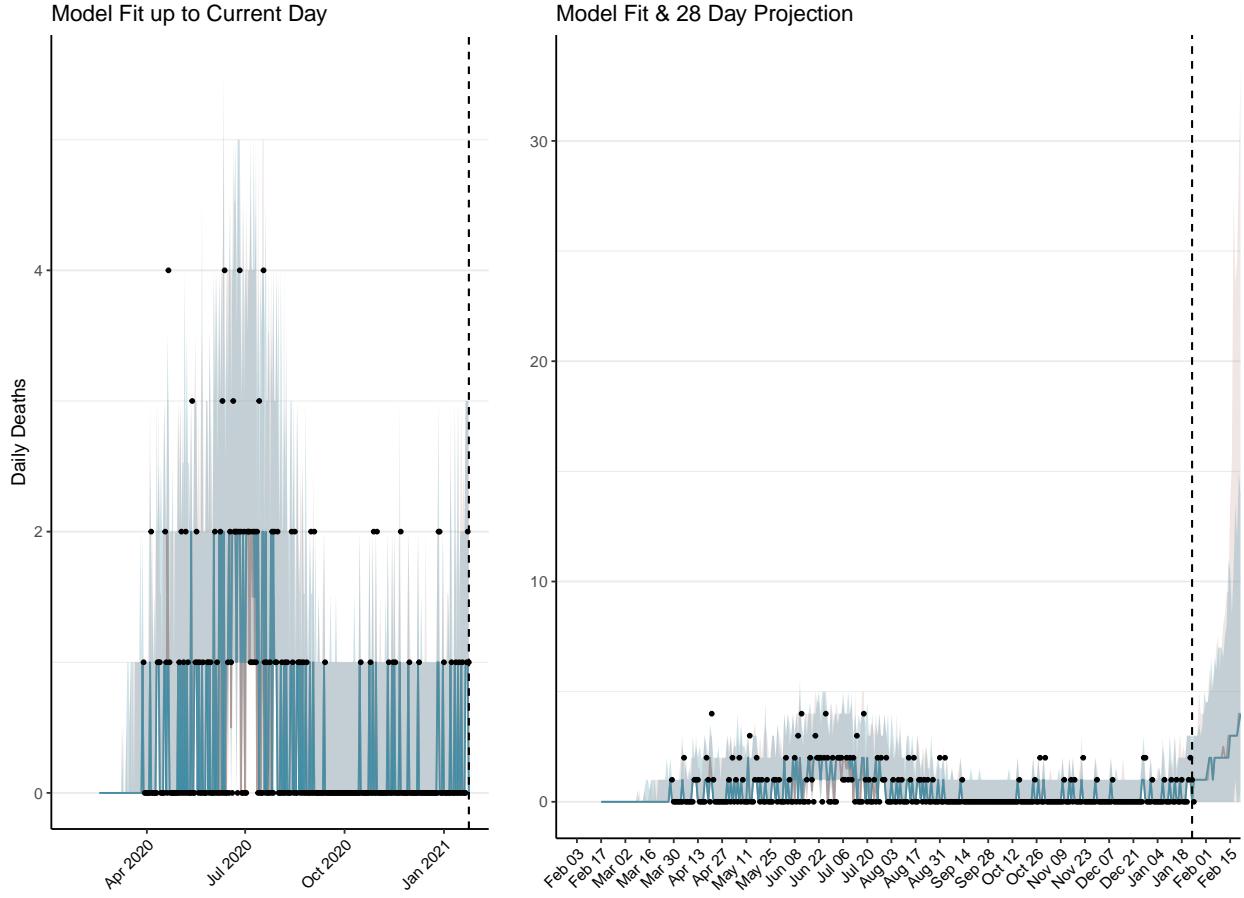


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 50 (95% CI: 45-54) patients requiring treatment with high-pressure oxygen at the current date to 235 (95% CI: 198-272) hospital beds being required on 2021-02-21 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 18 (95% CI: 17-20) patients requiring treatment with mechanical ventilation at the current date to 76 (95% CI: 67-86) by 2021-02-21. 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.**

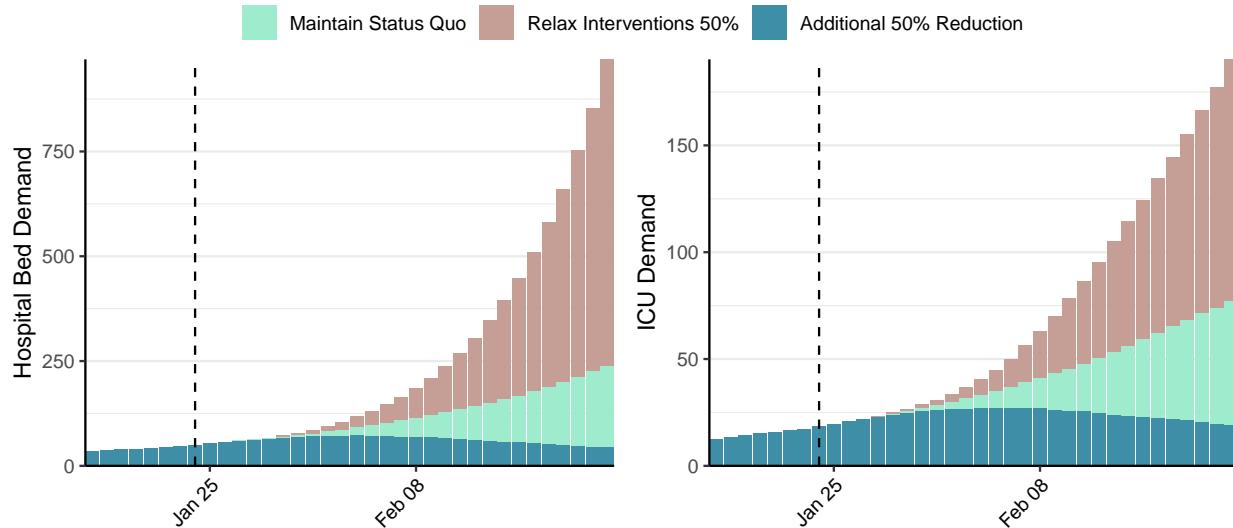


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 1,091 (95% CI: 988-1,194) at the current date to 327 (95% CI: 272-383) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,091 (95% CI: 988-1,194) at the current date to 39,473 (95% CI: 31,375-47,572) by 2021-02-21.

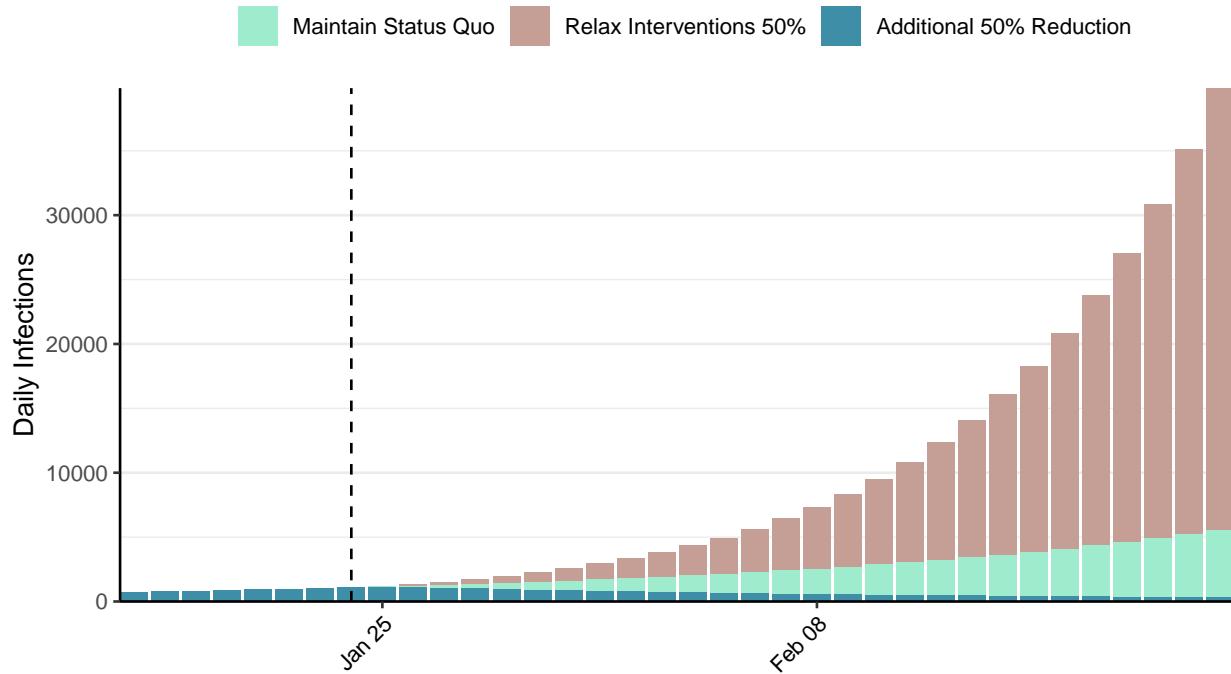


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Cameroon, 2021-01-24 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	1.43 (95% CI: 1.12-1.72)

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. Cameroon is not shown in the following plot as only 0 deaths have been reported to date**

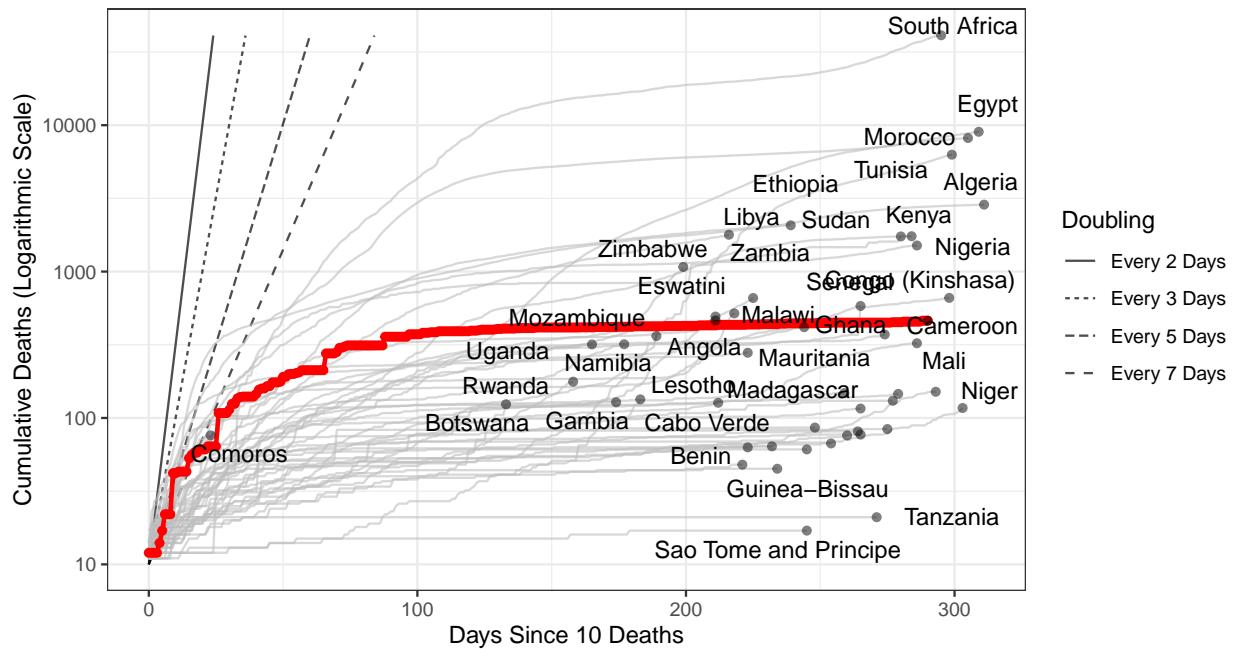


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 13,522 (95% CI: 12,596-14,448) 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

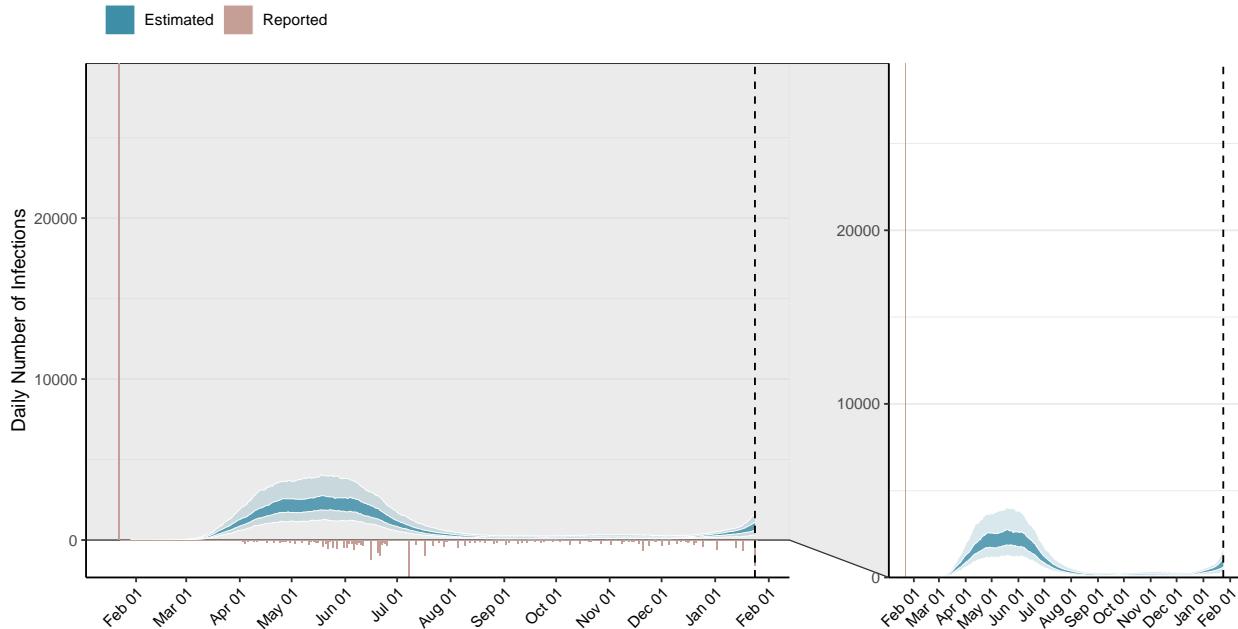


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

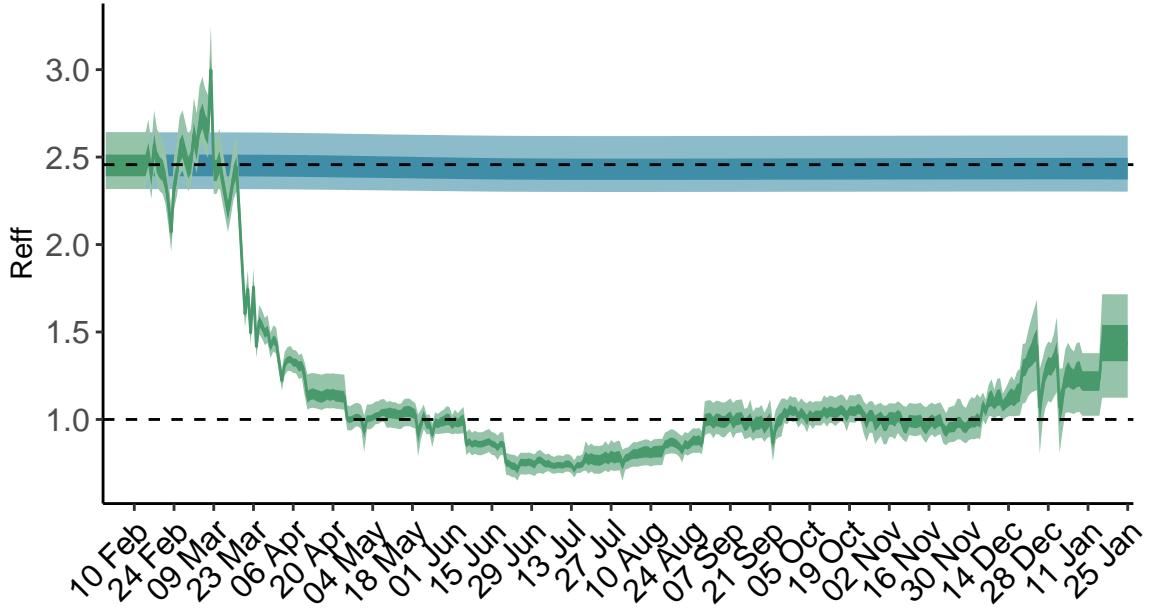


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

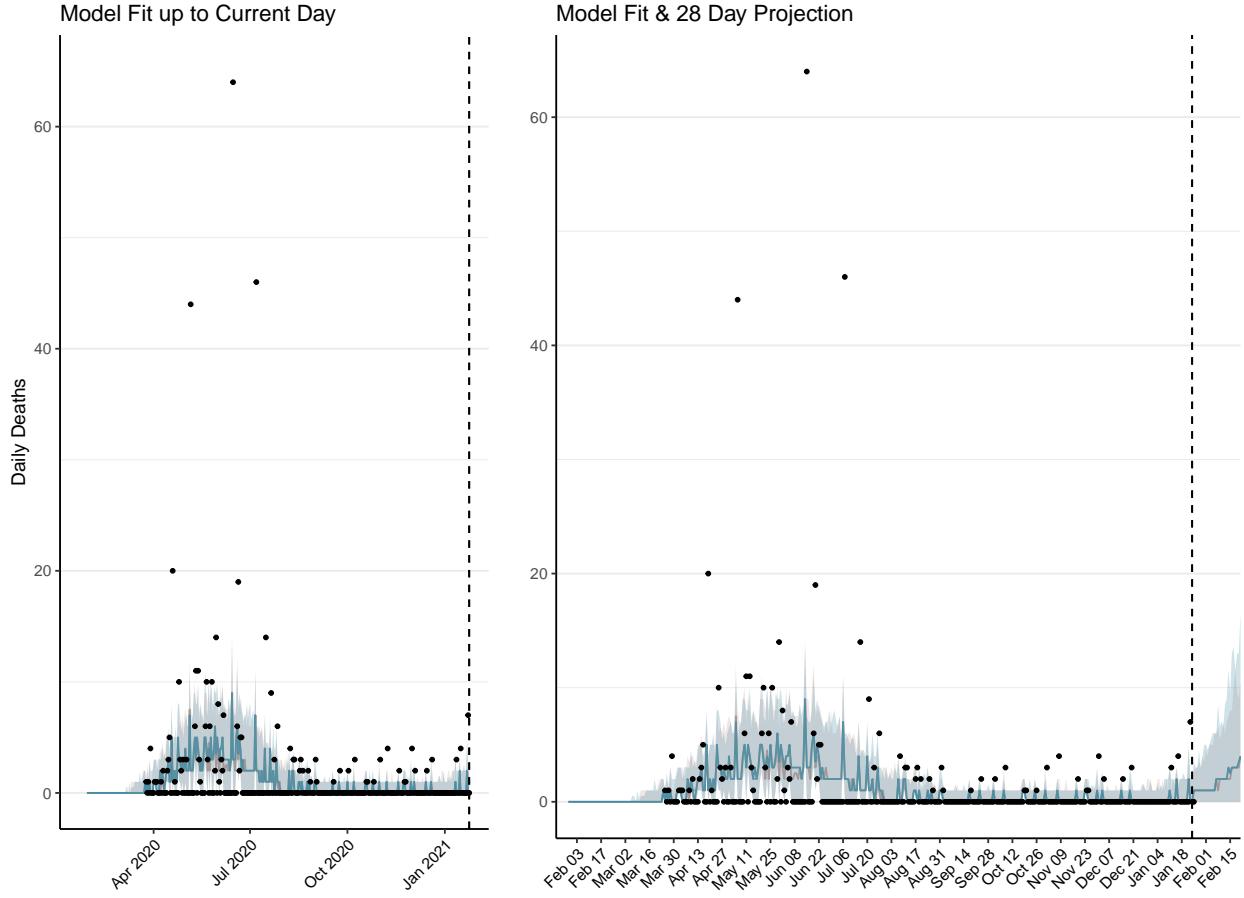


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 39 (95% CI: 36-42) patients requiring treatment with high-pressure oxygen at the current date to 221 (95% CI: 189-253) hospital beds being required on 2021-02-21 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: 13-15) patients requiring treatment with mechanical ventilation at the current date to 78 (95% CI: 67-90) by 2021-02-21. 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.**

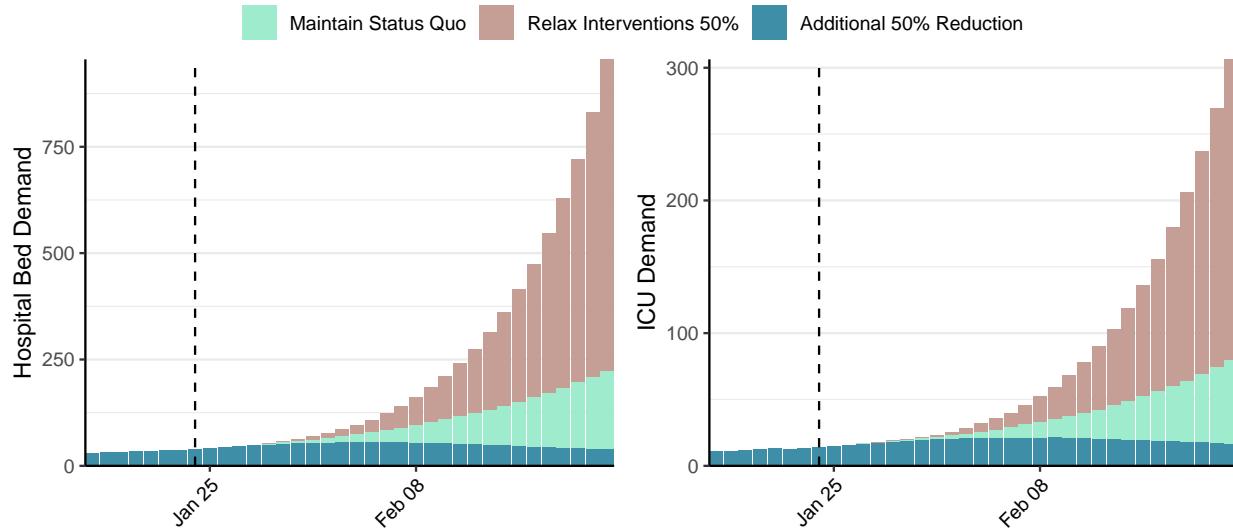


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 875 (95% CI: 796-955) at the current date to 316 (95% CI: 268-364) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 875 (95% CI: 796-955) at the current date to 41,890 (95% CI: 34,417-49,362) by 2021-02-21.

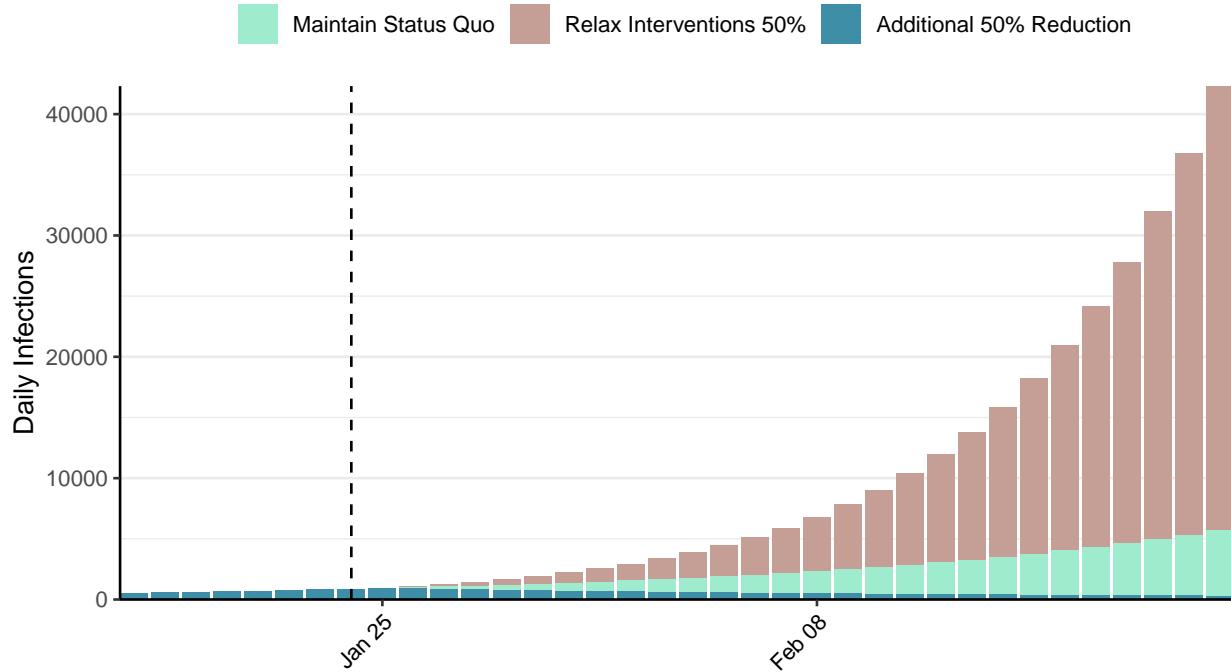


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Democratic Republic of Congo, 2021-01-24

[Download the report for Democratic Republic of Congo, 2021-01-24 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}
85	85	0	0	0.95 (95% CI: 0.81-1.05)

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.** Democratic Republic of Congo is not shown in the following plot as only 0 deaths have been reported to date

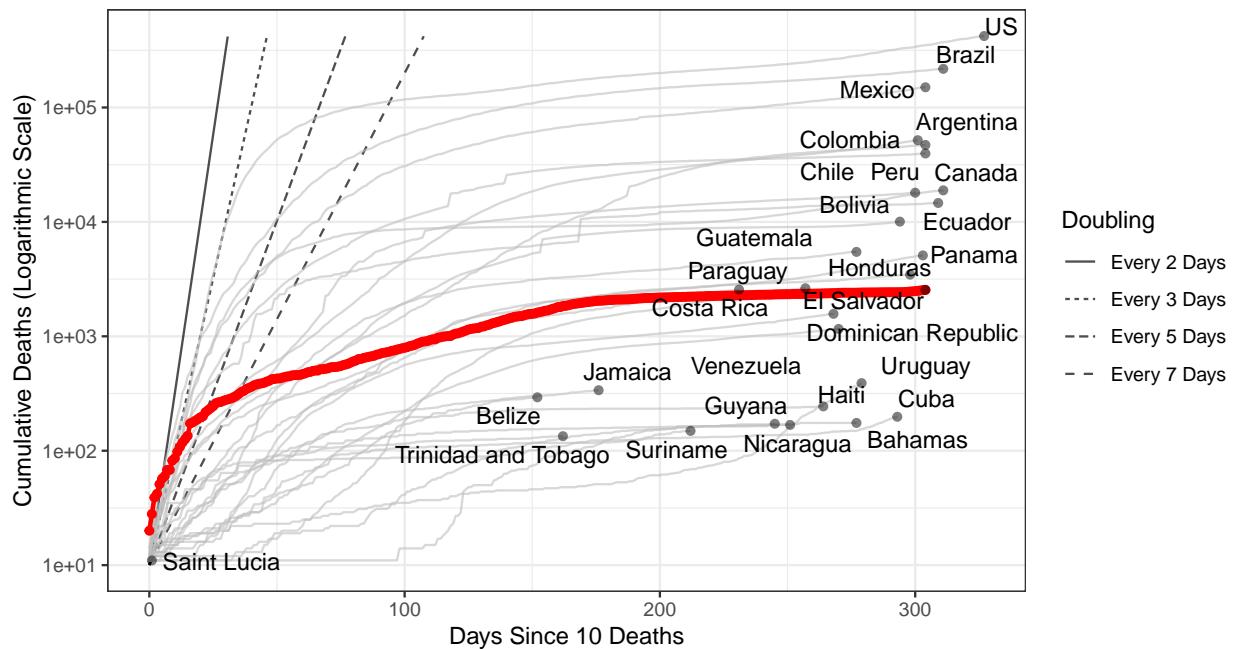


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 126,916 (95% CI: 114,416-139,417) 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

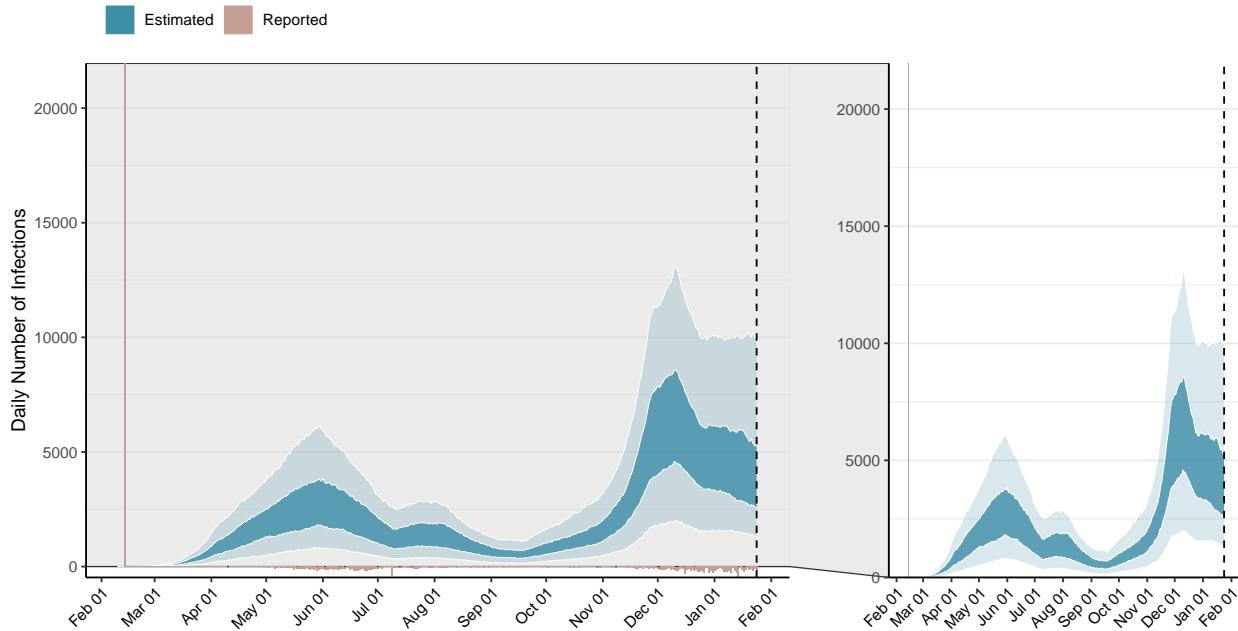


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

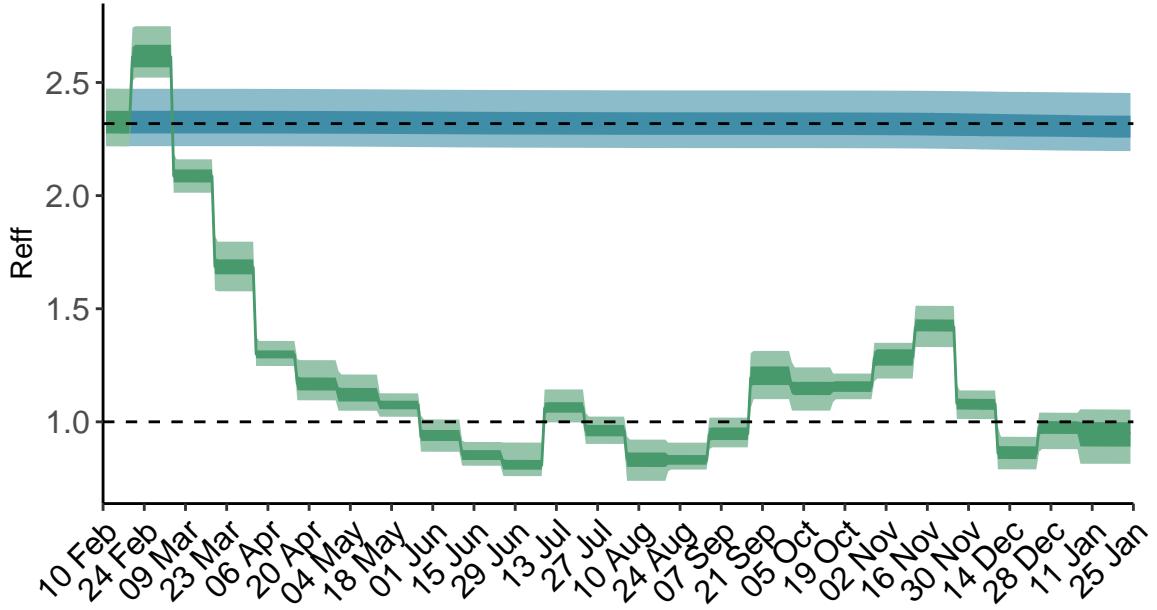


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

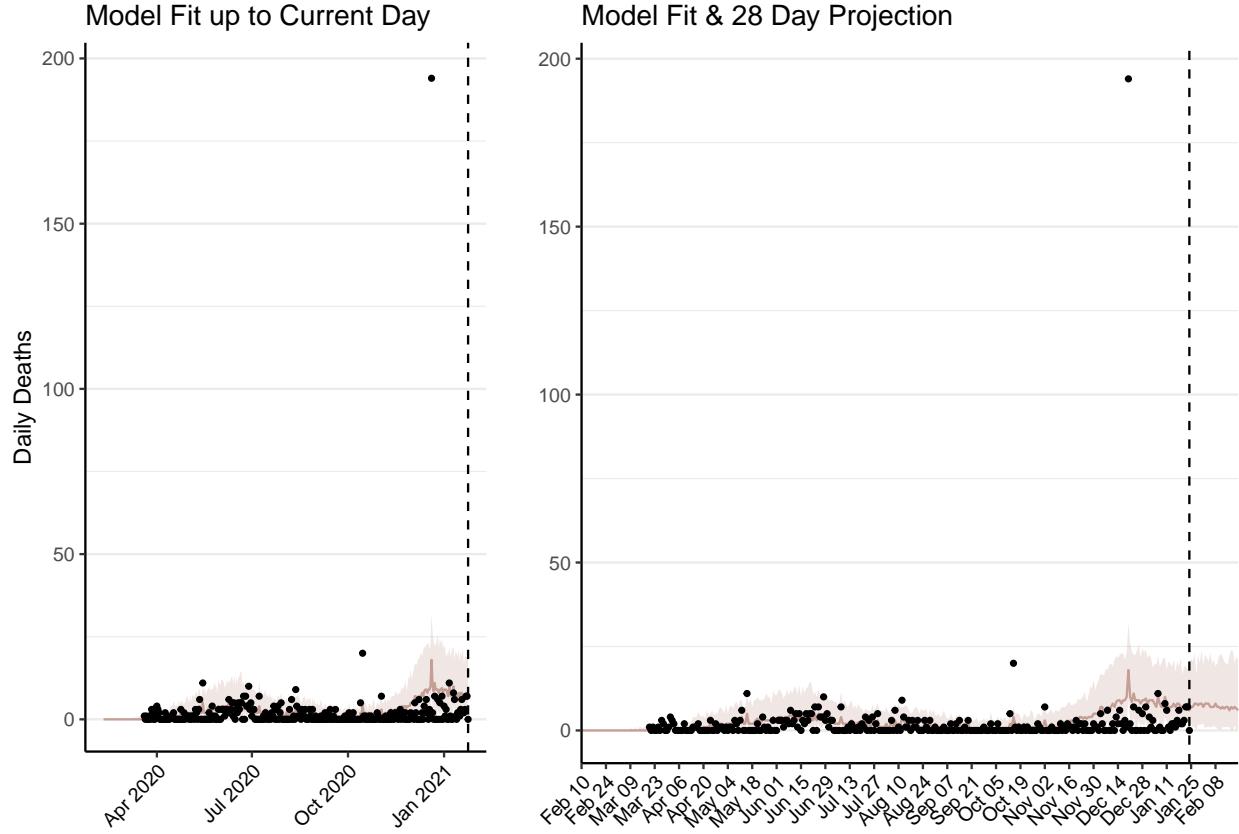


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 353 (95% CI: 317-389) patients requiring treatment with high-pressure oxygen at the current date to 310 (95% CI: 269-352) hospital beds being required on 2021-02-21 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 141 (95% CI: 127-155) patients requiring treatment with mechanical ventilation at the current date to 122 (95% CI: 106-137) by 2021-02-21. 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.**

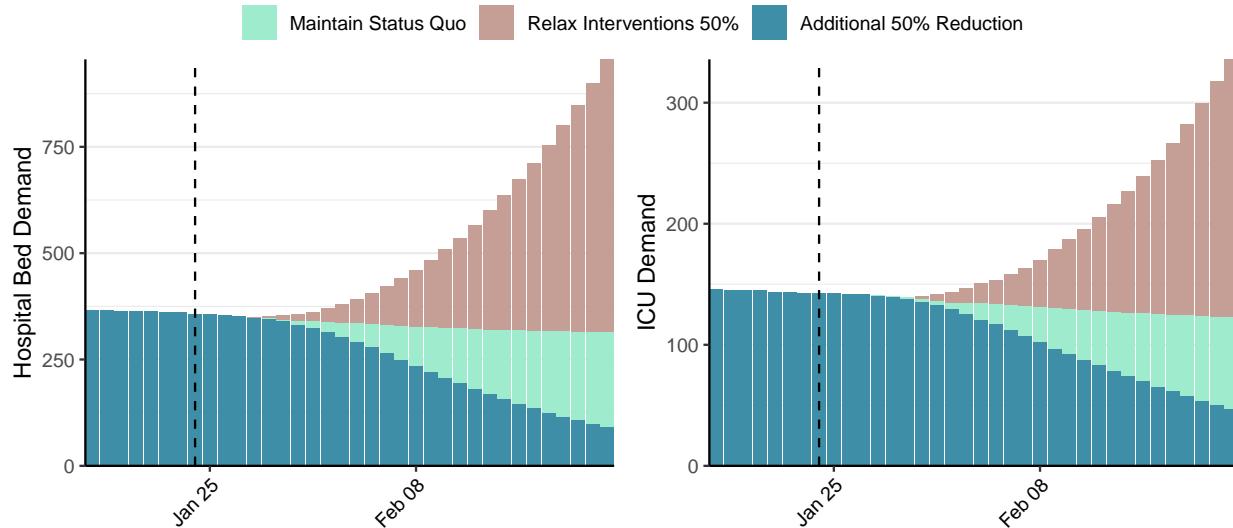


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 4,230 (95% CI: 3,764-4,695) at the current date to 324 (95% CI: 279-370) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 4,230 (95% CI: 3,764-4,695) at the current date to 22,145 (95% CI: 18,667-25,624) by 2021-02-21.

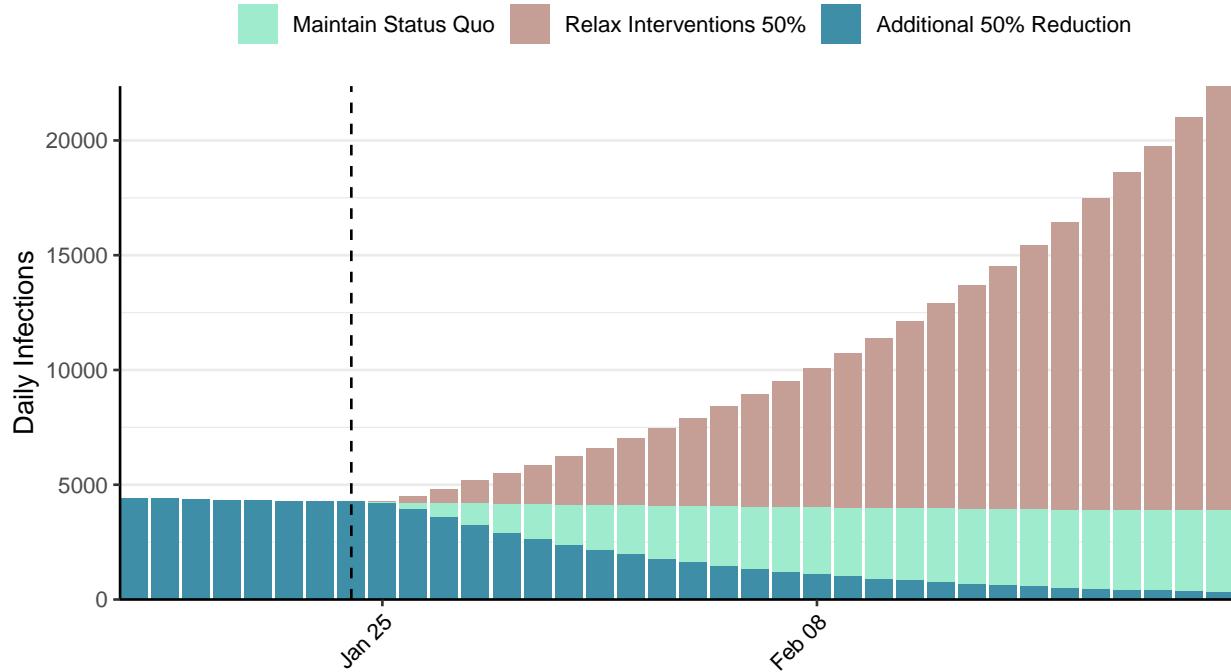


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Republic of the Congo, 2021-01-24 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}
93	93	0	0	0.99 (95% CI: 0.75-1.28)

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

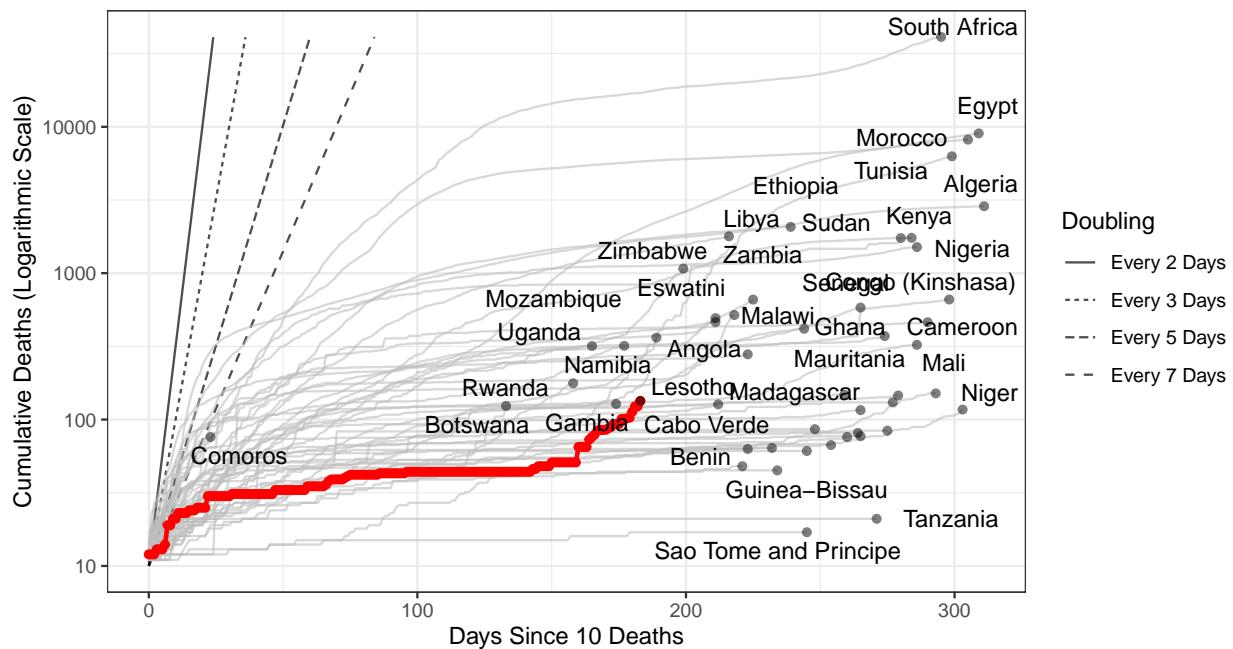


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 8,352 (95% CI: 7,569-9,136) 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).

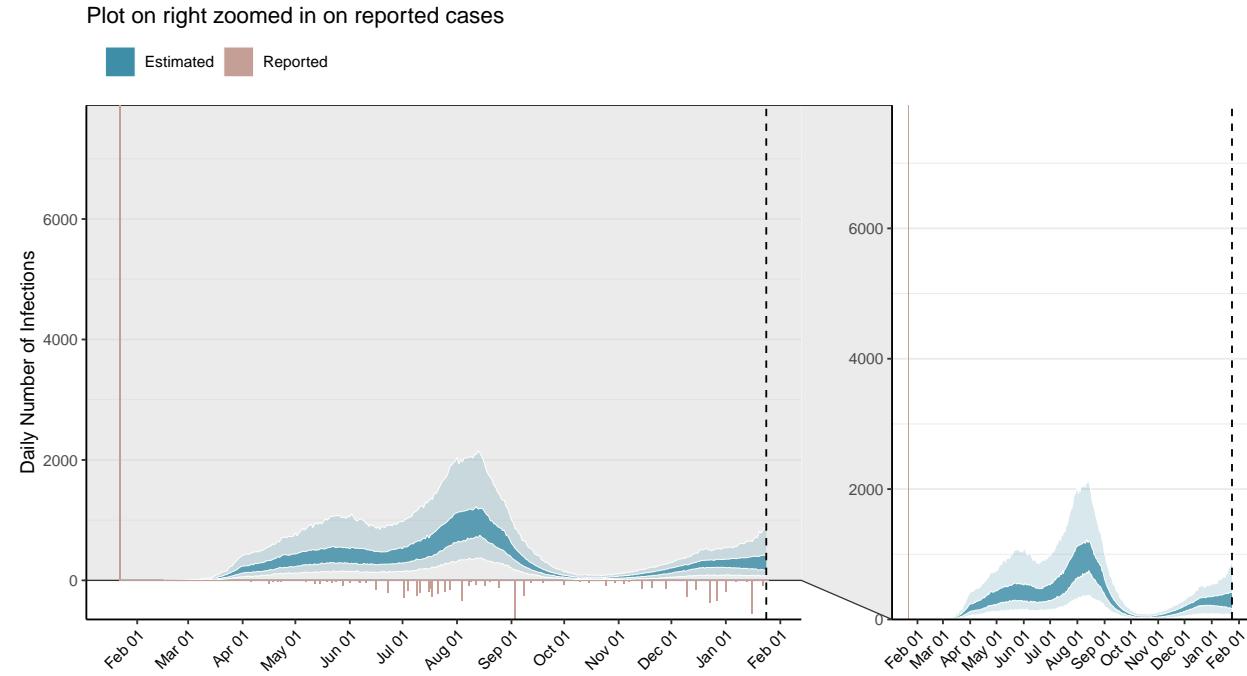


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

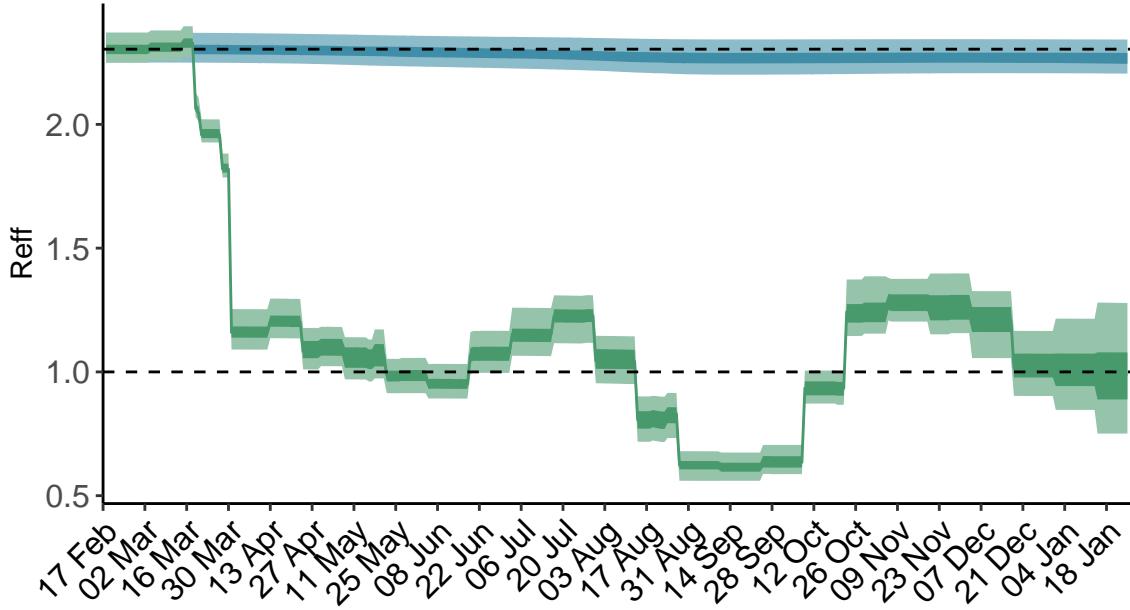


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

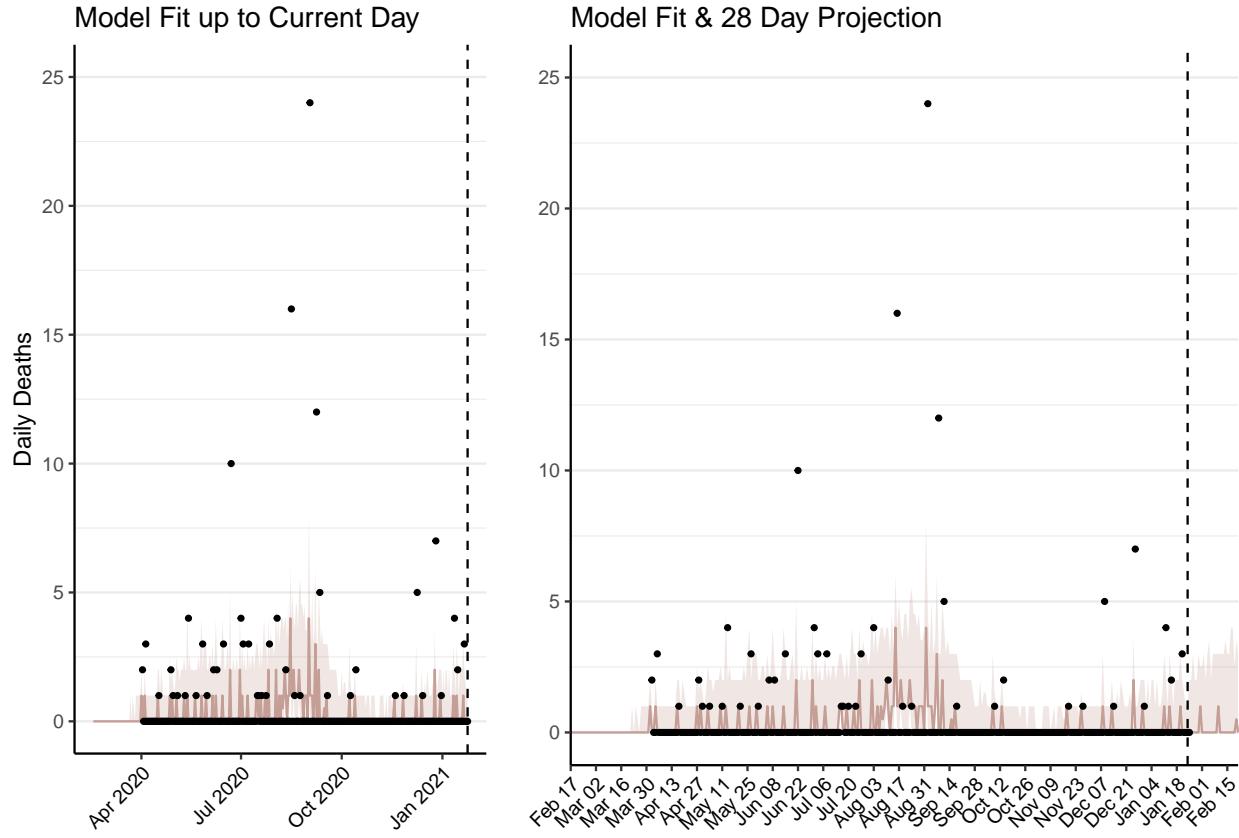


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 23 (95% CI: 21-26) patients requiring treatment with high-pressure oxygen at the current date to 33 (95% CI: 24-42) hospital beds being required on 2021-02-21 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 9 (95% CI: 8-10) patients requiring treatment with mechanical ventilation at the current date to 13 (95% CI: 9-16) by 2021-02-21. 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.**

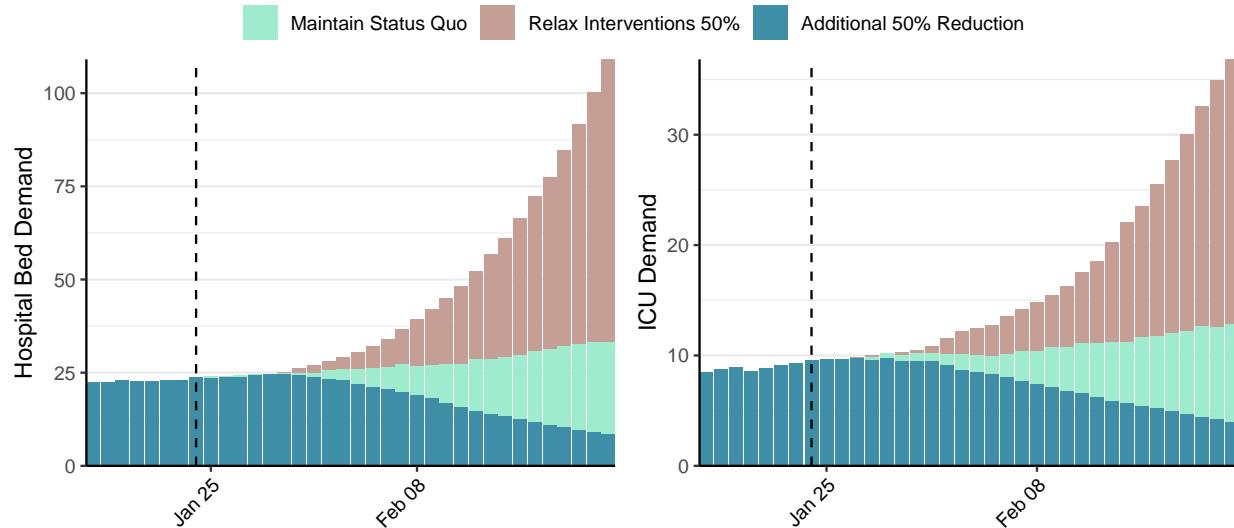


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 323 (95% CI: 279-368) at the current date to 38 (95% CI: 26-50) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 323 (95% CI: 279-368) at the current date to 3,165 (95% CI: 1,900-4,429) by 2021-02-21.

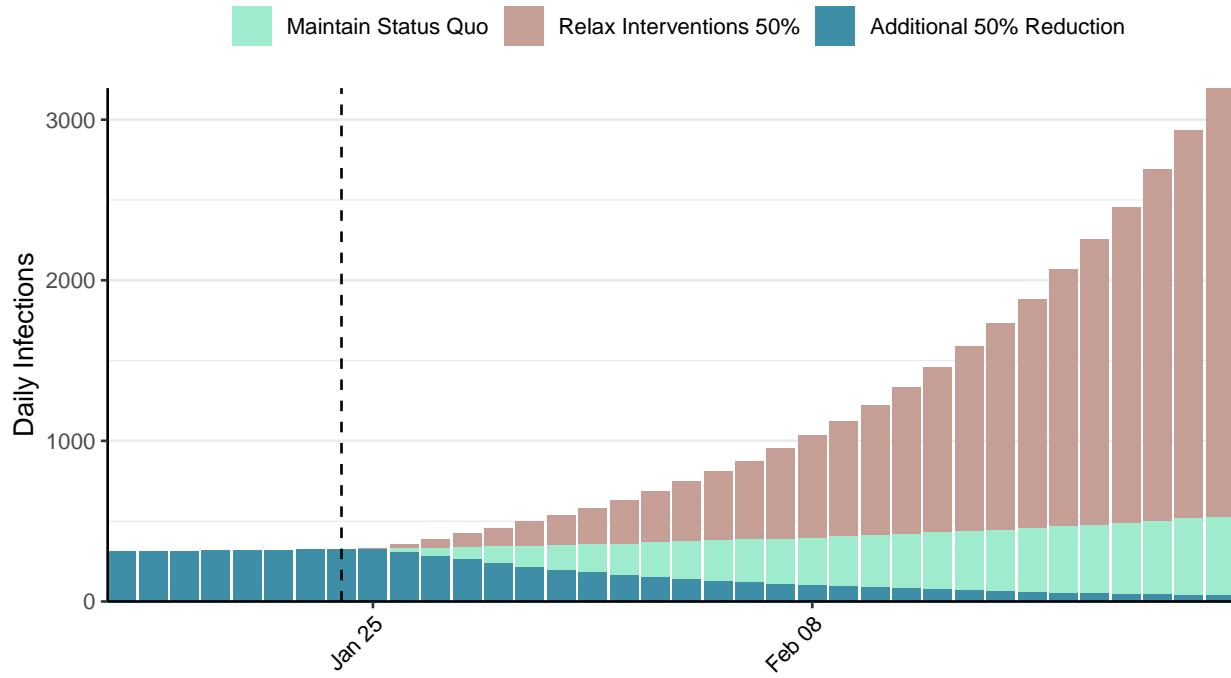


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Colombia, 2021-01-24 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}
12,261	12,261	373	373	1.06 (95% CI: 0.91-1.18)

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.

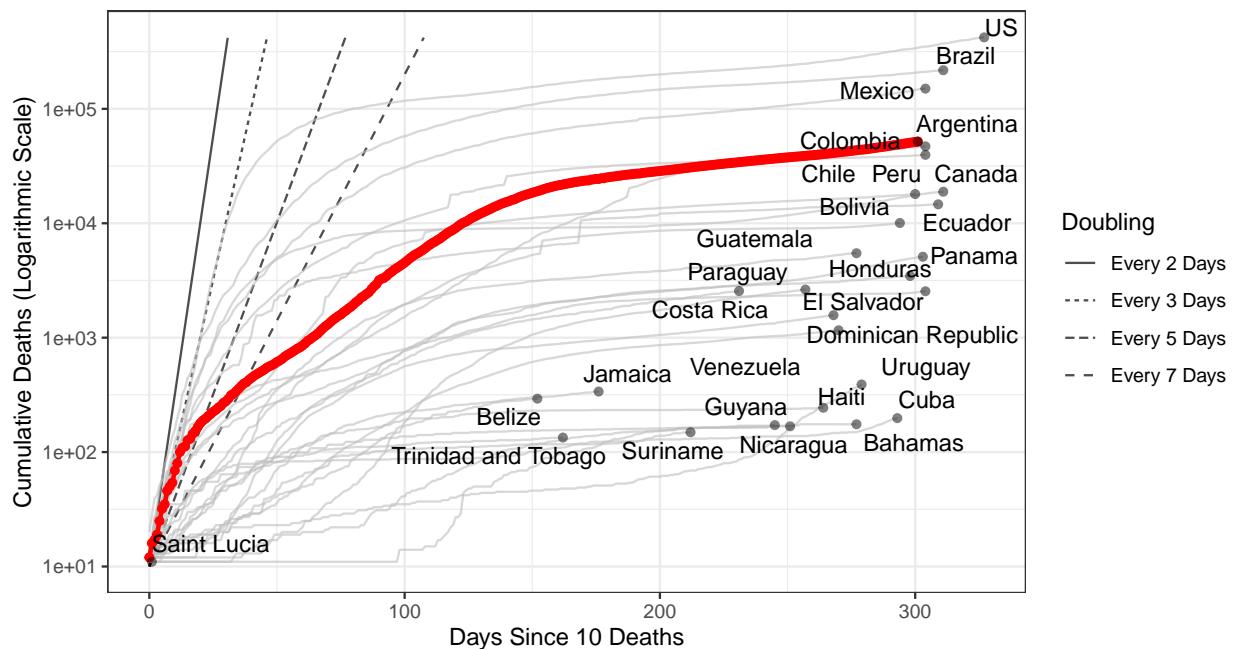


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 2,823,506 (95% CI: 2,741,484-2,905,528) 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

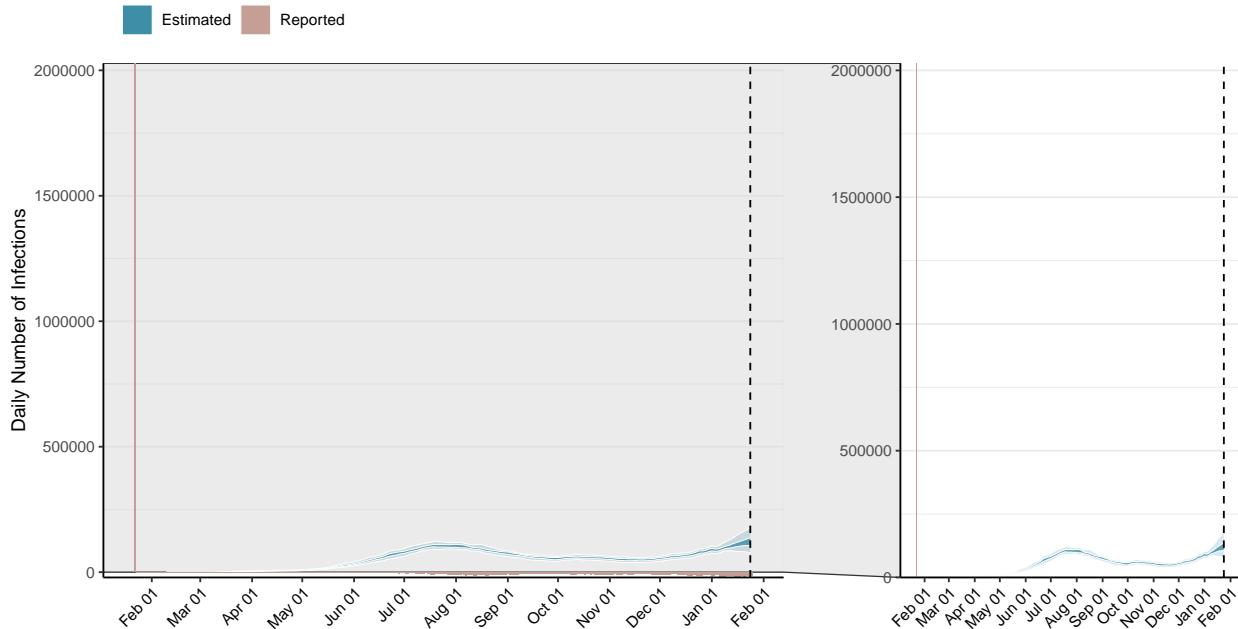


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

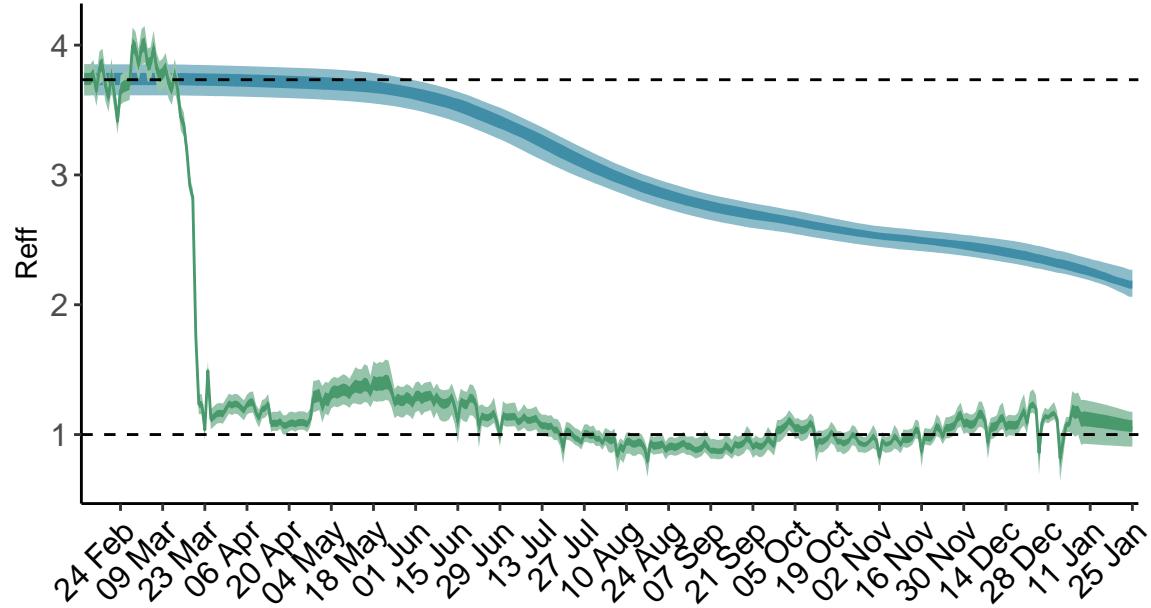


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

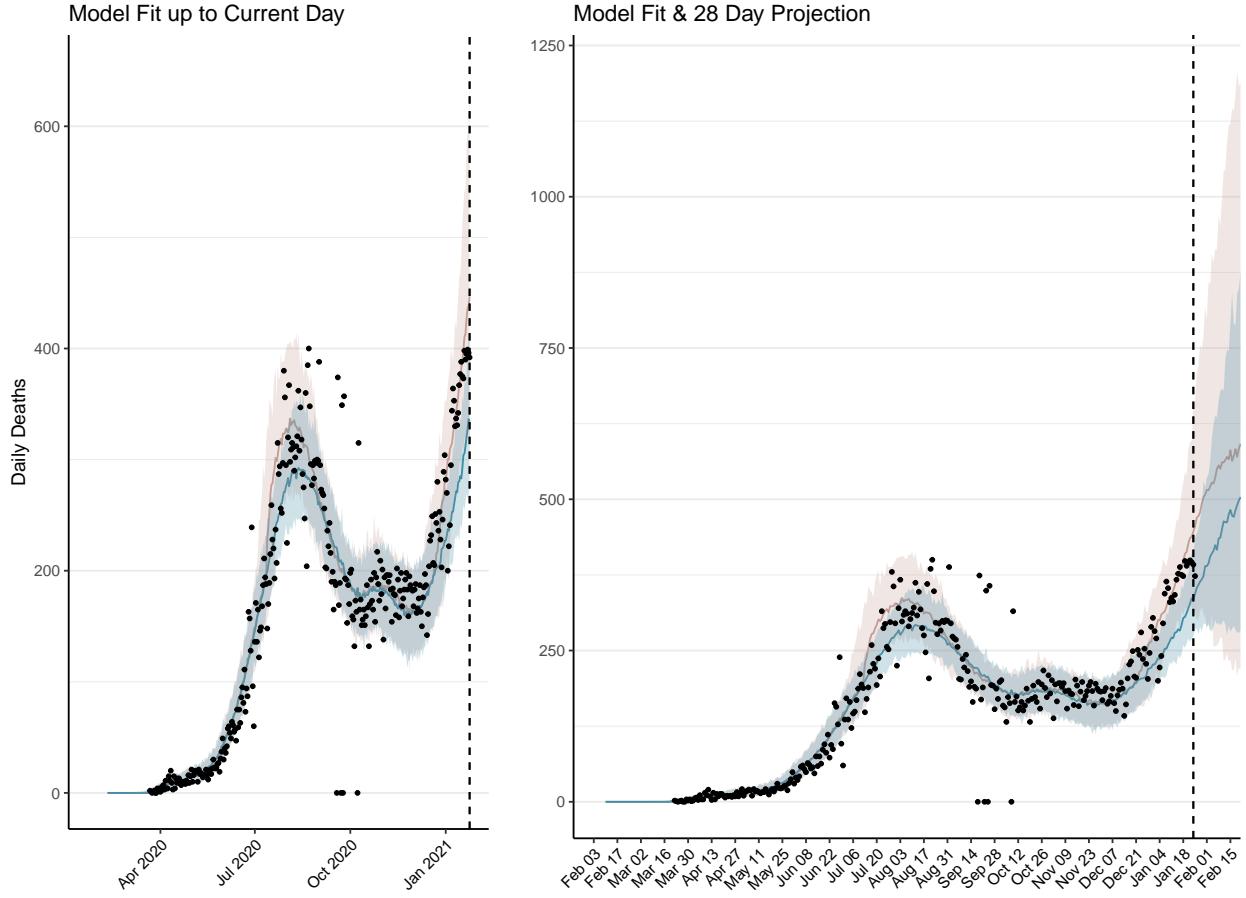


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 12,566 (95% CI: 12,167-12,965) patients requiring treatment with high-pressure oxygen at the current date to 16,751 (95% CI: 15,623-17,879) hospital beds being required on 2021-02-21 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 2,936 (95% CI: 2,875-2,998) patients requiring treatment with mechanical ventilation at the current date to 3,120 (95% CI: 3,034-3,206) by 2021-02-21. 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.

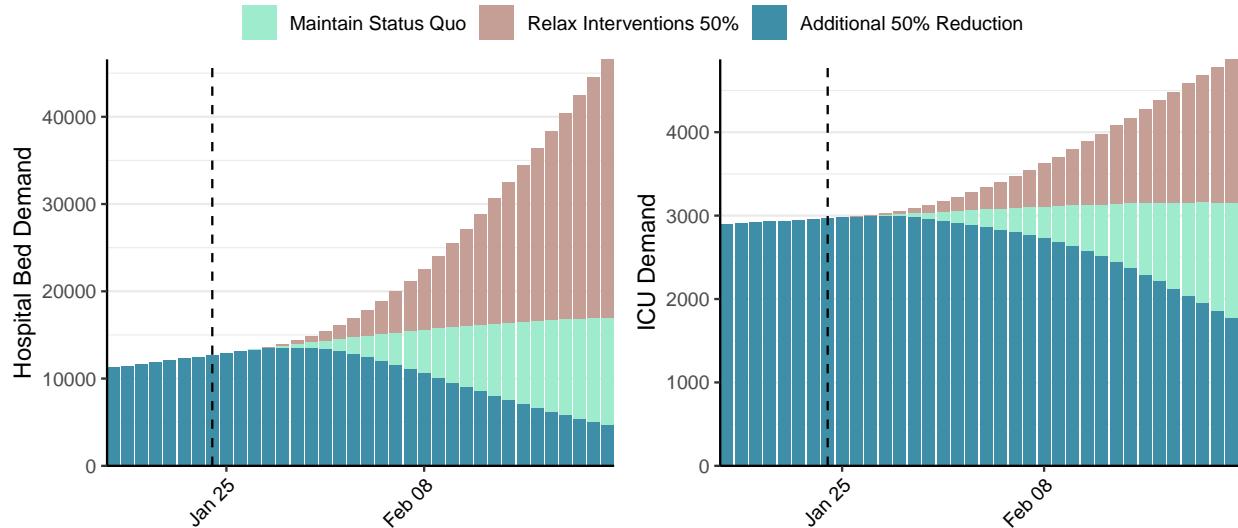


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 122,476 (95% CI: 116,839-128,112) at the current date to 12,884 (95% CI: 11,885-13,884) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 122,476 (95% CI: 116,839-128,112) at the current date to 489,956 (95% CI: 465,289-514,622) by 2021-02-21.

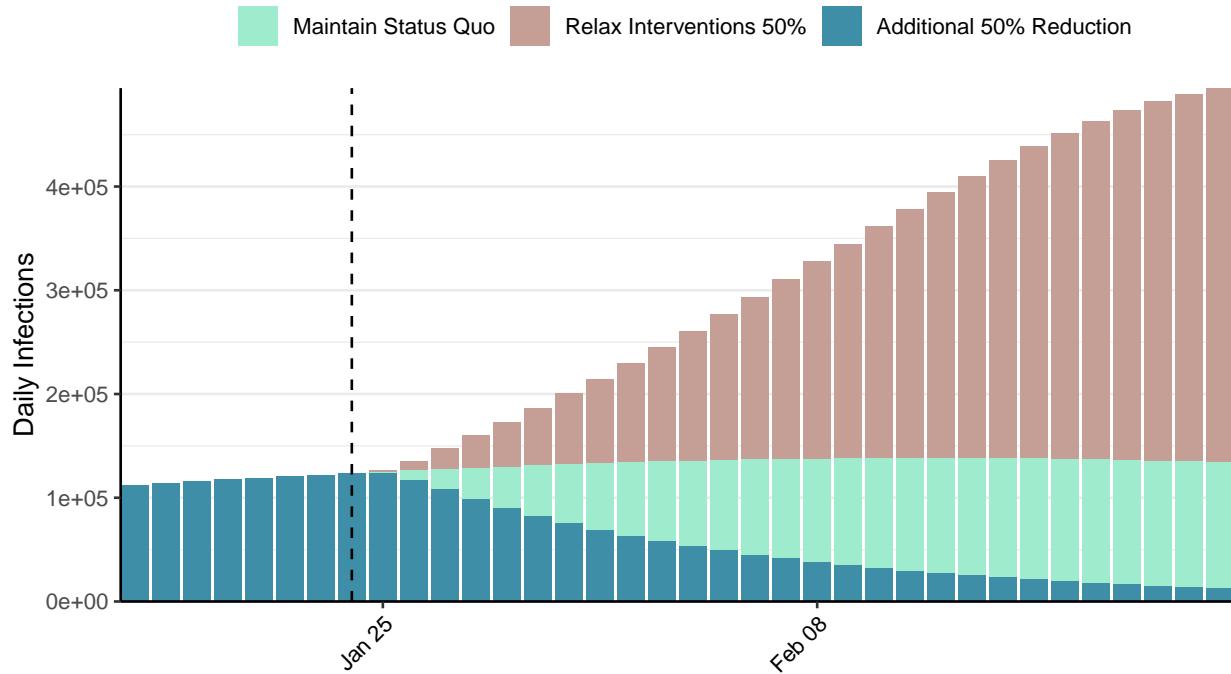


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Comoros, 2021-01-24 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}
82	82	5	5	1.38 (95% CI: 1.2-1.64)

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 5 deaths have been reported to date**

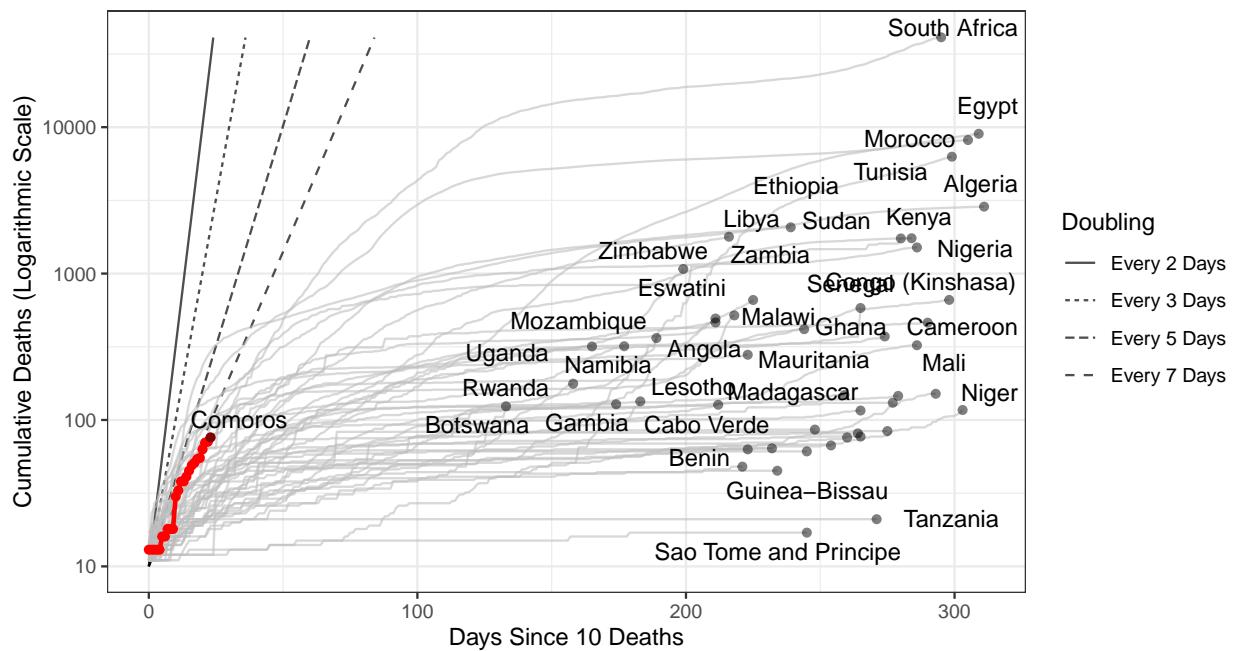


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 35,874 (95% CI: 30,755-40,994) 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).

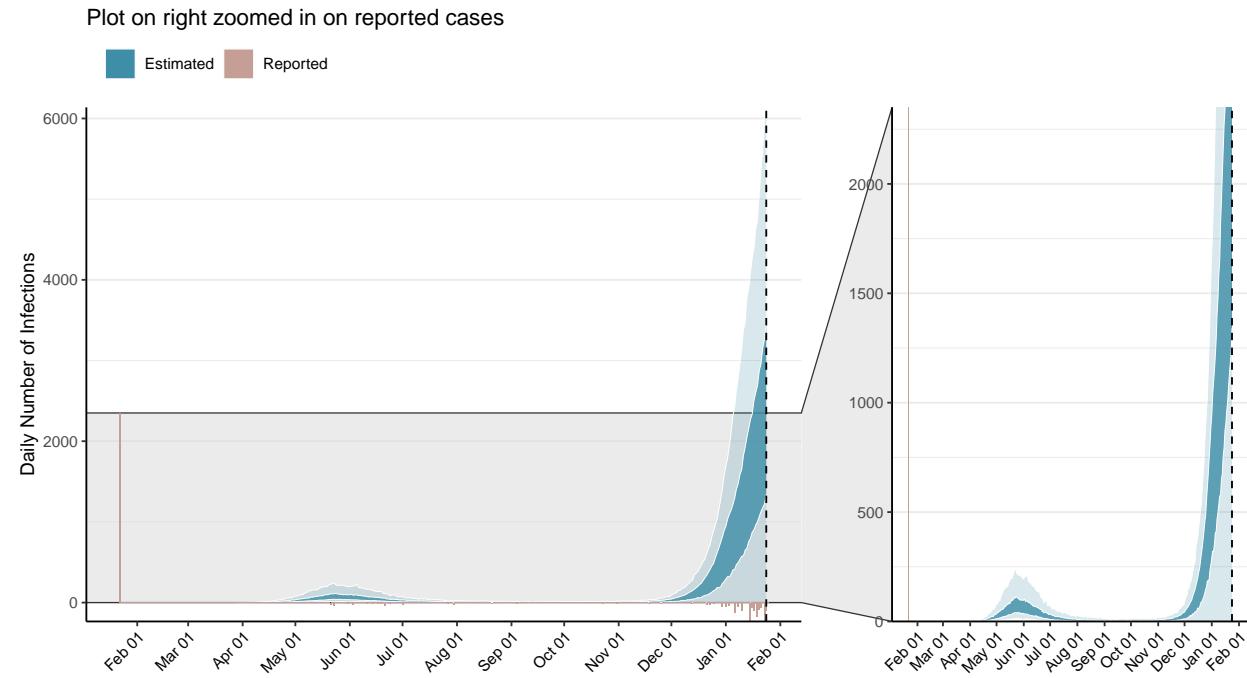


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

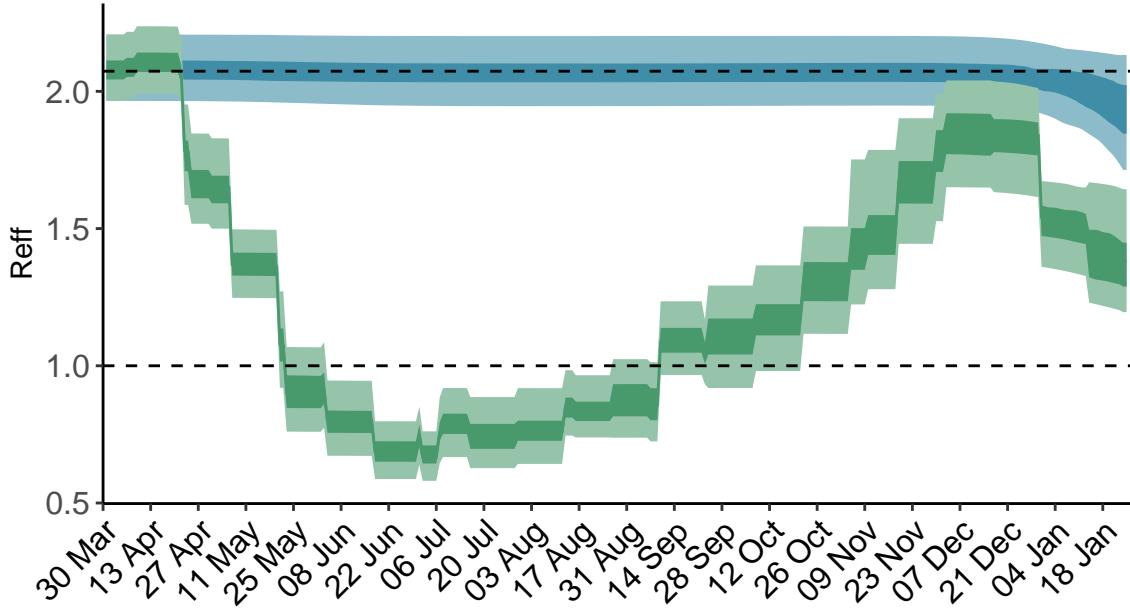


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

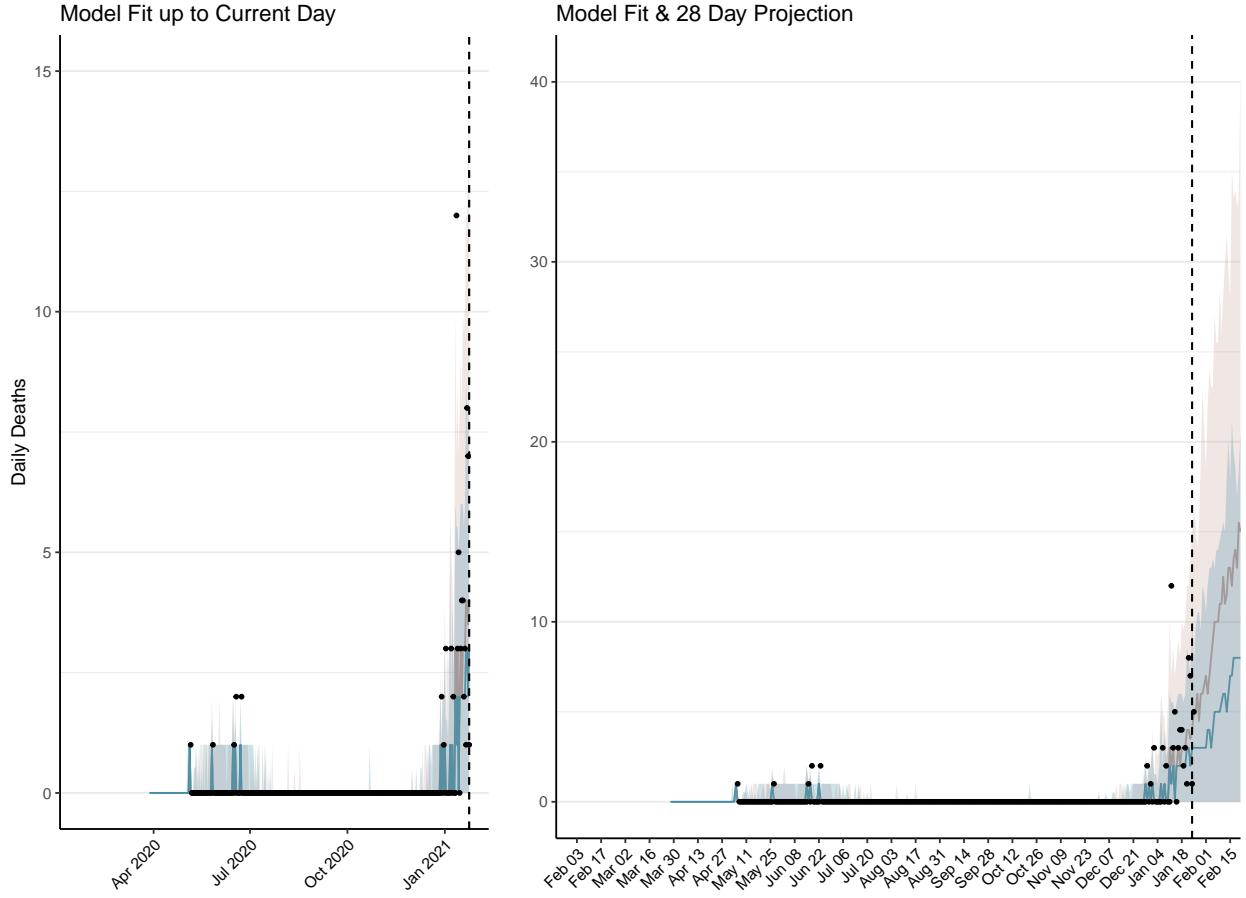


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 113 (95% CI: 97-129) patients requiring treatment with high-pressure oxygen at the current date to 358 (95% CI: 313-403) hospital beds being required on 2021-02-21 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 17 (95% CI: 16-19) patients requiring treatment with mechanical ventilation at the current date to 31 (95% CI: 27-34) by 2021-02-21. 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.**

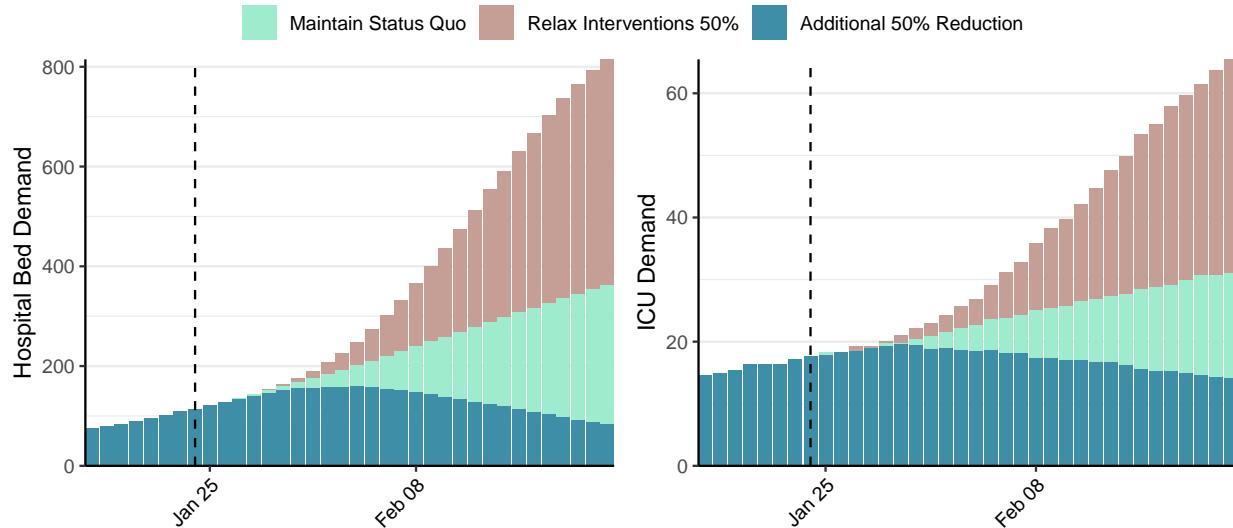


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 2,455 (95% CI: 2,109-2,800) at the current date to 542 (95% CI: 469-615) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,455 (95% CI: 2,109-2,800) at the current date to 16,281 (95% CI: 14,727-17,835) by 2021-02-21.

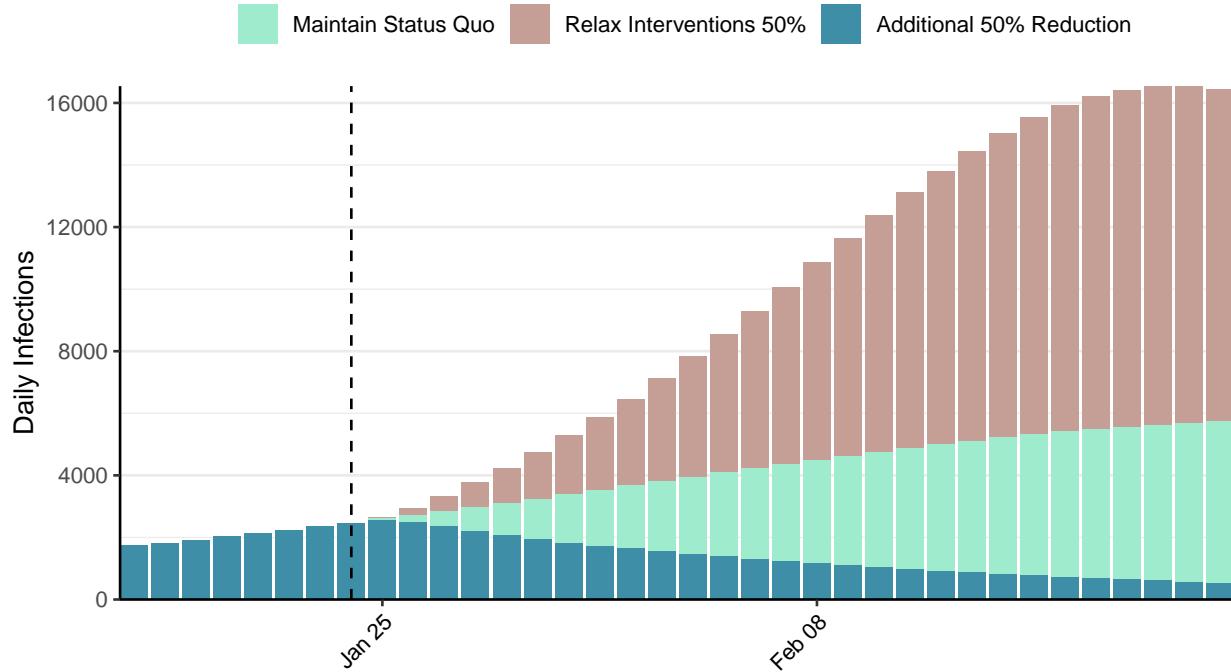


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Cabo Verde, 2021-01-24 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}
68	68	0	0	1.34 (95% CI: 1.07-1.61)

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. Cabo Verde is not shown in the following plot as only 0 deaths have been reported to date**

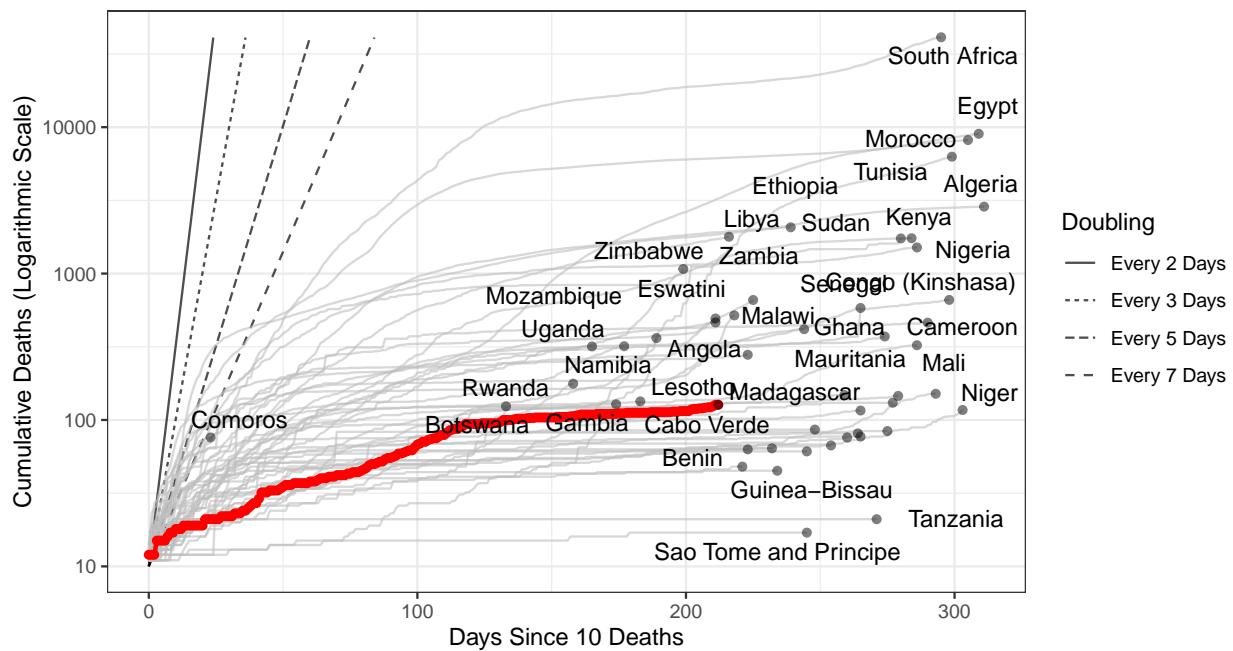


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 10,535 (95% CI: 9,606-11,464) 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

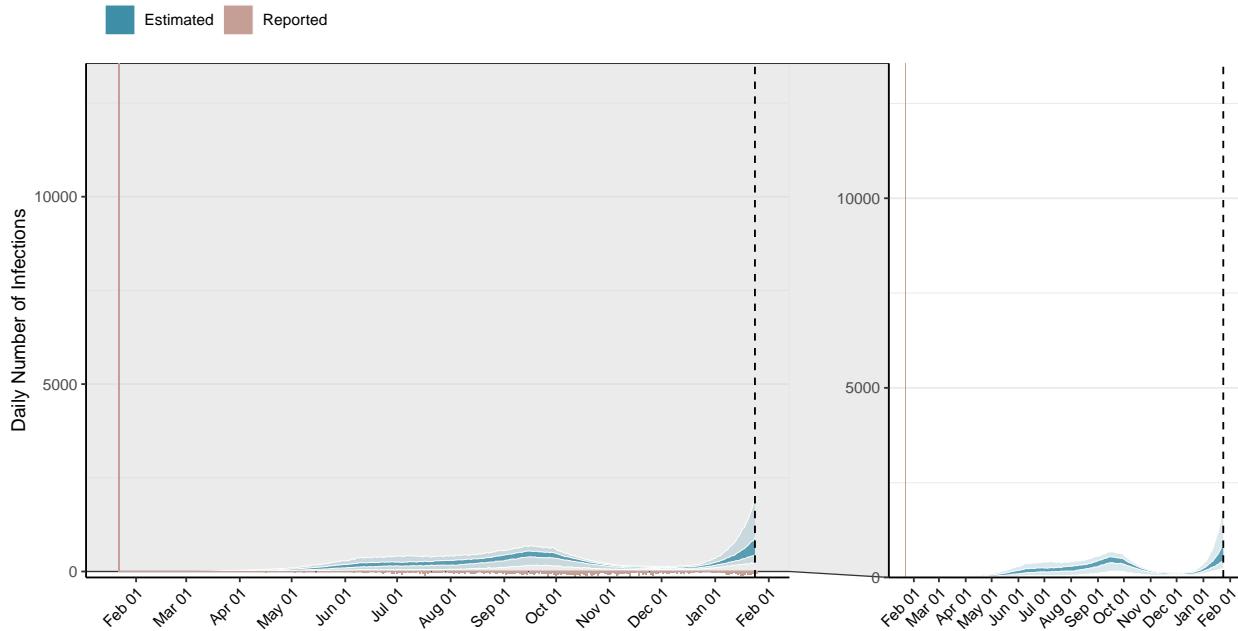


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

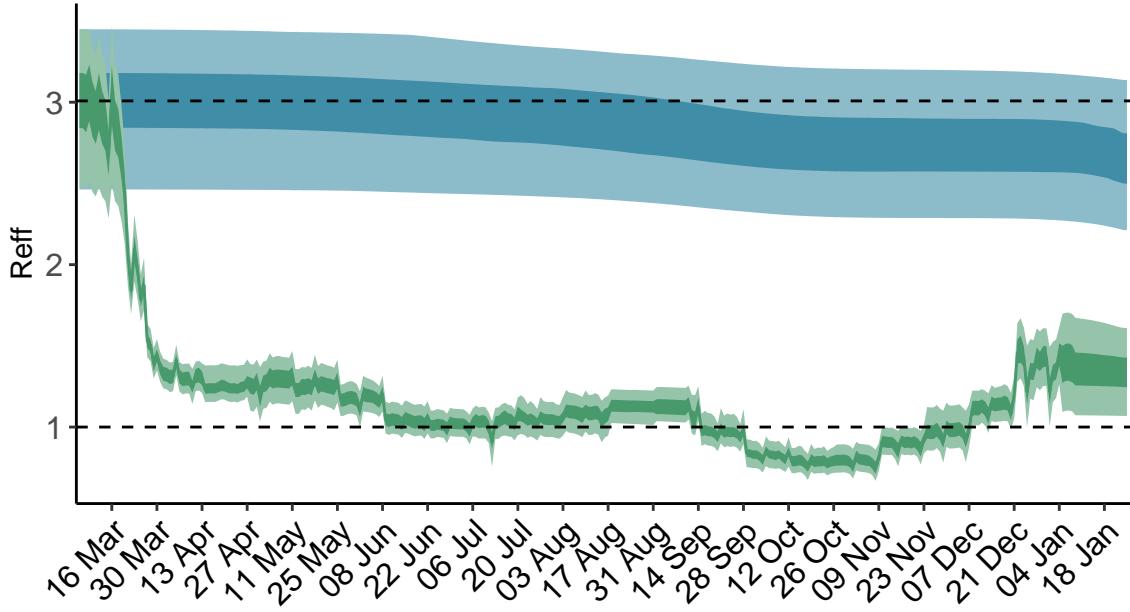


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

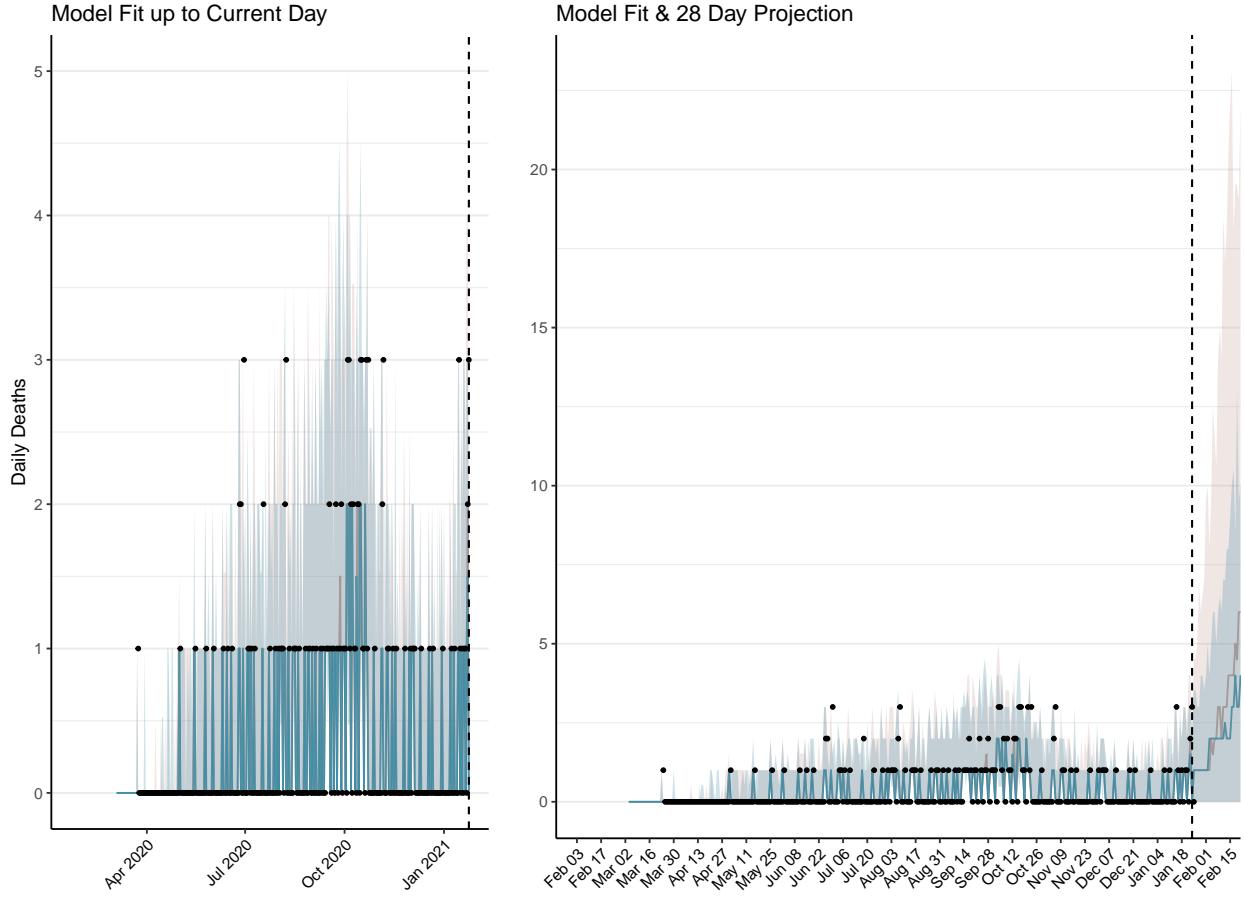


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 43 (95% CI: 39-47) patients requiring treatment with high-pressure oxygen at the current date to 167 (95% CI: 141-193) hospital beds being required on 2021-02-21 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: 26-31) by 2021-02-21. 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.**

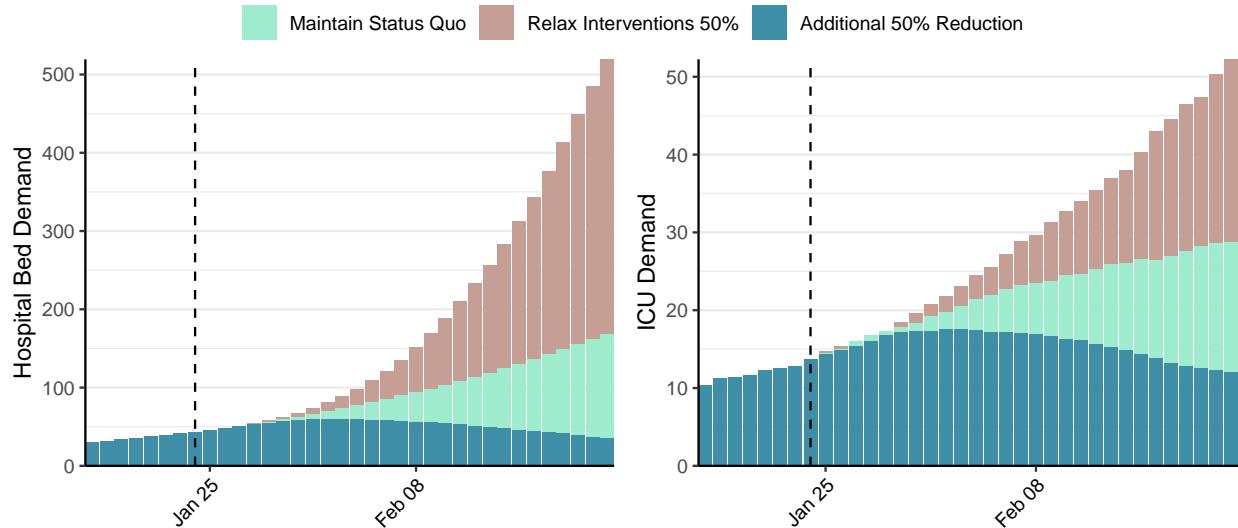


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 712 (95% CI: 627-797) at the current date to 196 (95% CI: 159-233) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 712 (95% CI: 627-797) at the current date to 9,309 (95% CI: 8,444-10,174) by 2021-02-21.

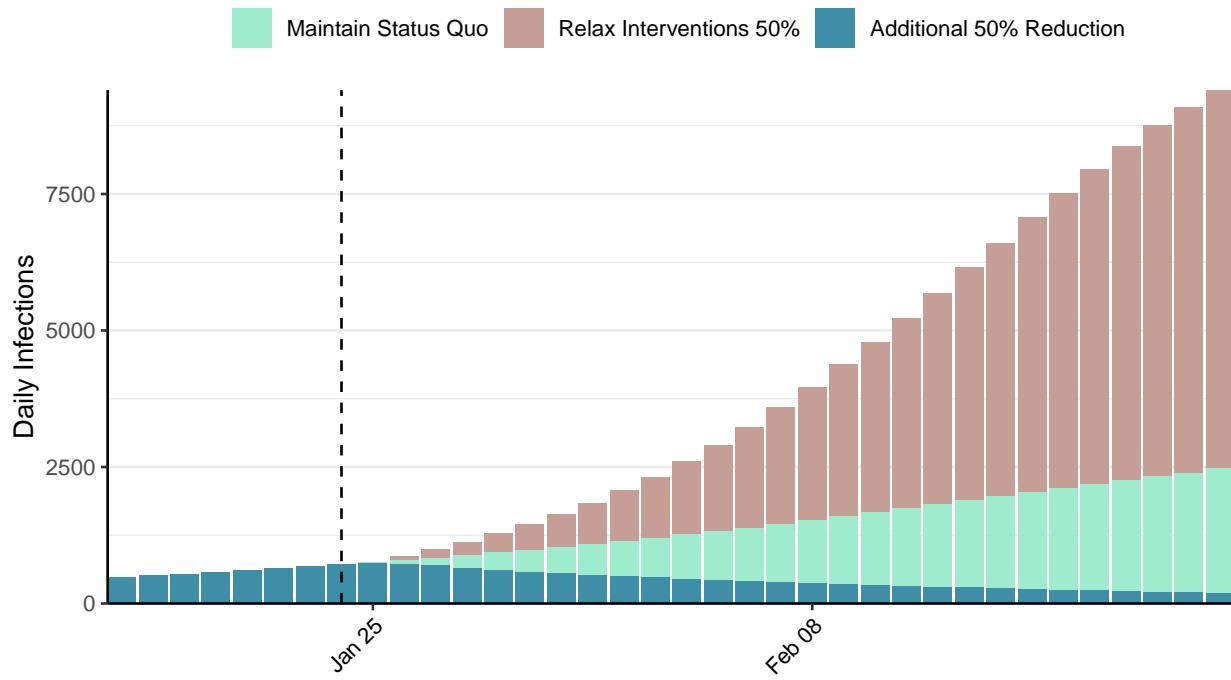


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Costa Rica, 2021-01-24 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}
1,437	1,437	40	40	0.92 (95% CI: 0.82-1.03)

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.

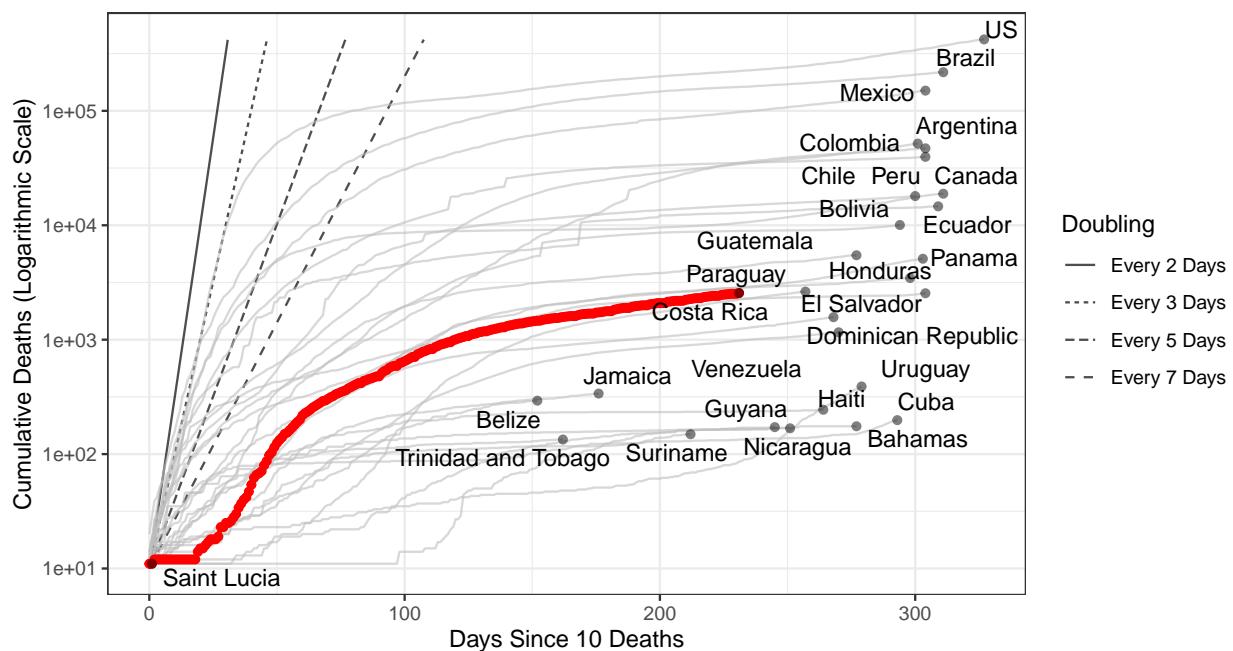


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 103,102 (95% CI: 92,036-114,167) 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).

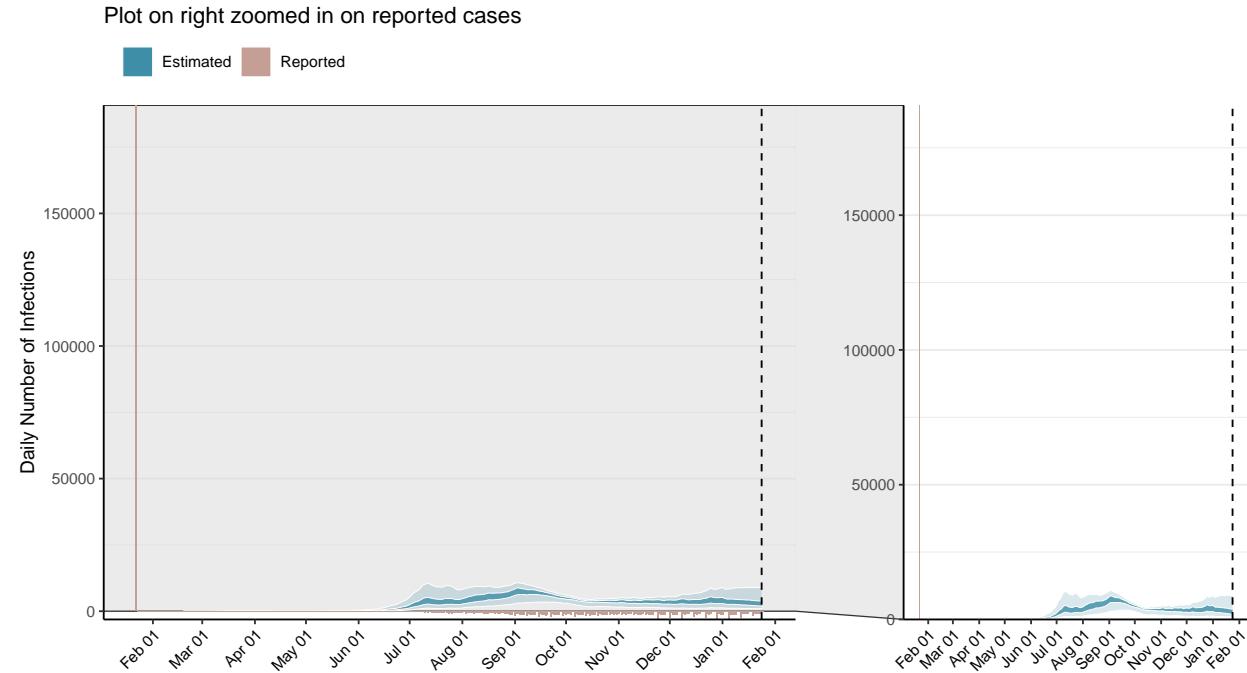


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

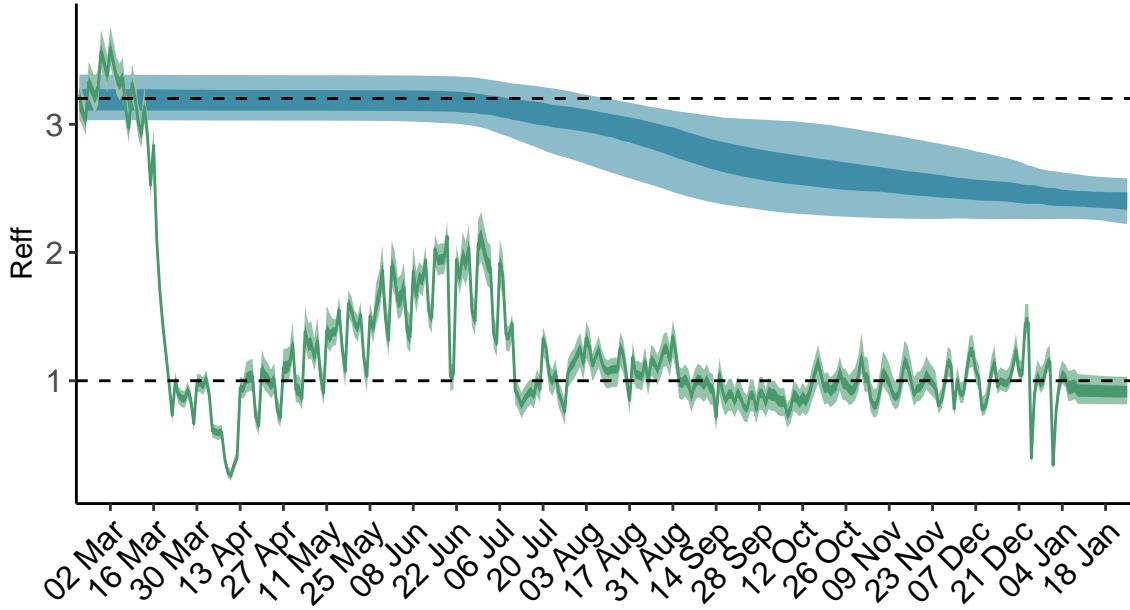


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

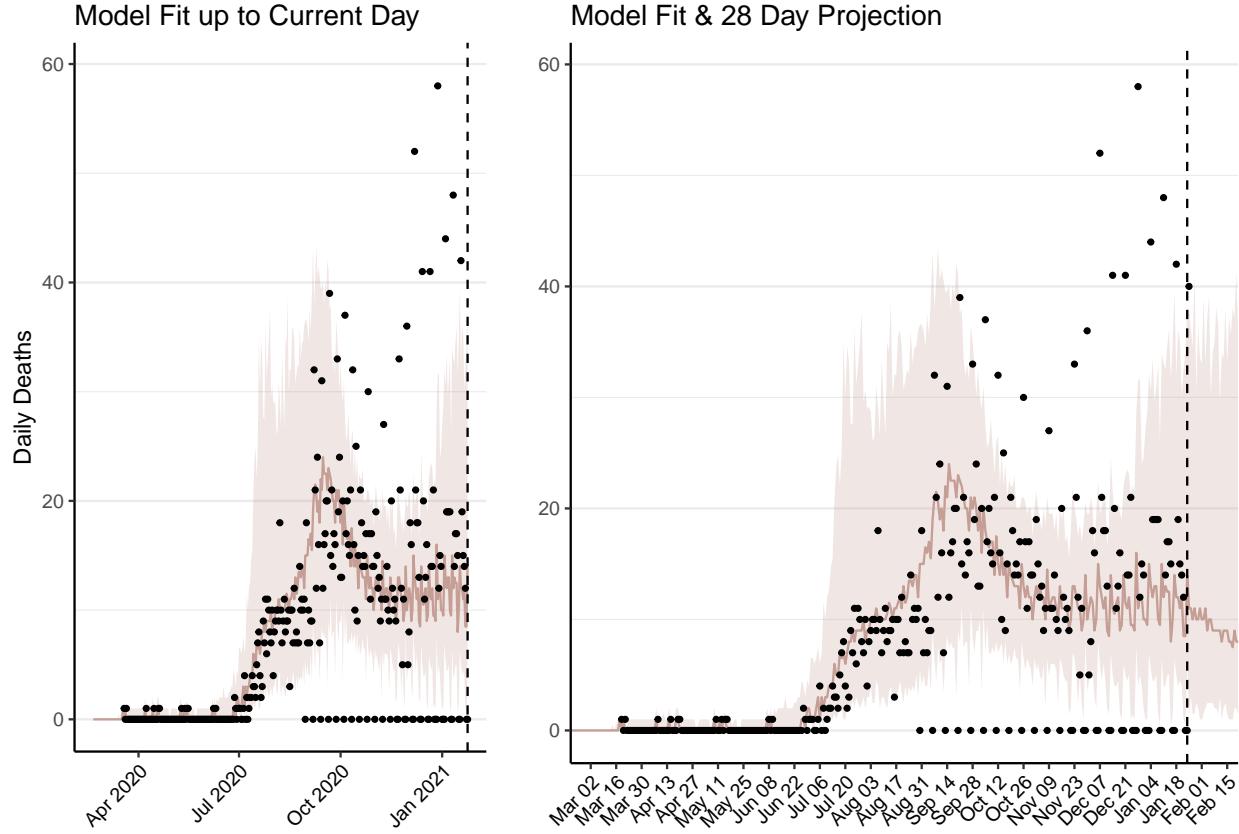


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 423 (95% CI: 378-469) patients requiring treatment with high-pressure oxygen at the current date to 336 (95% CI: 288-383) hospital beds being required on 2021-02-21 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 144 (95% CI: 132-156) patients requiring treatment with mechanical ventilation at the current date to 114 (95% CI: 102-127) by 2021-02-21. 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.**

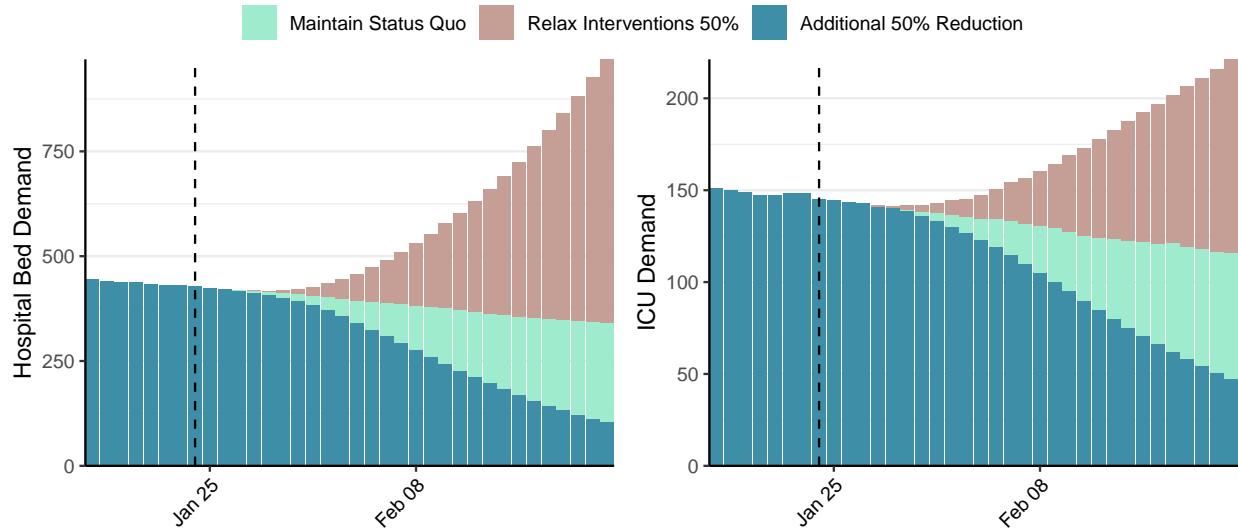


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 3,293 (95% CI: 2,879-3,707) at the current date to 229 (95% CI: 194-264) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,293 (95% CI: 2,879-3,707) at the current date to 12,369 (95% CI: 10,674-14,063) by 2021-02-21.

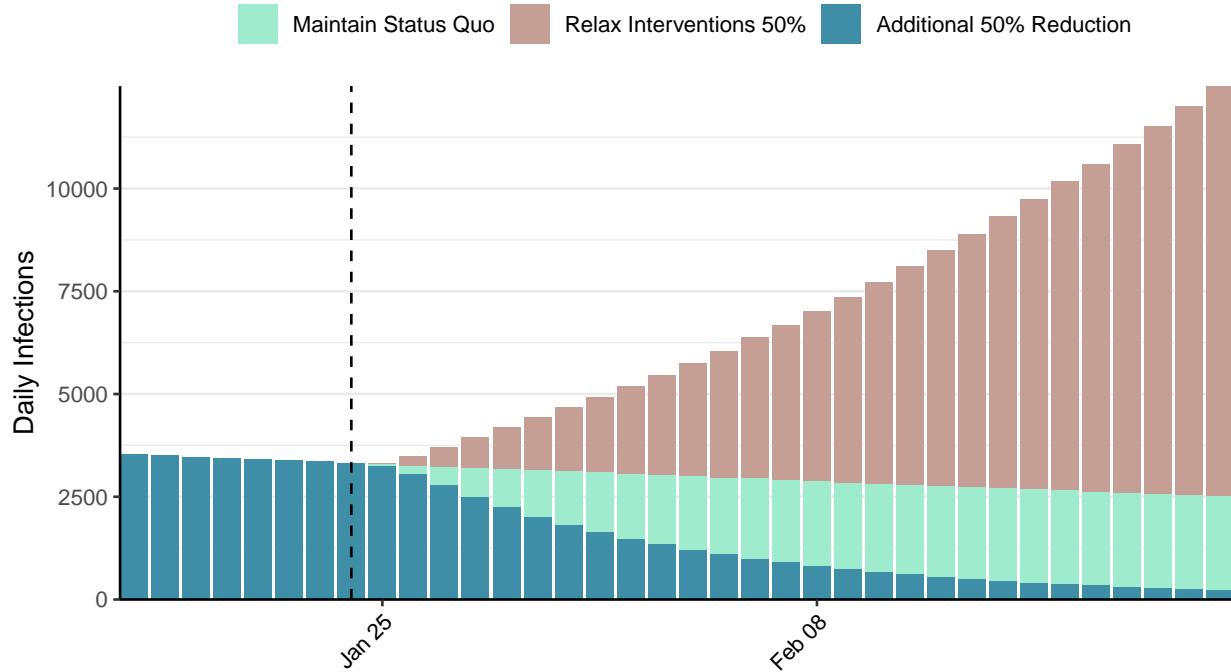


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Cuba, 2021-01-24 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}
567	567	3	3	1.45 (95% CI: 1.19-1.73)

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. Cuba is not shown in the following plot as only 3 deaths have been reported to date**

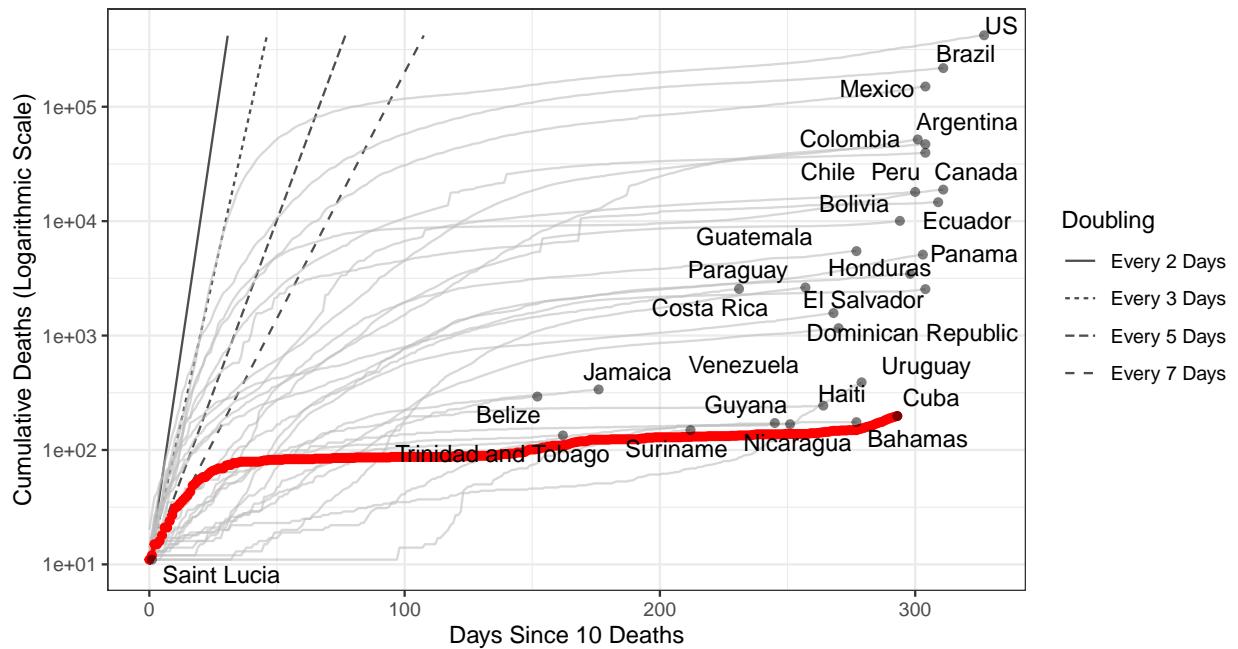


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 56,210 (95% CI: 51,442-60,979) 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

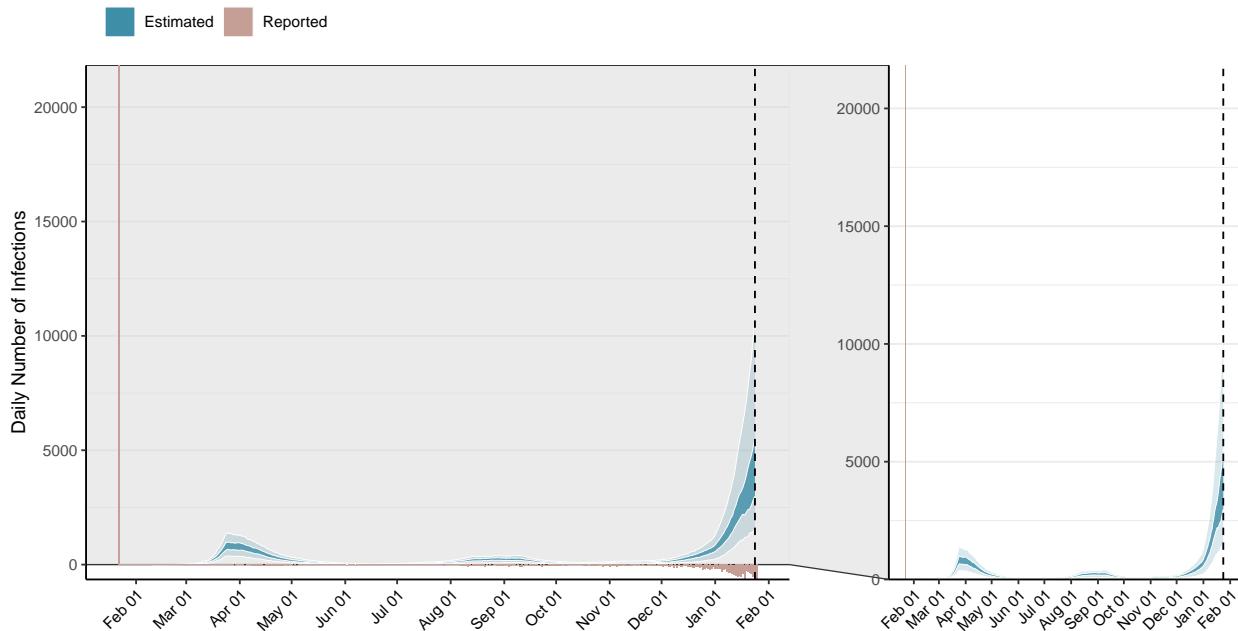


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

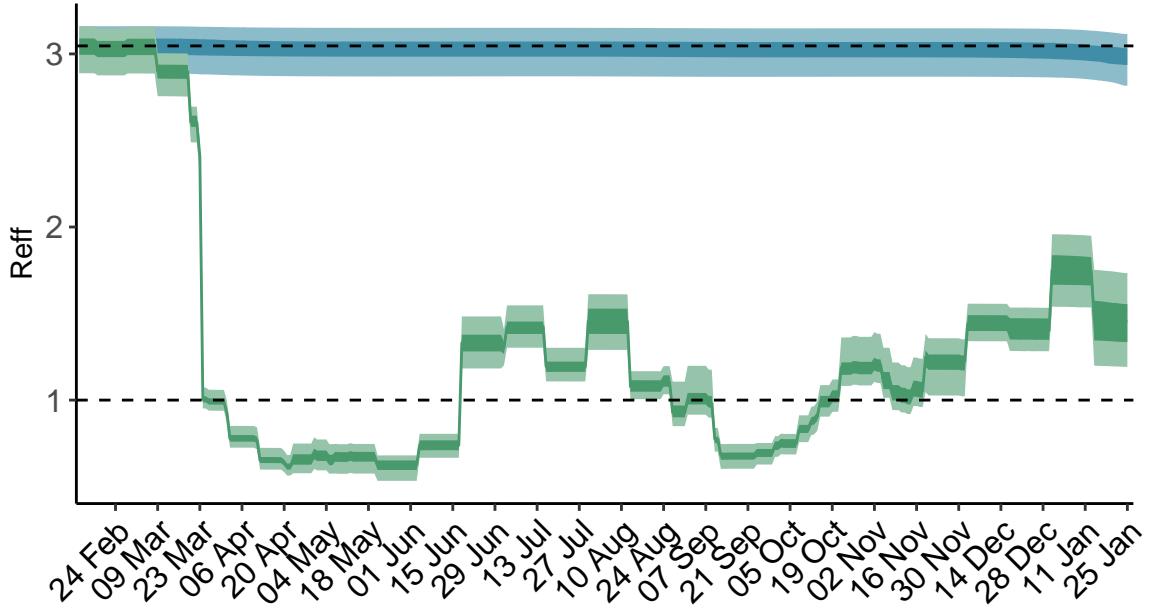


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

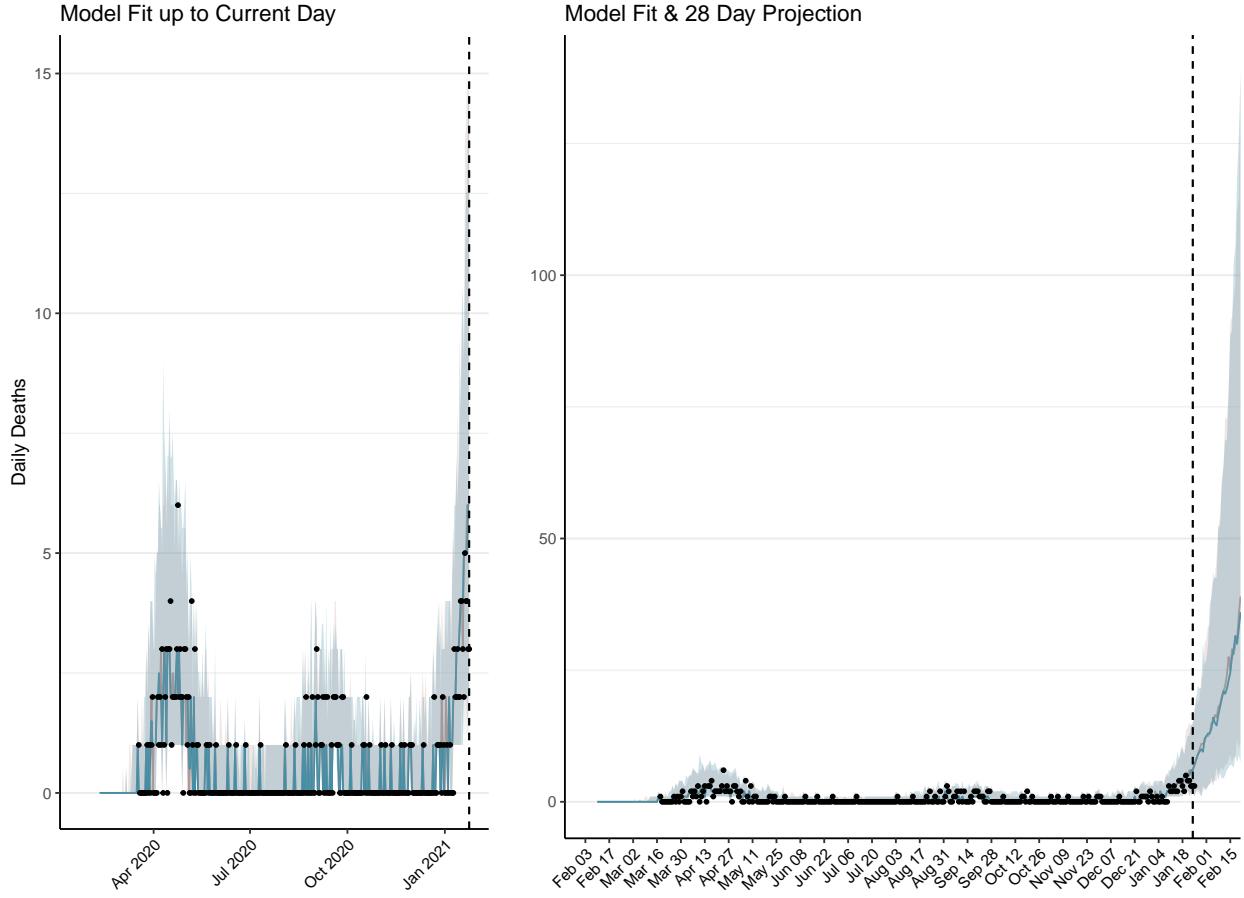


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 309 (95% CI: 282-336) patients requiring treatment with high-pressure oxygen at the current date to 1,891 (95% CI: 1,611-2,172) hospital beds being required on 2021-02-21 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 96 (95% CI: 88-104) patients requiring treatment with mechanical ventilation at the current date to 598 (95% CI: 514-681) by 2021-02-21. 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.**

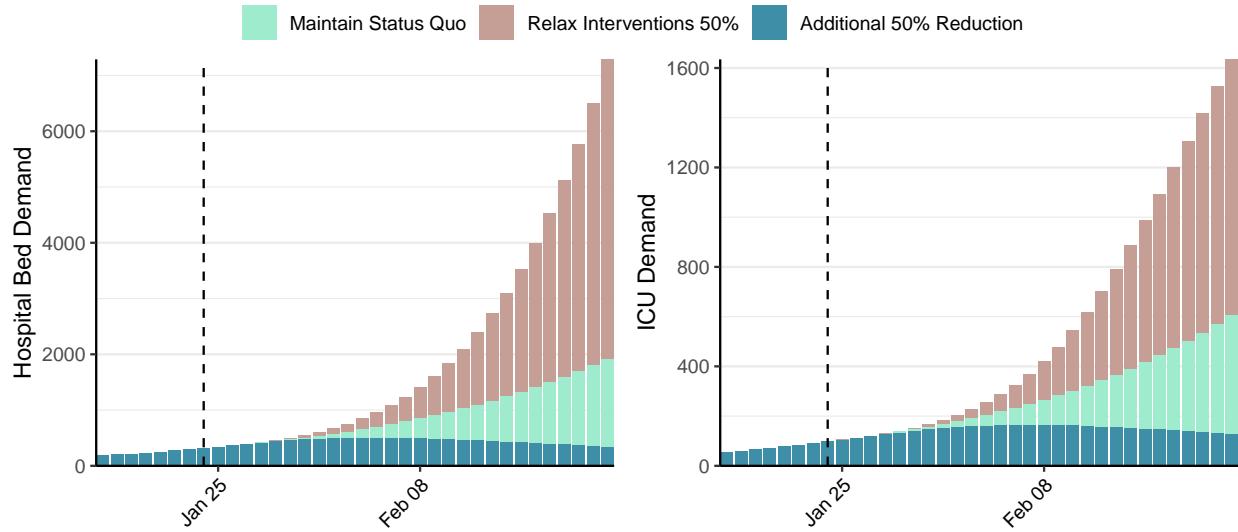


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 4,438 (95% CI: 3,986-4,890) at the current date to 1,557 (95% CI: 1,308-1,806) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 4,438 (95% CI: 3,986-4,890) at the current date to 121,333 (95% CI: 107,177-135,489) by 2021-02-21.

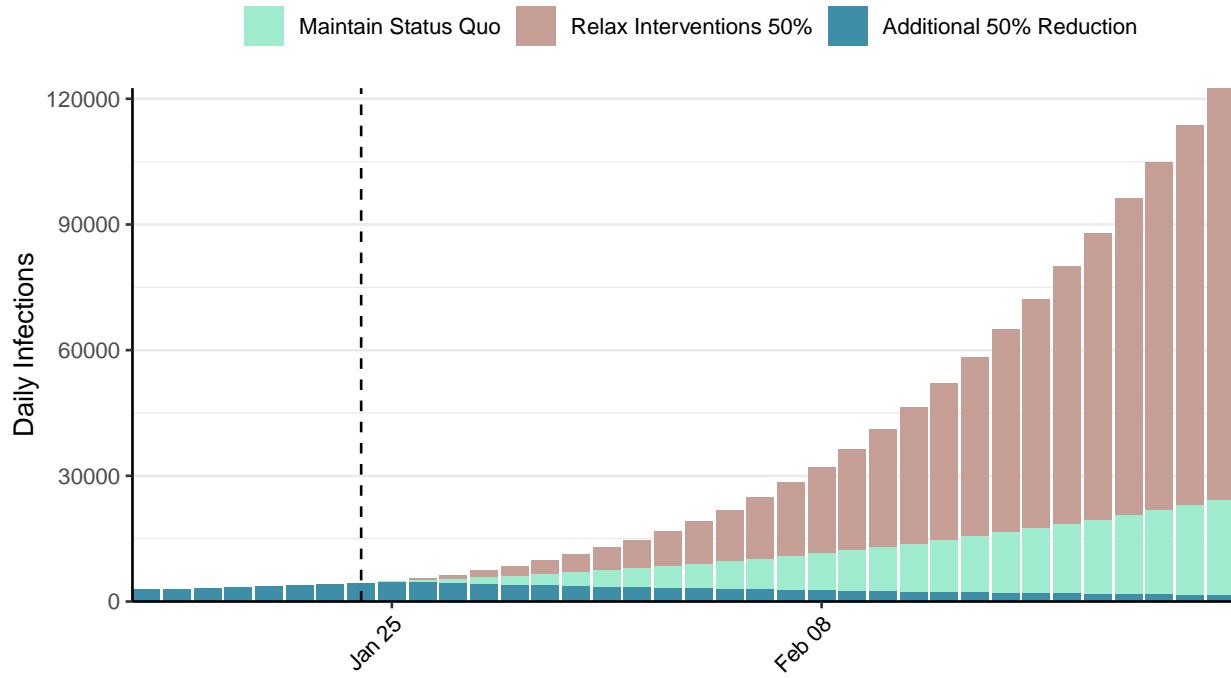


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Djibouti, 2021-01-24 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}
1	1	0	0	0.53 (95% CI: 0.3-0.92)

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**

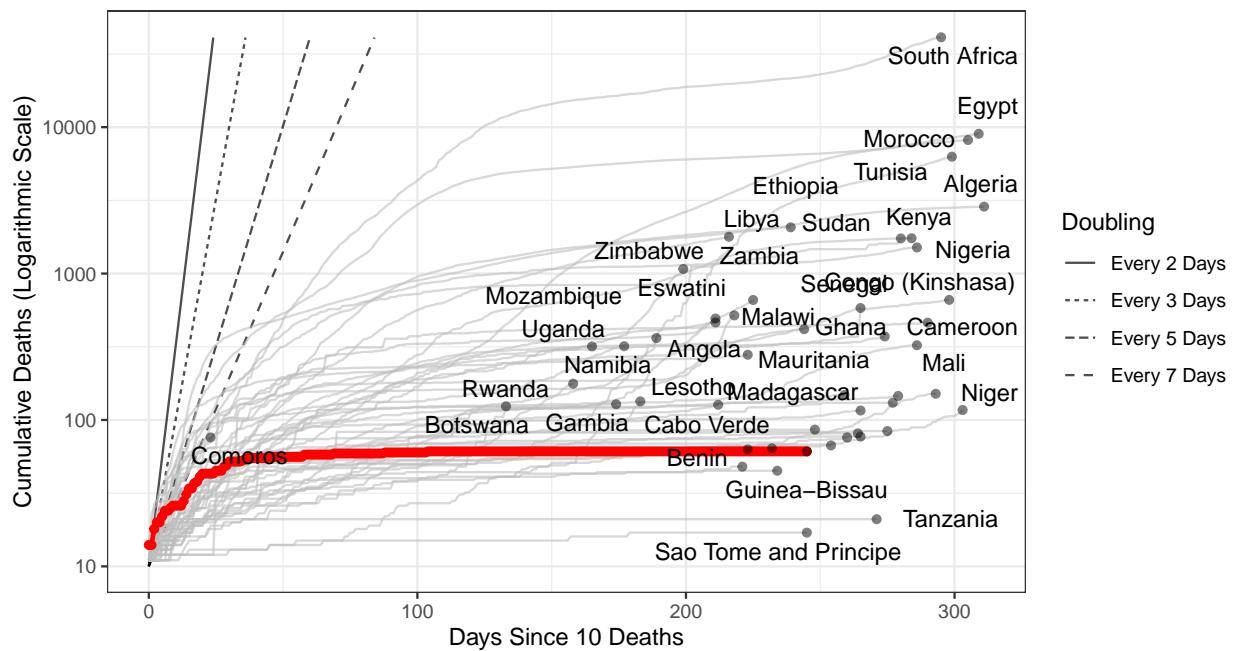


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 0 (95% CI: 0-1) 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).

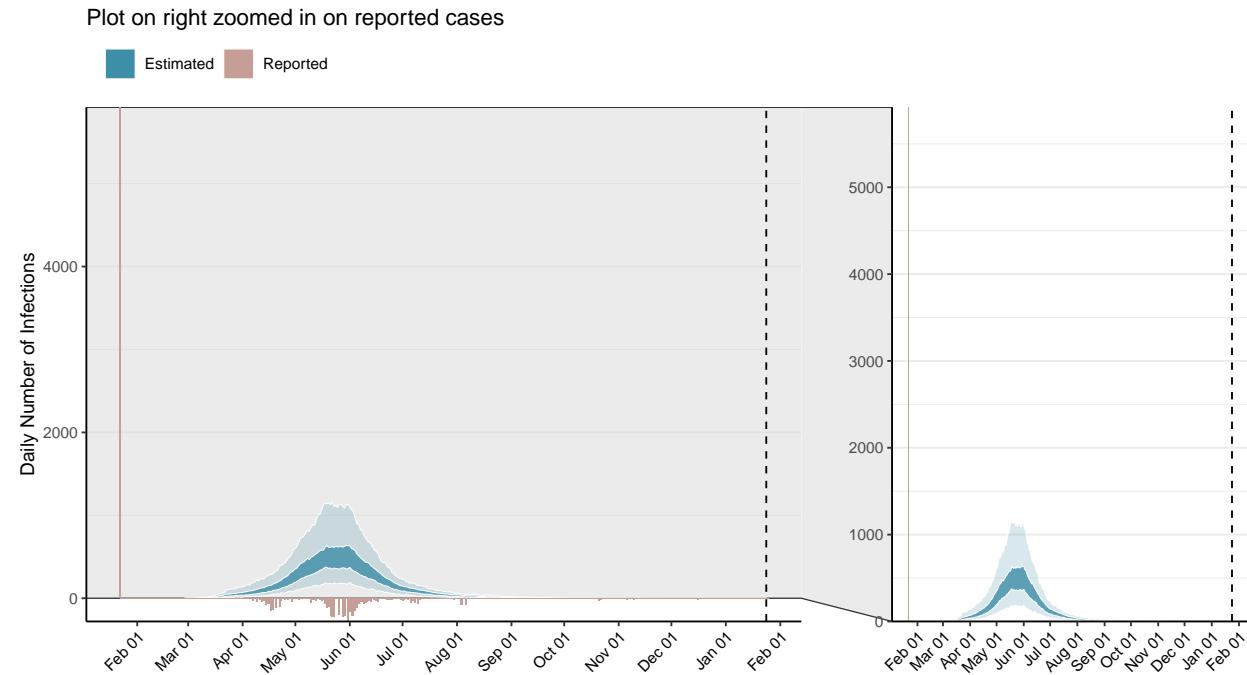


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

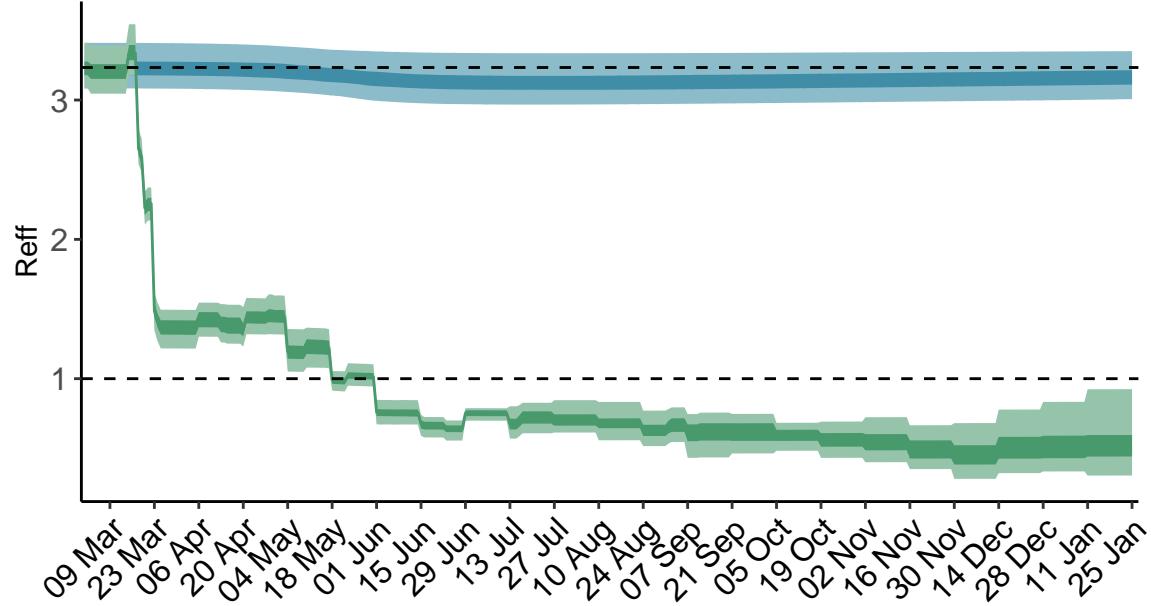


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

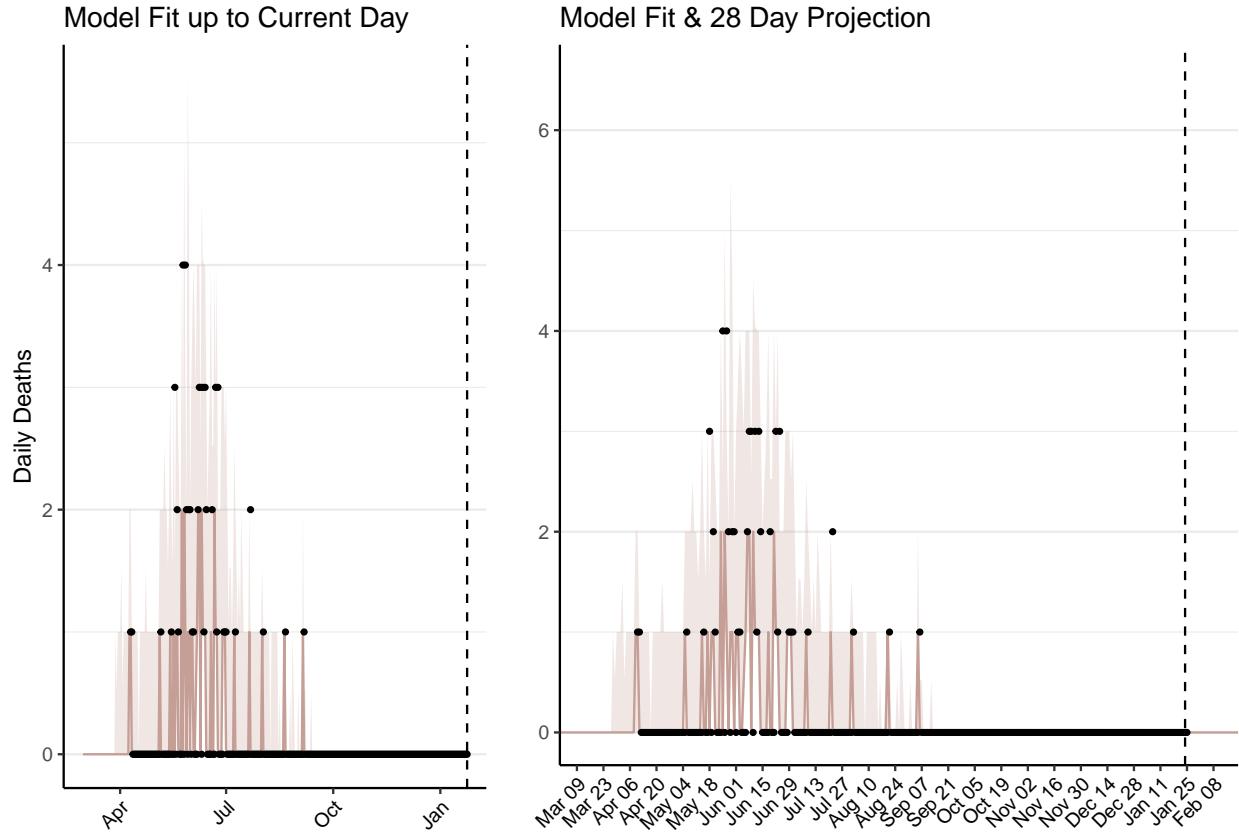


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 2021-02-21 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 2021-02-21. 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.**

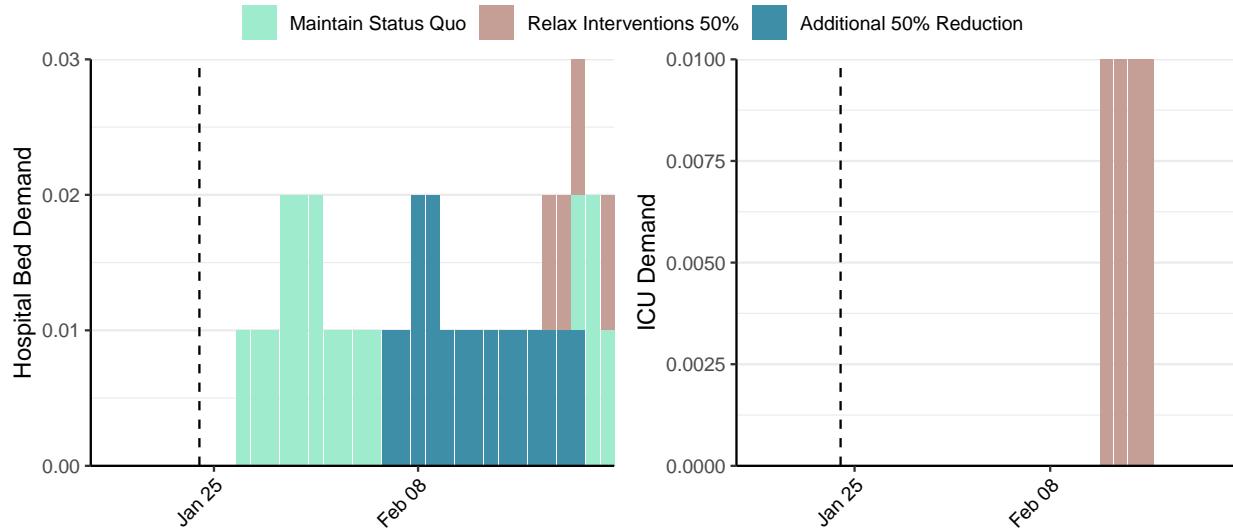


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 2021-02-21. 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: 0-1) by 2021-02-21.

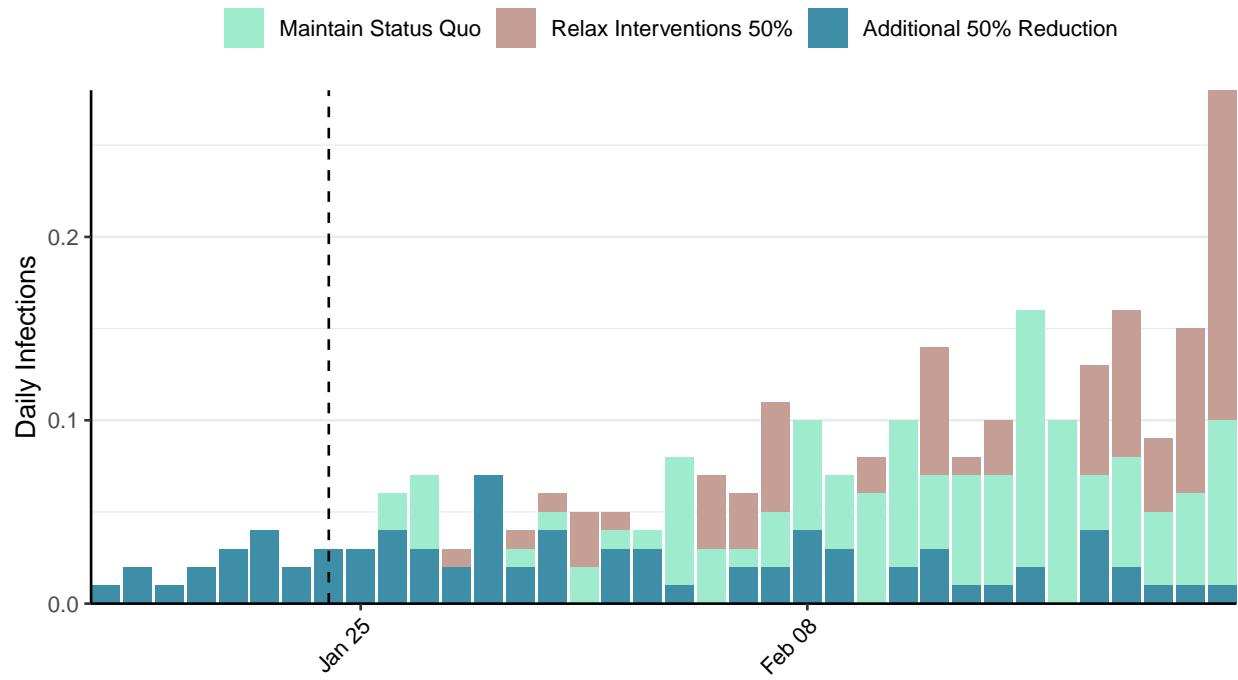


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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: Dominican Republic, 2021-01-24

[Download the report for Dominican Republic, 2021-01-24 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}
1,216	1,216	14	14	1.32 (95% CI: 1.09-1.56)

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.

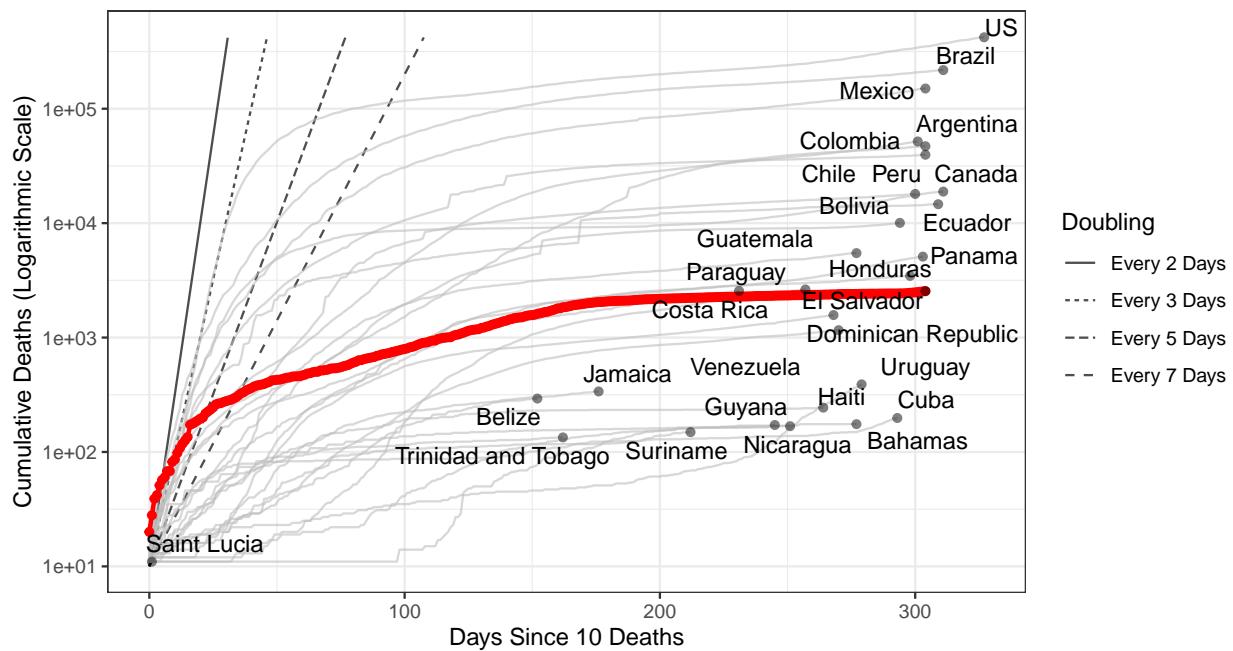


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 102,363 (95% CI: 96,903-107,822) 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).

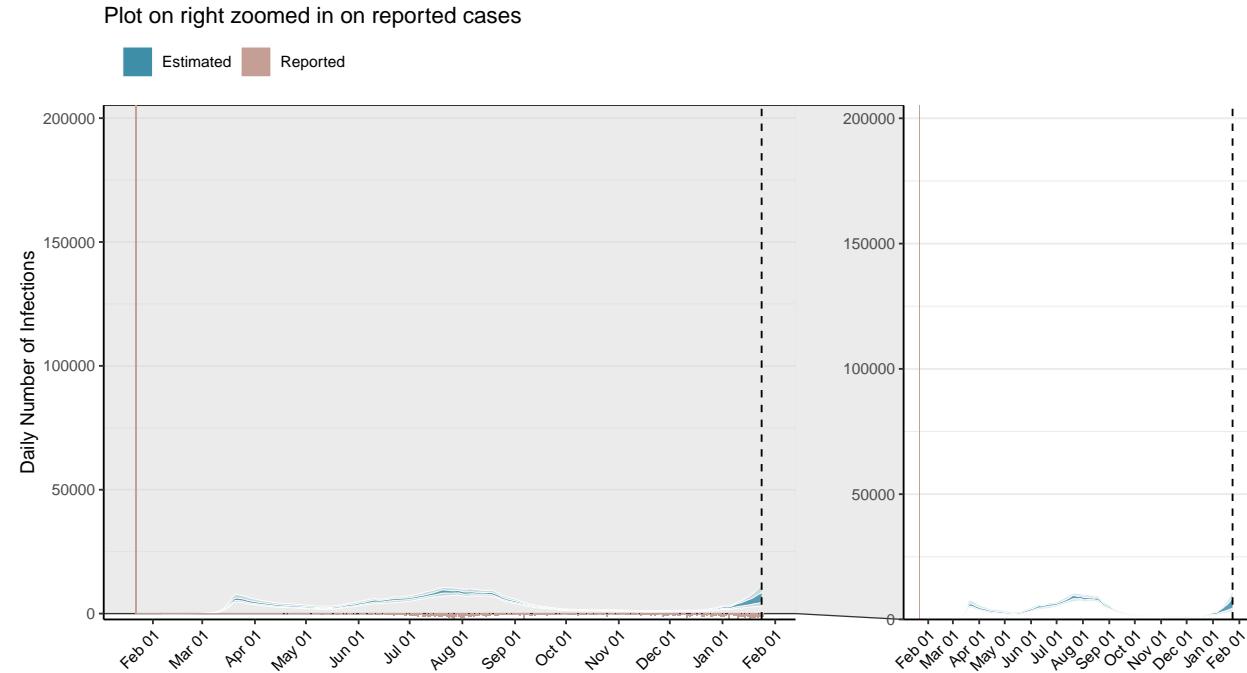


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

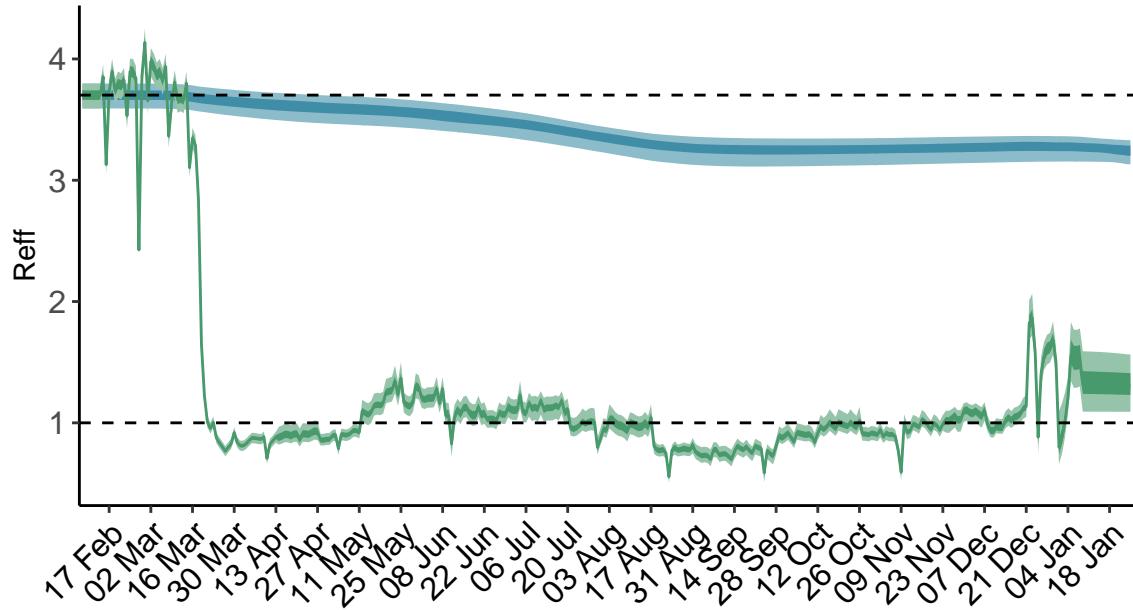


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

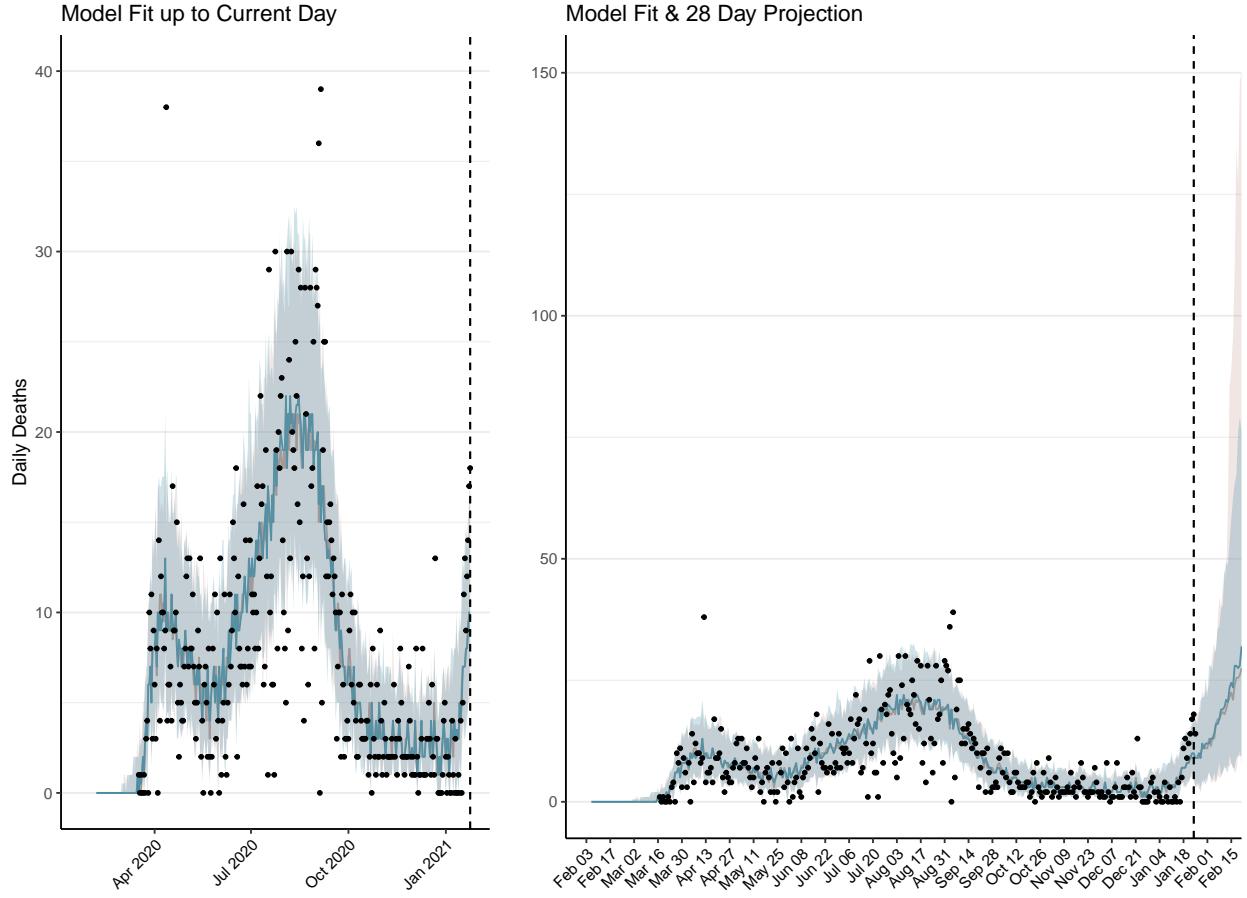


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 363 (95% CI: 342-383) patients requiring treatment with high-pressure oxygen at the current date to 1,426 (95% CI: 1,234-1,618) hospital beds being required on 2021-02-21 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 118 (95% CI: 112-125) patients requiring treatment with mechanical ventilation at the current date to 426 (95% CI: 382-469) by 2021-02-21. 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.**

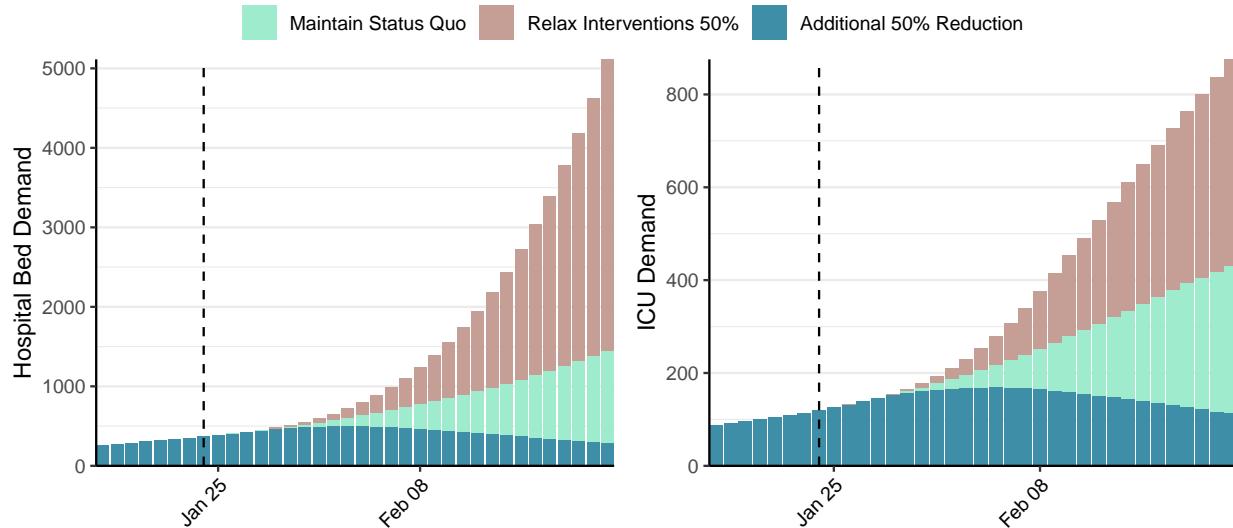


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 6,536 (95% CI: 6,016-7,056) at the current date to 1,669 (95% CI: 1,419-1,920) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 6,536 (95% CI: 6,016-7,056) at the current date to 117,204 (95% CI: 103,823-130,584) by 2021-02-21.

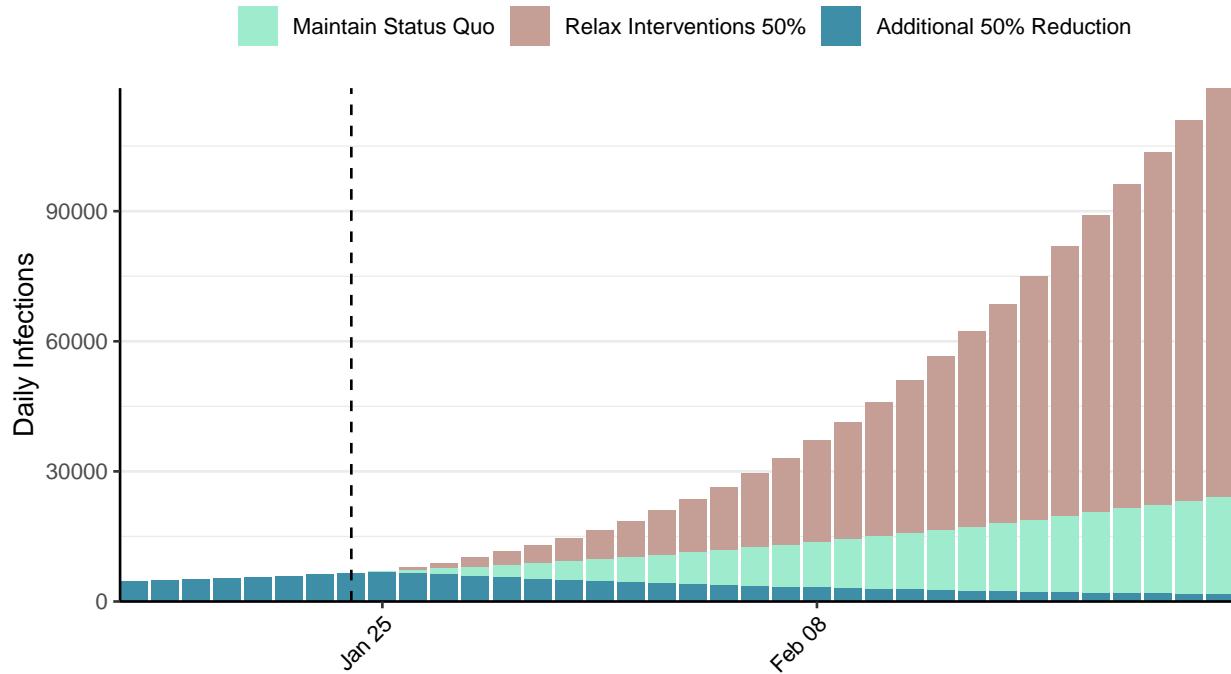


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Algeria, 2021-01-24 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}
258	258	3	3	0.9 (95% CI: 0.78-1.04)

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. Algeria is not shown in the following plot as only 3 deaths have been reported to date**

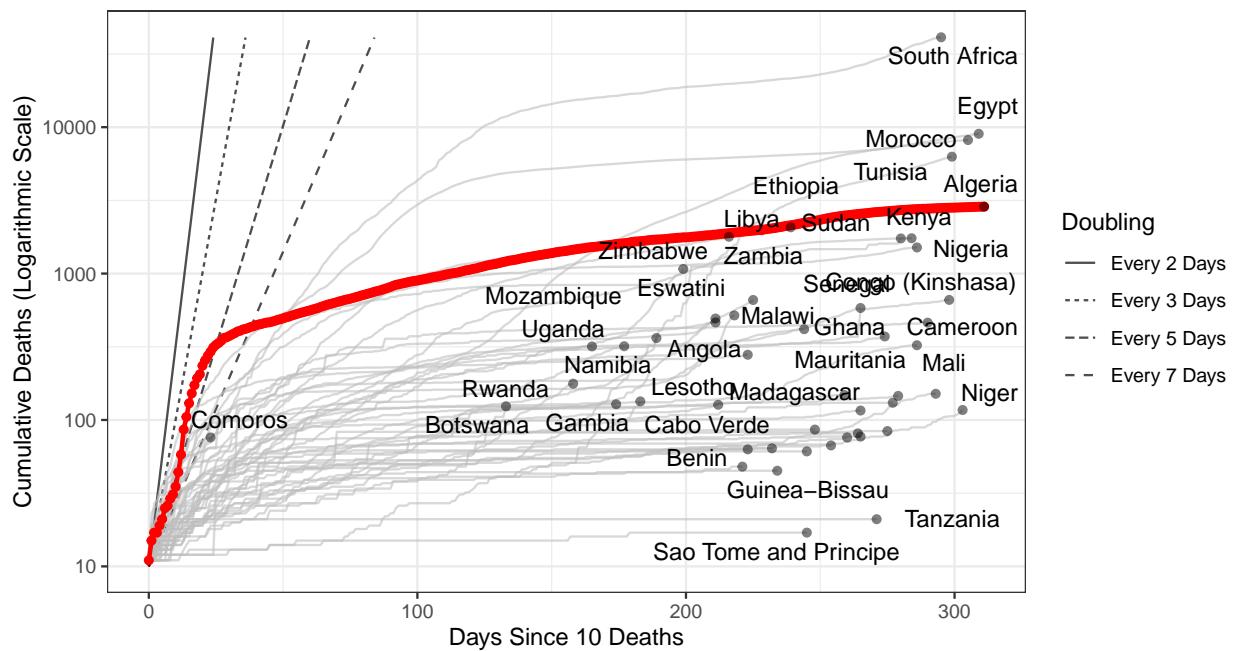


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 36,469 (95% CI: 35,196-37,742) 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).

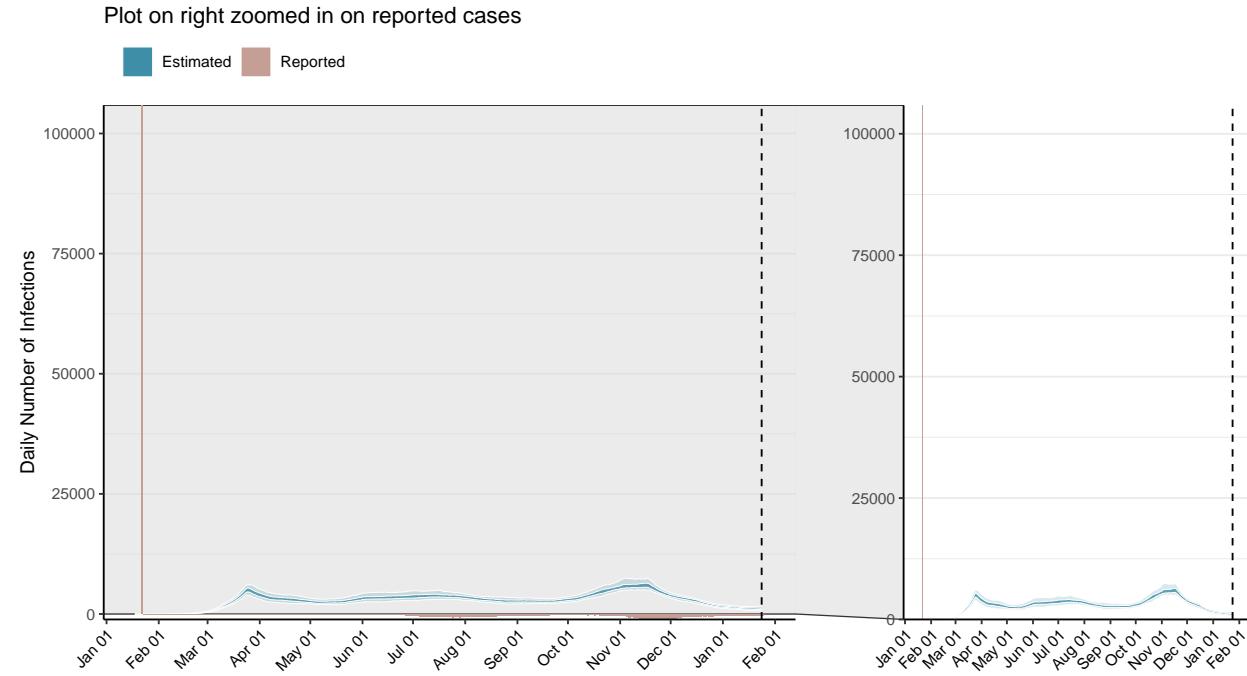


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

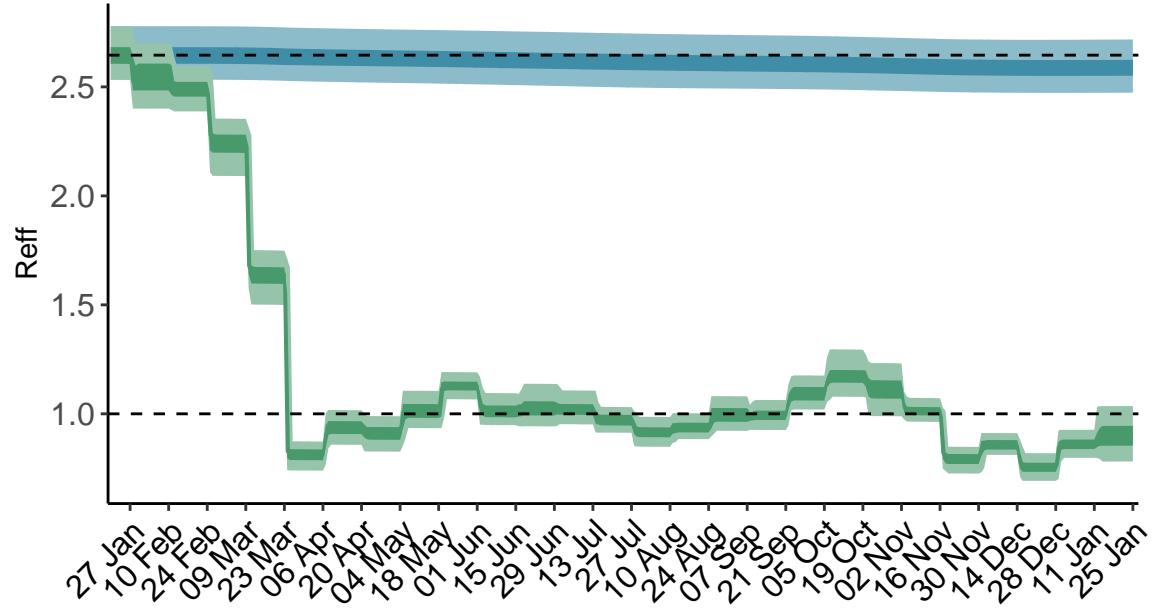


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

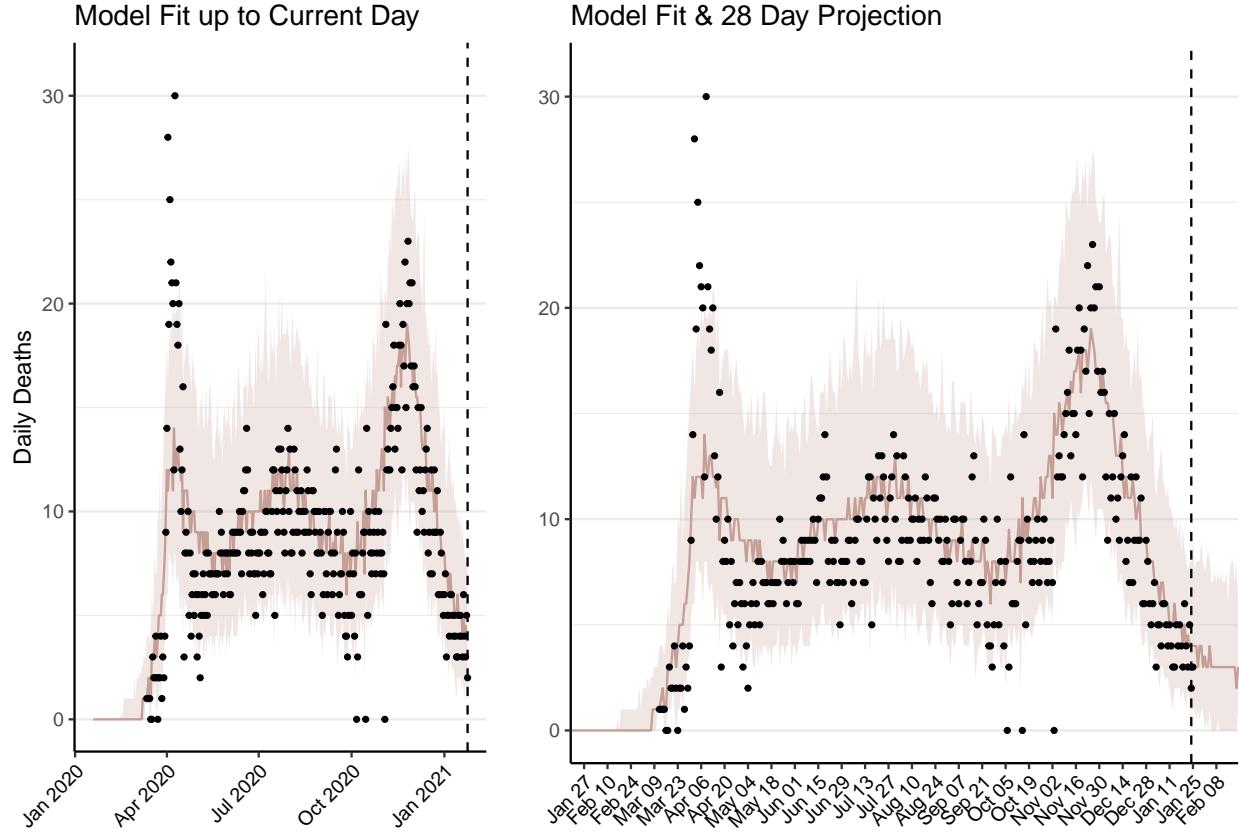


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 150 (95% CI: 144-156) patients requiring treatment with high-pressure oxygen at the current date to 104 (95% CI: 96-113) hospital beds being required on 2021-02-21 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 64 (95% CI: 61-66) patients requiring treatment with mechanical ventilation at the current date to 41 (95% CI: 38-44) by 2021-02-21. 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.**

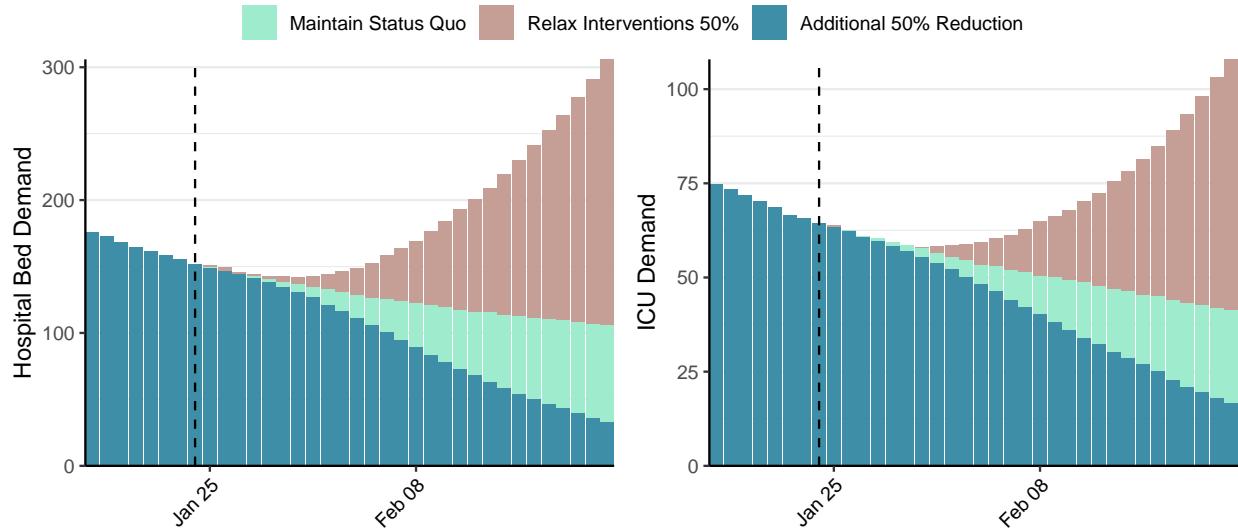


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 1,046 (95% CI: 995-1,097) at the current date to 68 (95% CI: 62-74) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,046 (95% CI: 995-1,097) at the current date to 4,245 (95% CI: 3,766-4,725) by 2021-02-21.

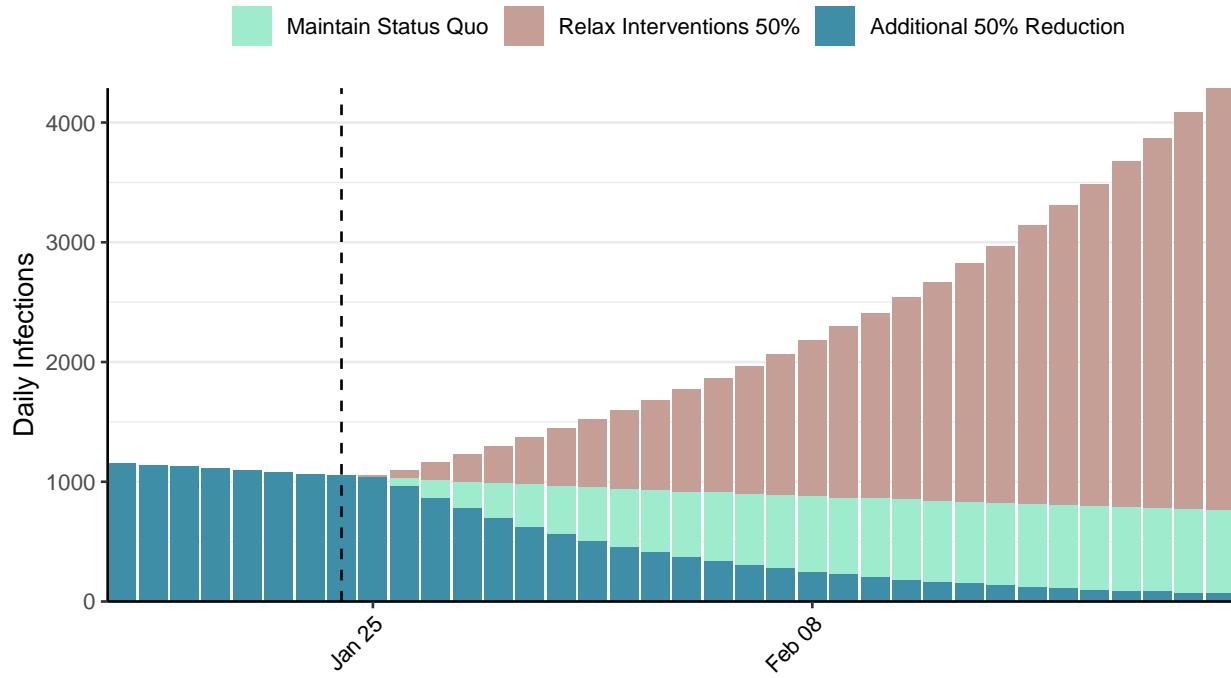


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Ecuador, 2021-01-24 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}
275	275	16	16	1.24 (95% CI: 1.05-1.46)

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.

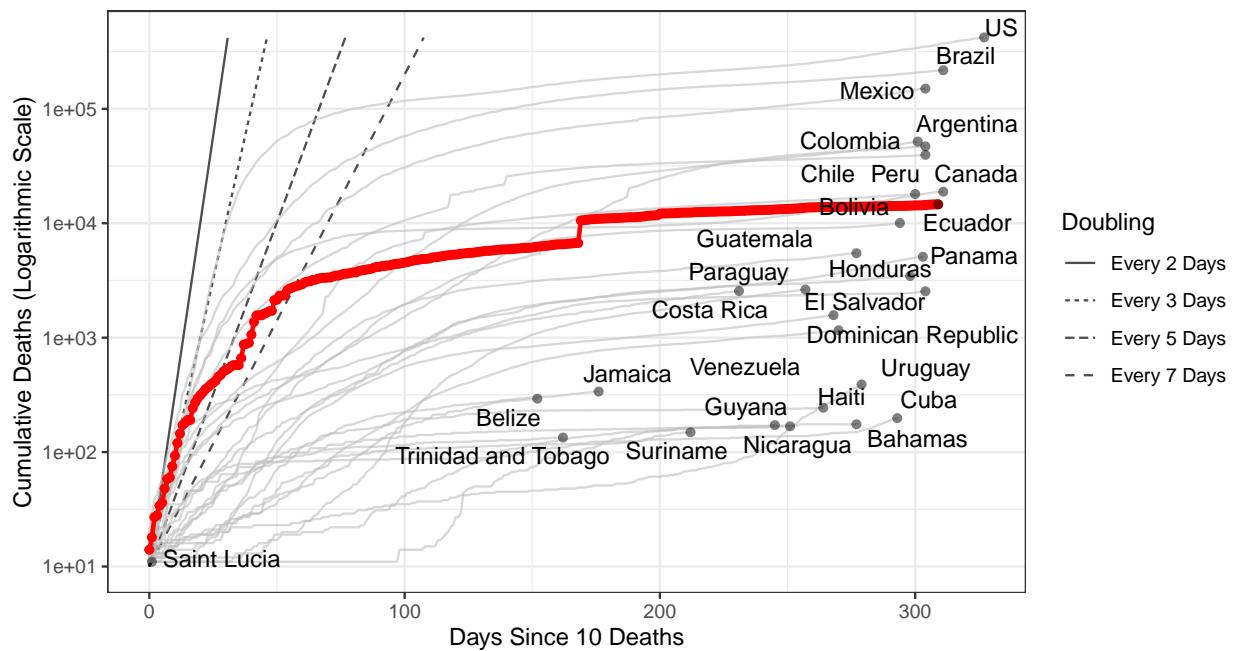


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 371,027 (95% CI: 355,123–386,931) 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).

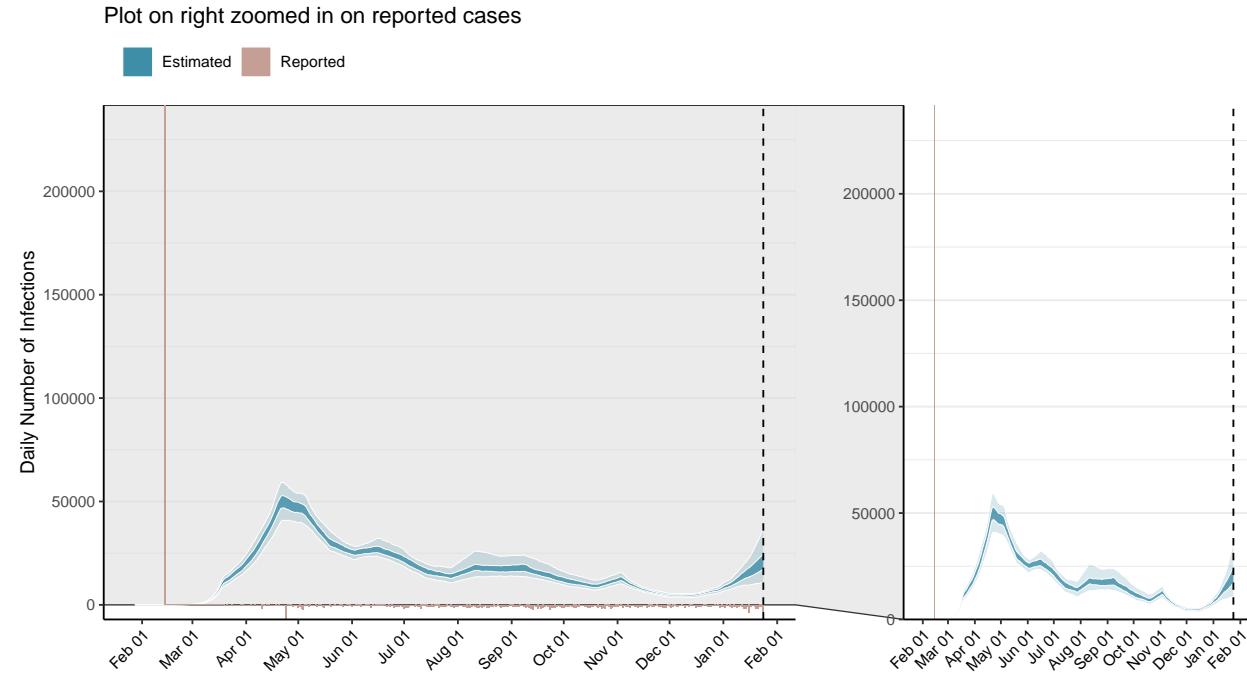


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

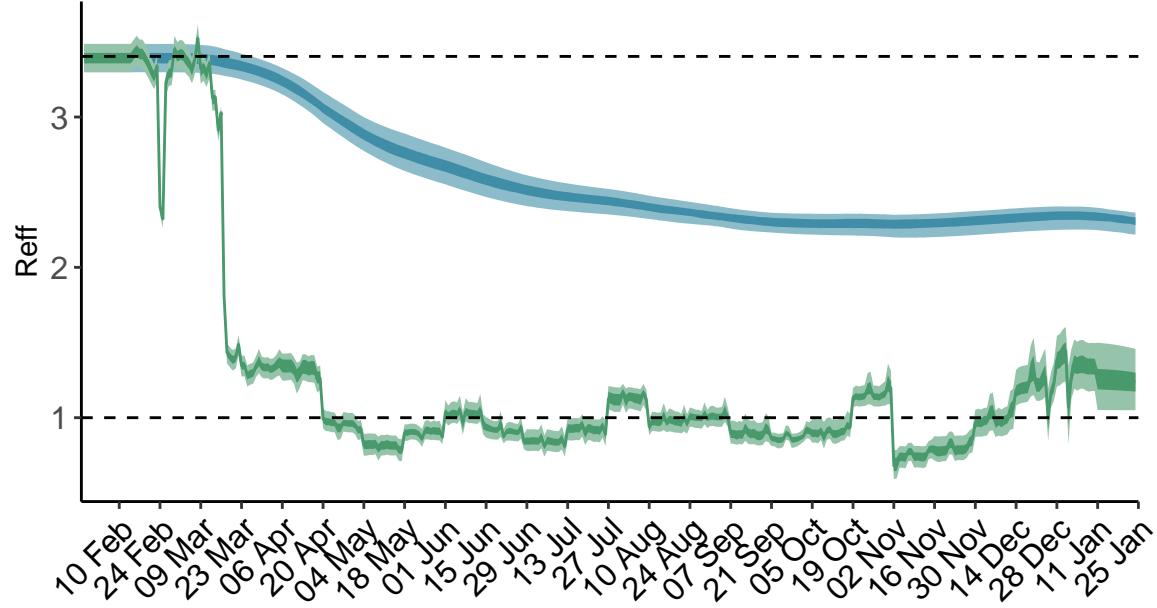


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

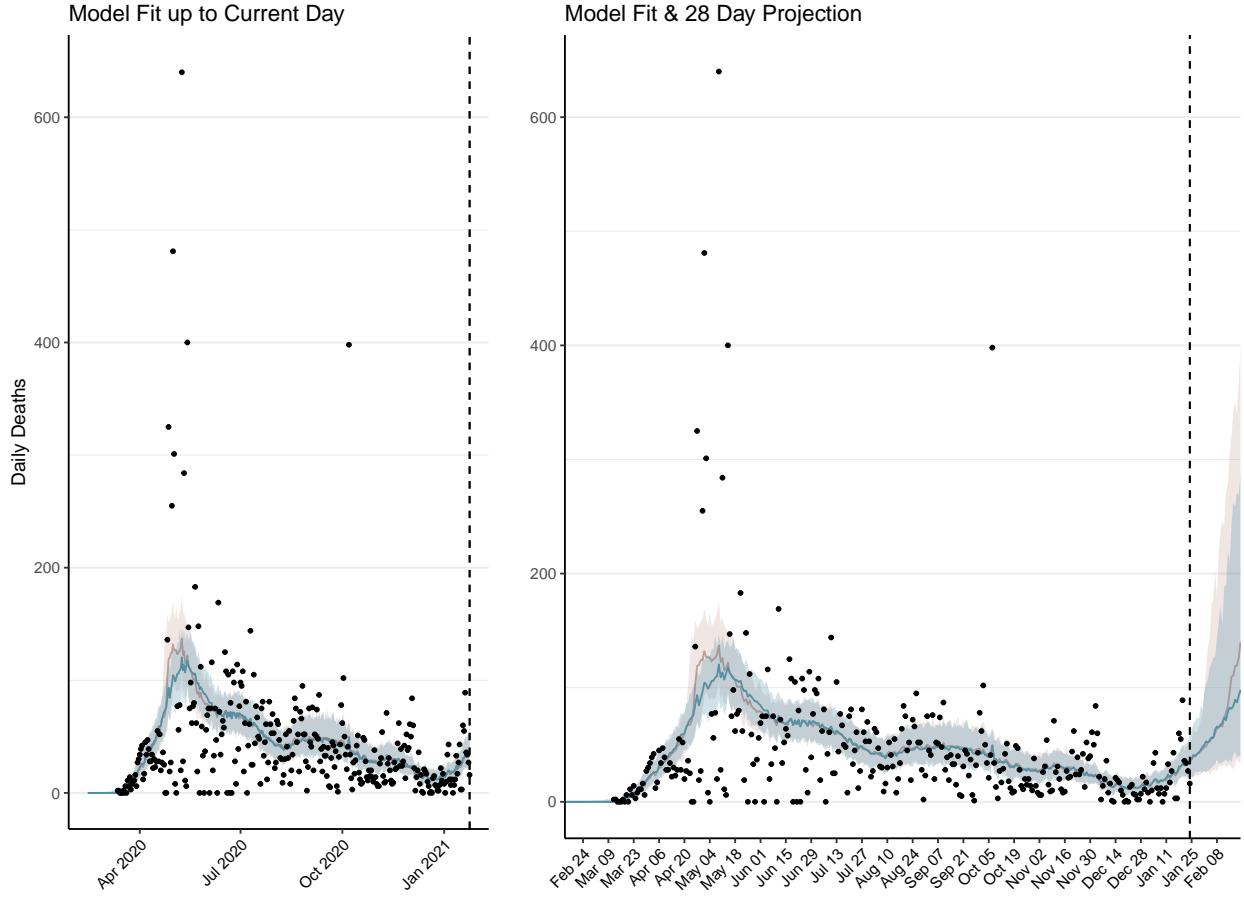


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 1,478 (95% CI: 1,411-1,546) patients requiring treatment with high-pressure oxygen at the current date to 4,062 (95% CI: 3,655-4,469) hospital beds being required on 2021-02-21 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 491 (95% CI: 470-513) patients requiring treatment with mechanical ventilation at the current date to 1,022 (95% CI: 970-1,074) by 2021-02-21. 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.**

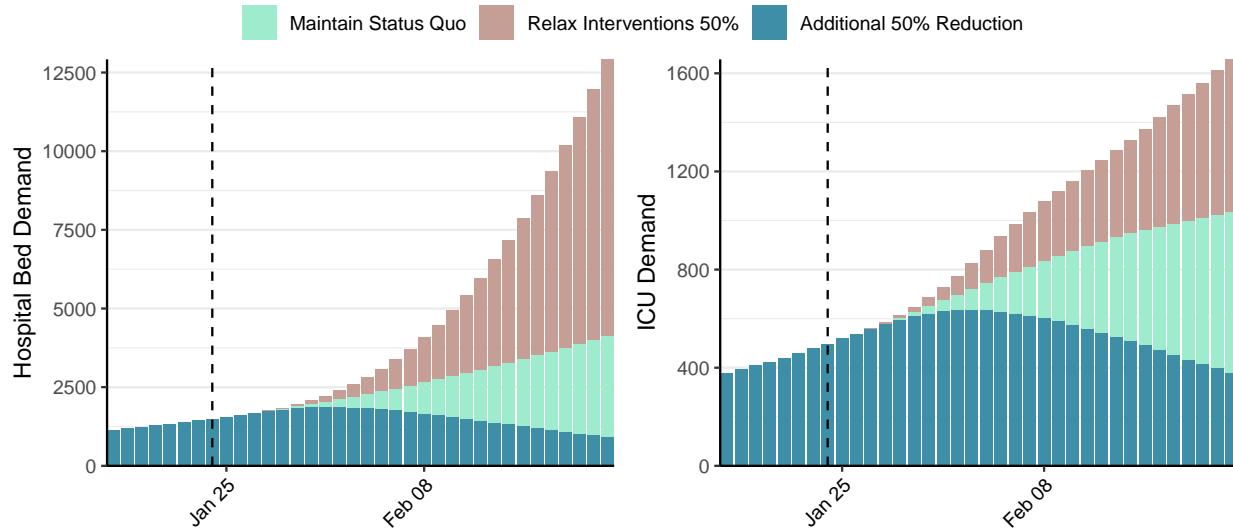


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 21,470 (95% CI: 20,100-22,840) at the current date to 4,184 (95% CI: 3,702-4,665) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 21,470 (95% CI: 20,100-22,840) at the current date to 214,200 (95% CI: 198,117-230,283) by 2021-02-21.

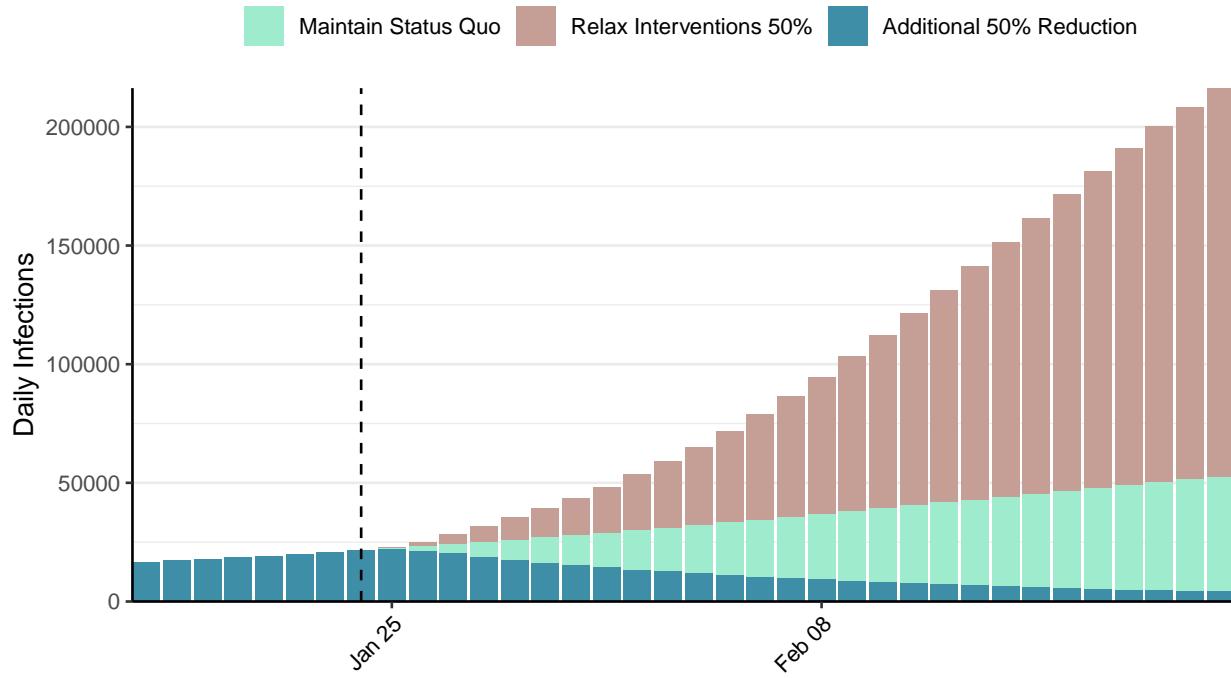


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Egypt, 2021-01-24 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}
669	669	53	53	0.78 (95% CI: 0.6-0.93)

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.

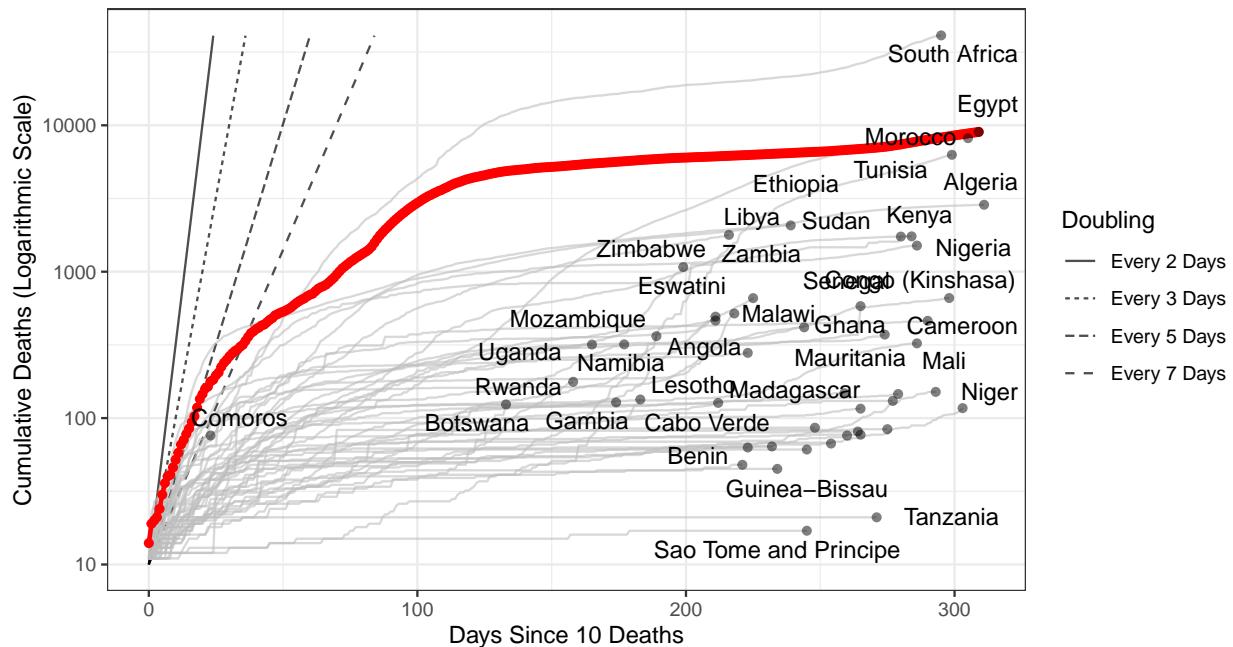


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 675,020 (95% CI: 647,913–702,127) 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).

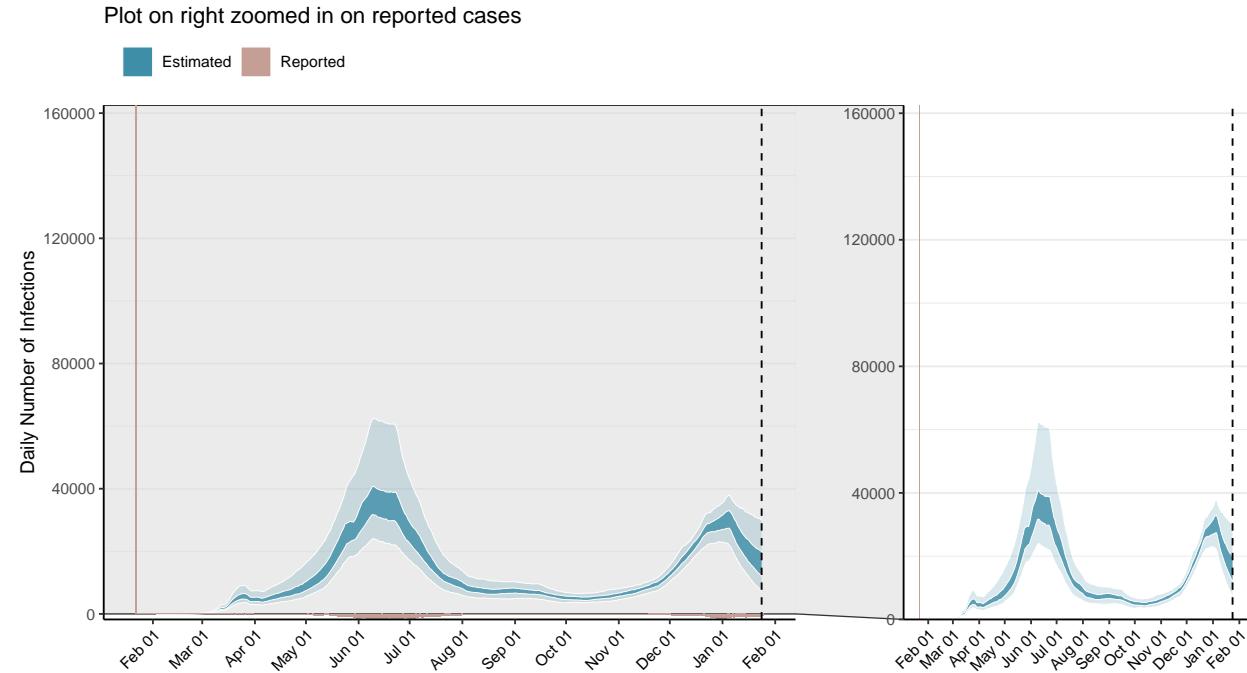


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

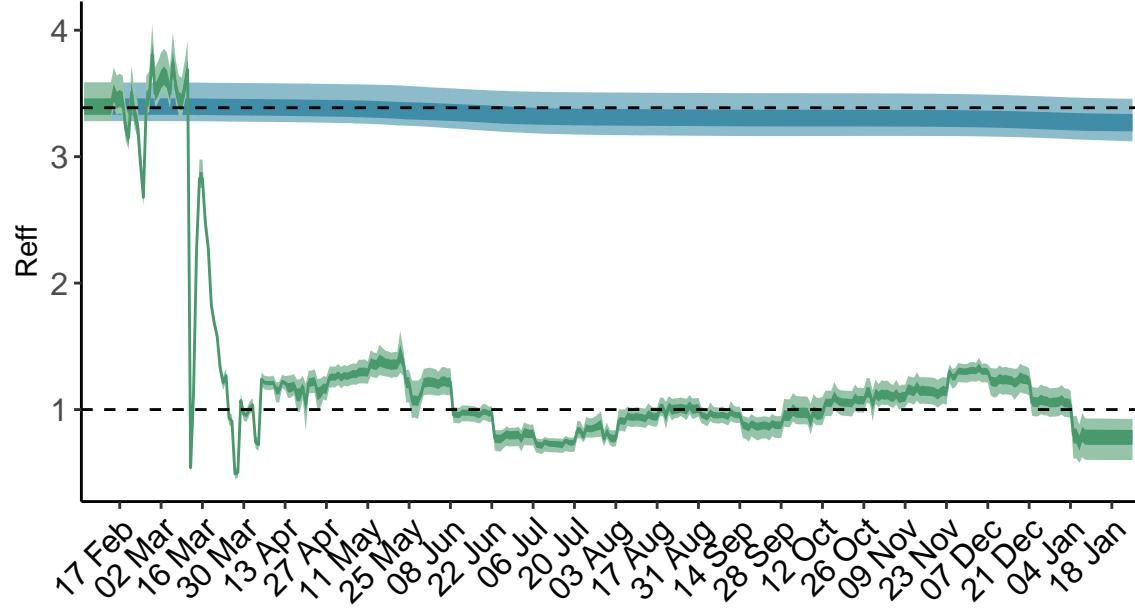


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

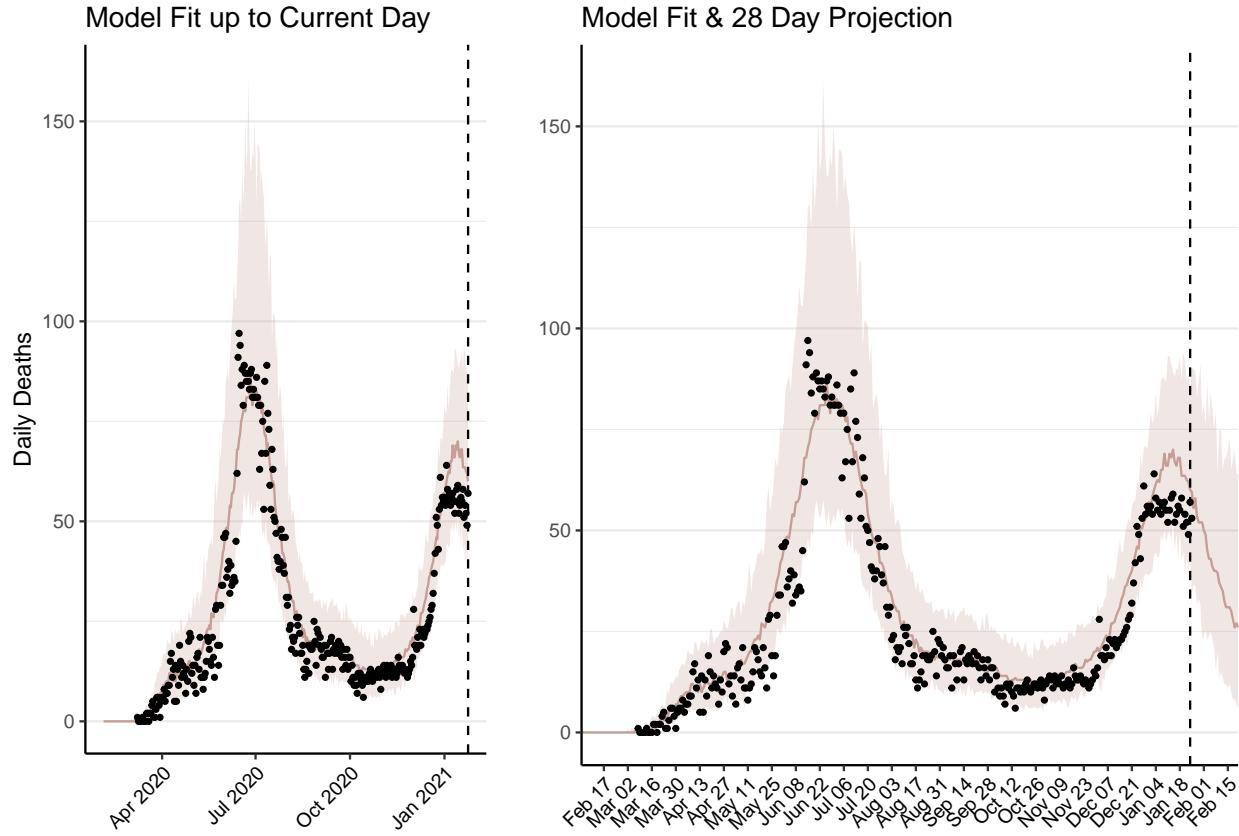


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 2,186 (95% CI: 2,086-2,286) patients requiring treatment with high-pressure oxygen at the current date to 984 (95% CI: 872-1,096) hospital beds being required on 2021-02-21 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 895 (95% CI: 857-934) patients requiring treatment with mechanical ventilation at the current date to 425 (95% CI: 381-469) by 2021-02-21. 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.**

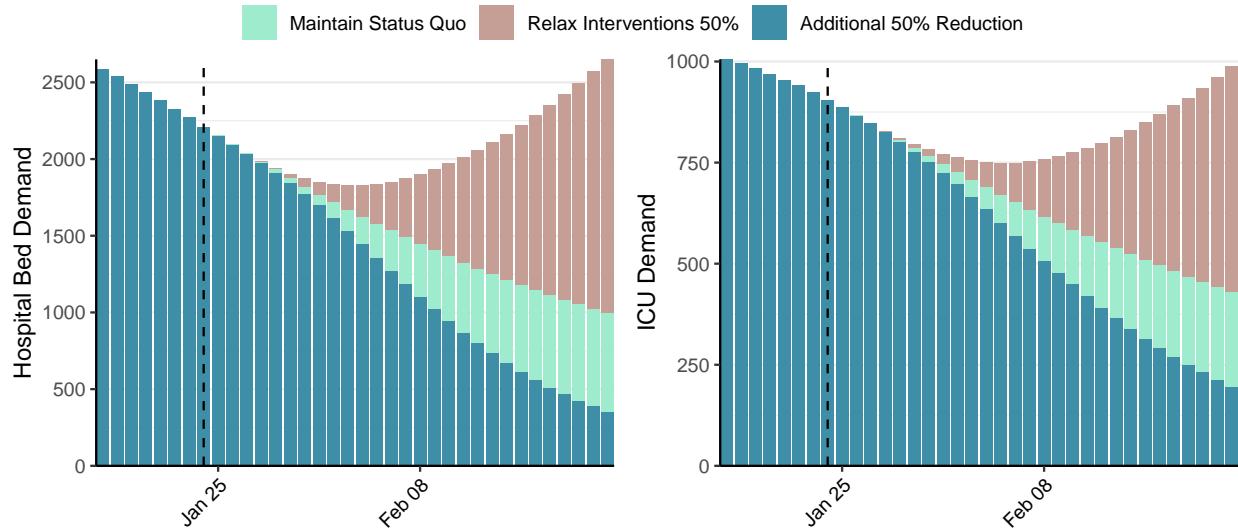


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 16,025 (95% CI: 14,836-17,215) at the current date to 702 (95% CI: 609-796) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 16,025 (95% CI: 14,836-17,215) at the current date to 37,533 (95% CI: 31,630-43,435) by 2021-02-21.

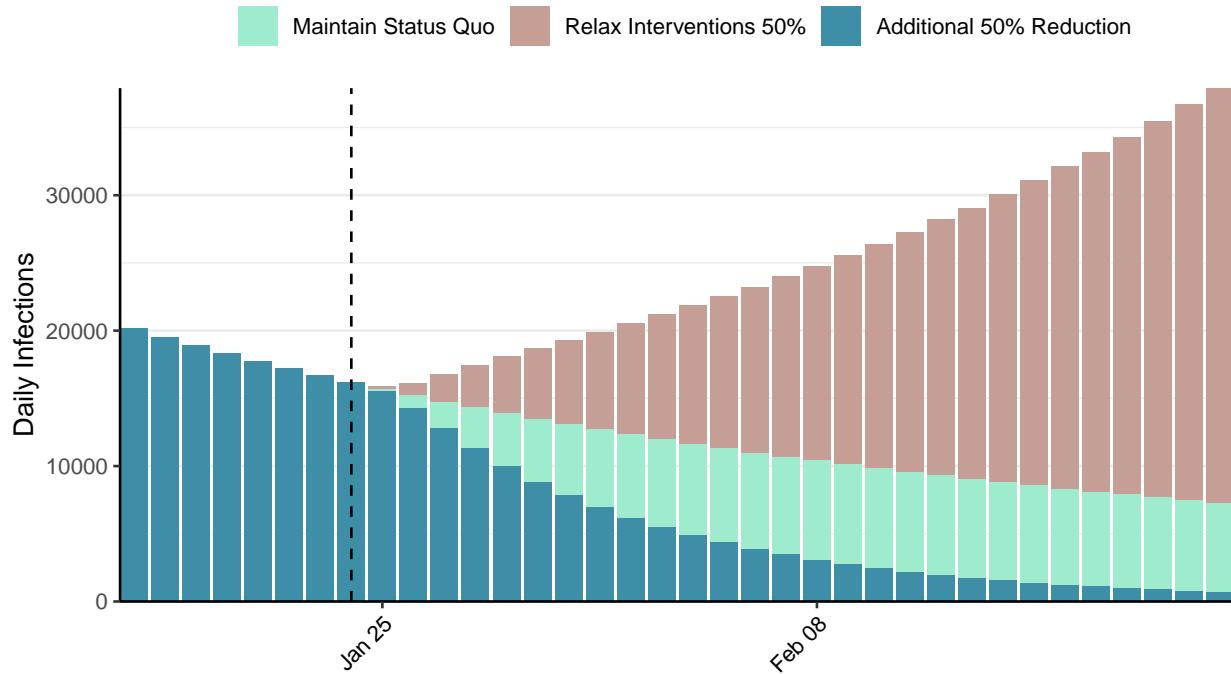


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Eritrea, 2021-01-24 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}
10	10	1	1	1.5 (95% CI: 1.2-1.85)

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. Eritrea is not shown in the following plot as only 1 deaths have been reported to date**

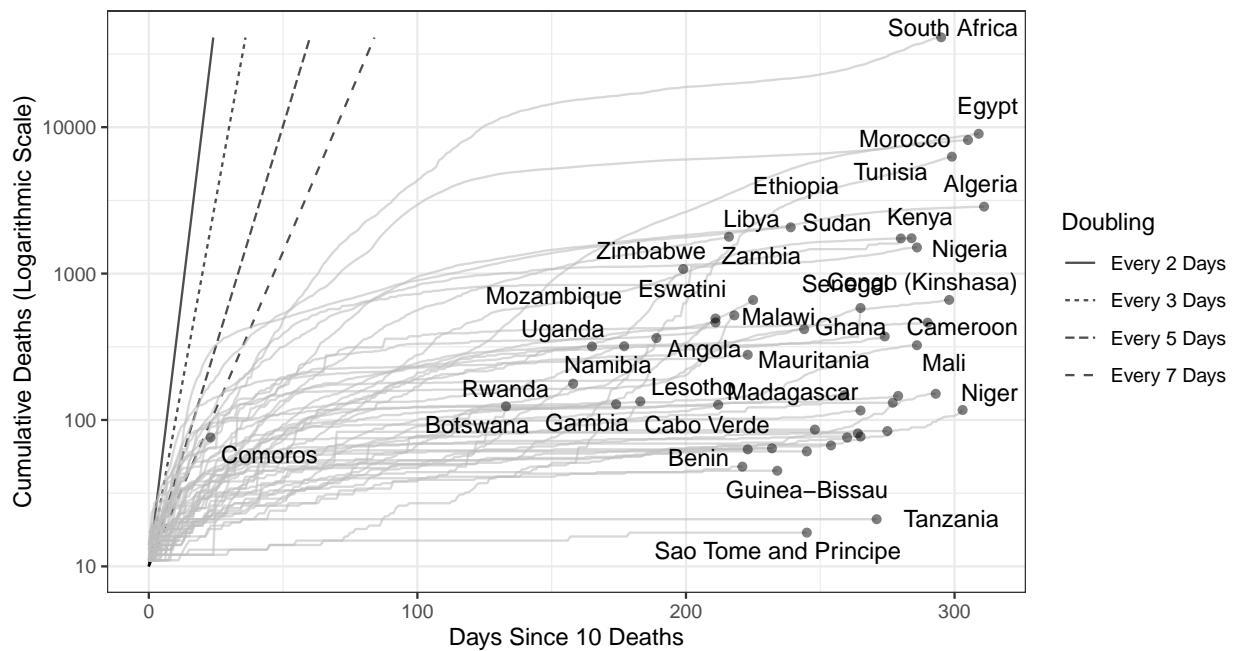


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 6,578 (95% CI: 5,765-7,392) 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).

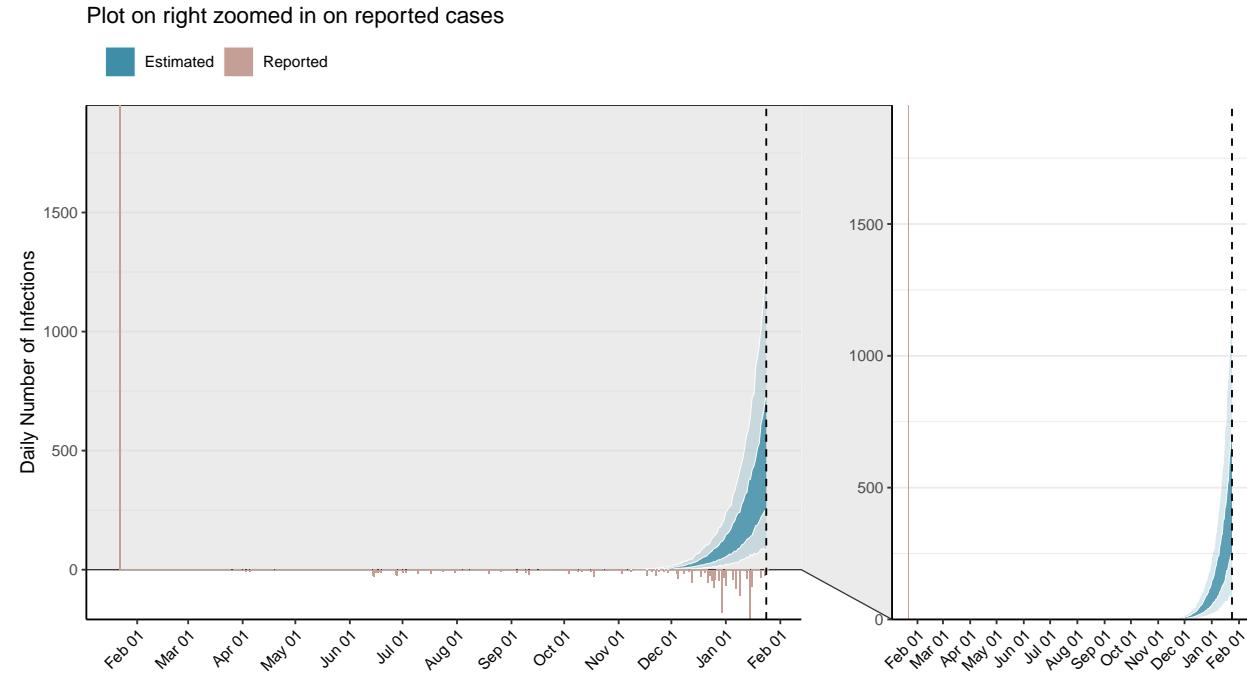


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

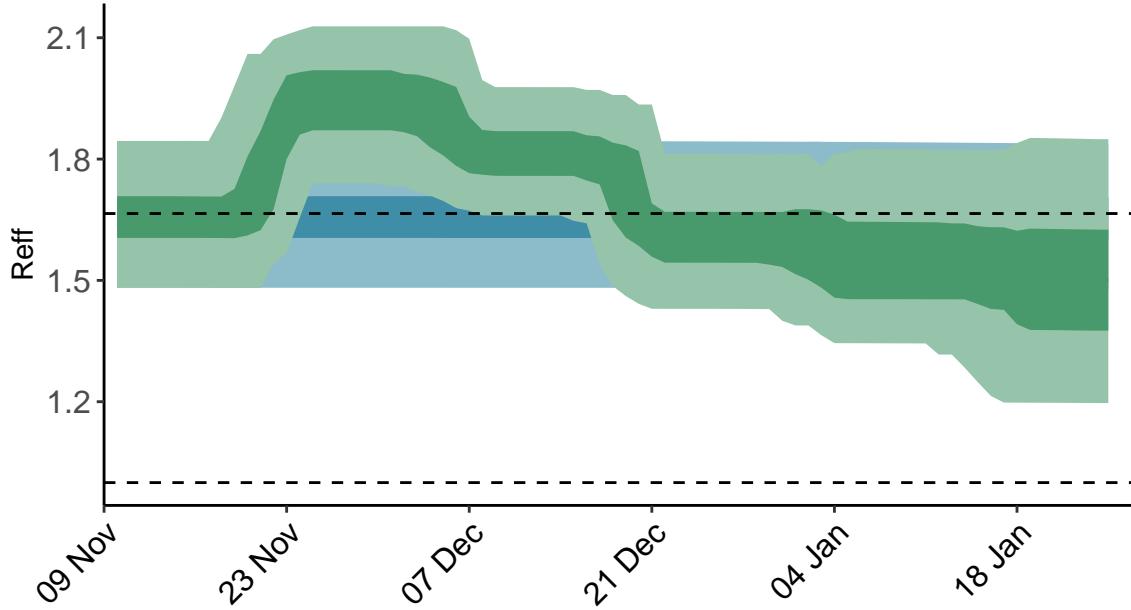


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

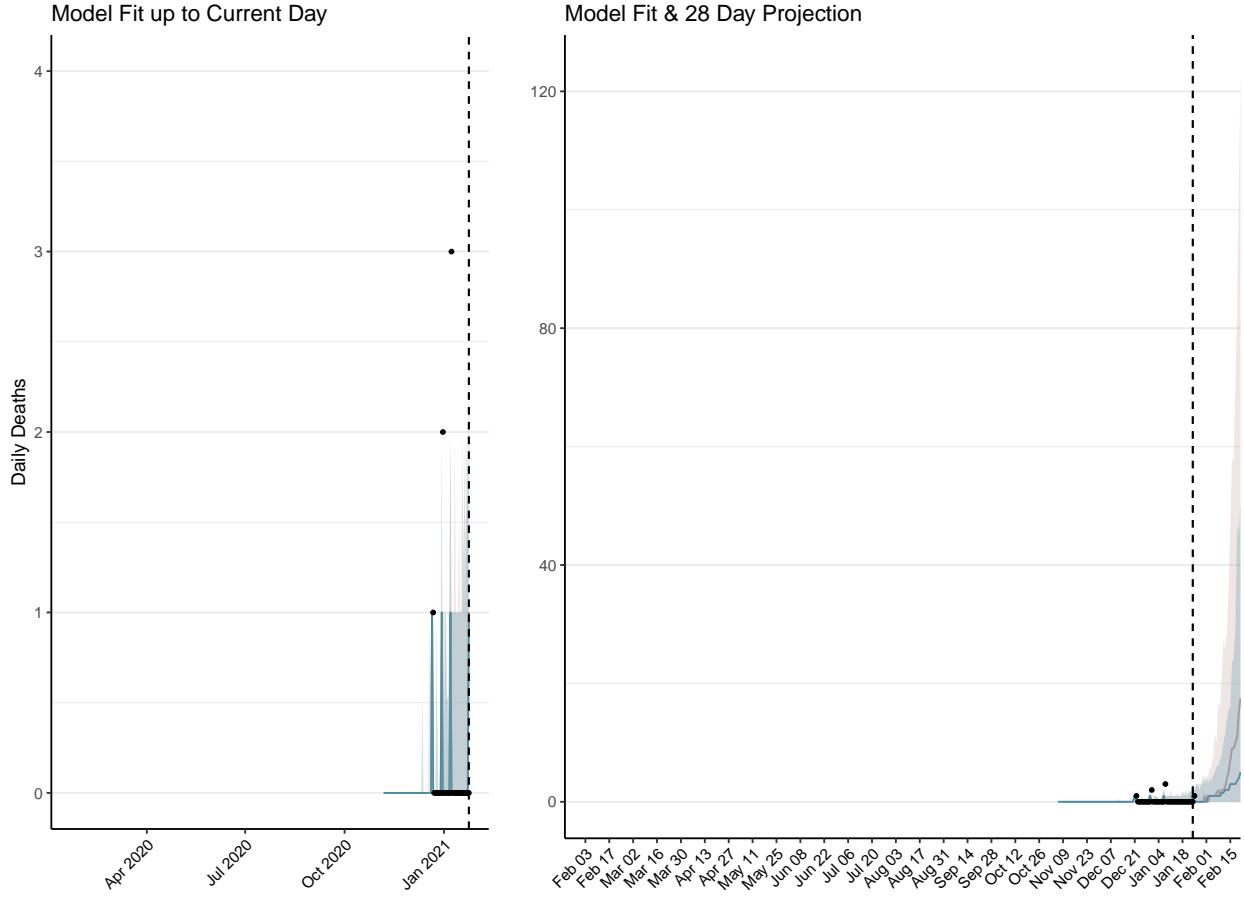


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 23 (95% CI: 20-26) patients requiring treatment with high-pressure oxygen at the current date to 526 (95% CI: 421-631) hospital beds being required on 2021-02-21 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 66 (95% CI: 57-75) by 2021-02-21. 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.**

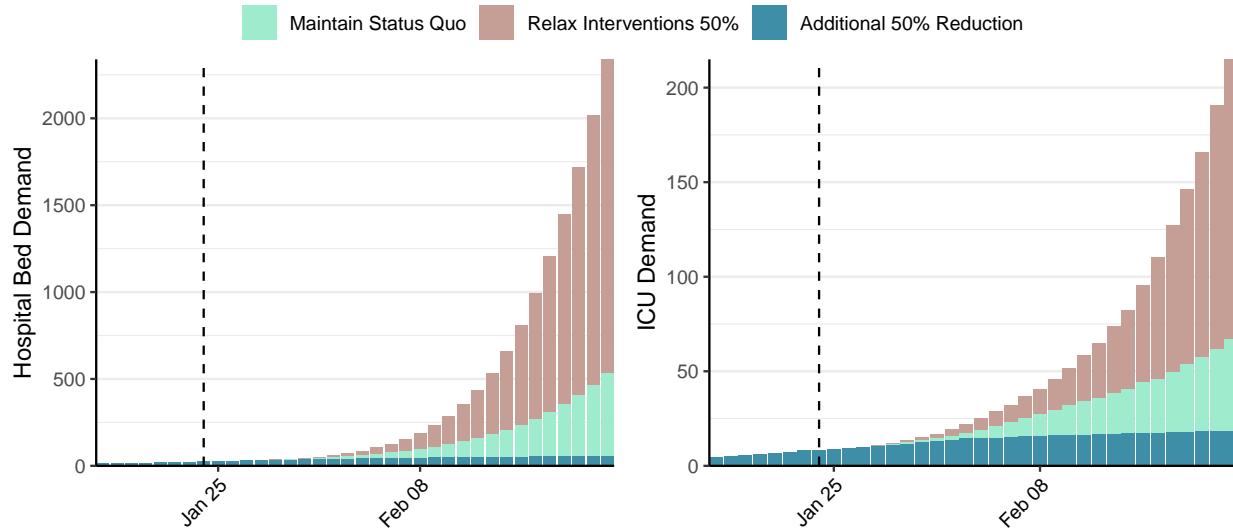


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 518 (95% CI: 446-590) at the current date to 805 (95% CI: 632-977) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 518 (95% CI: 446-590) at the current date to 95,254 (95% CI: 80,377-110,132) by 2021-02-21.

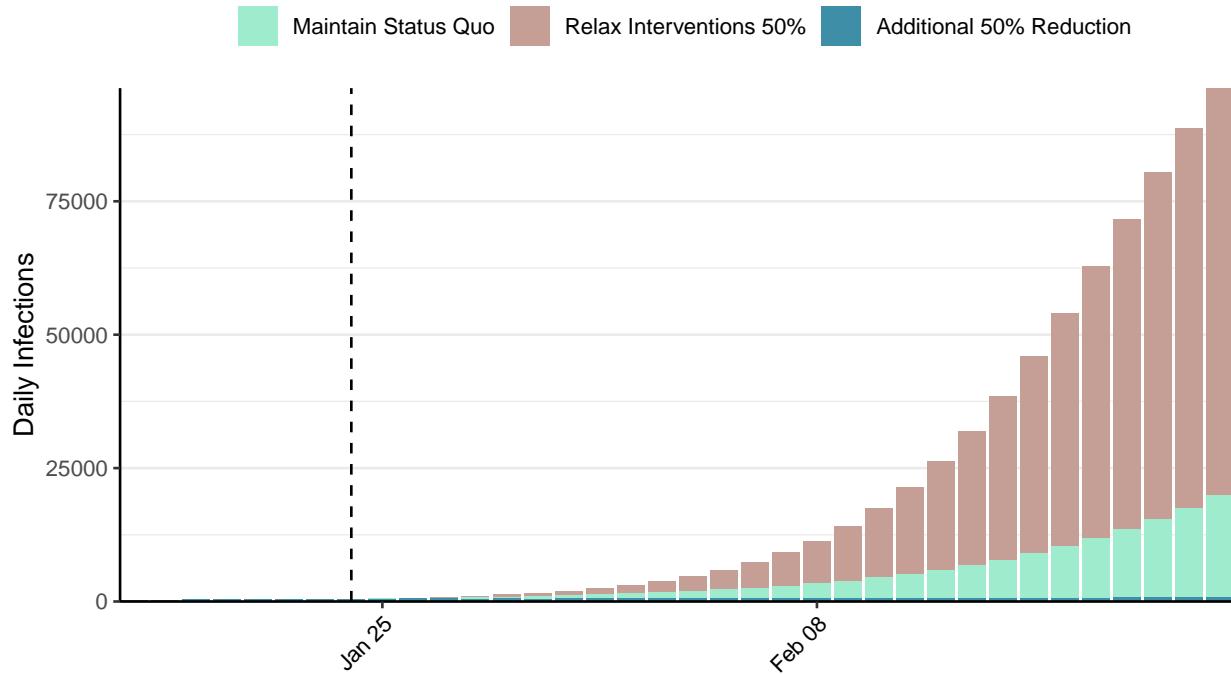


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Ethiopia, 2021-01-24 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}
365	365	5	5	1.02 (95% CI: 0.81-1.23)

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. Ethiopia is not shown in the following plot as only 5 deaths have been reported to date**

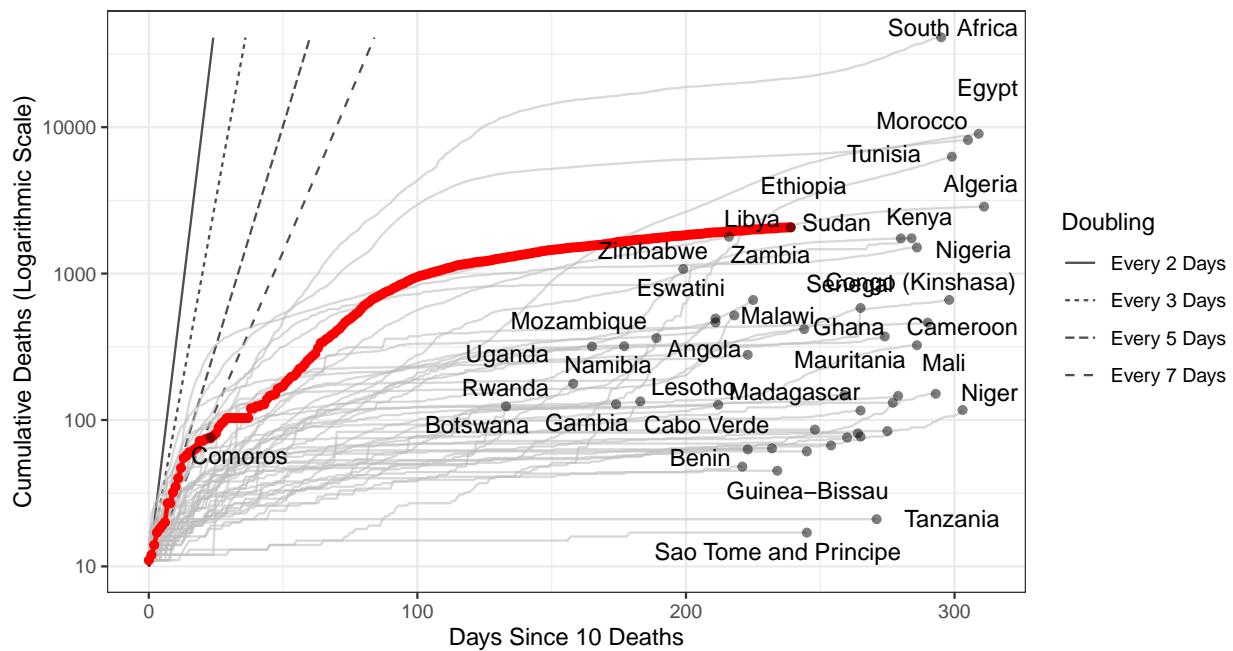


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 124,225 (95% CI: 114,260-134,190) 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

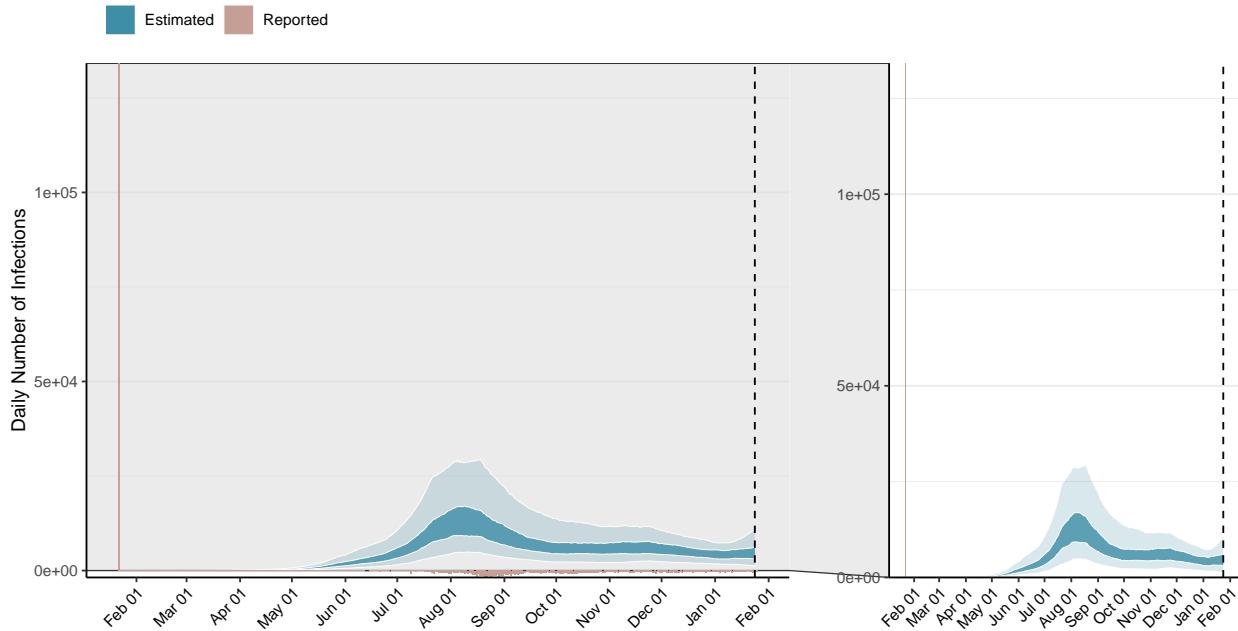


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

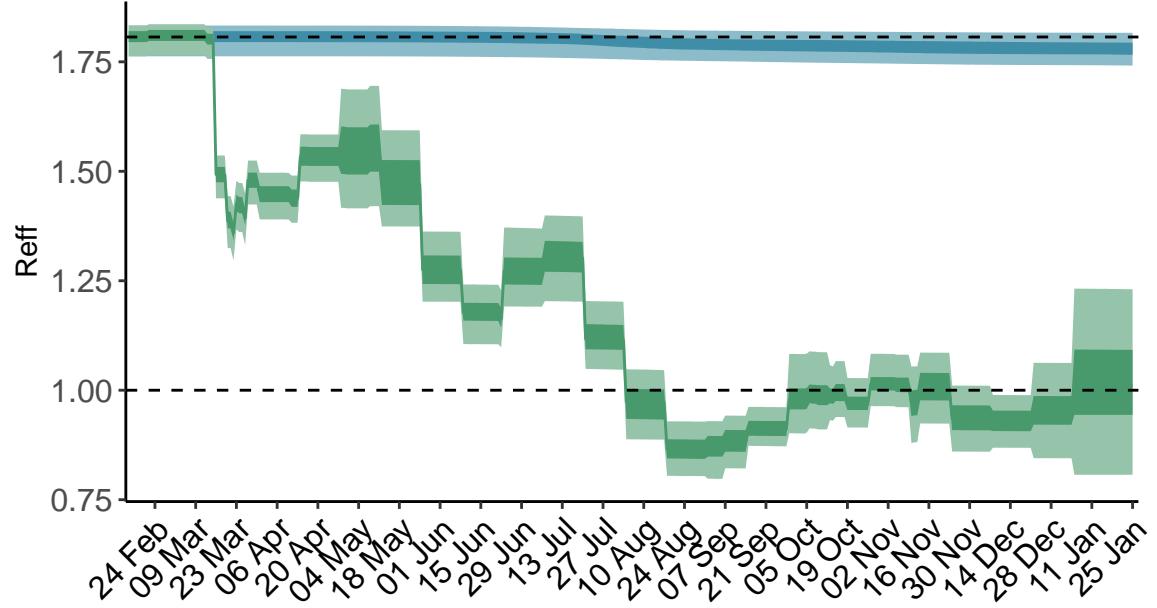


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

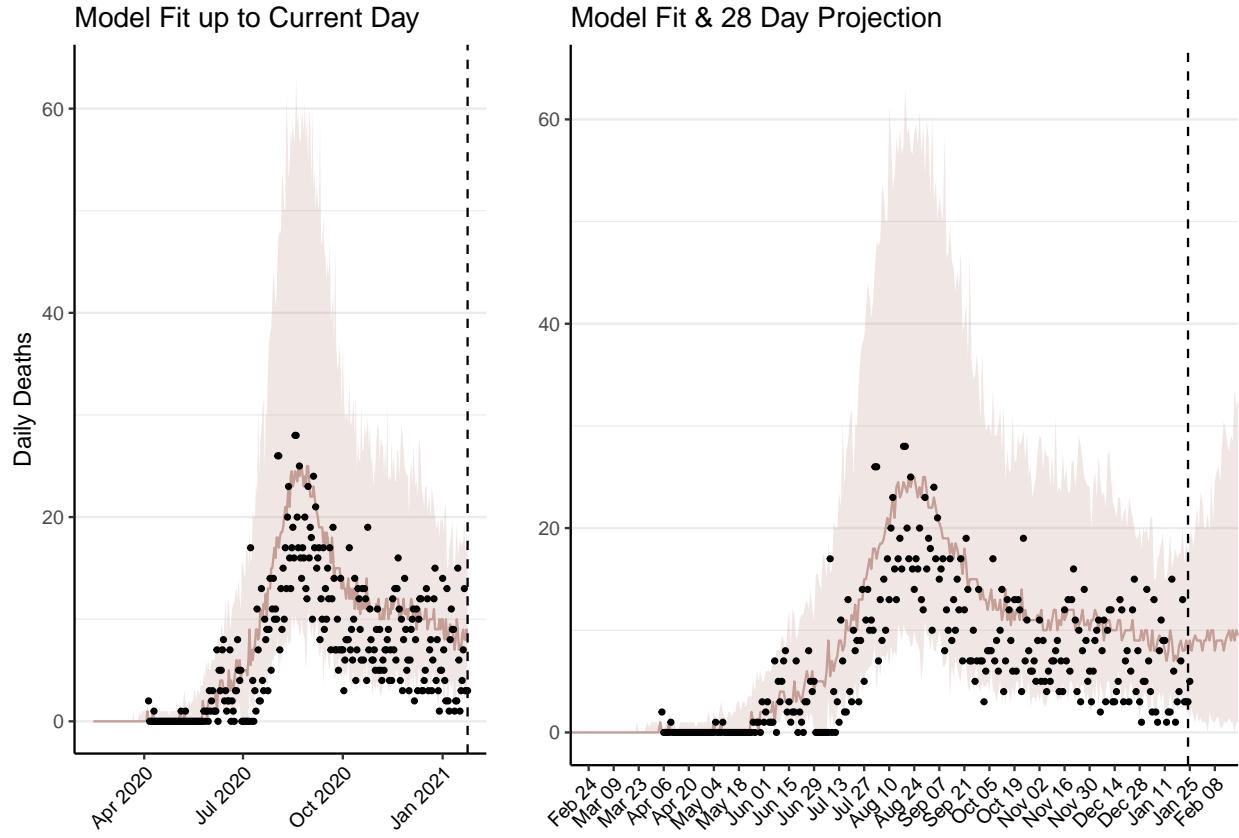


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 369 (95% CI: 338-399) patients requiring treatment with high-pressure oxygen at the current date to 476 (95% CI: 404-548) hospital beds being required on 2021-02-21 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 142 (95% CI: 131-154) patients requiring treatment with mechanical ventilation at the current date to 179 (95% CI: 152-205) by 2021-02-21. 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.**

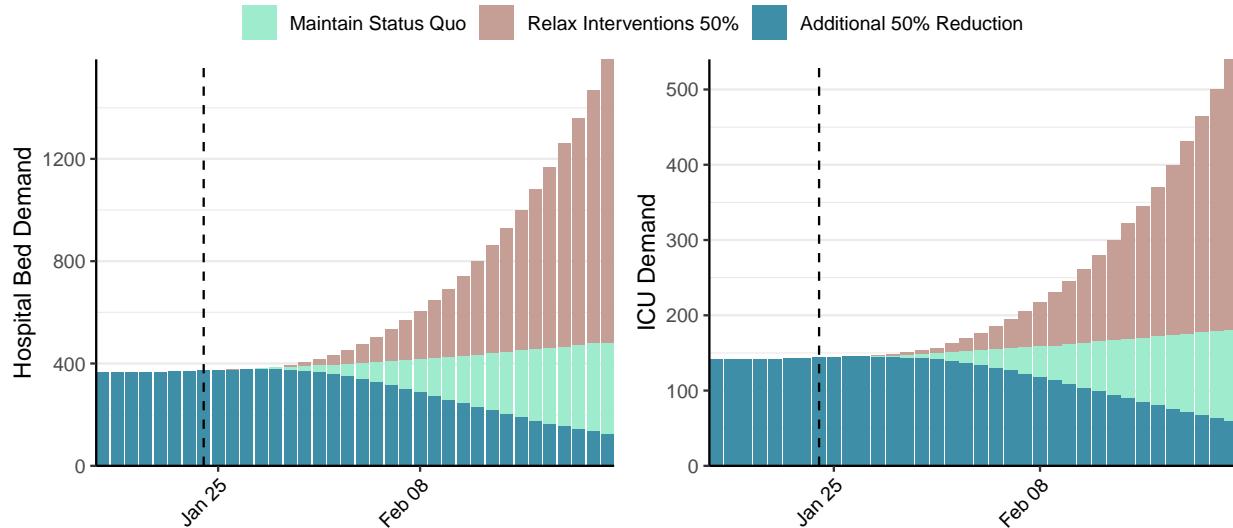


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 4,809 (95% CI: 4,309-5,309) at the current date to 516 (95% CI: 430-602) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 4,809 (95% CI: 4,309-5,309) at the current date to 40,818 (95% CI: 32,766-48,870) by 2021-02-21.

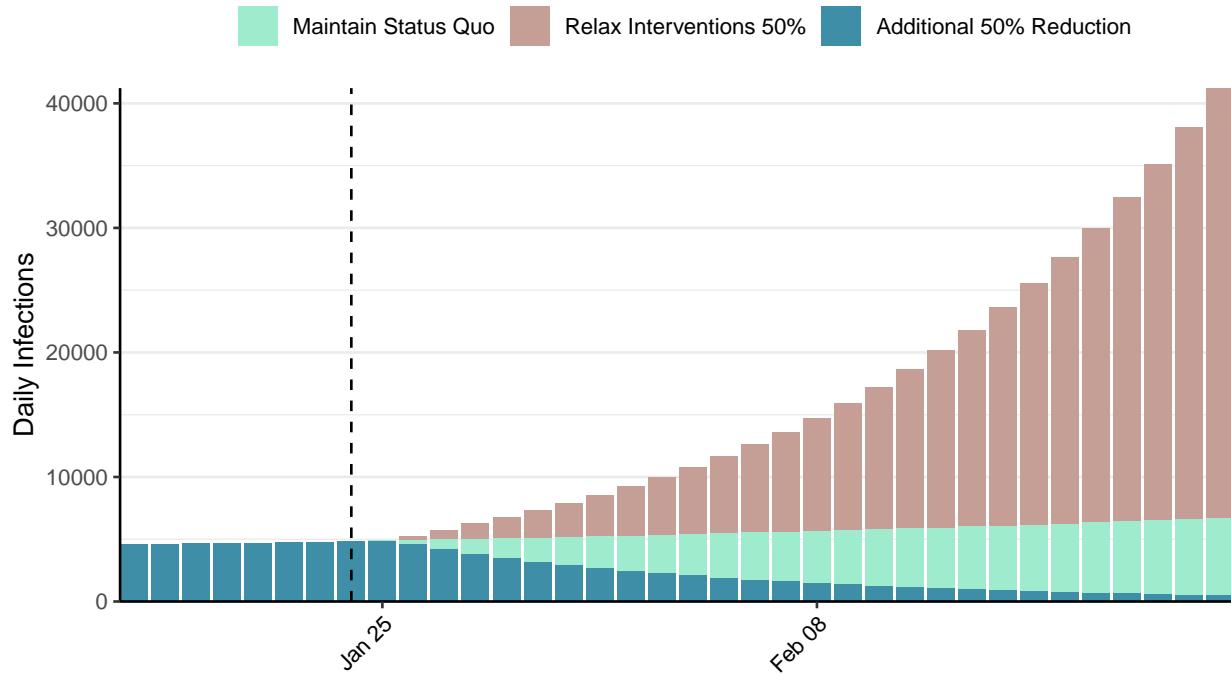


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Fiji, 2021-01-24 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	0.8 (95% CI: 0.54-1.12)

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. Fiji is not shown in the following plot as only 0 deaths have been reported to date**

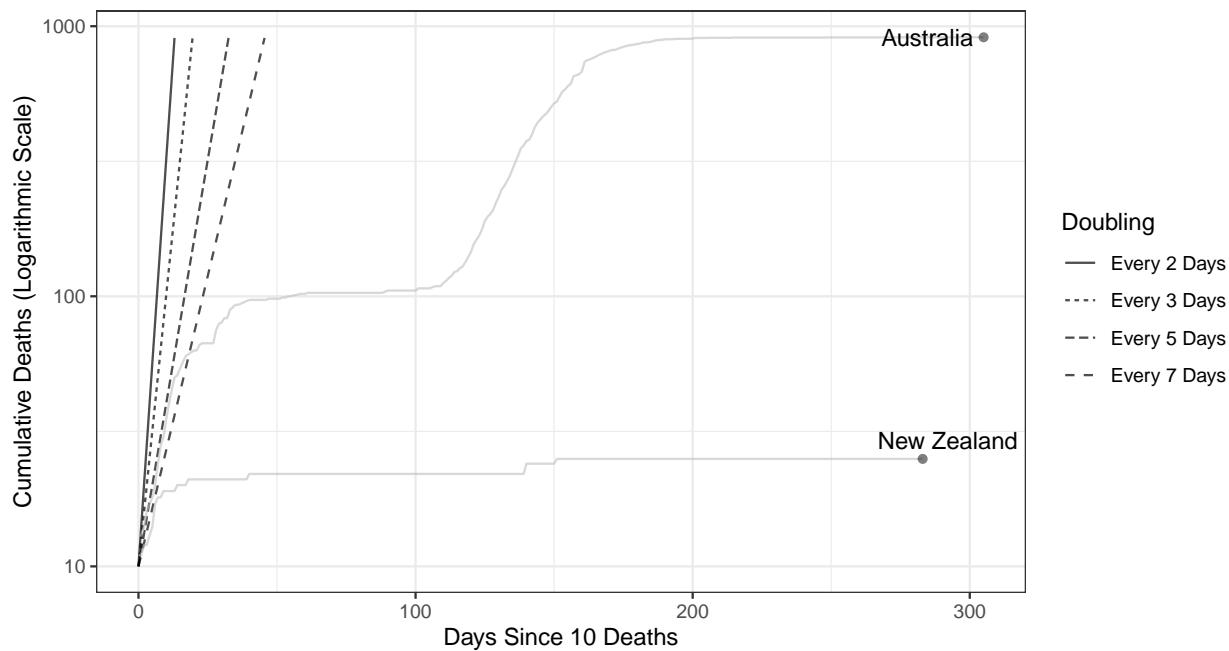


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 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).

Plot on right zoomed in on reported cases

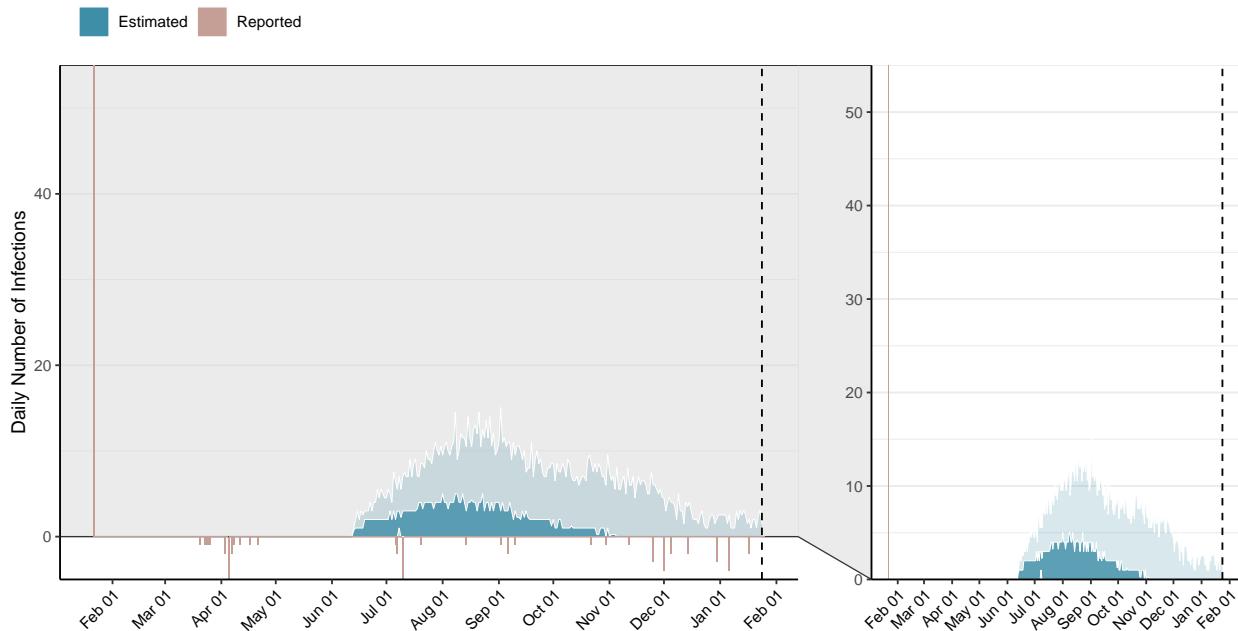


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

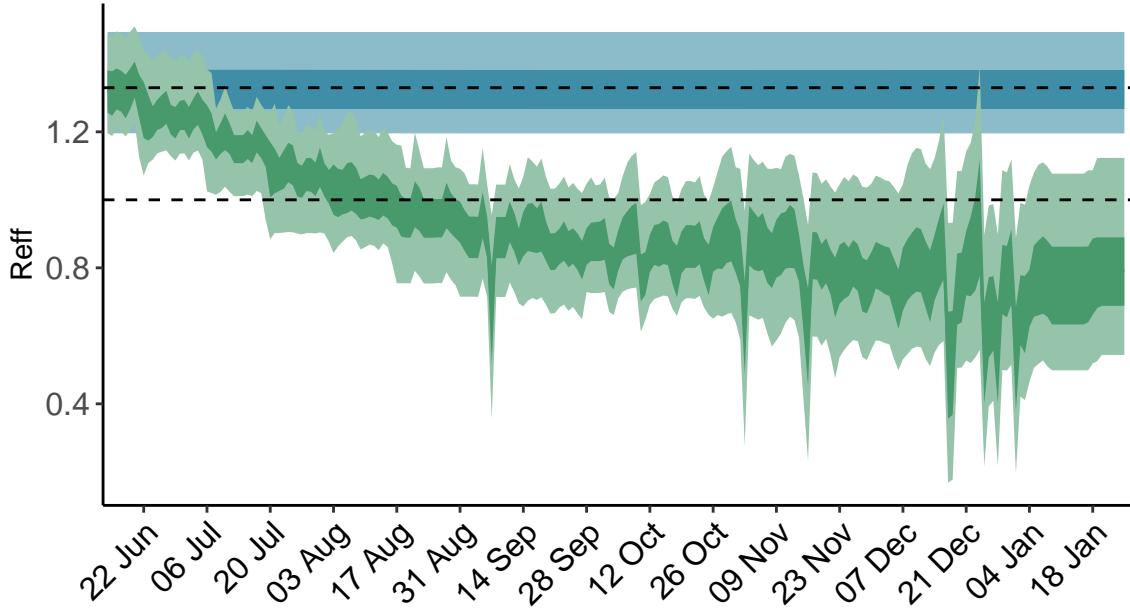


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

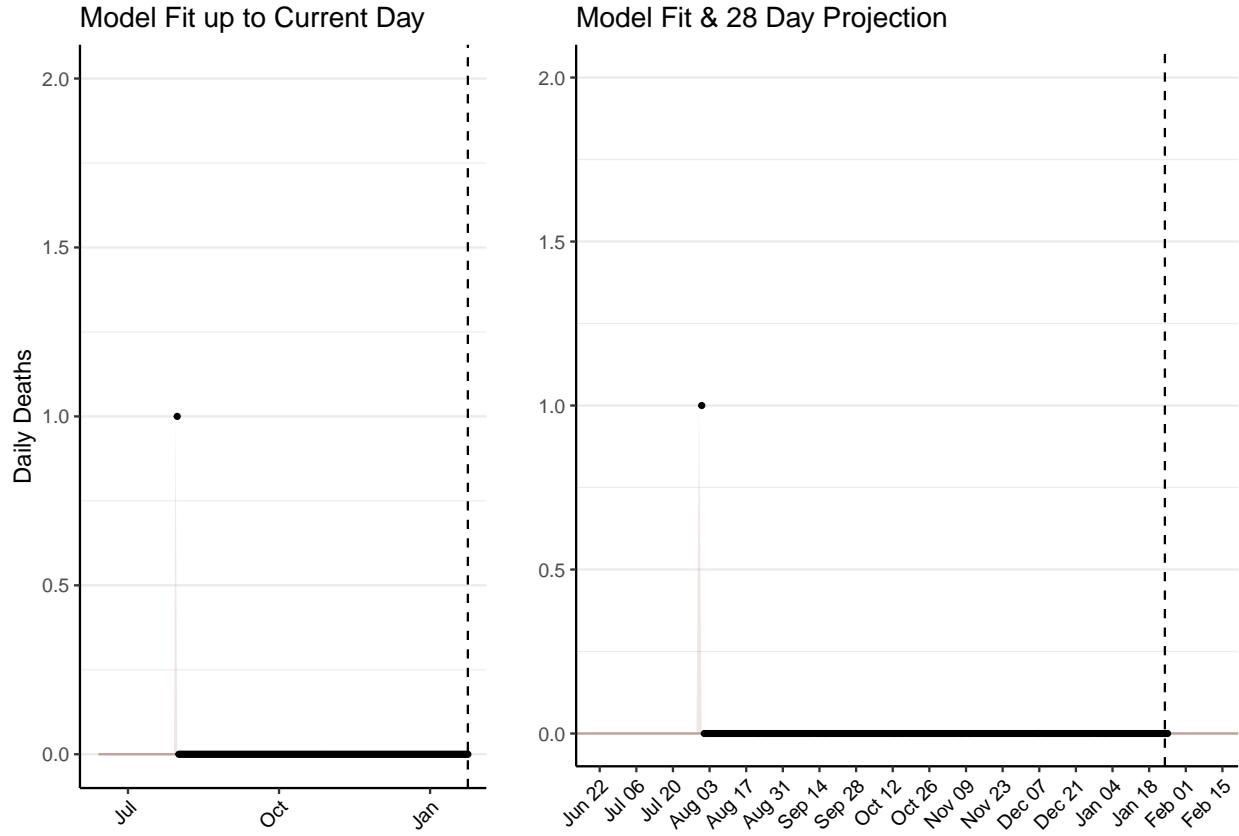


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 2021-02-21 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: NaN-NaN) by 2021-02-21. 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.**

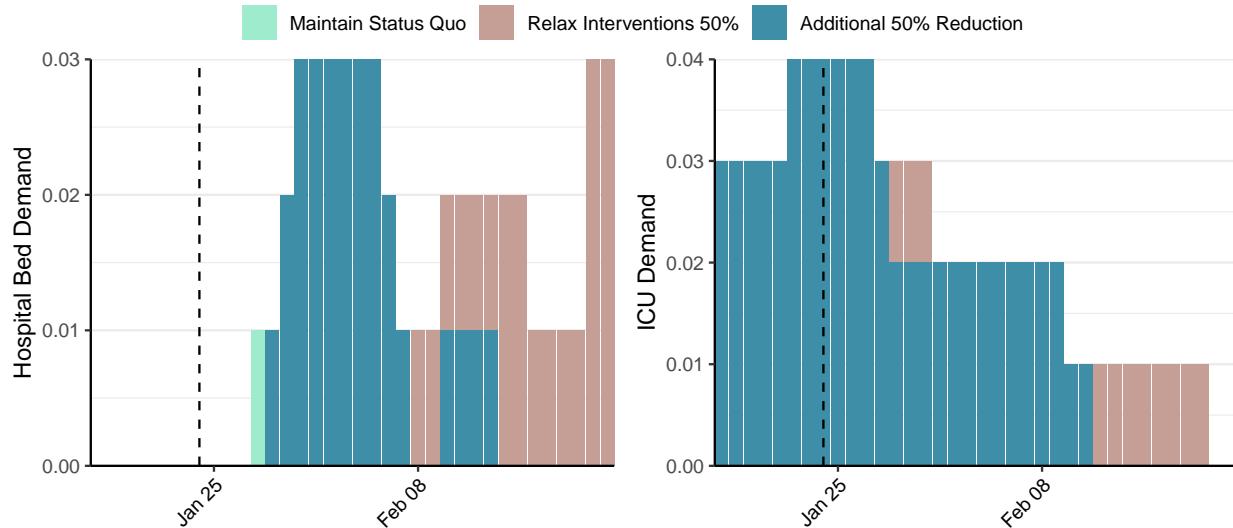


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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: NaN-NaN) by 2021-02-21. 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 2021-02-21.

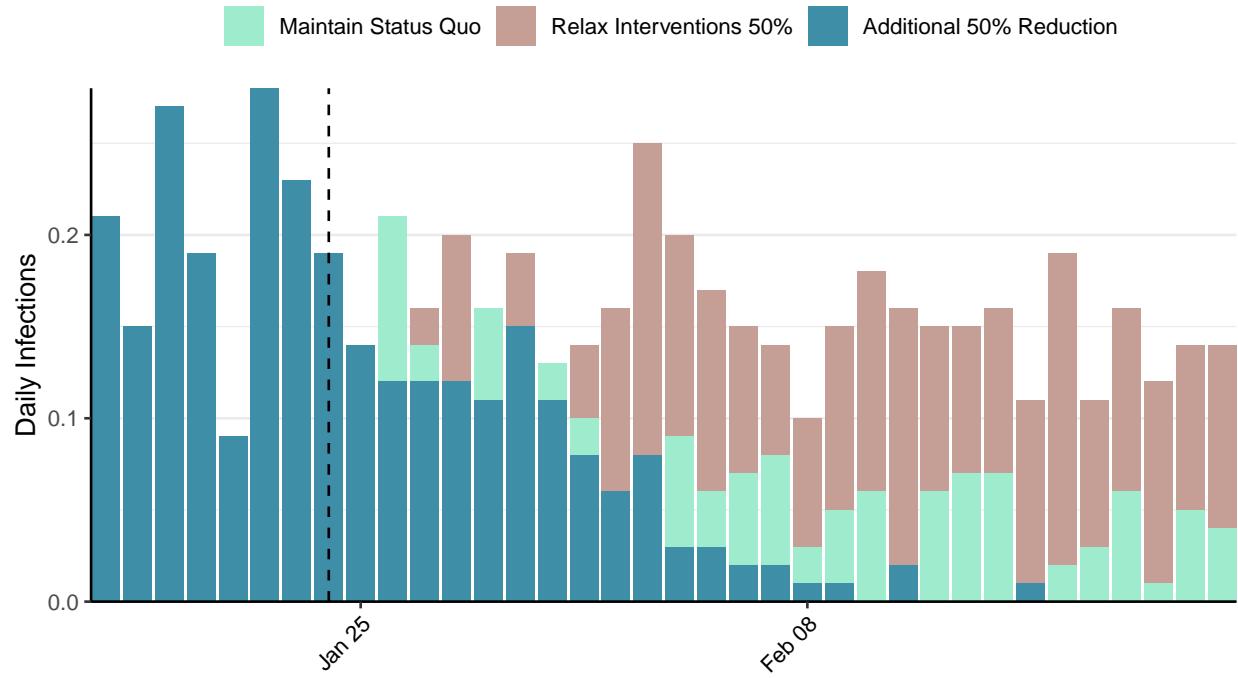


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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: Gabon, 2021-01-24

[Download the report for Gabon, 2021-01-24 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}
133	133	0	0	1.06 (95% CI: 0.84-1.3)

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. Gabon is not shown in the following plot as only 0 deaths have been reported to date**

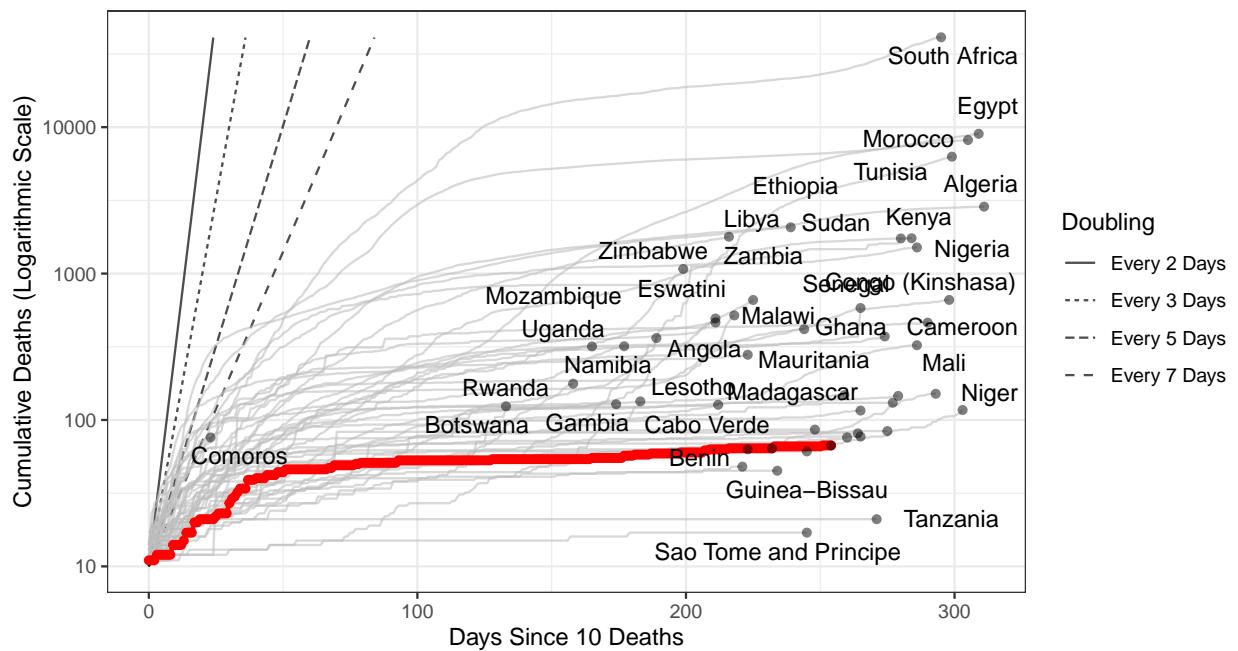


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 1,984 (95% CI: 1,738-2,230) 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

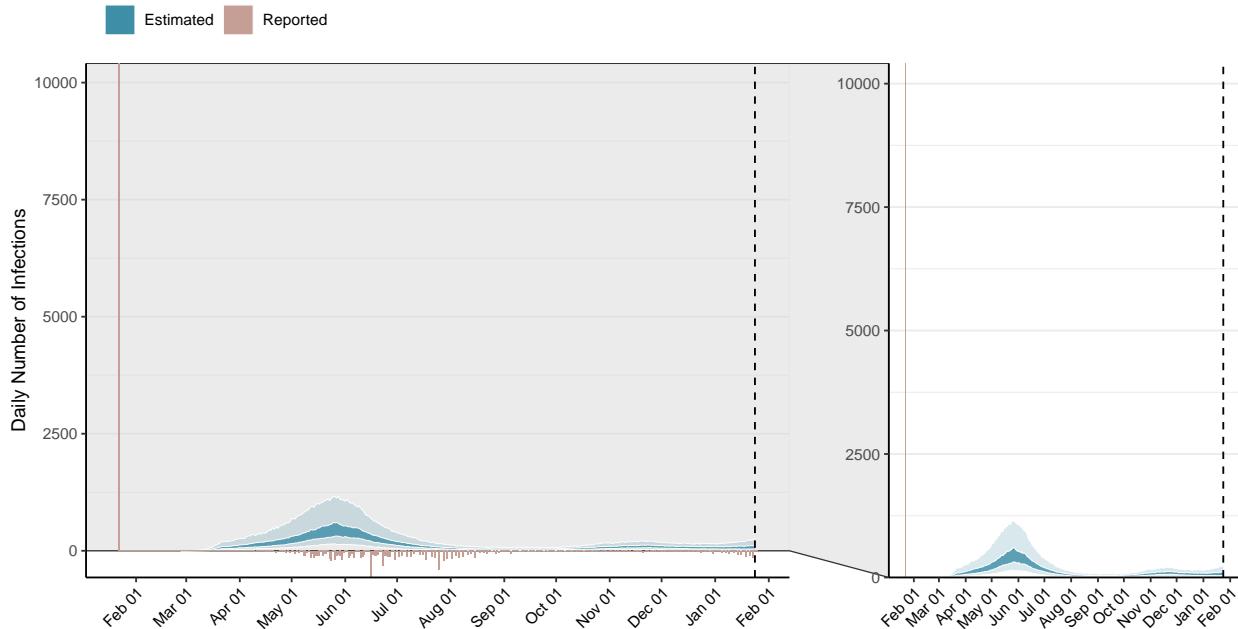


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

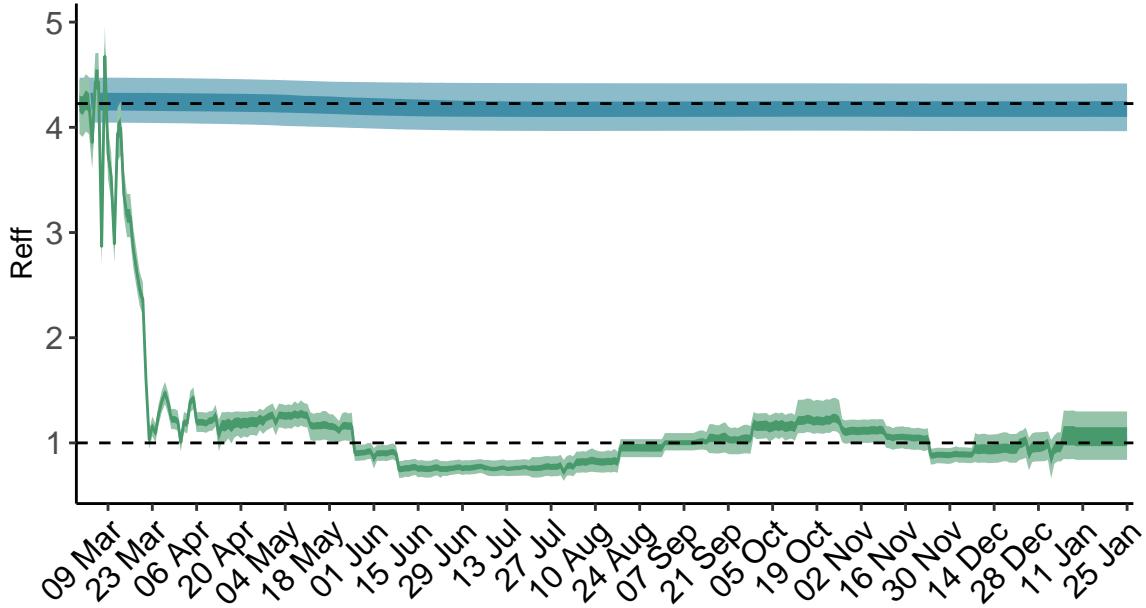


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

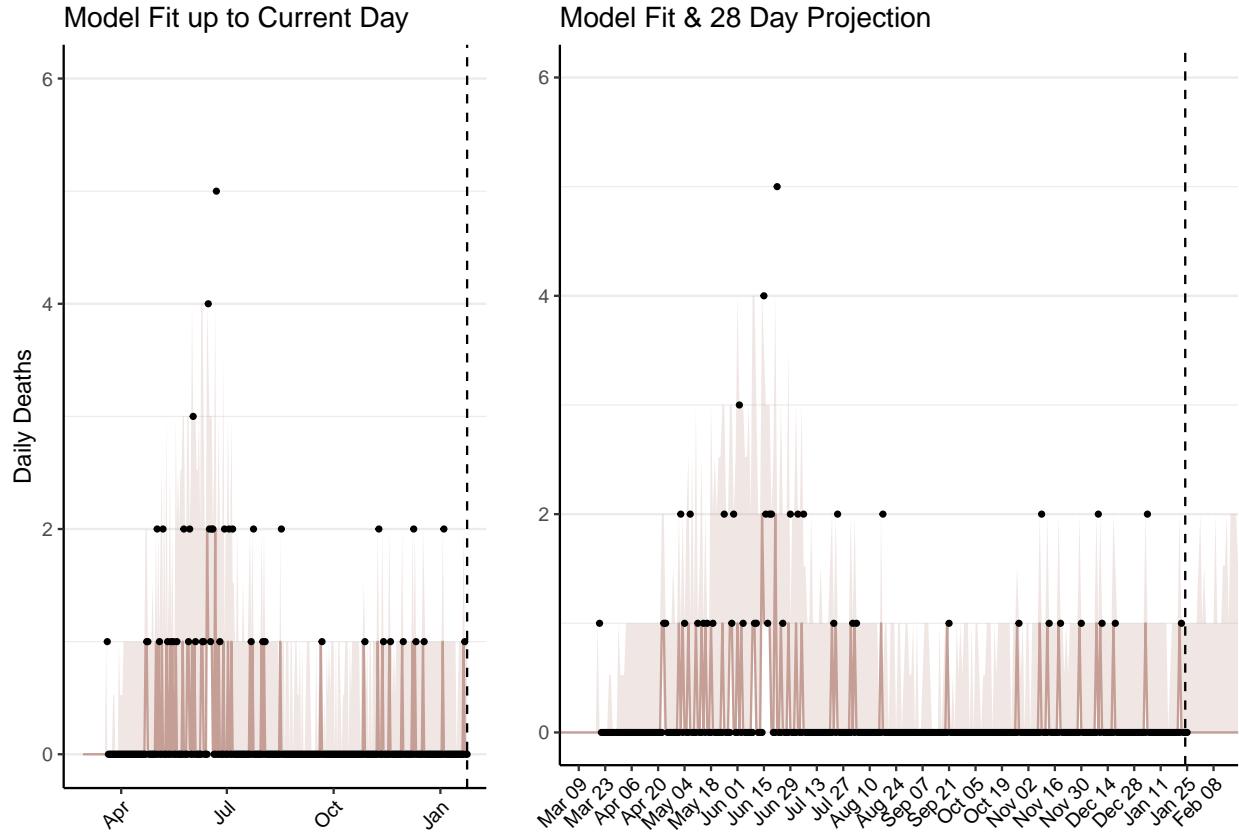


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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: 6-8) patients requiring treatment with high-pressure oxygen at the current date to 10 (95% CI: 8-13) hospital beds being required on 2021-02-21 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 4 (95% CI: 3-4) by 2021-02-21. 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.**

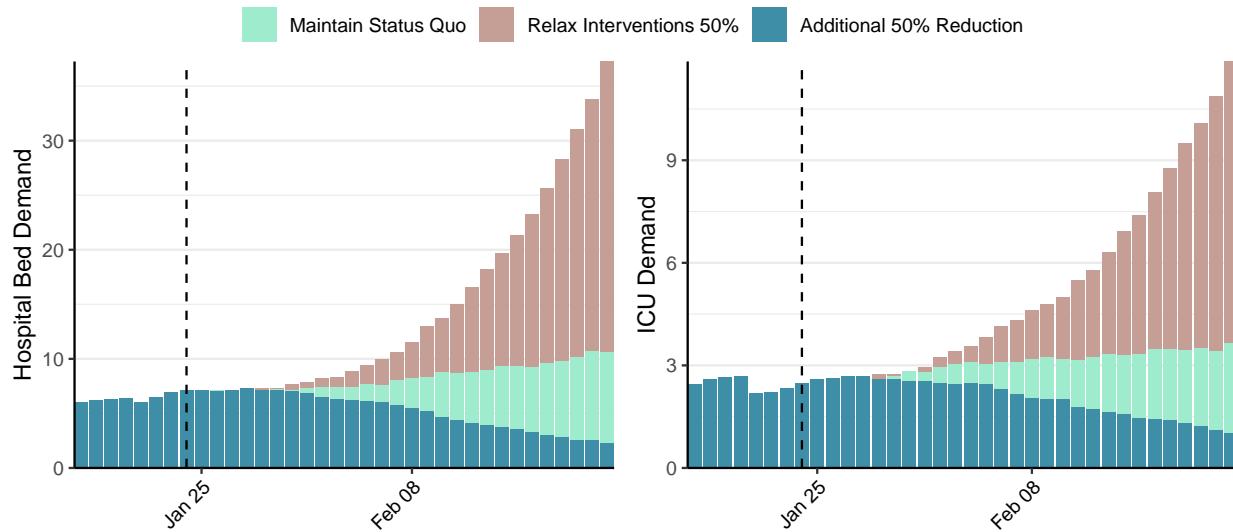


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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: 72-97) at the current date to 11 (95% CI: 8-14) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 84 (95% CI: 72-97) at the current date to 970 (95% CI: 732-1,208) by 2021-02-21.

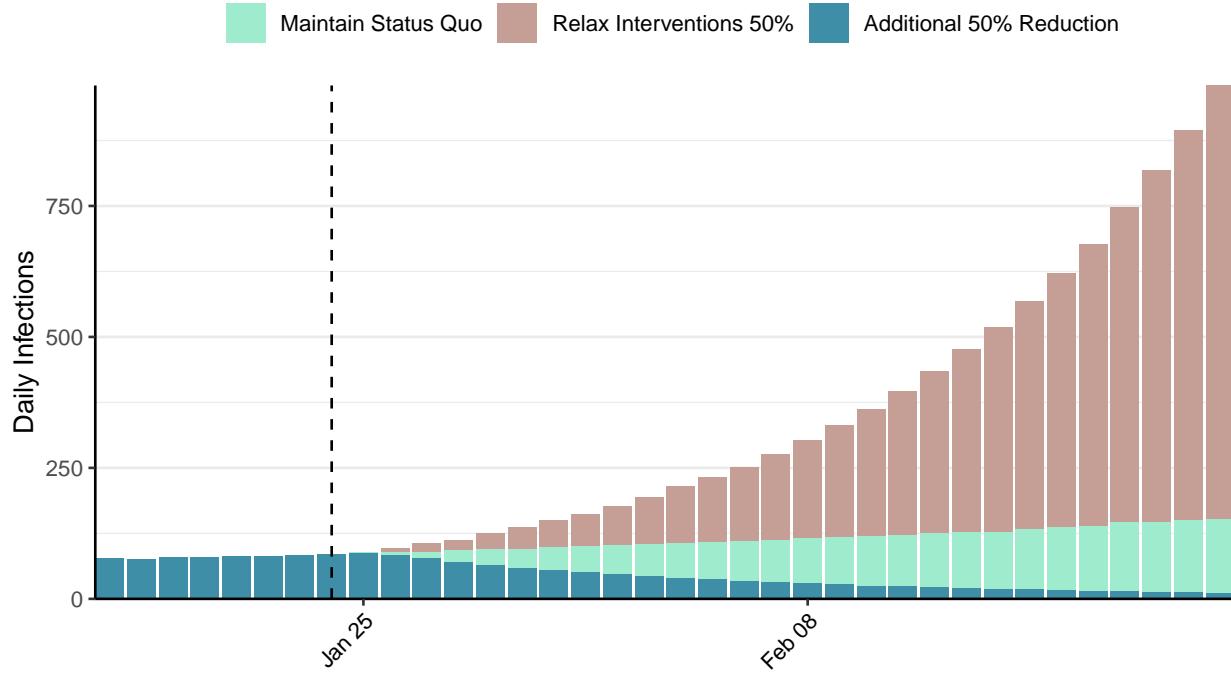


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Georgia, 2021-01-24 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}
298	298	16	16	0.85 (95% CI: 0.7-1.04)

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.

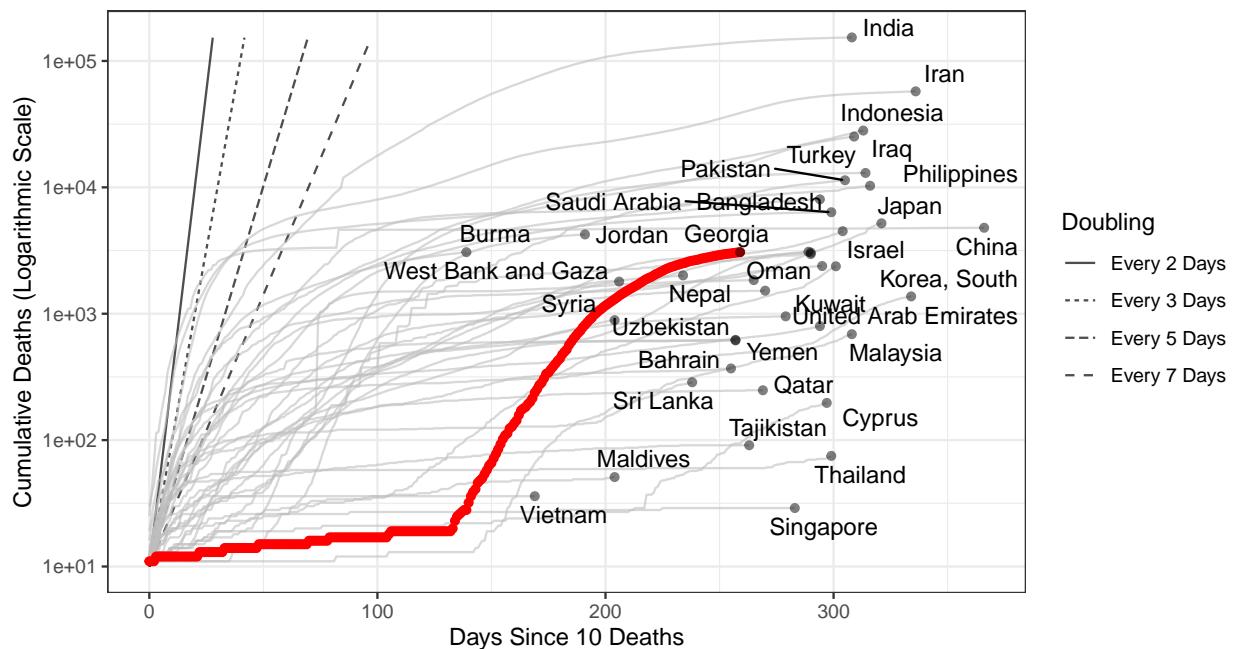


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 107,134 (95% CI: 99,374-114,893) 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

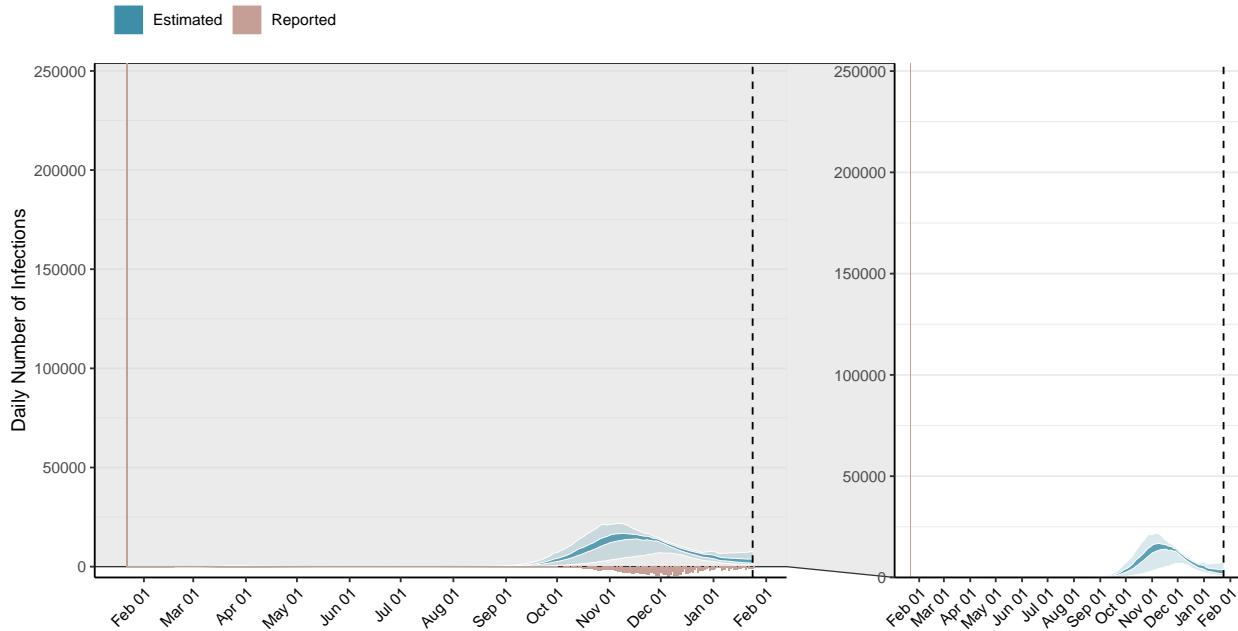


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

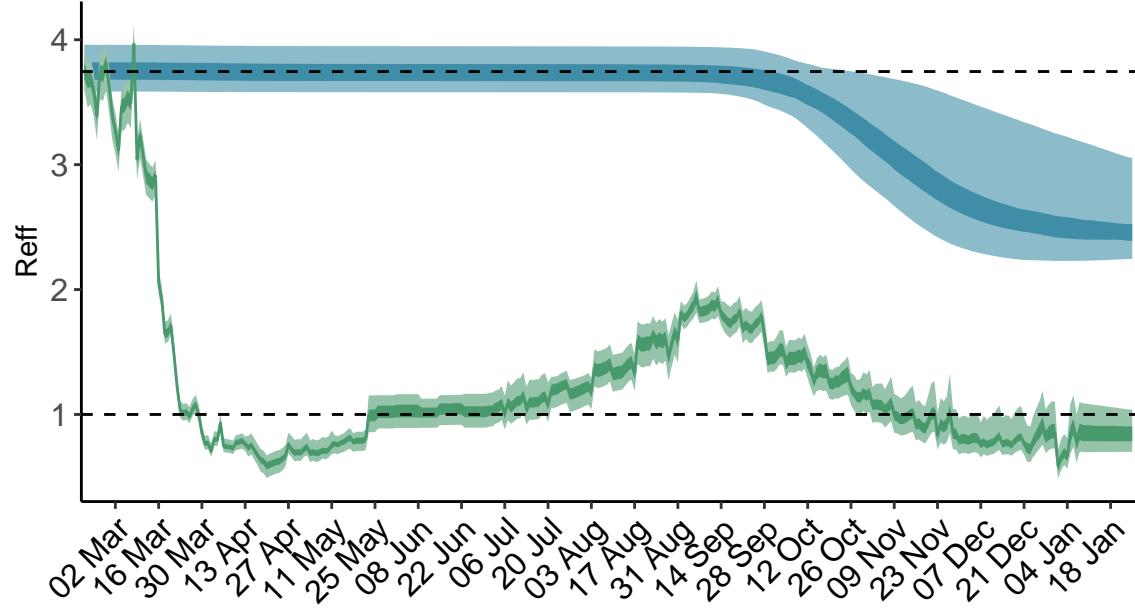


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

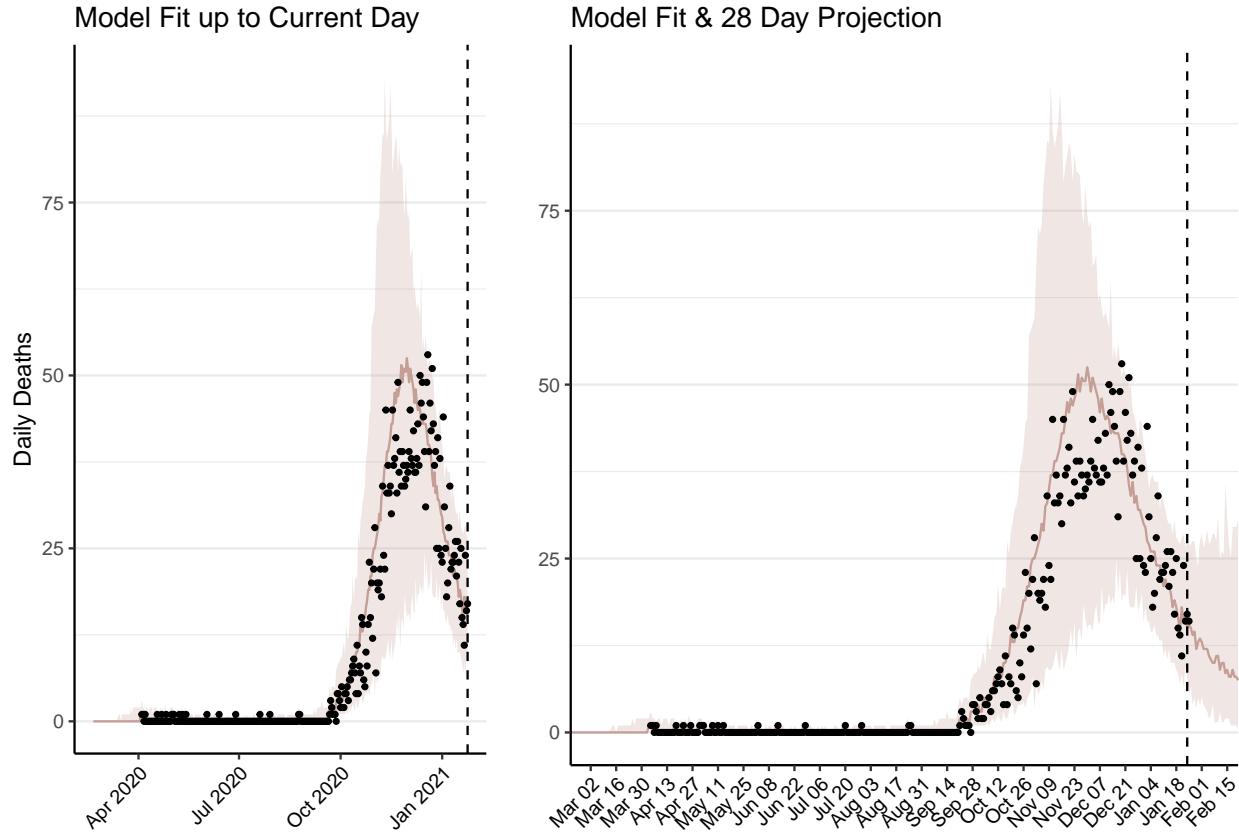


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 519 (95% CI: 483-555) patients requiring treatment with high-pressure oxygen at the current date to 325 (95% CI: 273-377) hospital beds being required on 2021-02-21 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 212 (95% CI: 199-224) patients requiring treatment with mechanical ventilation at the current date to 130 (95% CI: 110-149) by 2021-02-21. 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.**

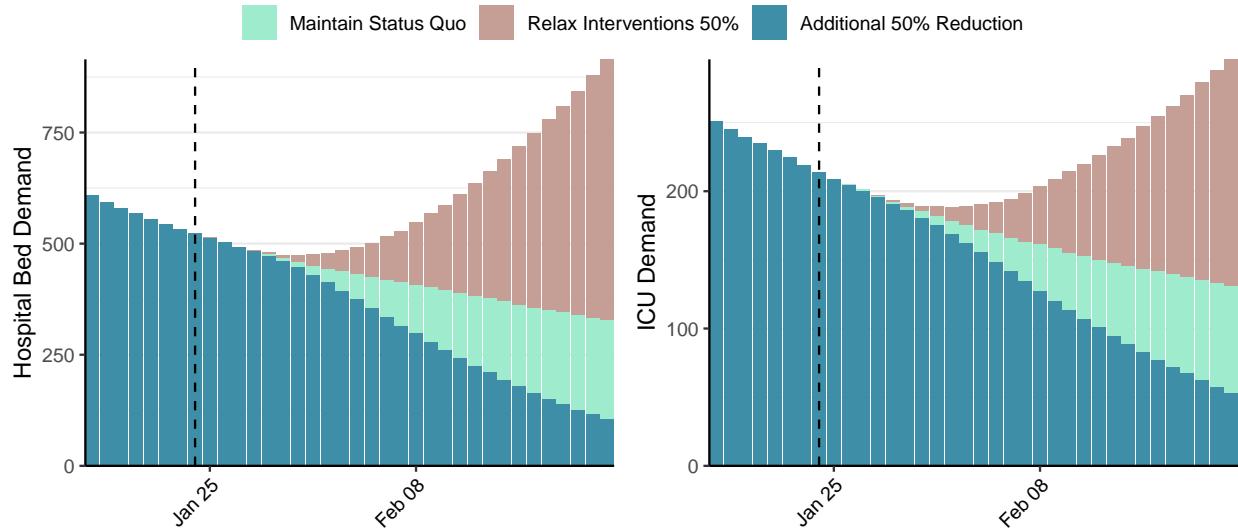


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 2,914 (95% CI: 2,569-3,258) at the current date to 181 (95% CI: 145-218) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,914 (95% CI: 2,569-3,258) at the current date to 8,975 (95% CI: 7,272-10,679) by 2021-02-21.

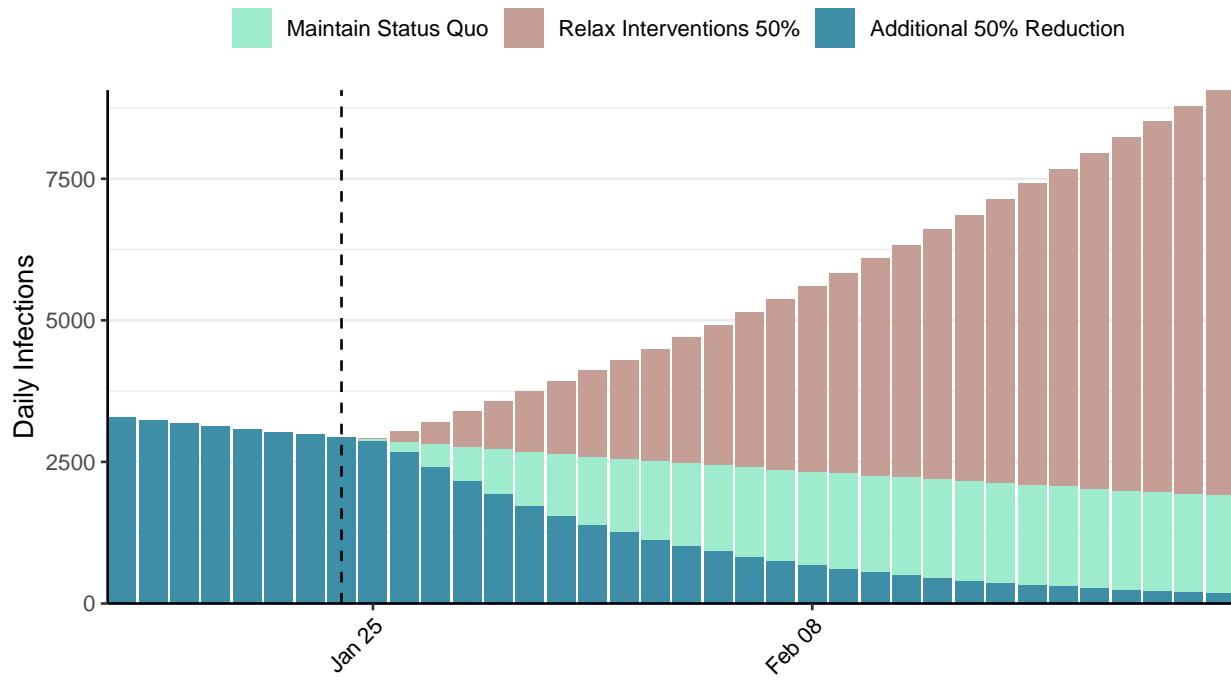


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Ghana, 2021-01-24 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}
1,341	1,341	5	5	1.69 (95% CI: 1.46-1.92)

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 5 deaths have been reported to date**

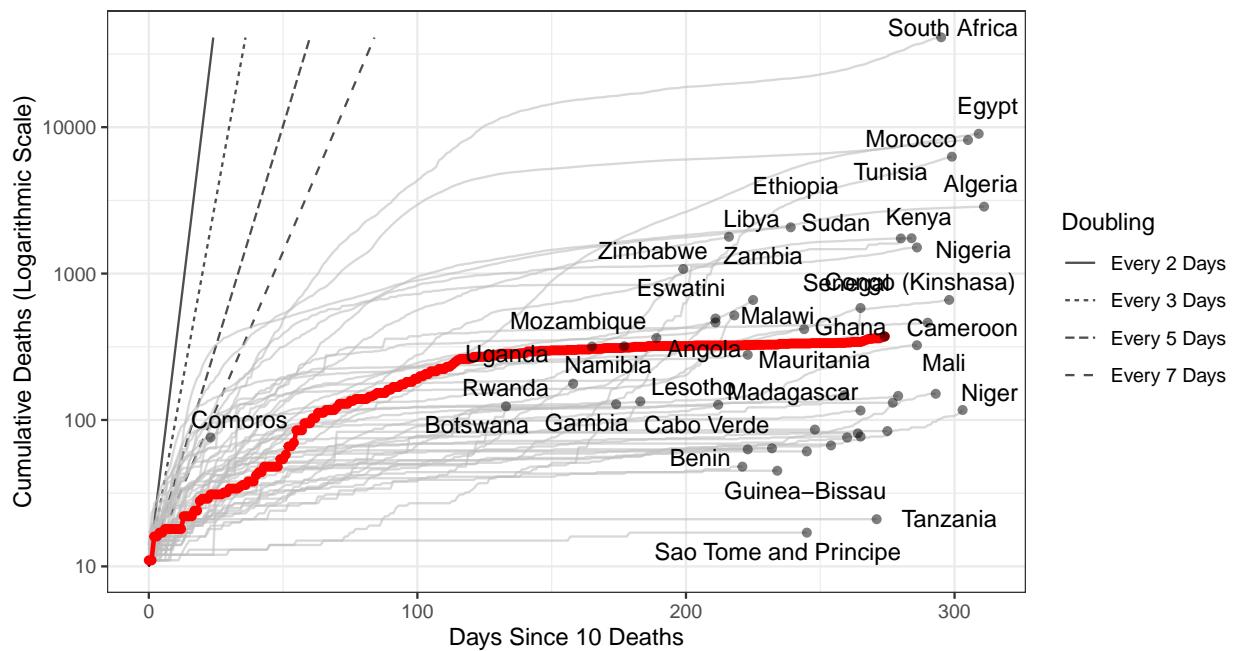


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 73,295 (95% CI: 67,689-78,901) 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

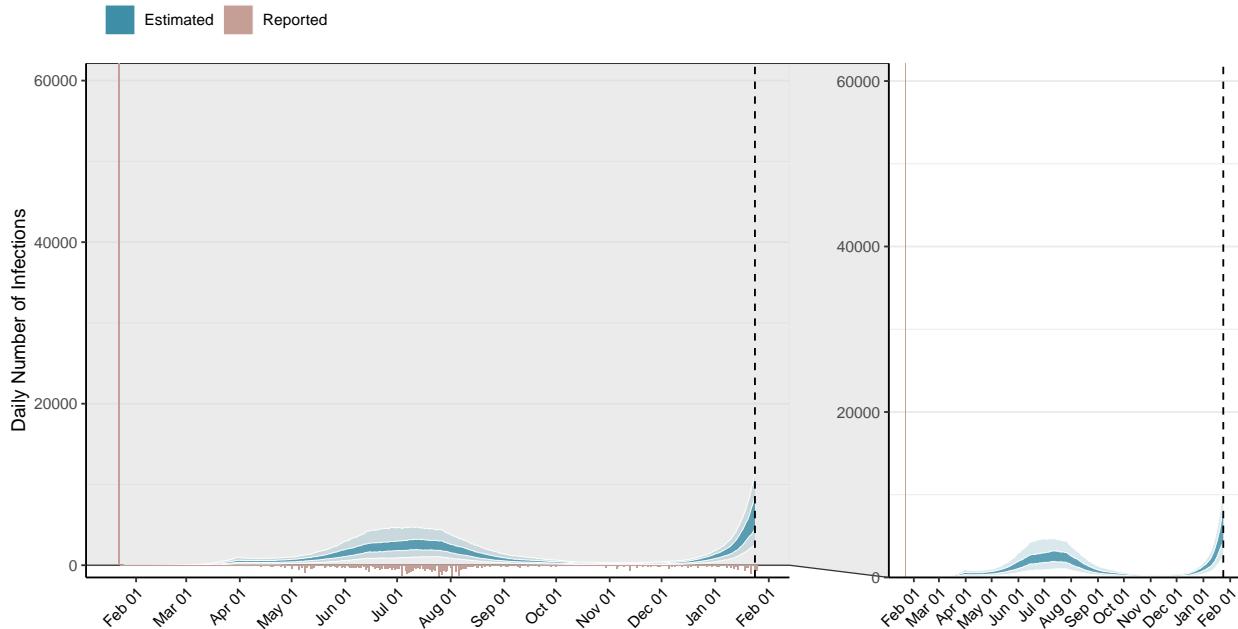


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

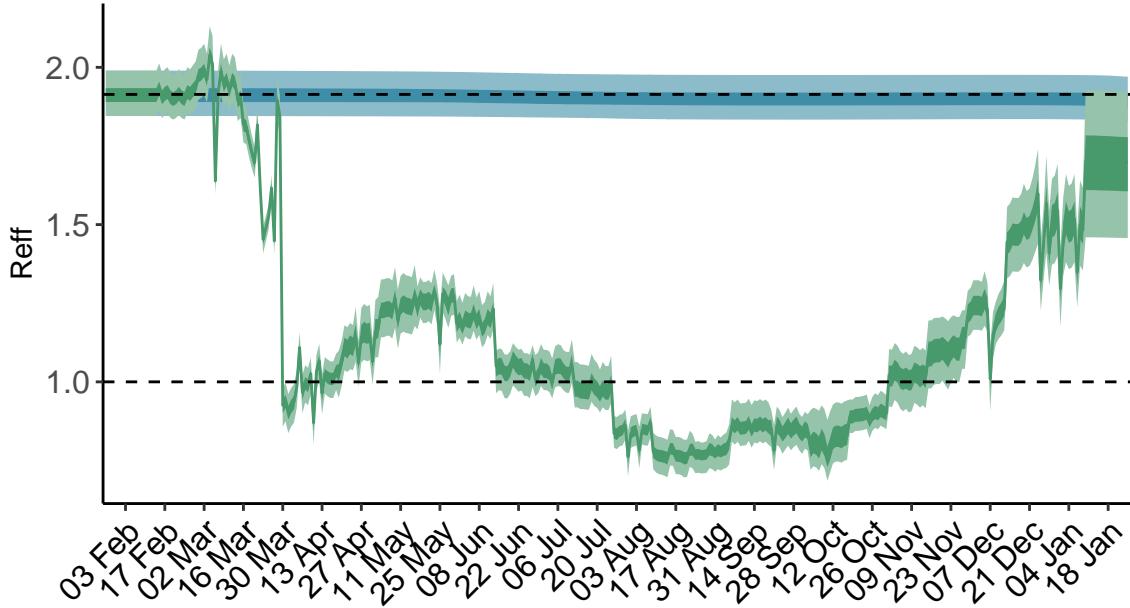


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

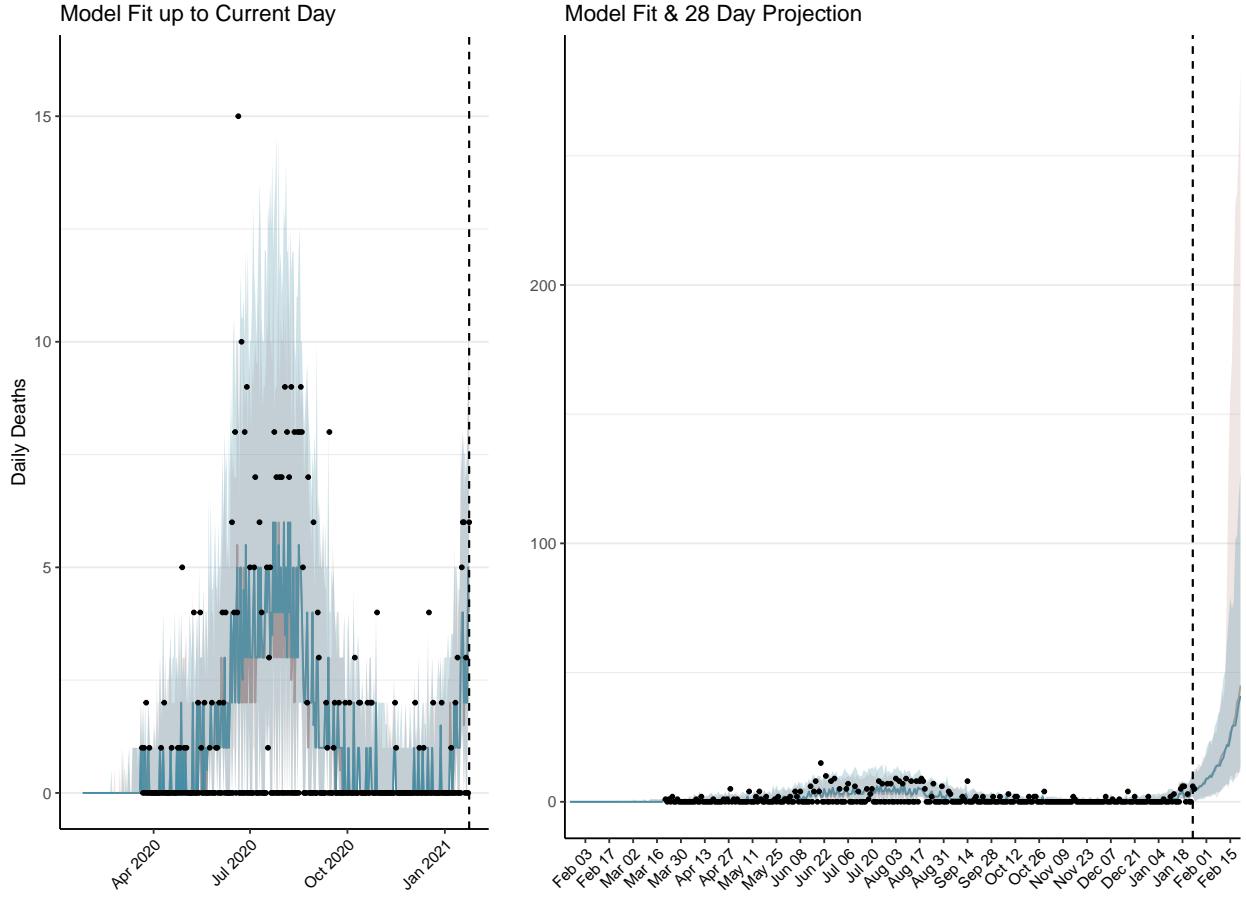


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 240 (95% CI: 221-259) patients requiring treatment with high-pressure oxygen at the current date to 2,721 (95% CI: 2,409-3,033) hospital beds being required on 2021-02-21 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 84 (95% CI: 77-90) patients requiring treatment with mechanical ventilation at the current date to 774 (95% CI: 716-833) by 2021-02-21. 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.**

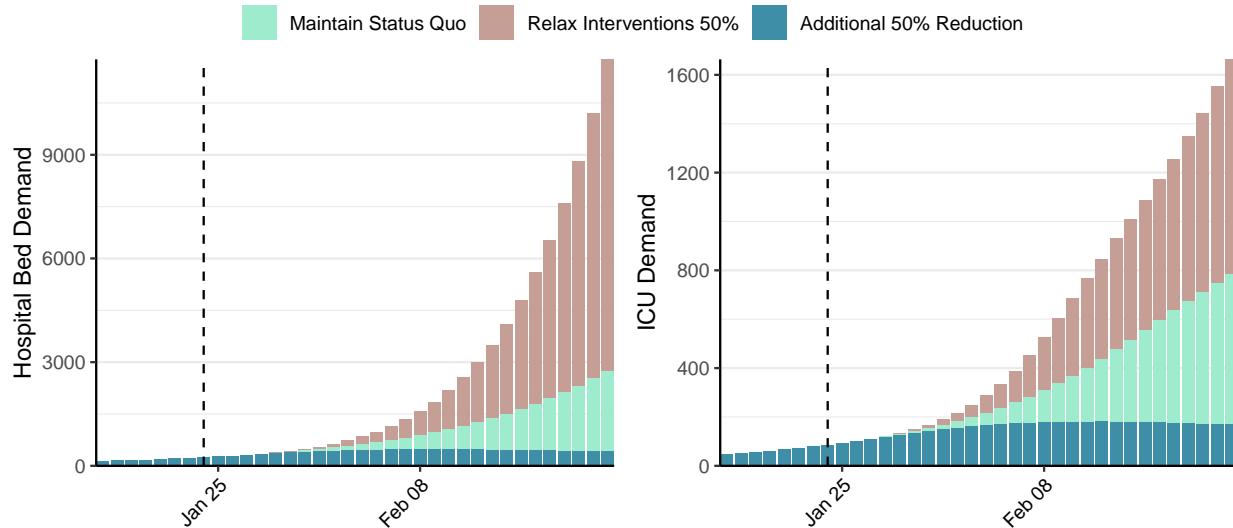


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 6,518 (95% CI: 5,965-7,072) at the current date to 3,965 (95% CI: 3,482-4,449) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 6,518 (95% CI: 5,965-7,072) at the current date to 470,102 (95% CI: 419,794-520,411) by 2021-02-21.

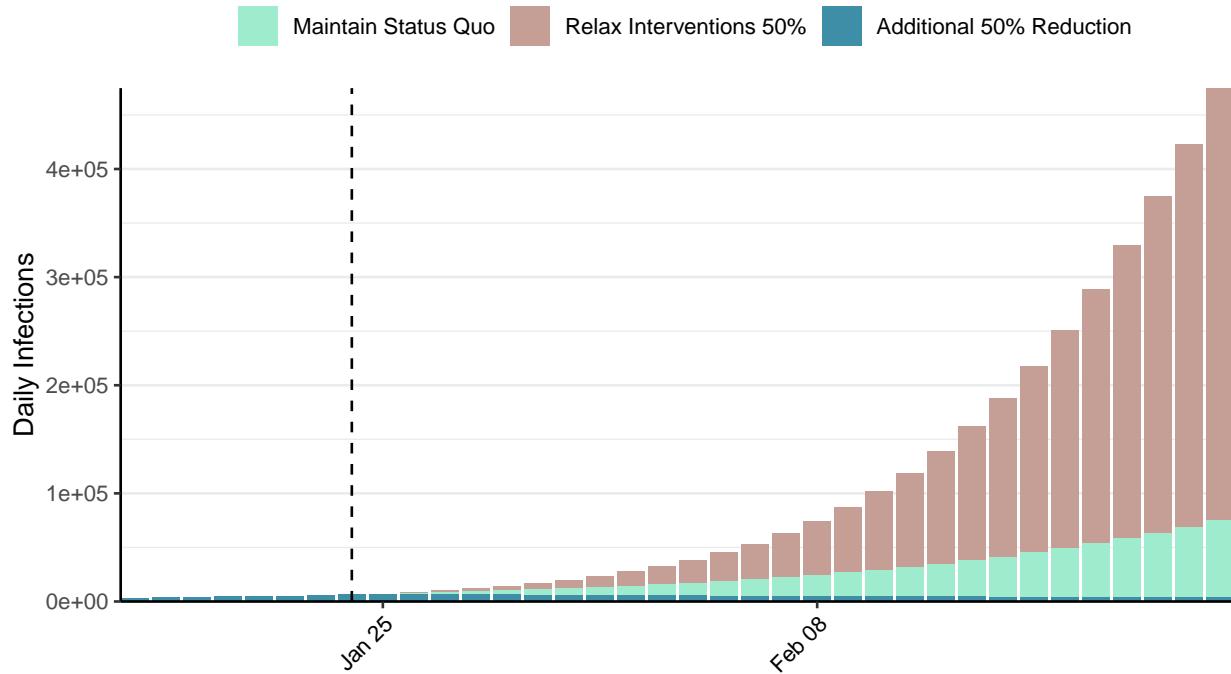


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Guinea, 2021-01-24 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}
56	56	0	0	0.56 (95% CI: 0.39-0.83)

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. Guinea is not shown in the following plot as only 0 deaths have been reported to date**

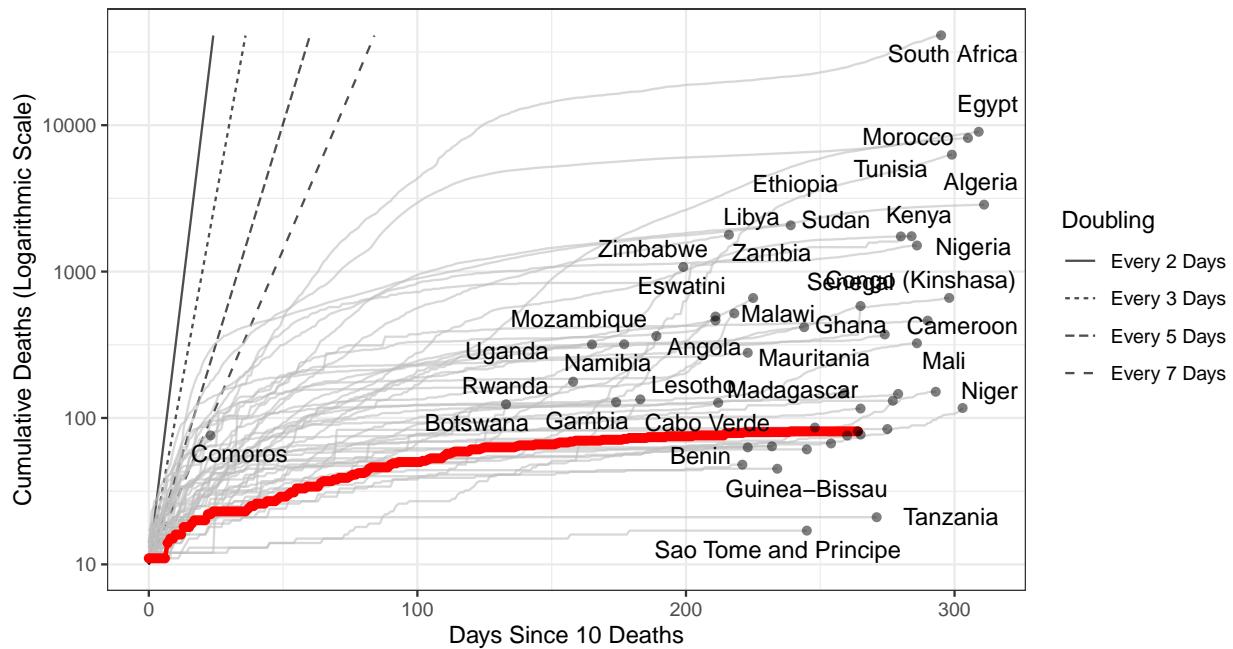


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 194 (95% CI: 161-227) 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

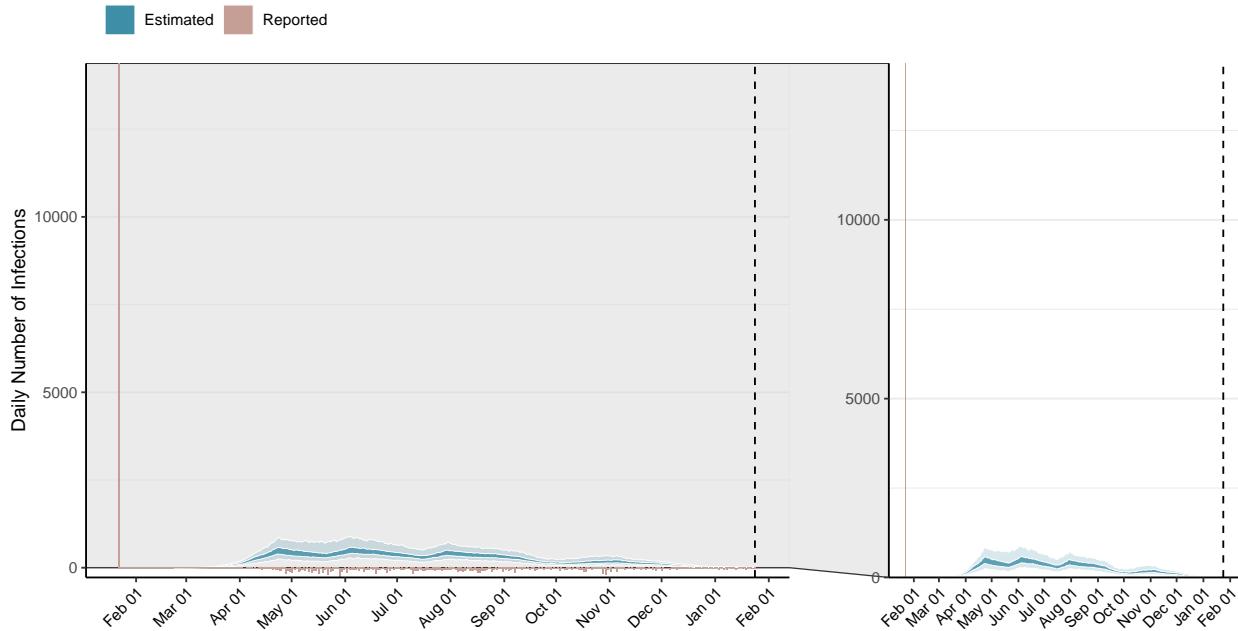


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

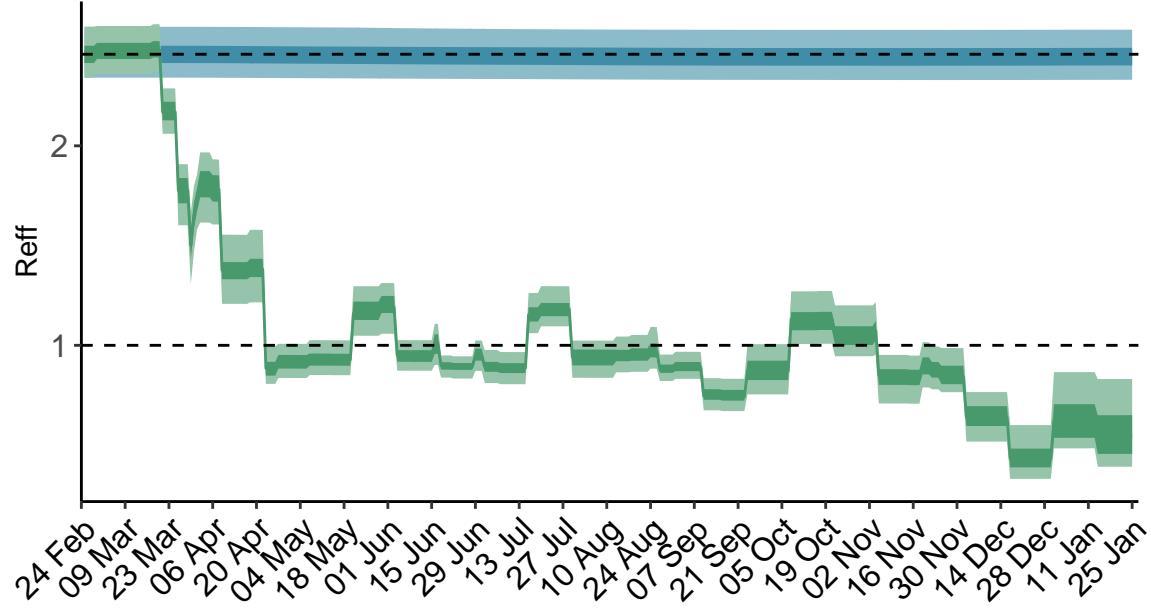


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

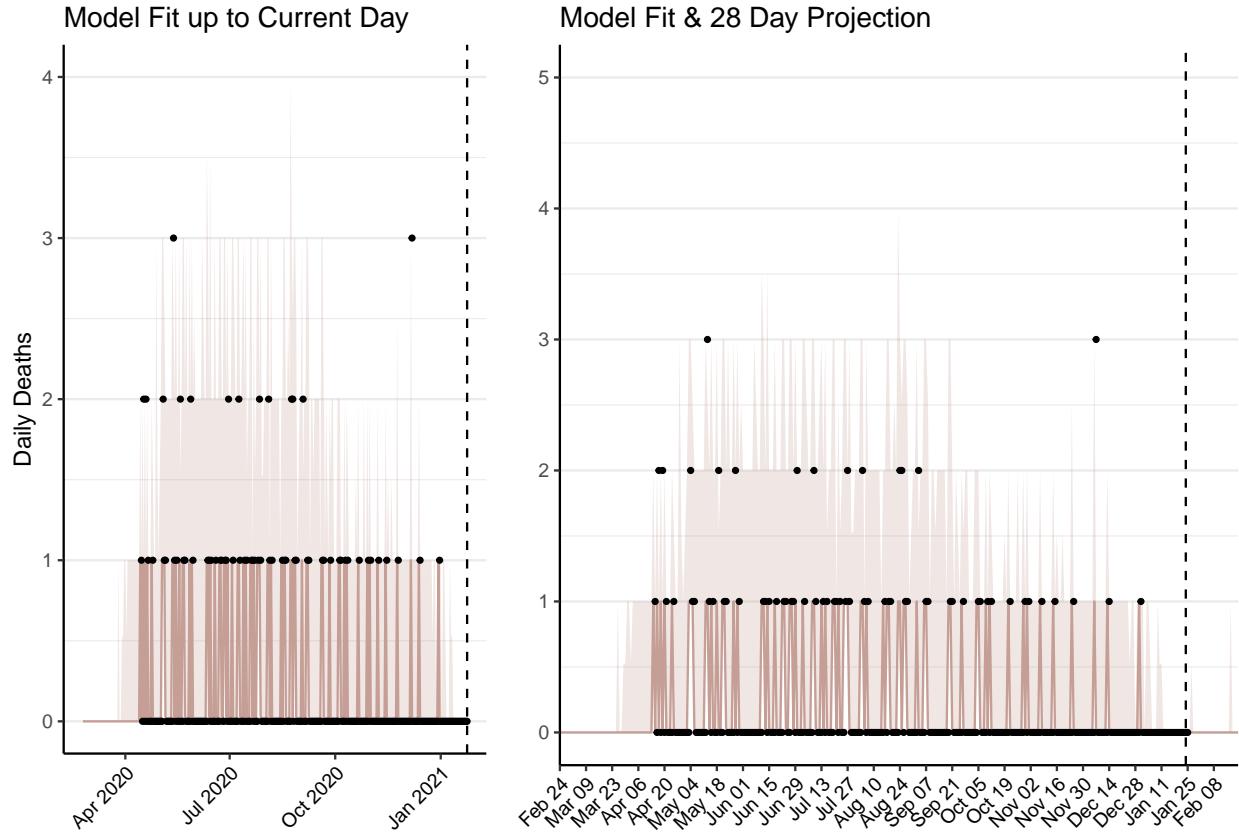


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 2021-02-21 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 2021-02-21. 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.**

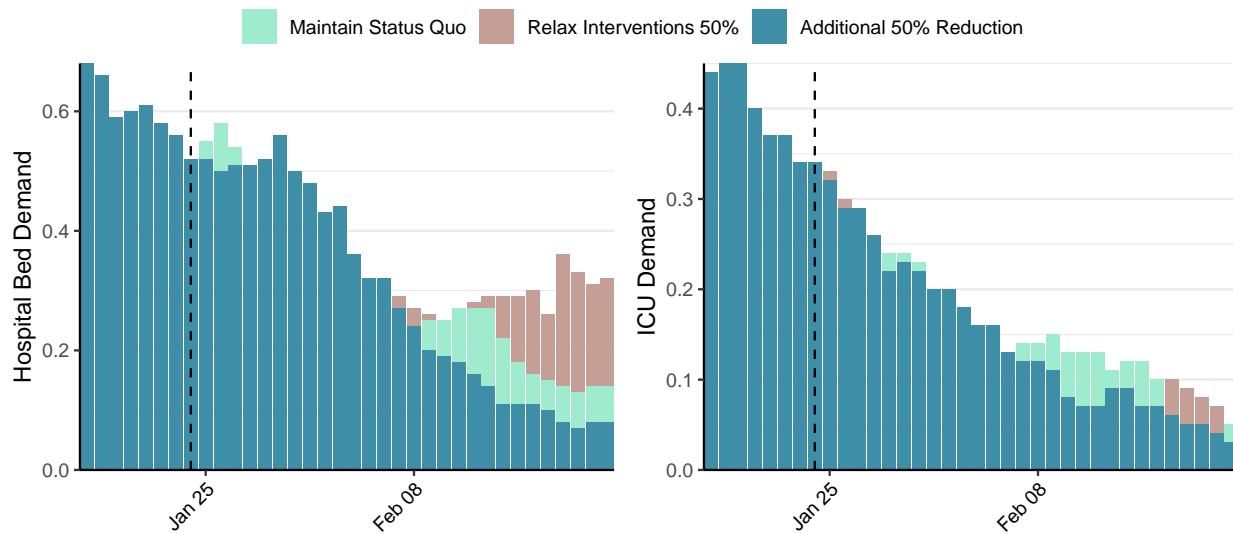


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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: 2-4) at the current date to 0 (95% CI: 0-0) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3 (95% CI: 2-4) at the current date to 5 (95% CI: 1-8) by 2021-02-21.

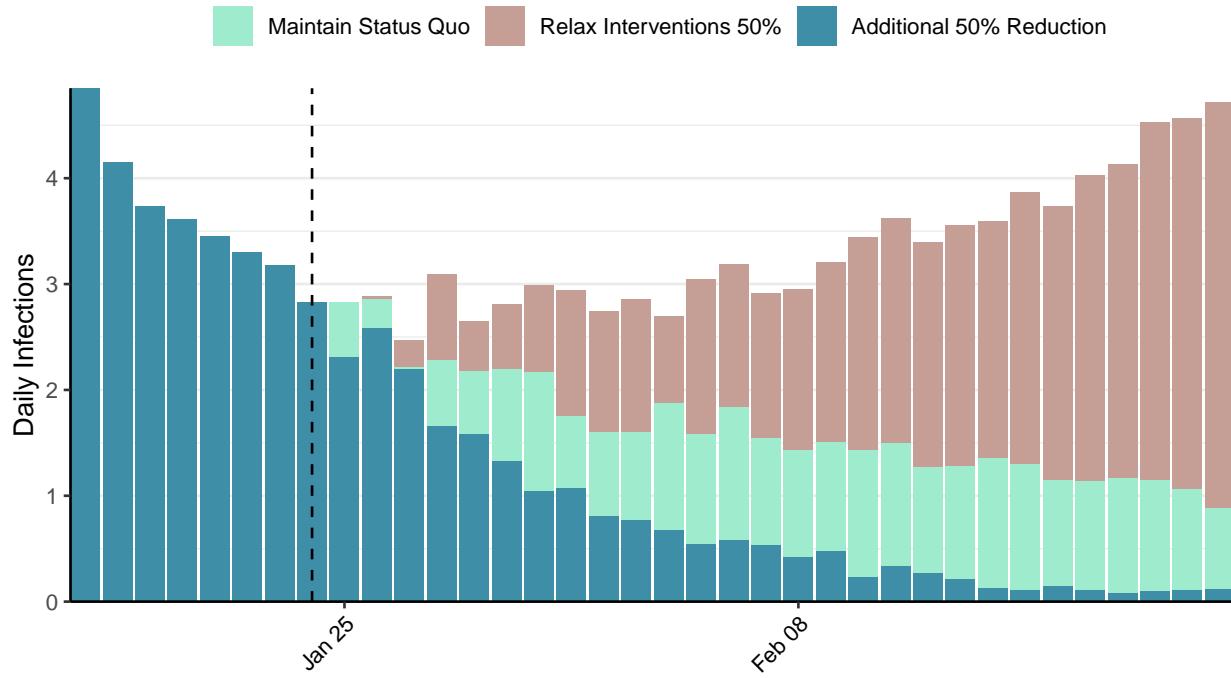


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Gambia, 2021-01-24

[Download the report for Gambia, 2021-01-24 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}
36	36	0	0	1.18 (95% CI: 0.84-1.57)

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. Gambia is not shown in the following plot as only 0 deaths have been reported to date**

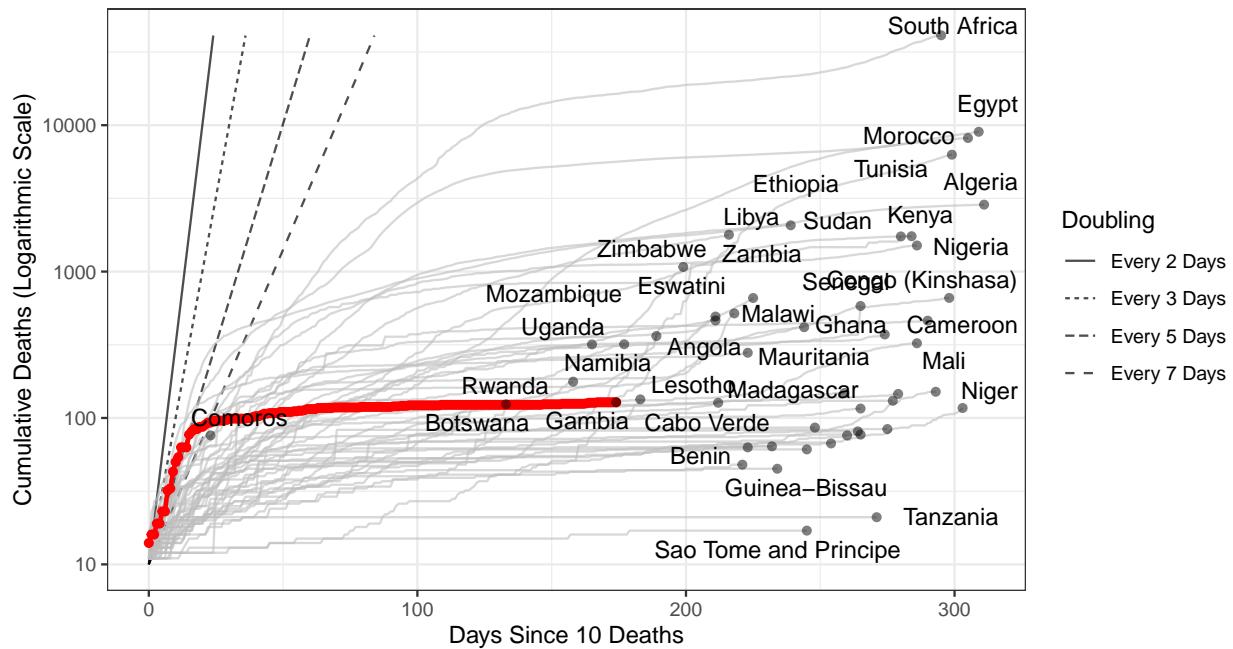


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 4,449 (95% CI: 4,060-4,837) 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.**

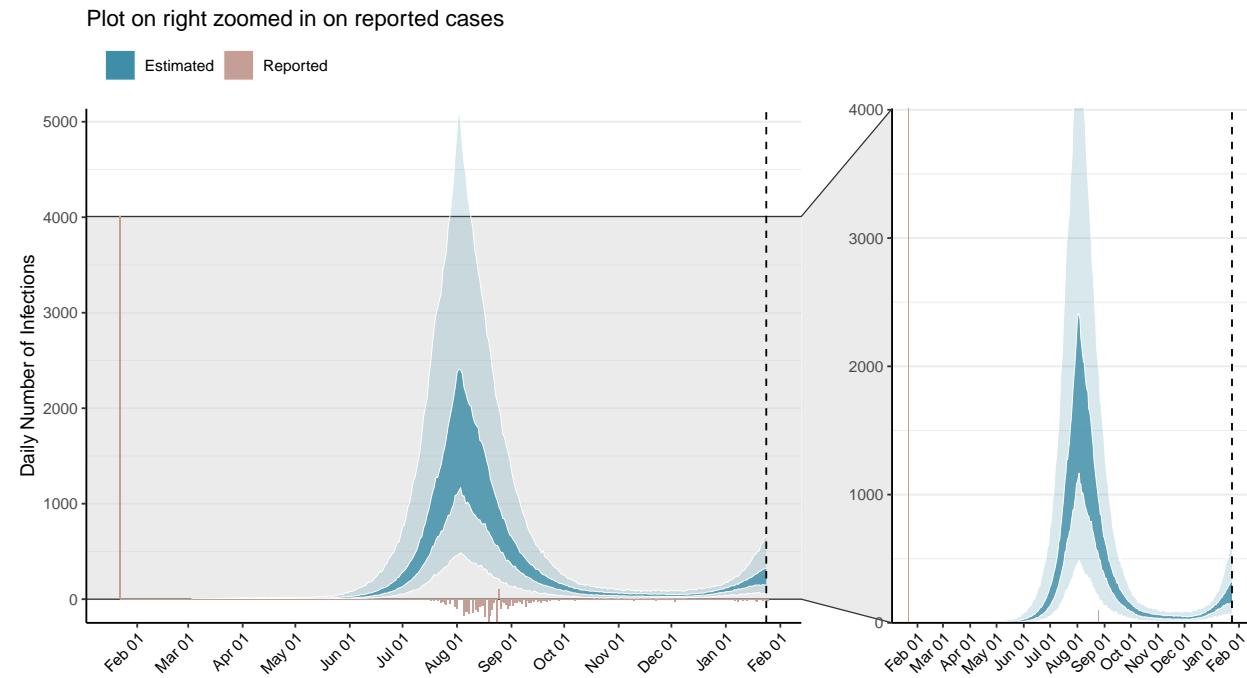


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

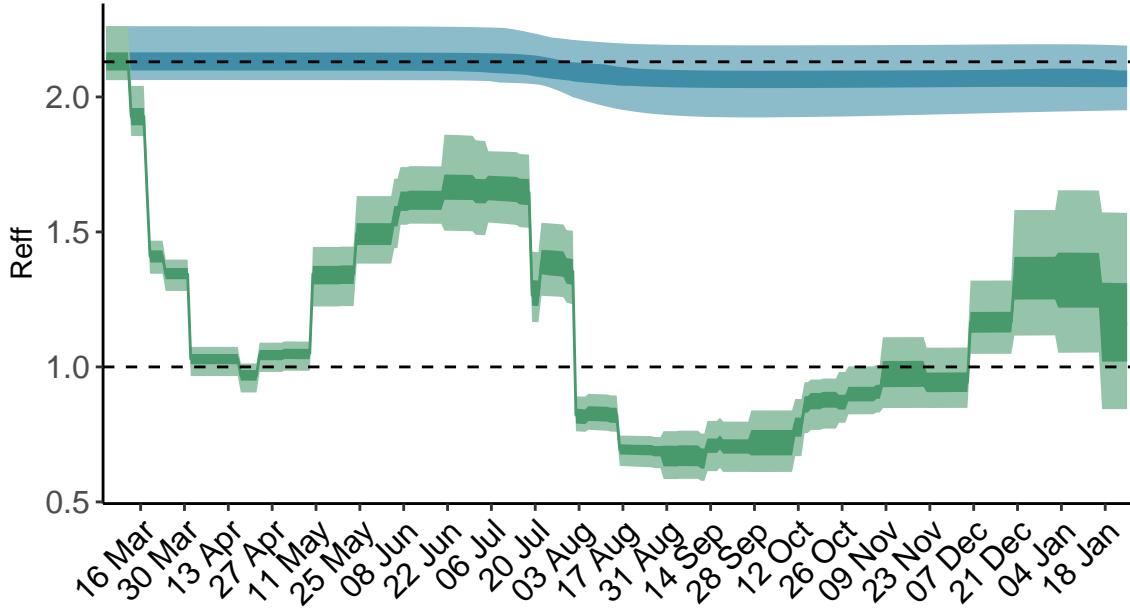


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

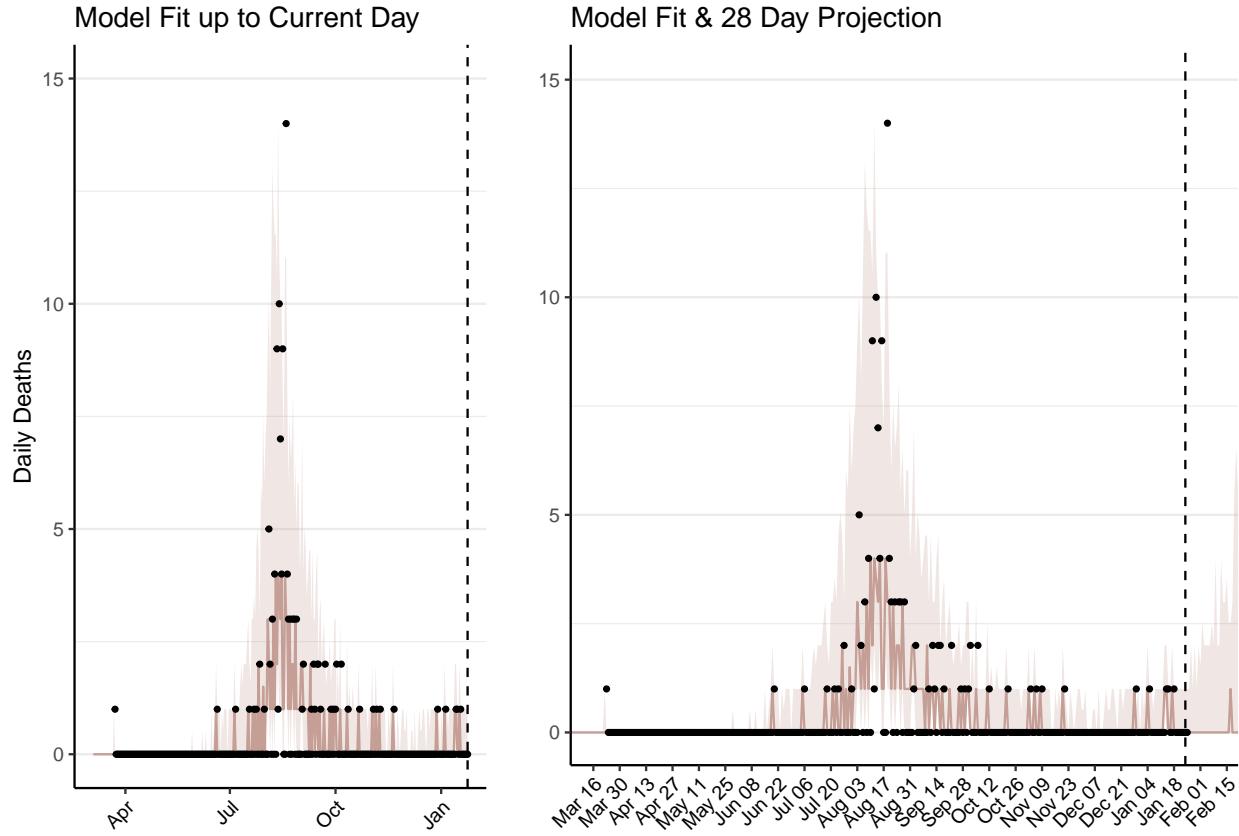


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 40 (95% CI: 29-52) hospital beds being required on 2021-02-21 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: 4-5) patients requiring treatment with mechanical ventilation at the current date to 14 (95% CI: 11-17) by 2021-02-21. 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.**

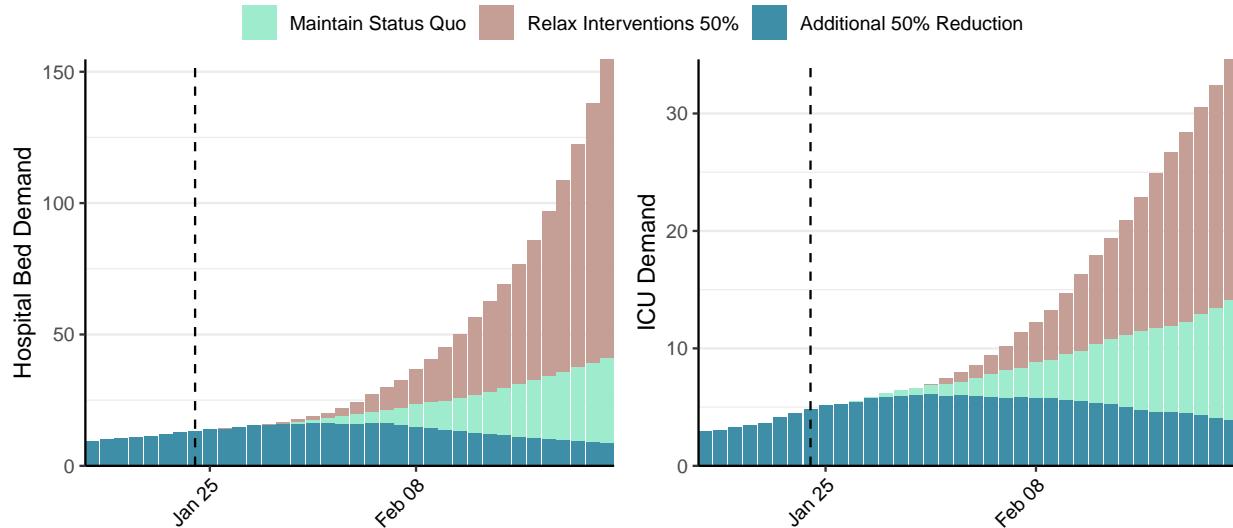


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 260 (95% CI: 225-294) at the current date to 58 (95% CI: 39-77) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 260 (95% CI: 225-294) at the current date to 5,703 (95% CI: 3,866-7,539) by 2021-02-21.

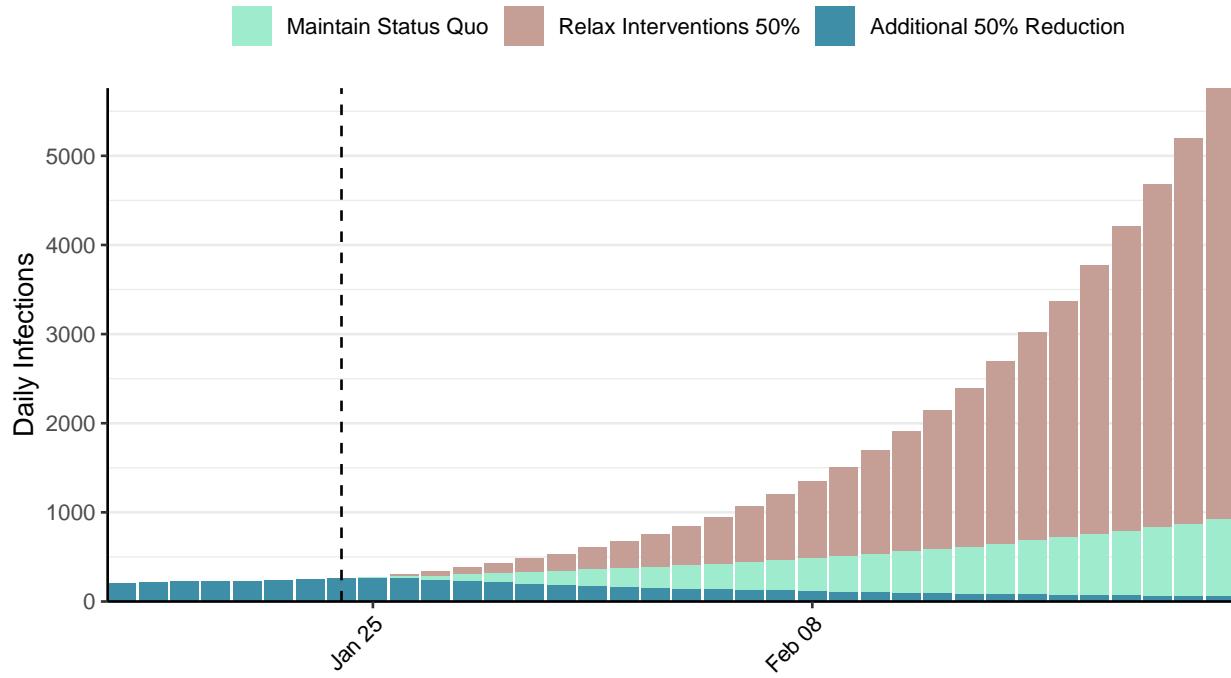


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Guinea-Bissau, 2021-01-24 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	0.7 (95% CI: 0.44-1.1)

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. Guinea-Bissau is not shown in the following plot as only 0 deaths have been reported to date**

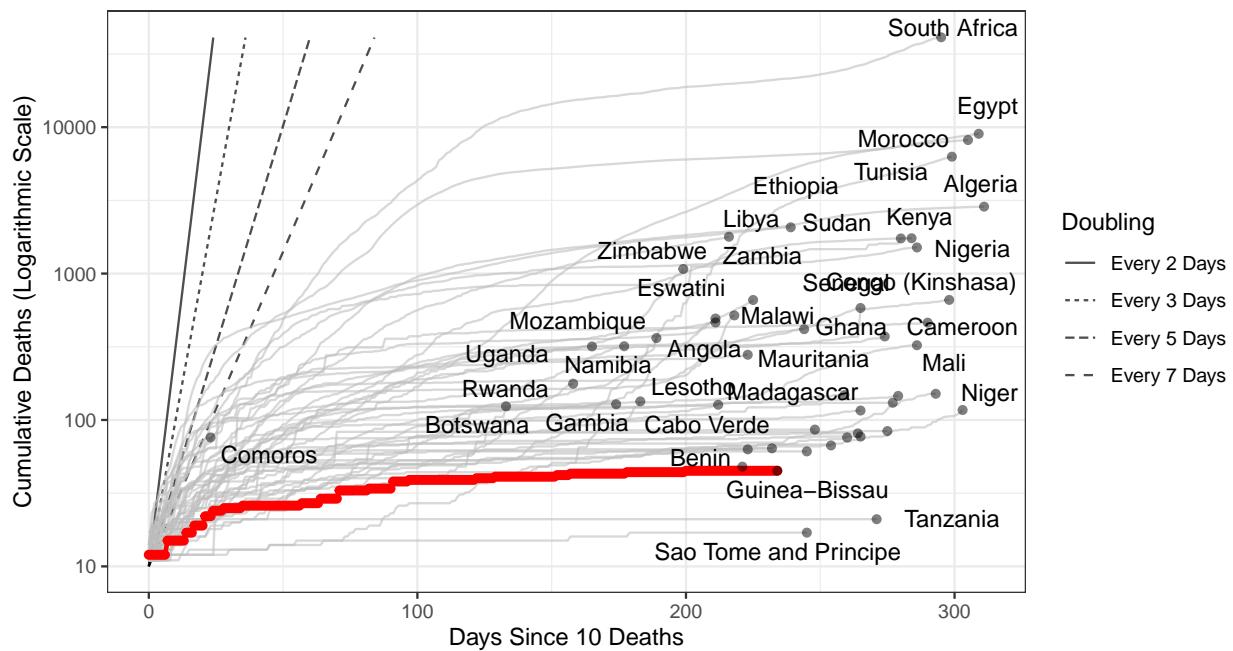


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 42 (95% CI: 23-62) 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).

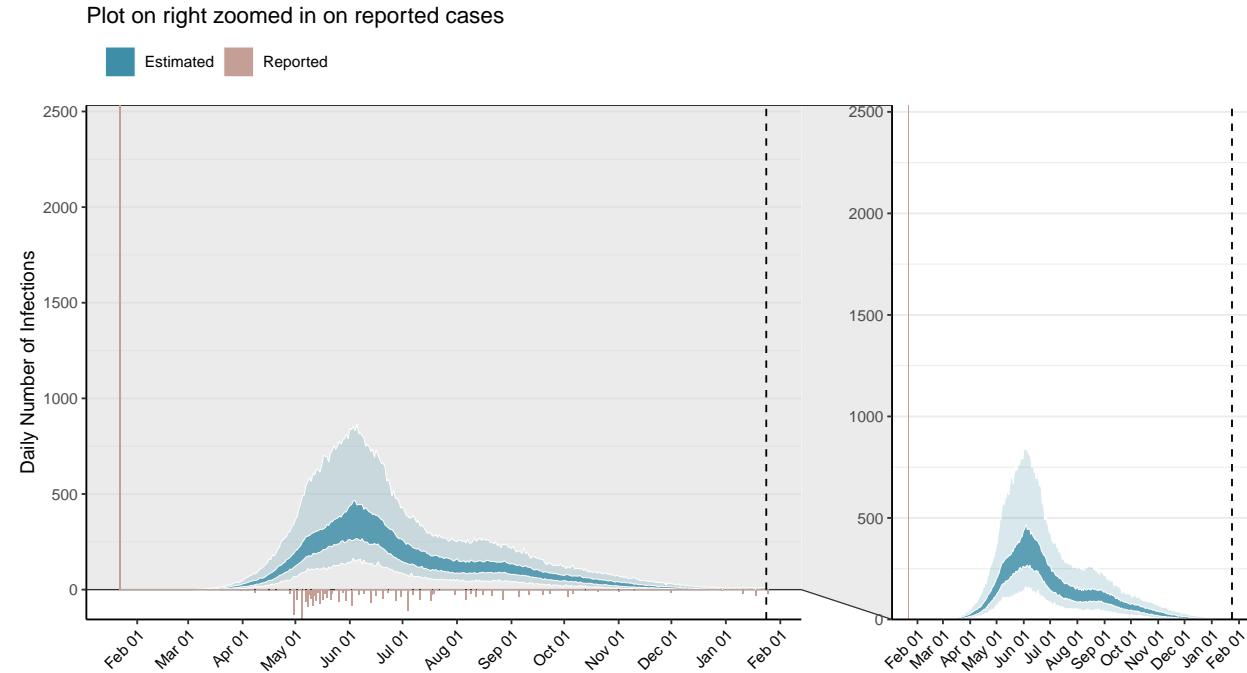


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

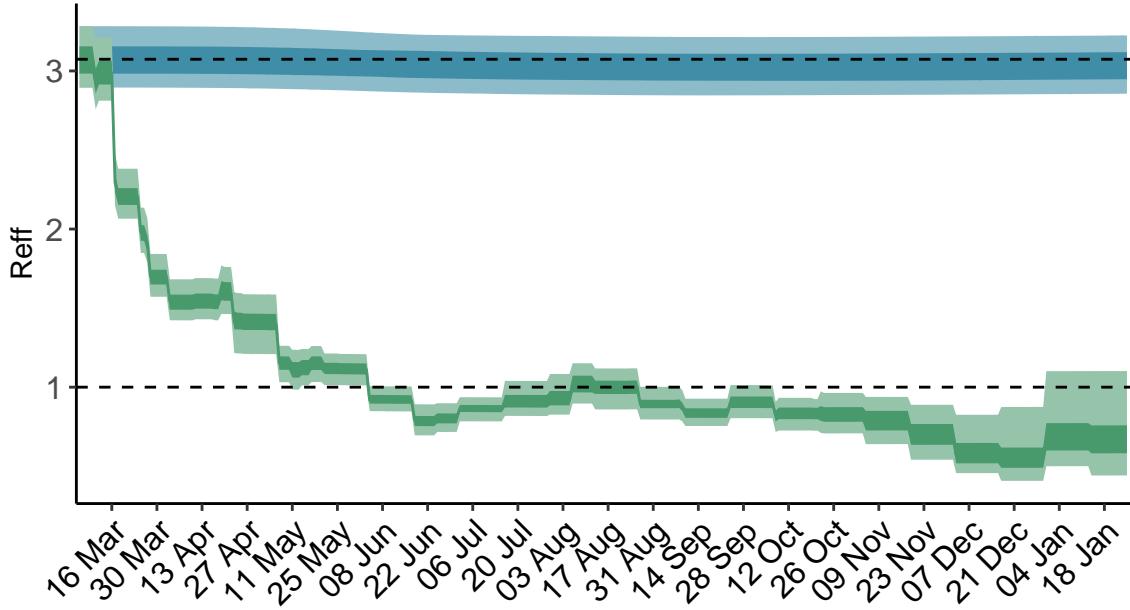


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

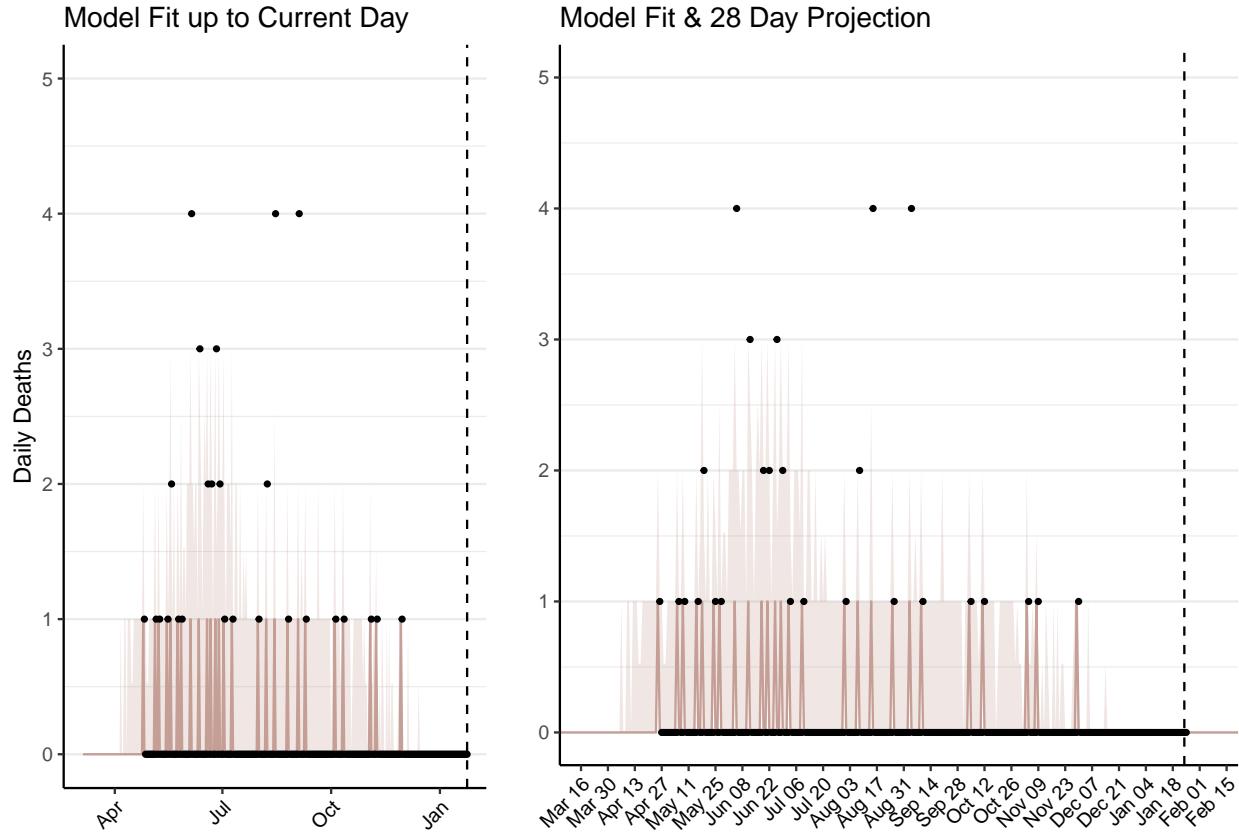


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 2021-02-21 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 2021-02-21. 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.**

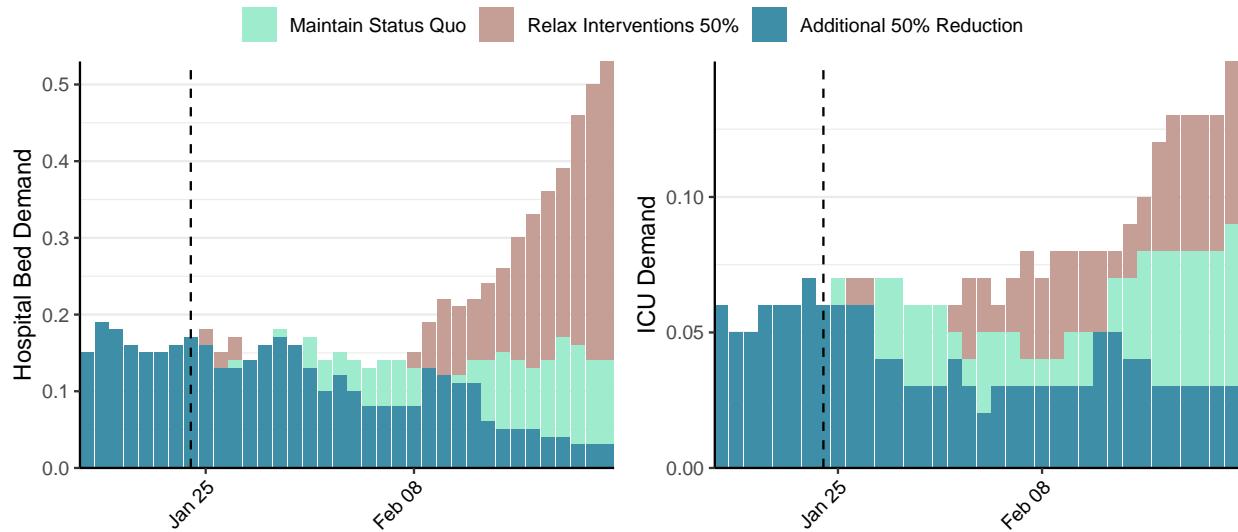


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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: 0-2) at the current date to 0 (95% CI: 0-0) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1 (95% CI: 0-2) at the current date to 15 (95% CI: 1-30) by 2021-02-21.

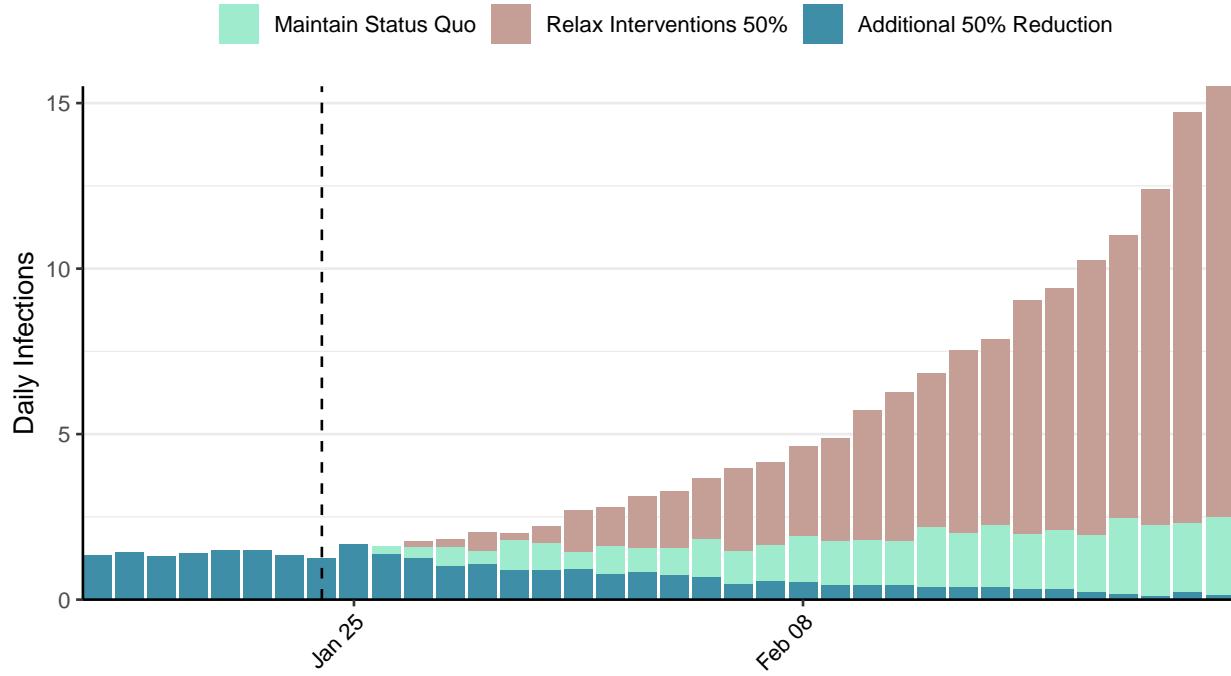


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Equatorial Guinea, 2021-01-24 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}
53	53	0	0	0.71 (95% CI: 0.45-1)

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.** Equatorial Guinea is not shown in the following plot as only 0 deaths have been reported to date

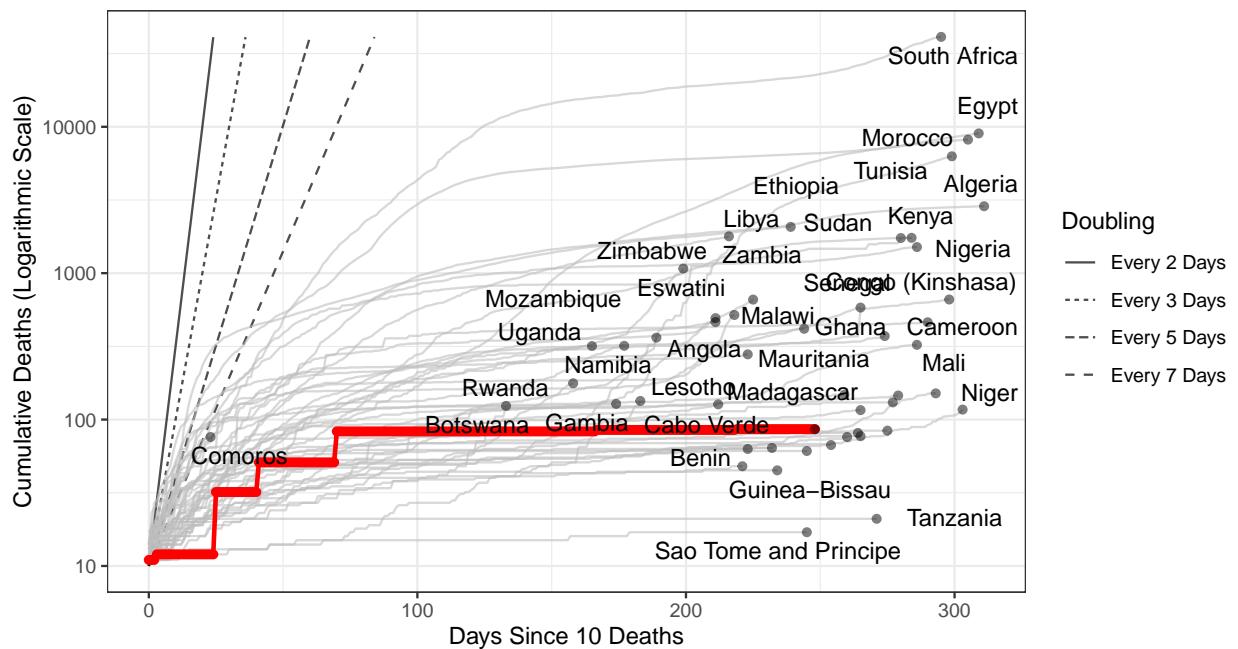


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 28 (95% CI: 17-38) 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).

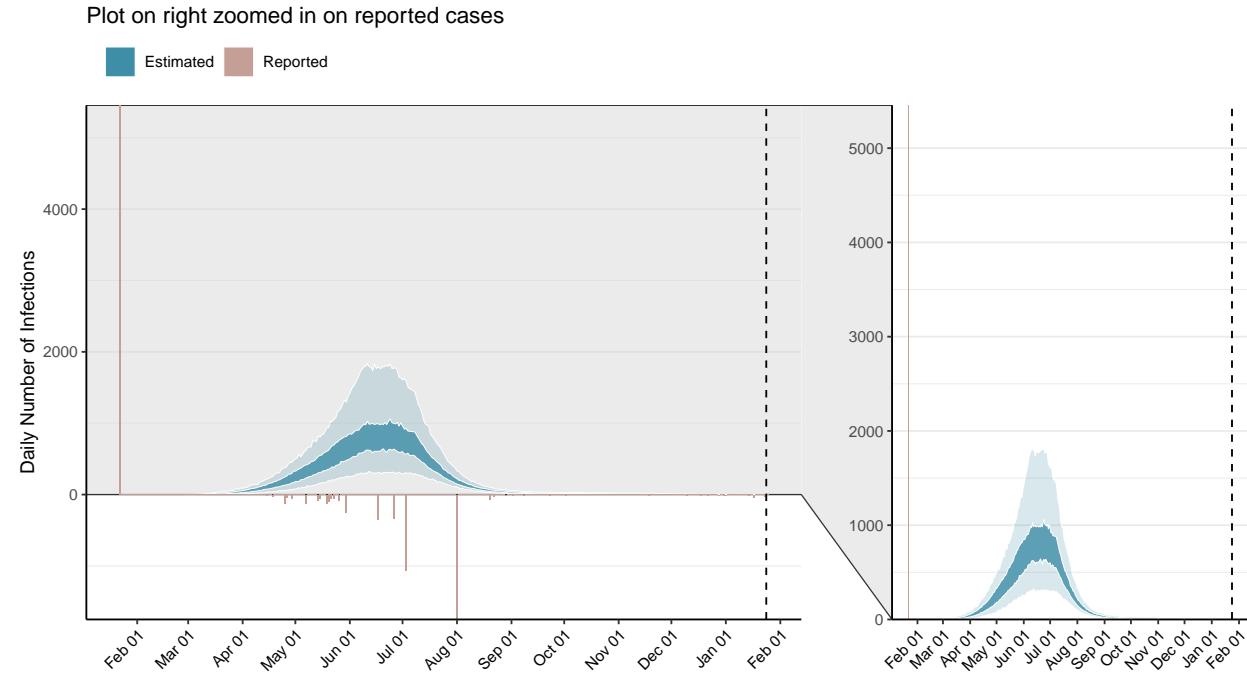


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

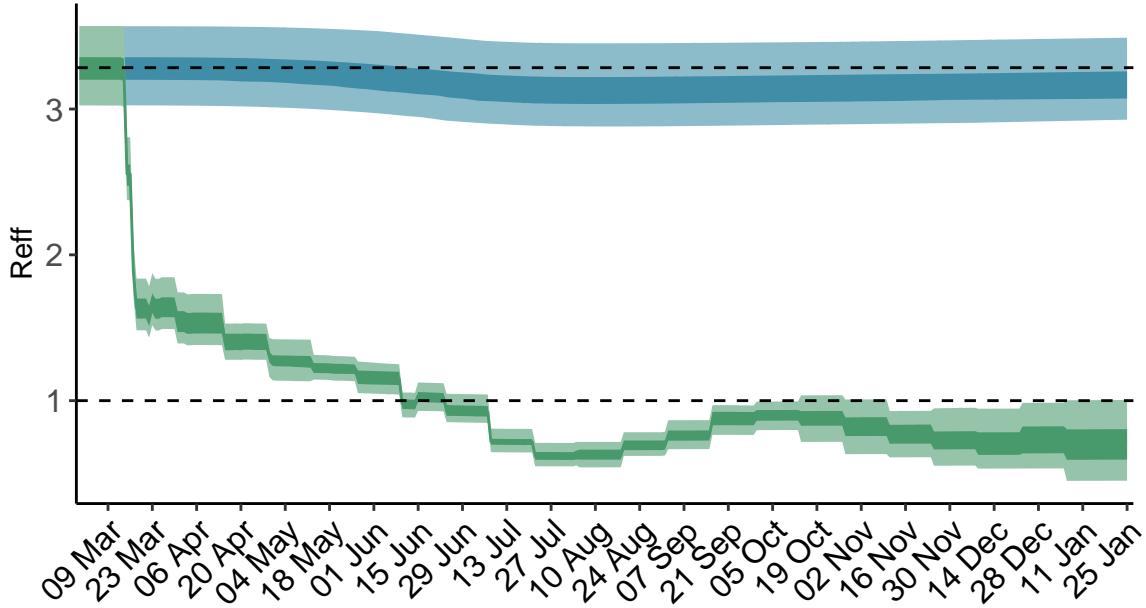


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

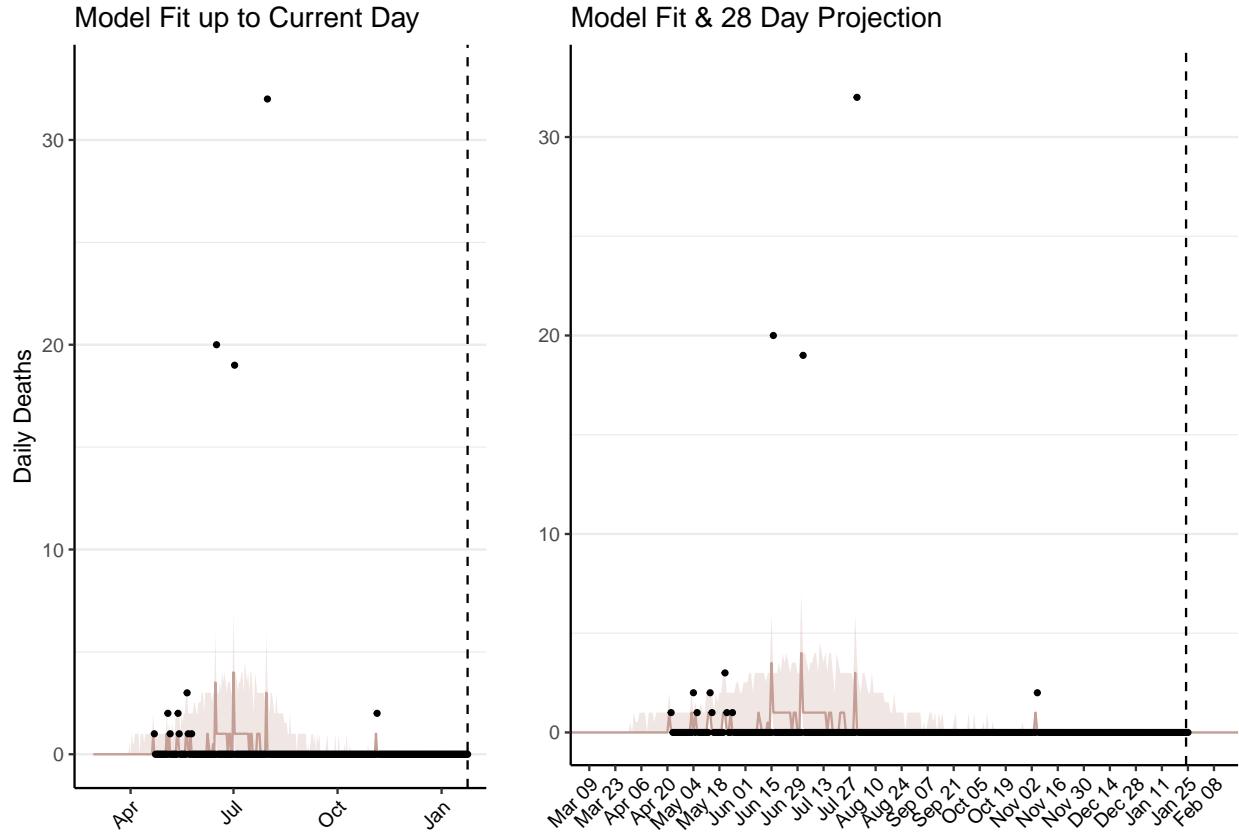


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 2021-02-21 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: NaN-NaN) by 2021-02-21. 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.**

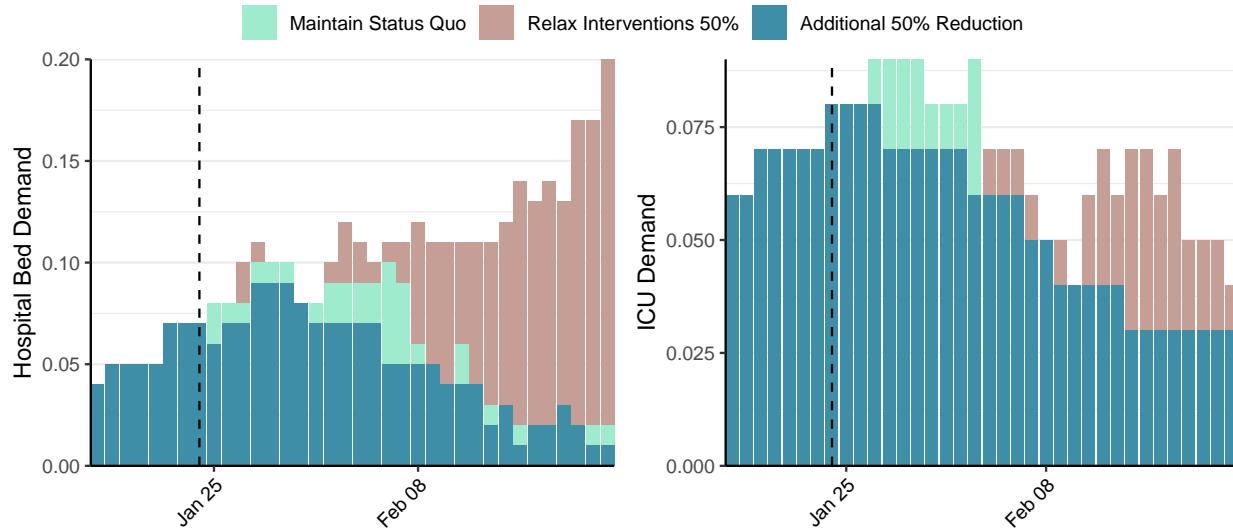


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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: 0-1) at the current date to 0 (95% CI: 0-0) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1 (95% CI: 0-1) at the current date to 4 (95% CI: 0-9) by 2021-02-21.

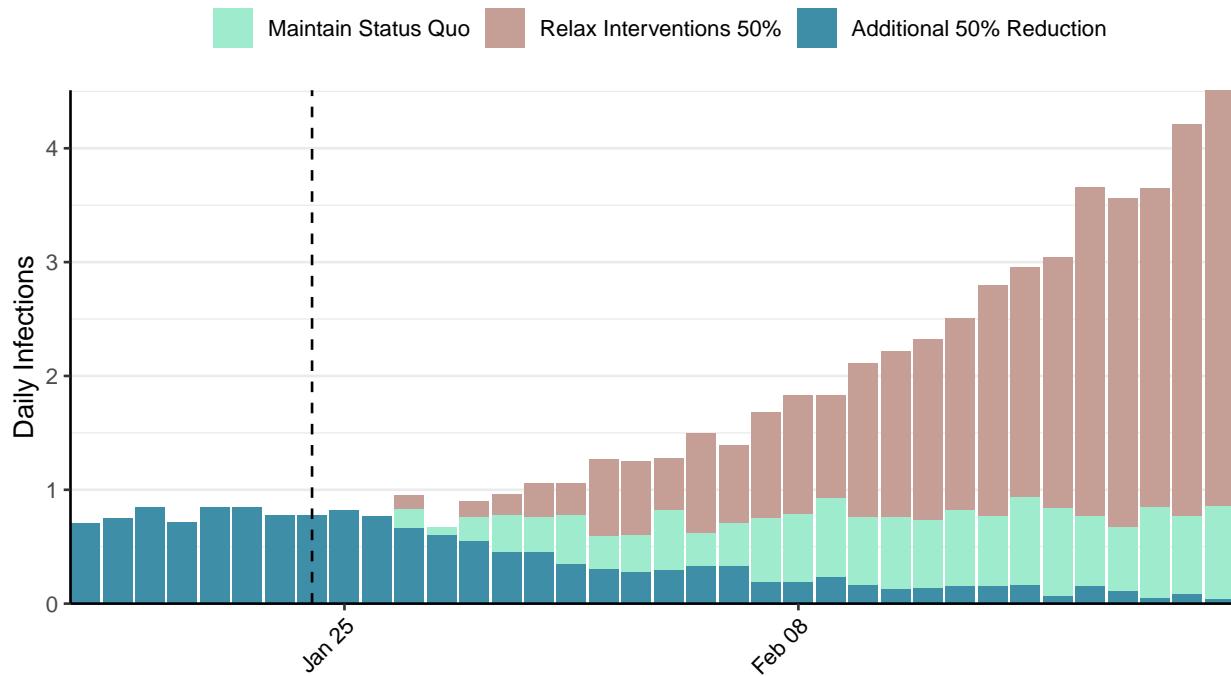


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Grenada, 2021-01-24 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}
1	1	0	0	1.69 (95% CI: 1.16-2.35)

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. Grenada is not shown in the following plot as only 0 deaths have been reported to date**

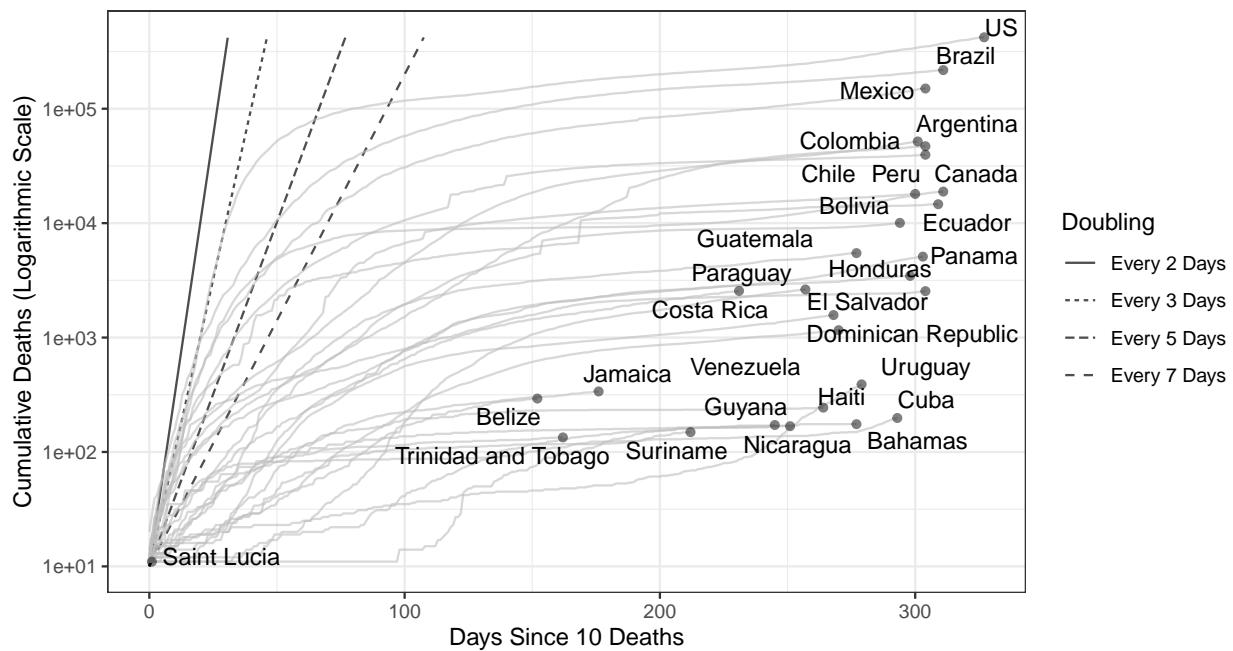


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 1,034 (95% CI: 635-1,432) 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

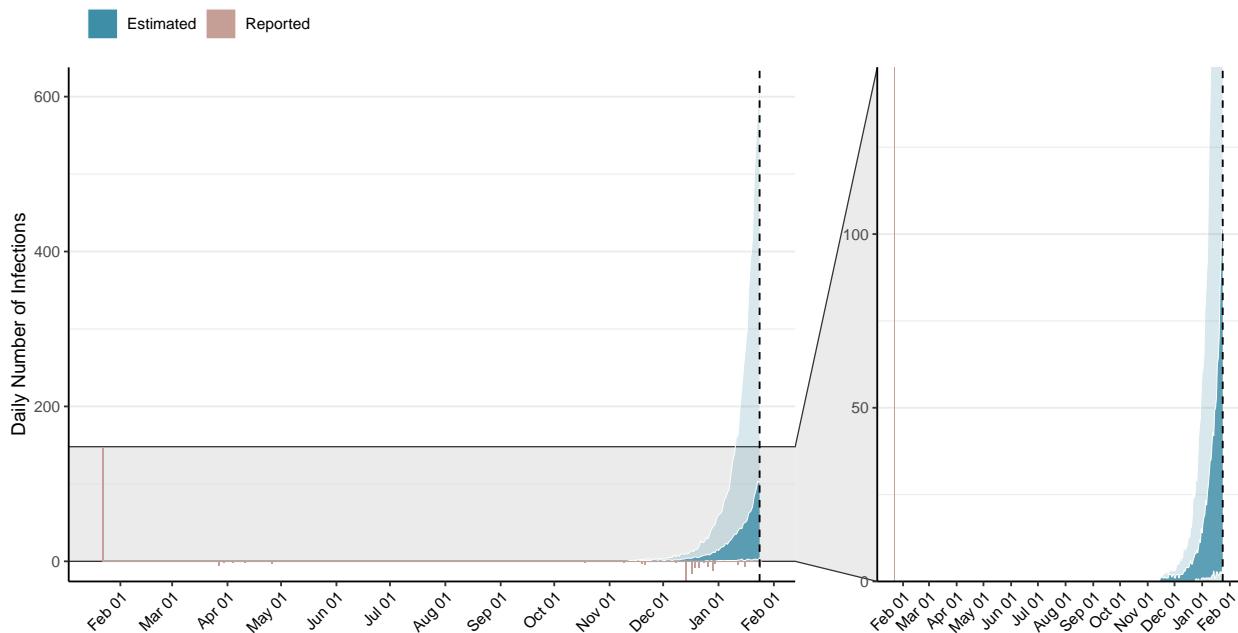


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

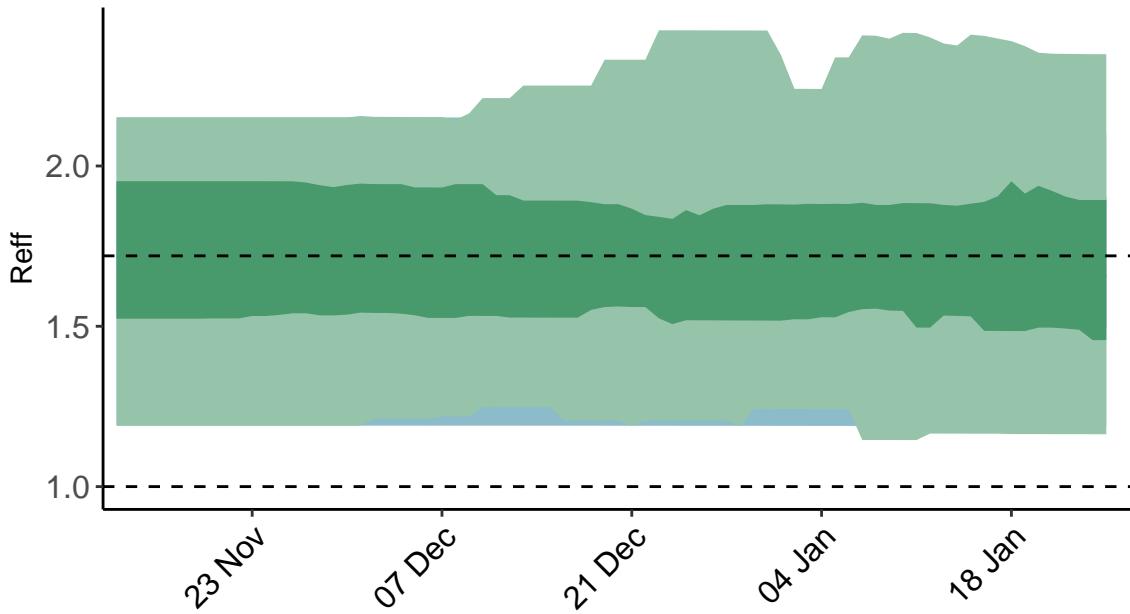


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

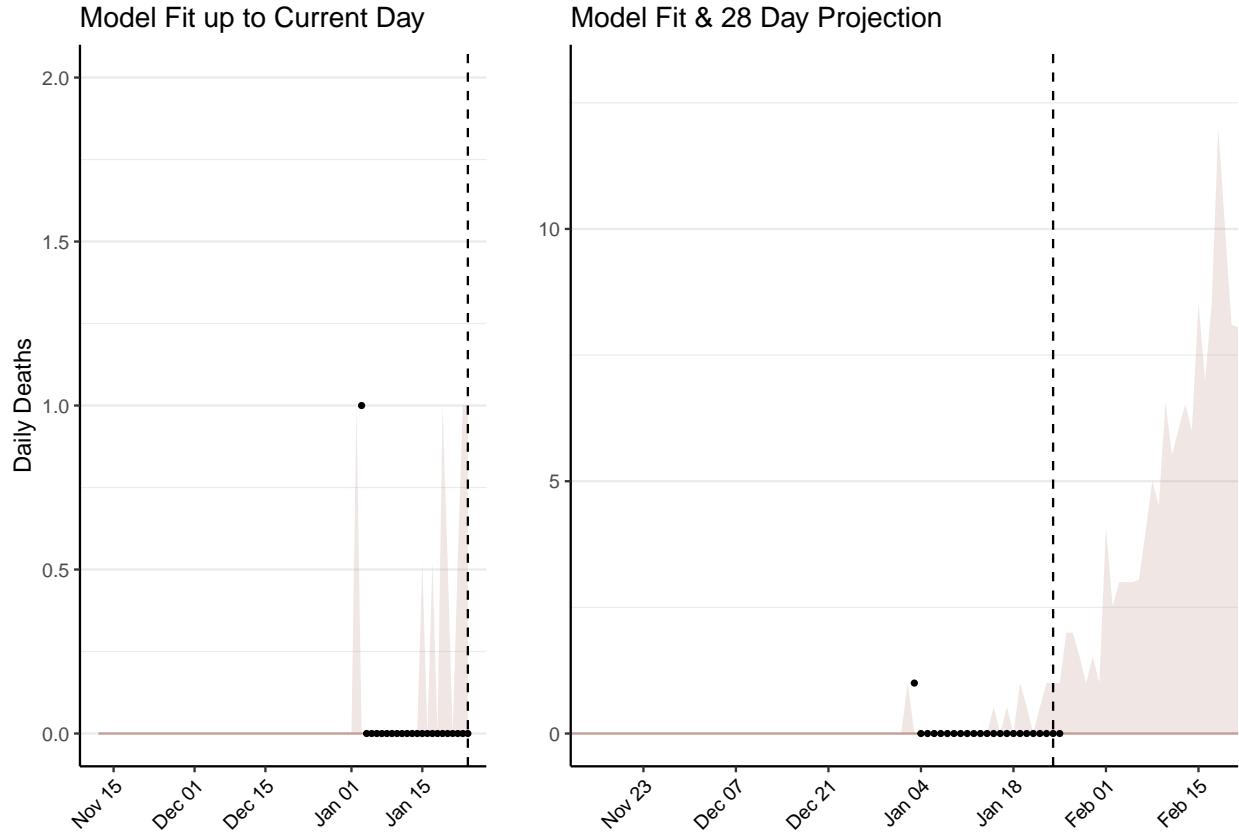


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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: 2-6) patients requiring treatment with high-pressure oxygen at the current date to 23 (95% CI: 13-34) hospital beds being required on 2021-02-21 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: 1-2) patients requiring treatment with mechanical ventilation at the current date to 4 (95% CI: 2-5) by 2021-02-21. 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.**

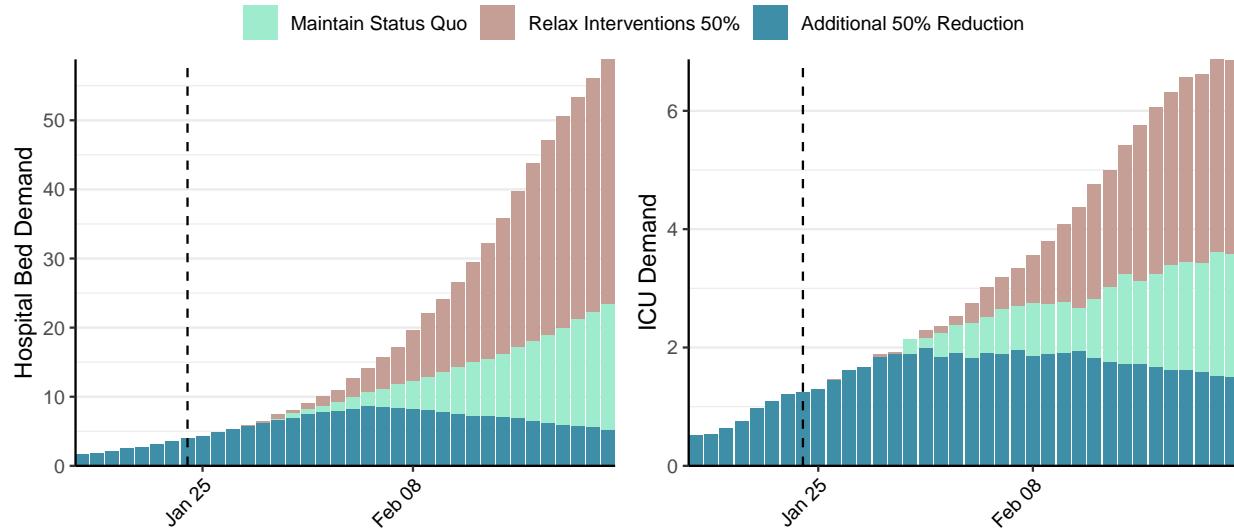


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 107 (95% CI: 60-155) at the current date to 29 (95% CI: 14-44) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 107 (95% CI: 60-155) at the current date to 674 (95% CI: 464-883) by 2021-02-21.

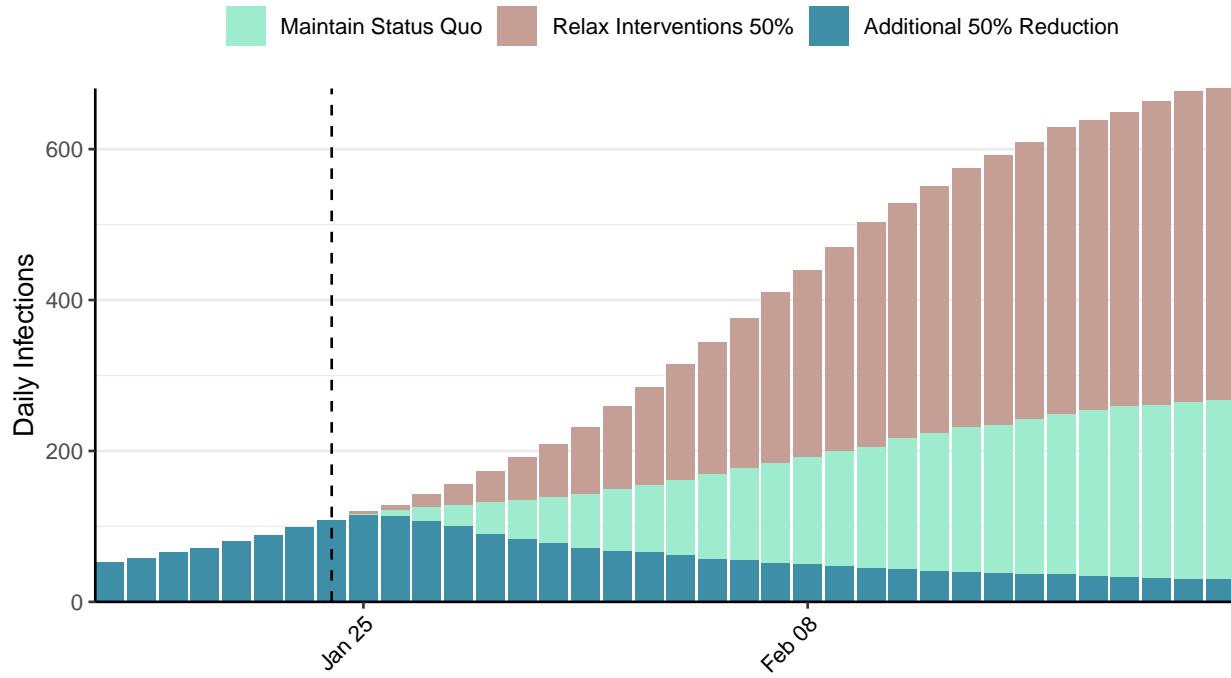


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Guatemala, 2021-01-24

[Download the report for Guatemala, 2021-01-24 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}
218	218	4	4	1.04 (95% CI: 0.92-1.19)

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. Guatemala is not shown in the following plot as only 4 deaths have been reported to date**

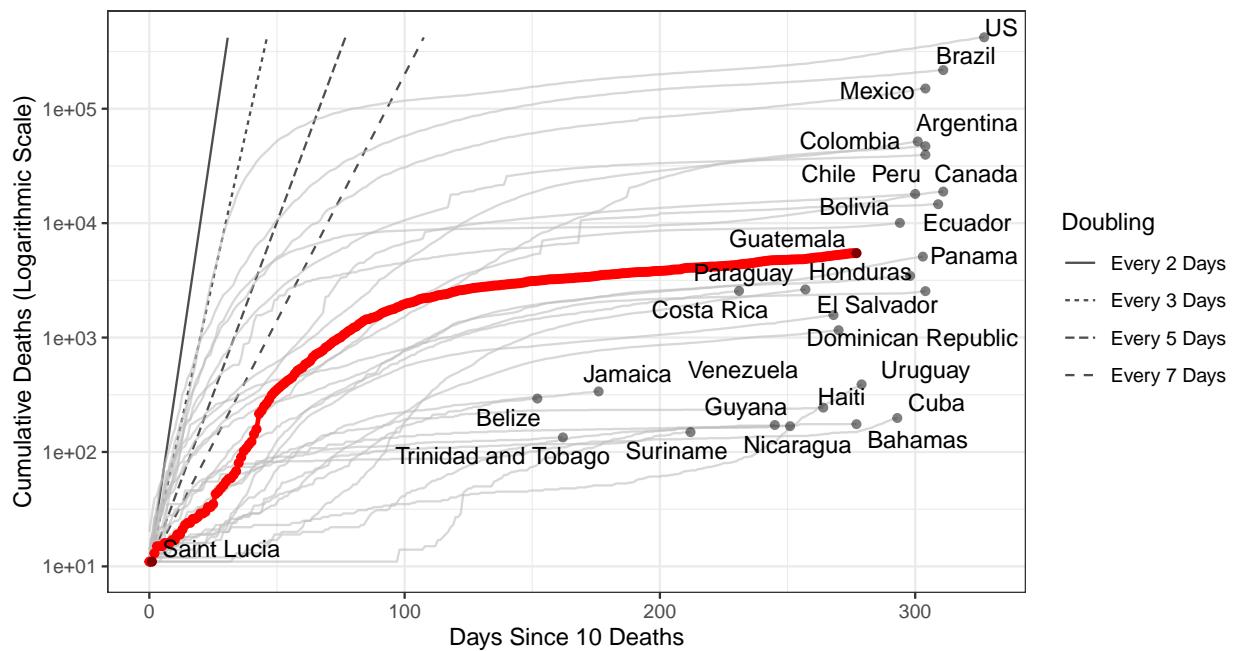


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 406,182 (95% CI: 372,266-440,098) 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).

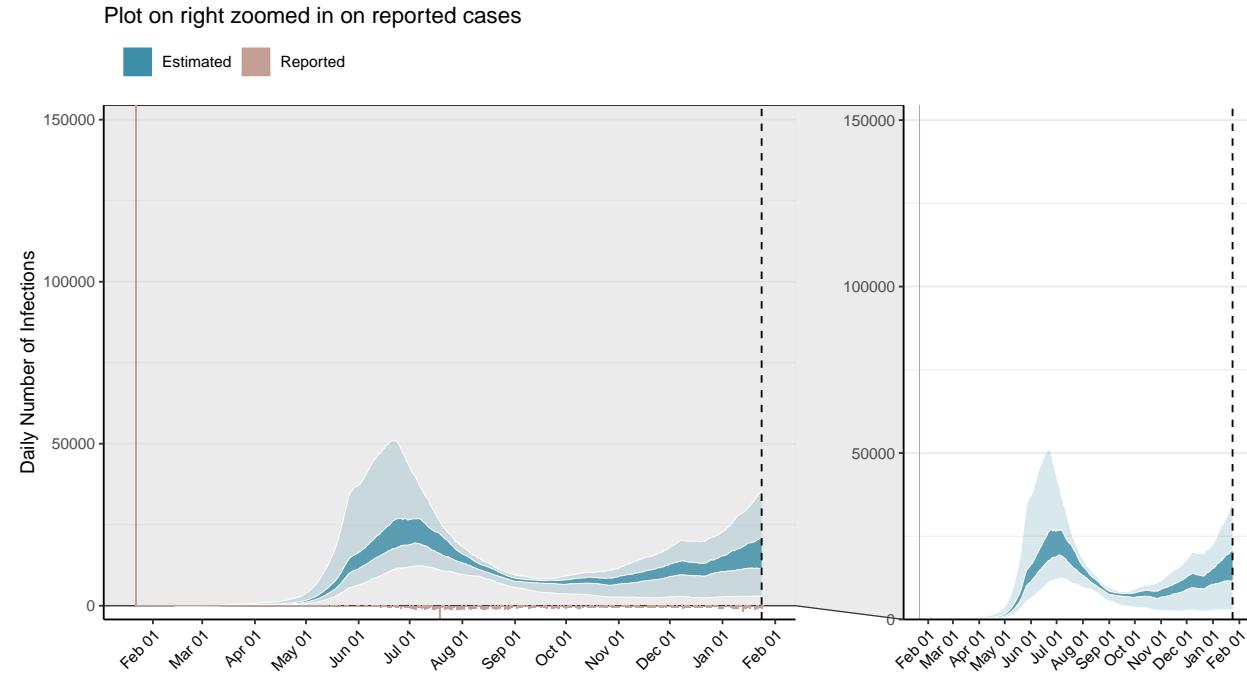


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

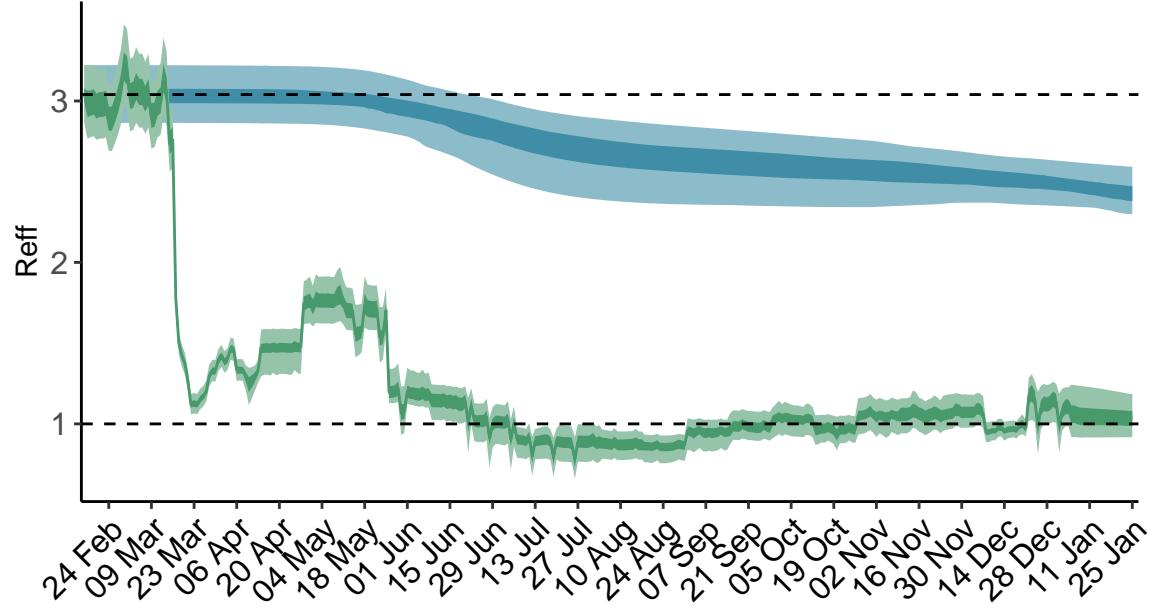


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

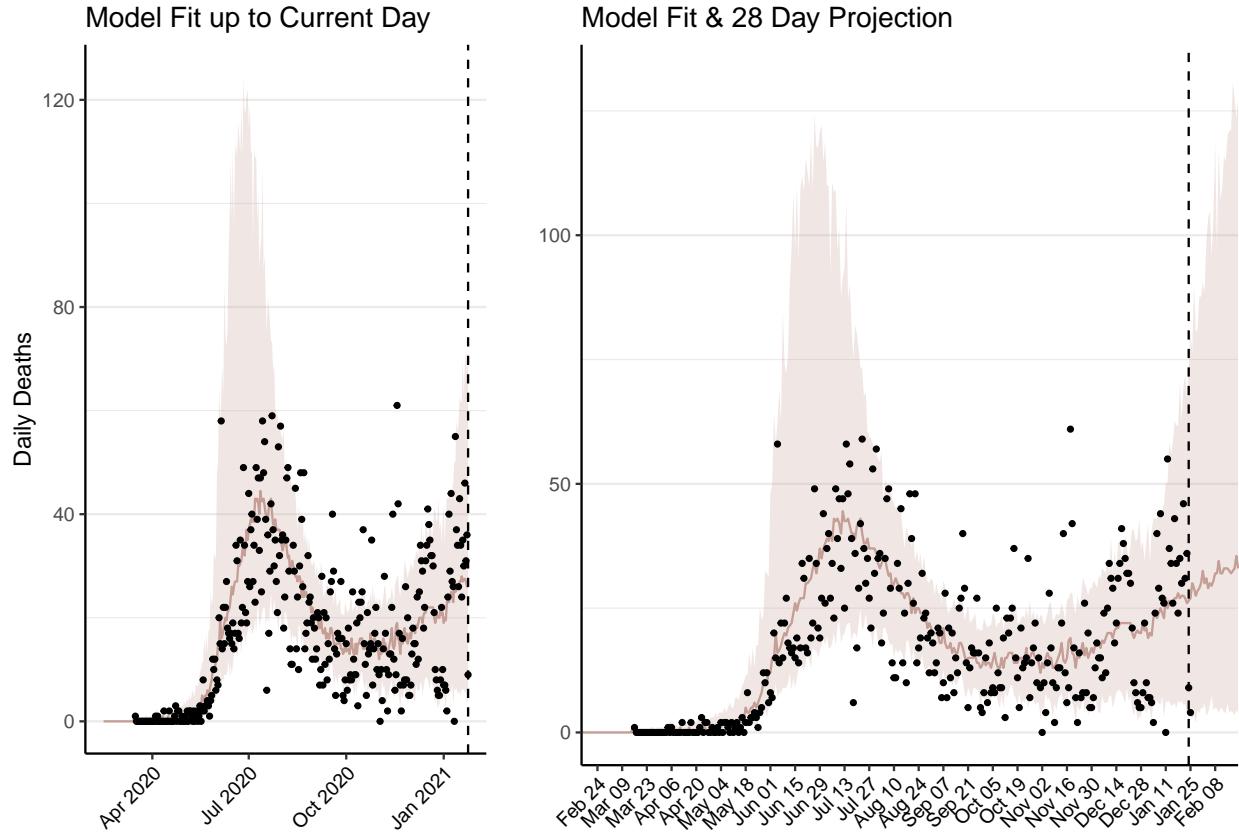


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 1,162 (95% CI: 1,062-1,262) patients requiring treatment with high-pressure oxygen at the current date to 1,479 (95% CI: 1,303-1,656) hospital beds being required on 2021-02-21 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 388 (95% CI: 360-416) patients requiring treatment with mechanical ventilation at the current date to 439 (95% CI: 404-473) by 2021-02-21. 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.**

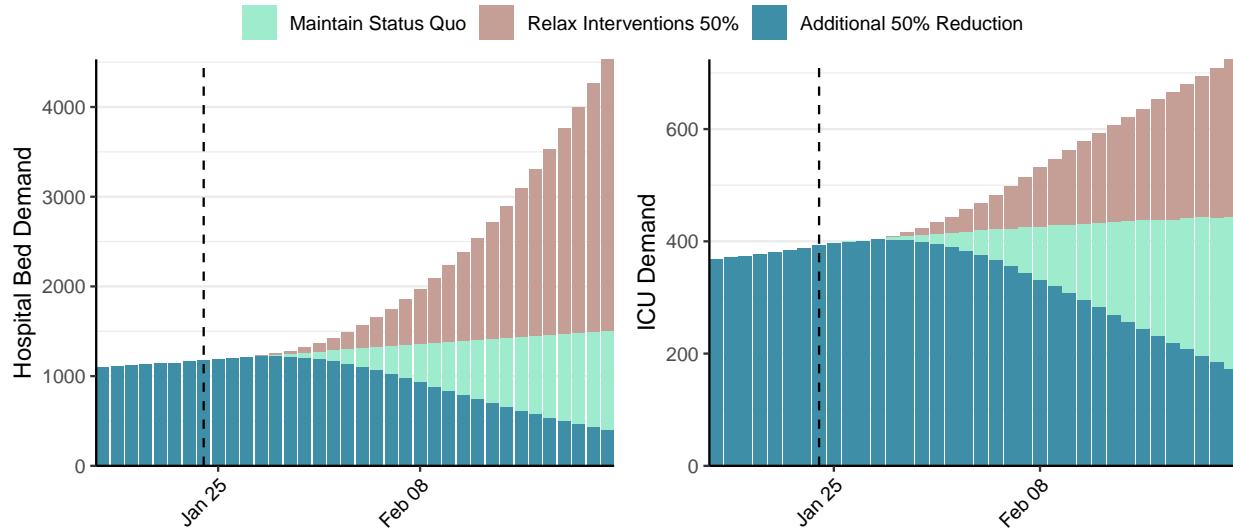


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 16,555 (95% CI: 14,934-18,177) at the current date to 1,681 (95% CI: 1,460-1,902) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 16,555 (95% CI: 14,934-18,177) at the current date to 97,169 (95% CI: 86,397-107,940) by 2021-02-21.

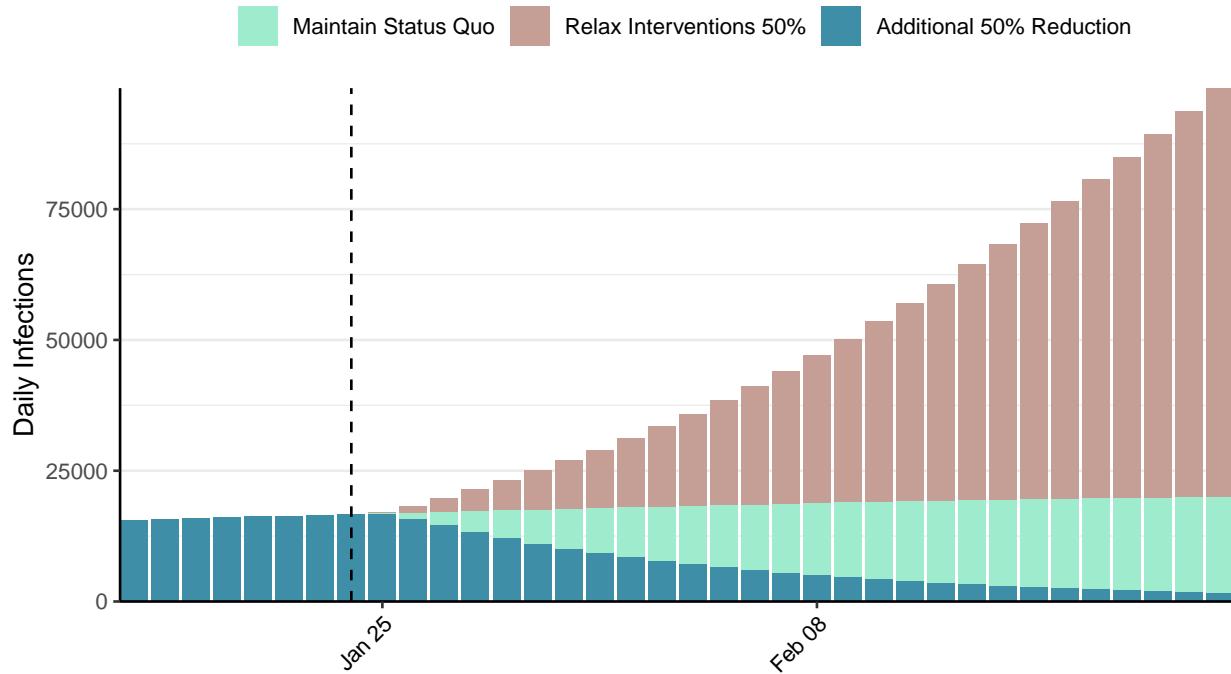


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for French Guiana, 2021-01-24 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}
38	38	0	0	1.09 (95% CI: 0.87-1.29)

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. French Guiana is not shown in the following plot as only 0 deaths have been reported to date**

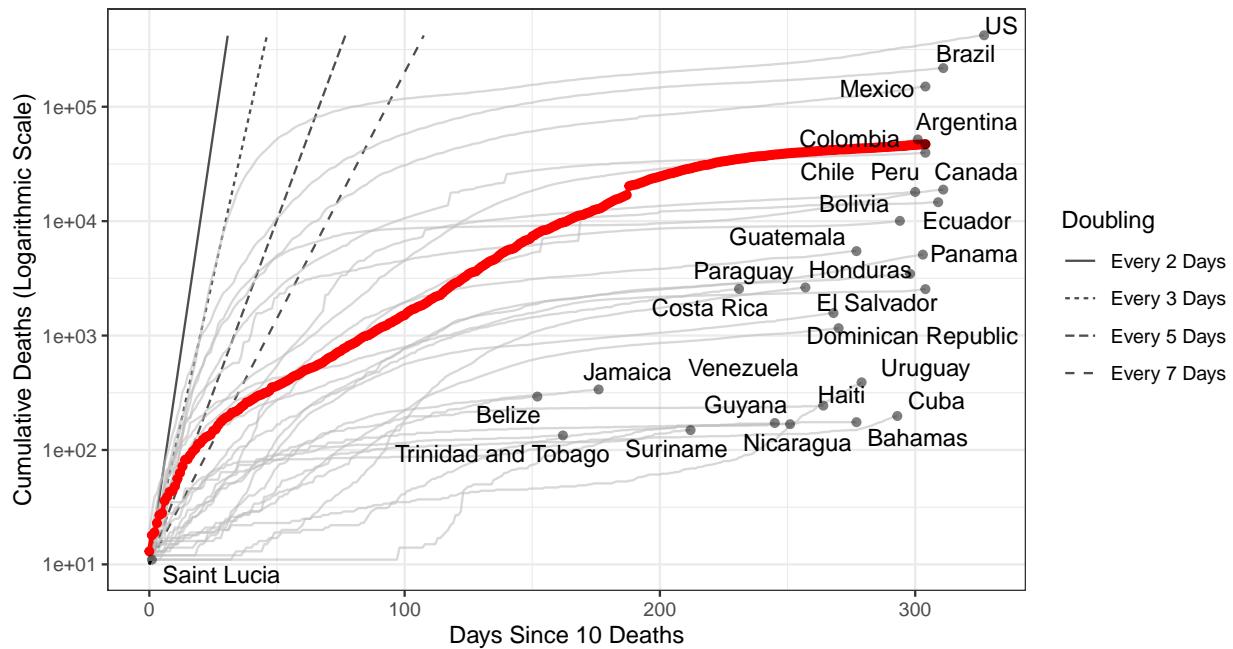


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 1,433 (95% CI: 1,159-1,707) 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

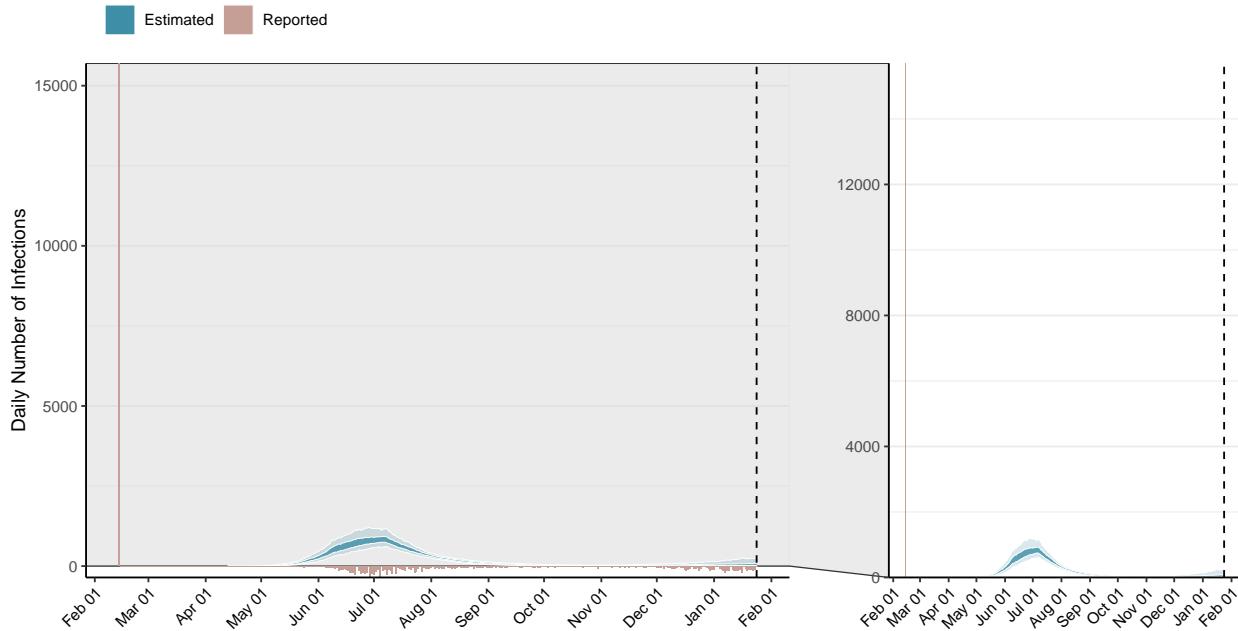


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

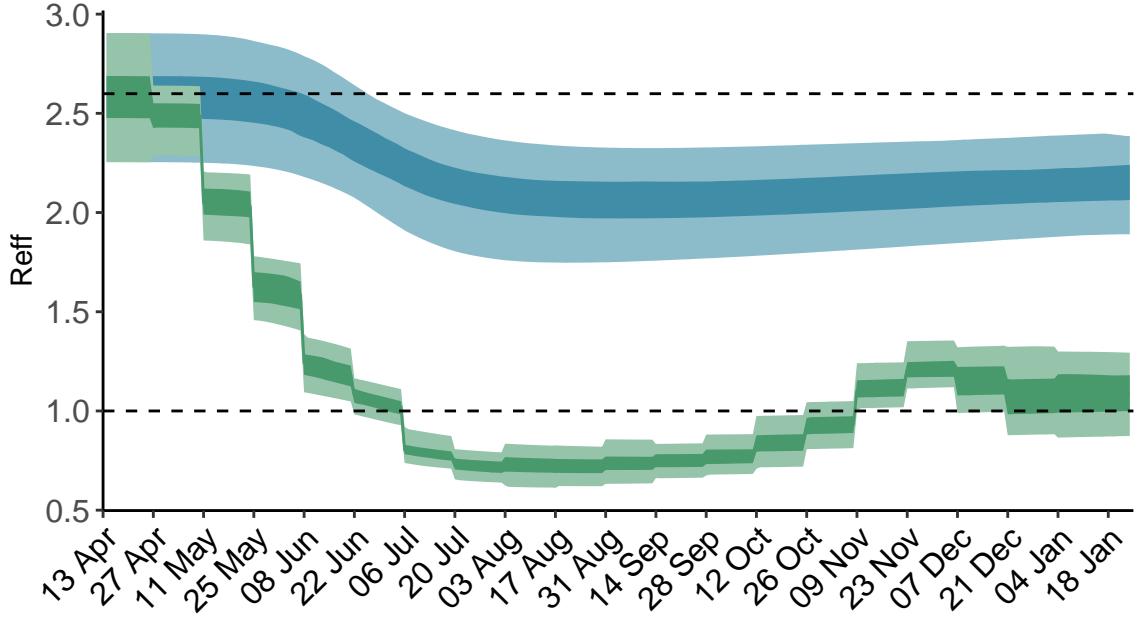


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

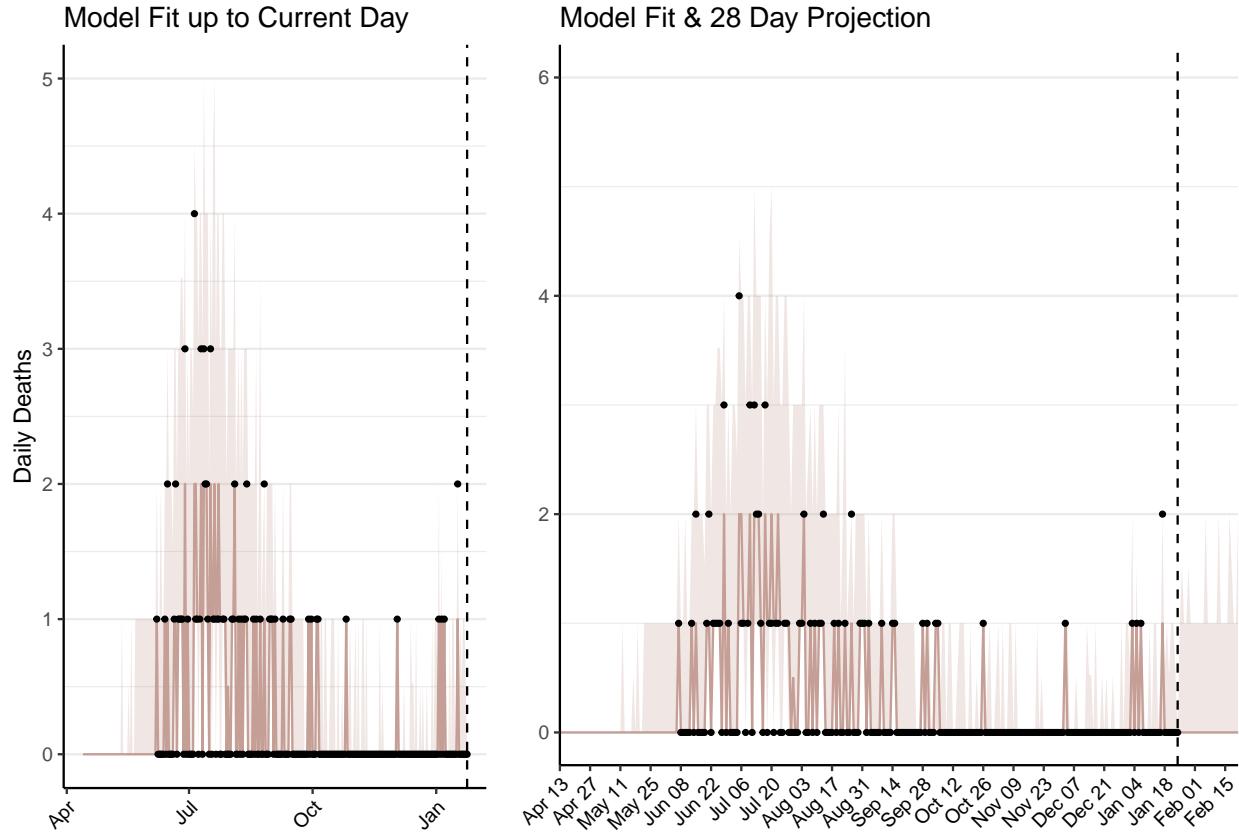


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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: 3-5) patients requiring treatment with high-pressure oxygen at the current date to 8 (95% CI: 5-10) hospital beds being required on 2021-02-21 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: 1-2) patients requiring treatment with mechanical ventilation at the current date to 3 (95% CI: 2-4) by 2021-02-21. 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.**

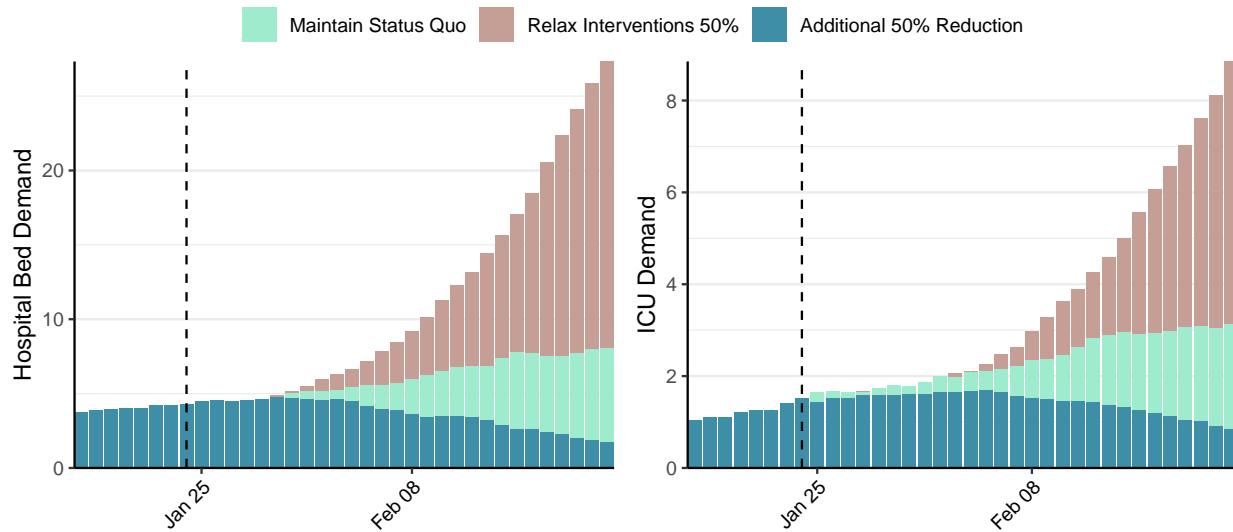


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 67 (95% CI: 52-82) at the current date to 10 (95% CI: 6-13) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 67 (95% CI: 52-82) at the current date to 711 (95% CI: 521-900) by 2021-02-21.

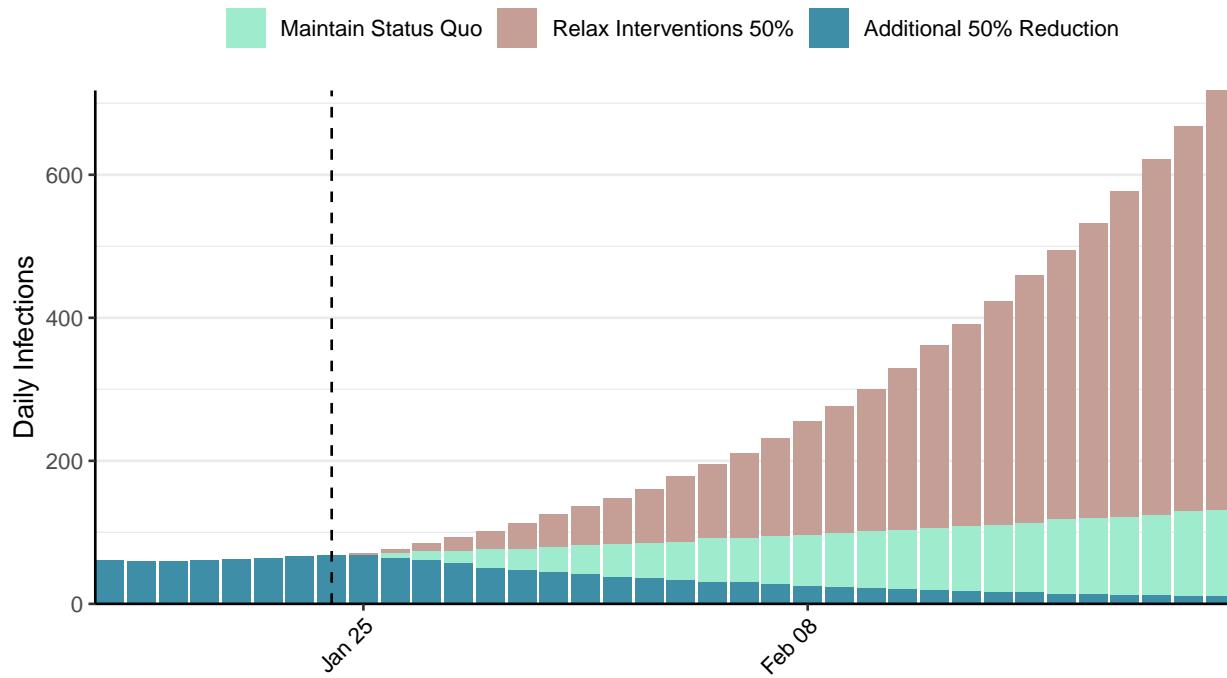


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Guyana, 2021-01-24

[Download the report for Guyana, 2021-01-24 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}
19	19	0	0	1.17 (95% CI: 0.95-1.46)

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**

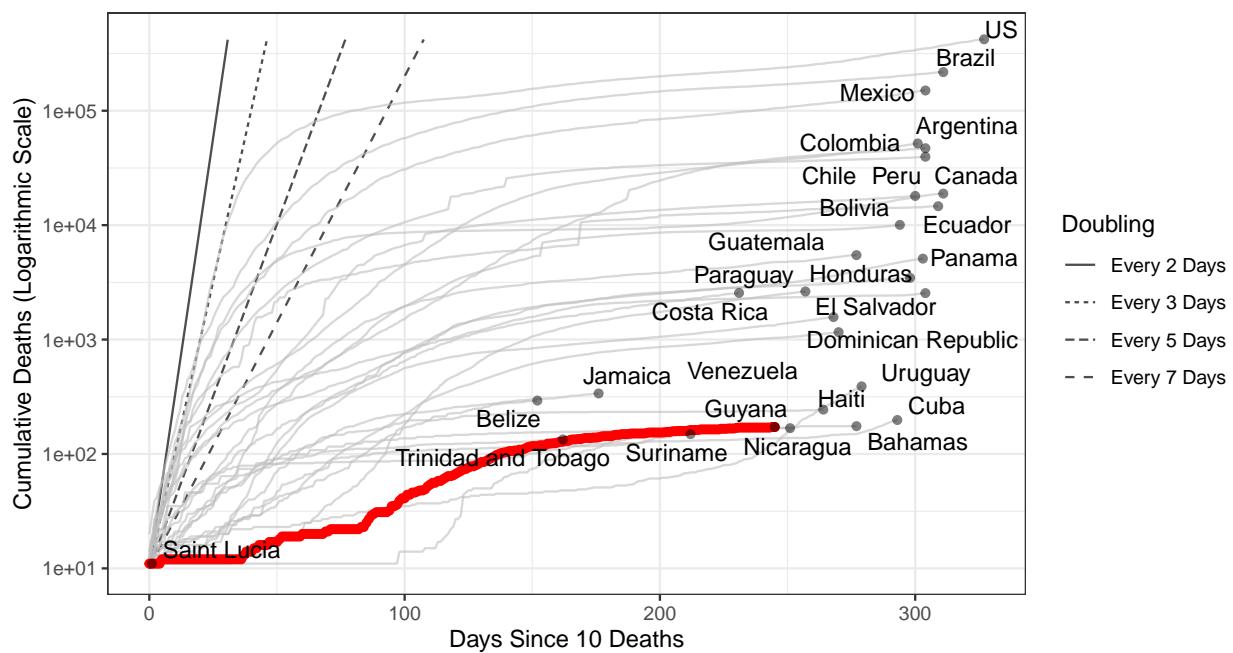


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 3,937 (95% CI: 3,566-4,308) 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.**

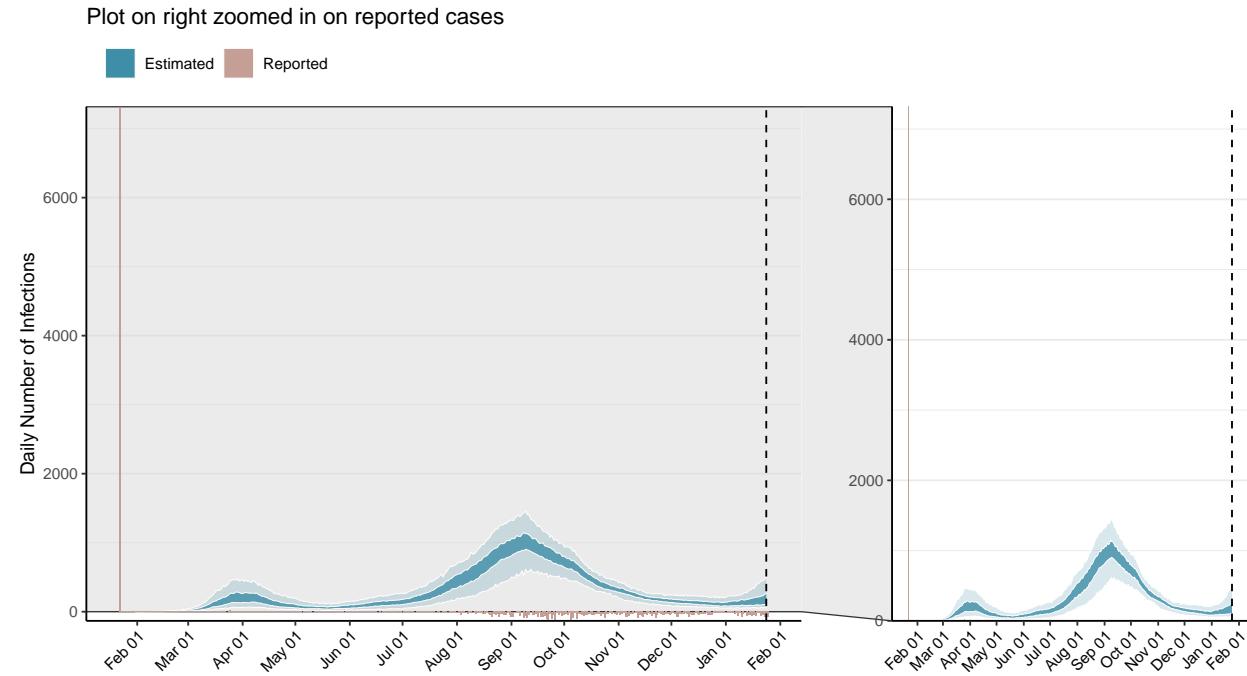


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

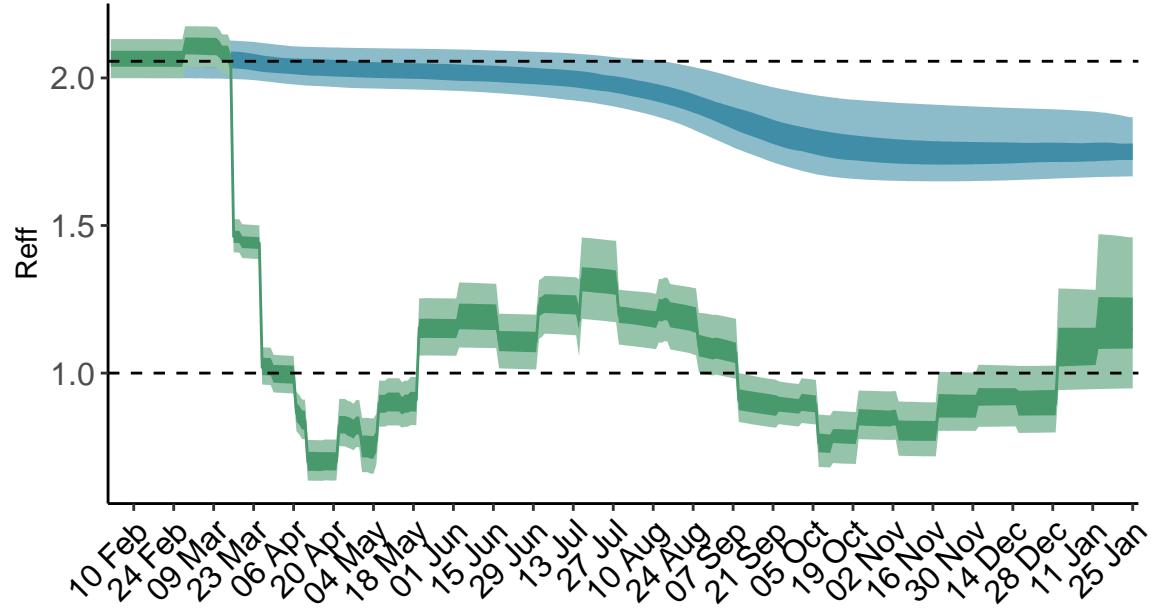


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

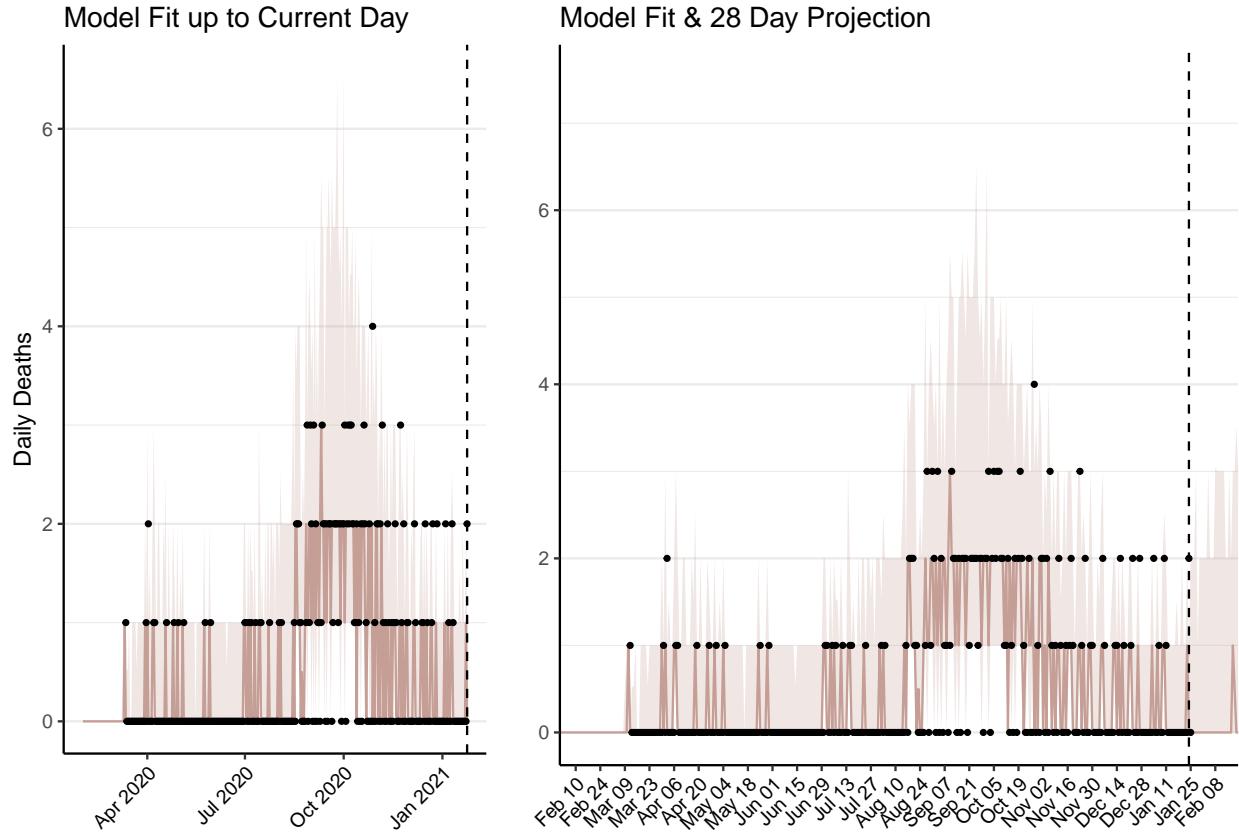


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 13 (95% CI: 12-15) patients requiring treatment with high-pressure oxygen at the current date to 33 (95% CI: 27-40) hospital beds being required on 2021-02-21 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: 5-6) patients requiring treatment with mechanical ventilation at the current date to 11 (95% CI: 9-14) by 2021-02-21. 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.**

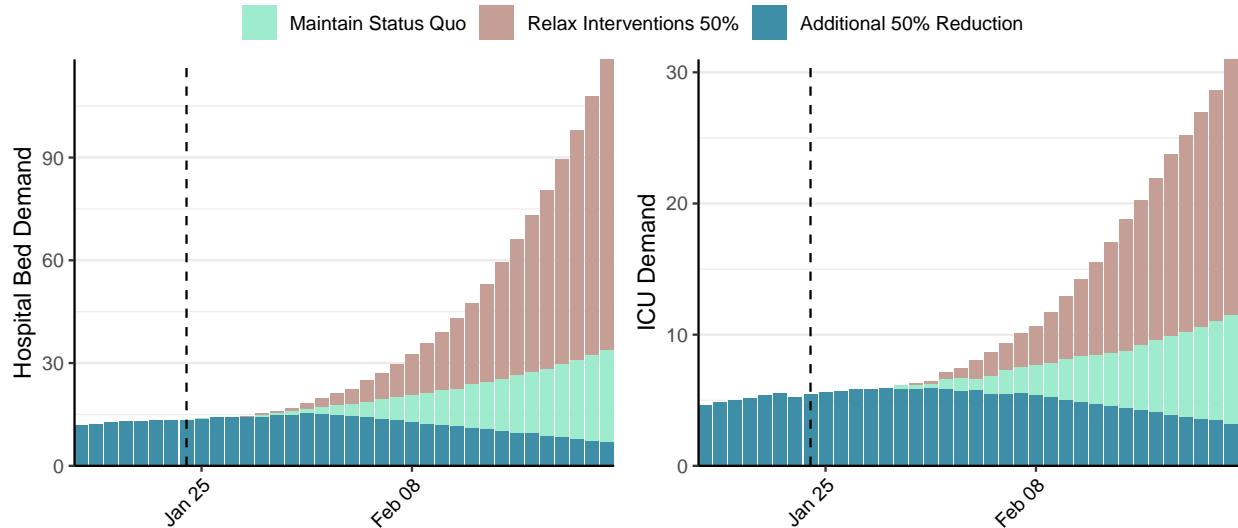


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 198 (95% CI: 173-223) at the current date to 36 (95% CI: 28-44) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 198 (95% CI: 173-223) at the current date to 2,992 (95% CI: 2,371-3,613) by 2021-02-21.

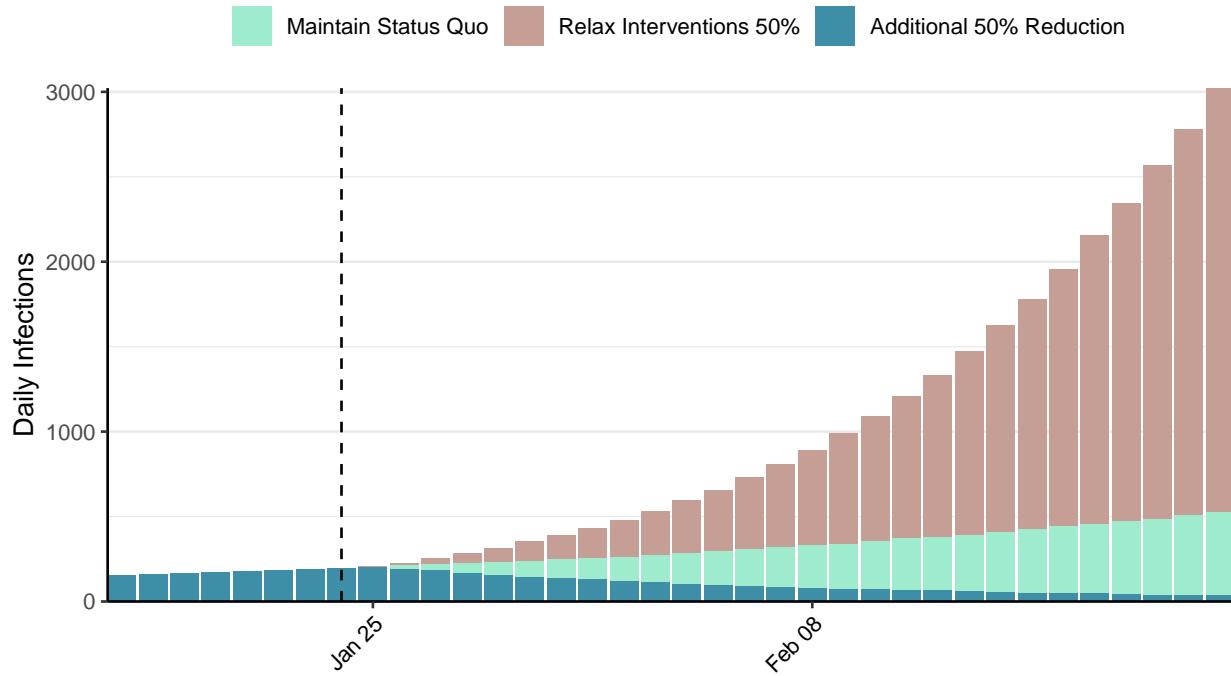


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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: Honduras, 2021-01-24

[Download the report for Honduras, 2021-01-24 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}
1,055	1,055	15	15	1.03 (95% CI: 0.76-1.23)

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.

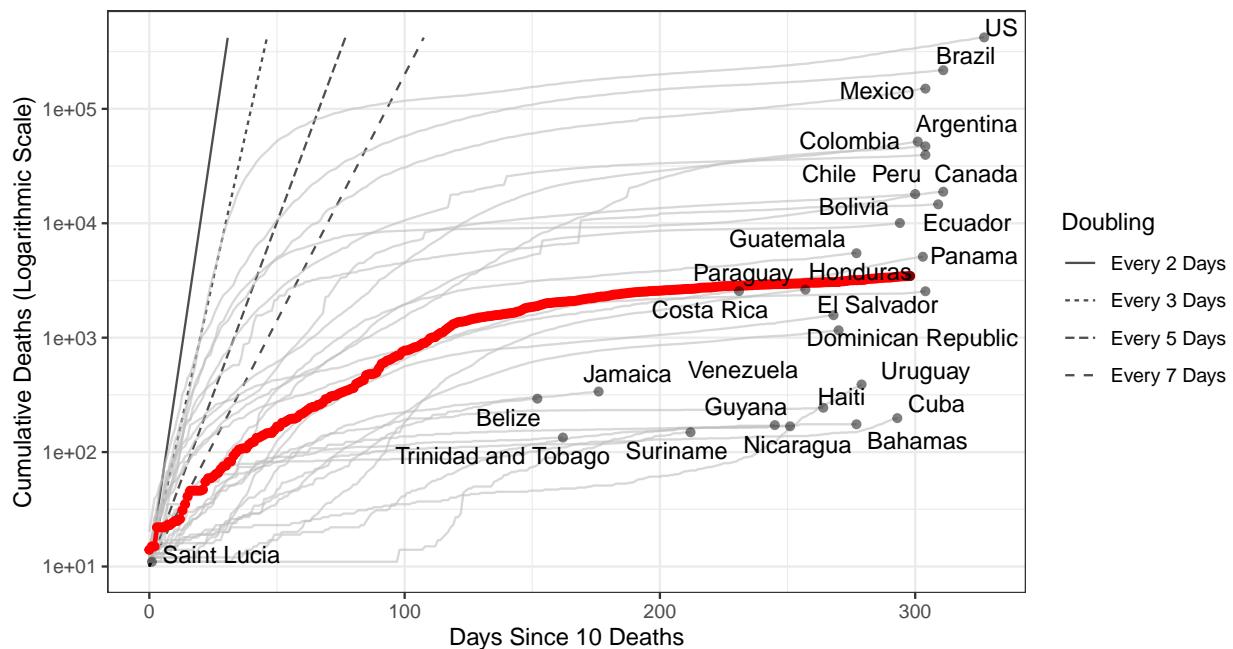


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 201,201 (95% CI: 190,544–211,857) 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). **N.B. Honduras has revised their historic reported cases and thus have reported negative cases.**

Plot on right zoomed in on reported cases

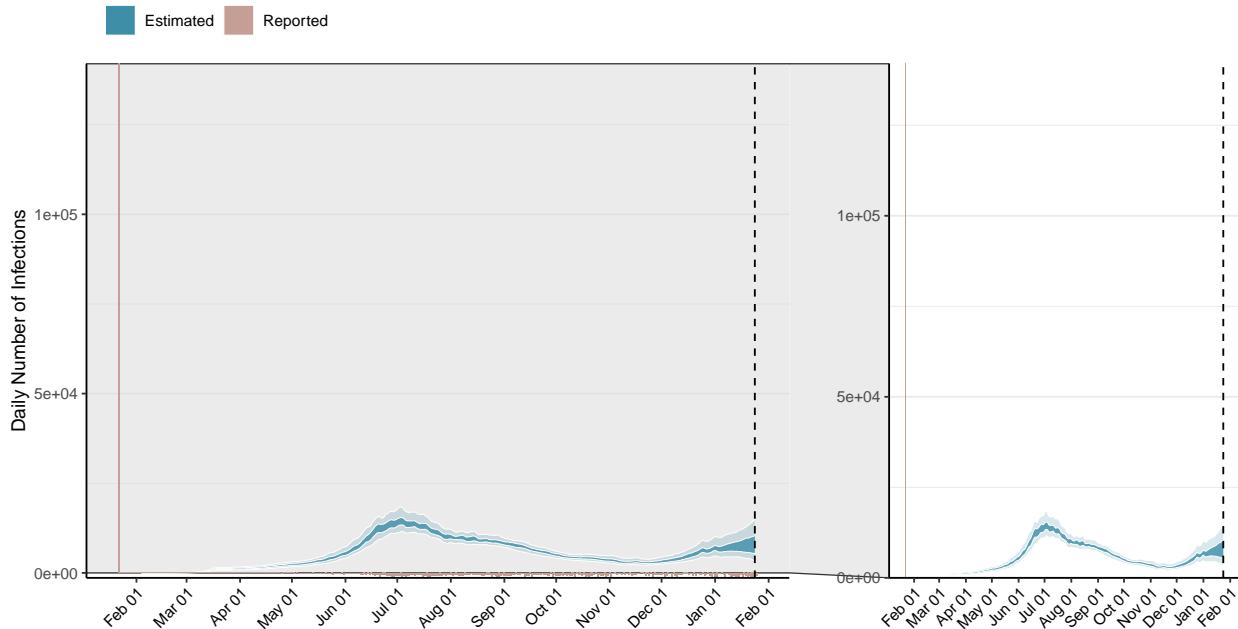


Figure 2: Daily number of infections estimated by fitting to the current total of deaths. Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

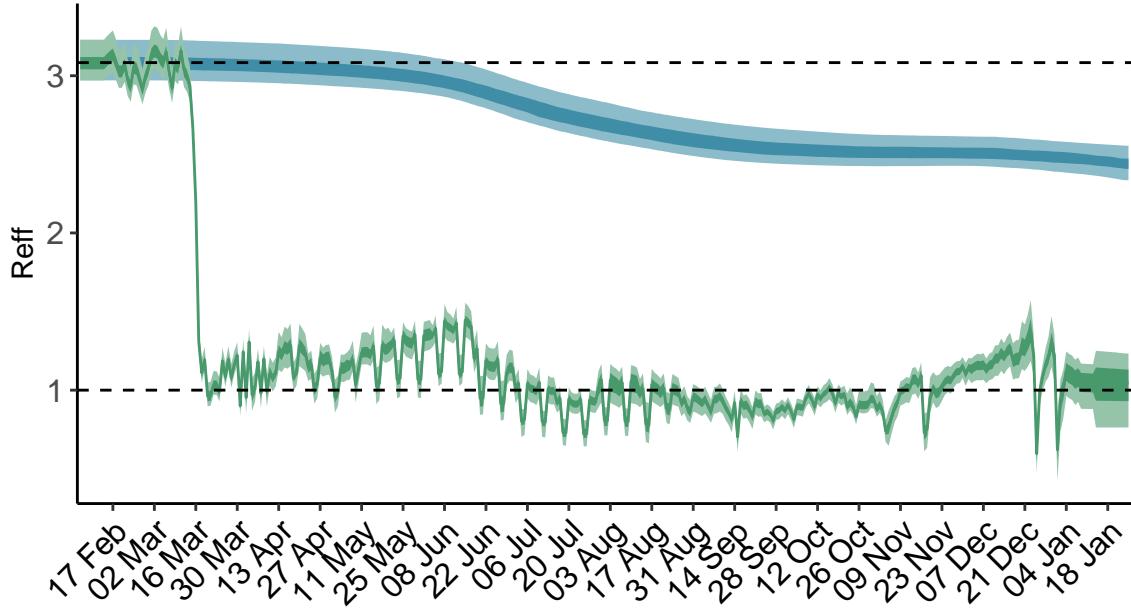


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

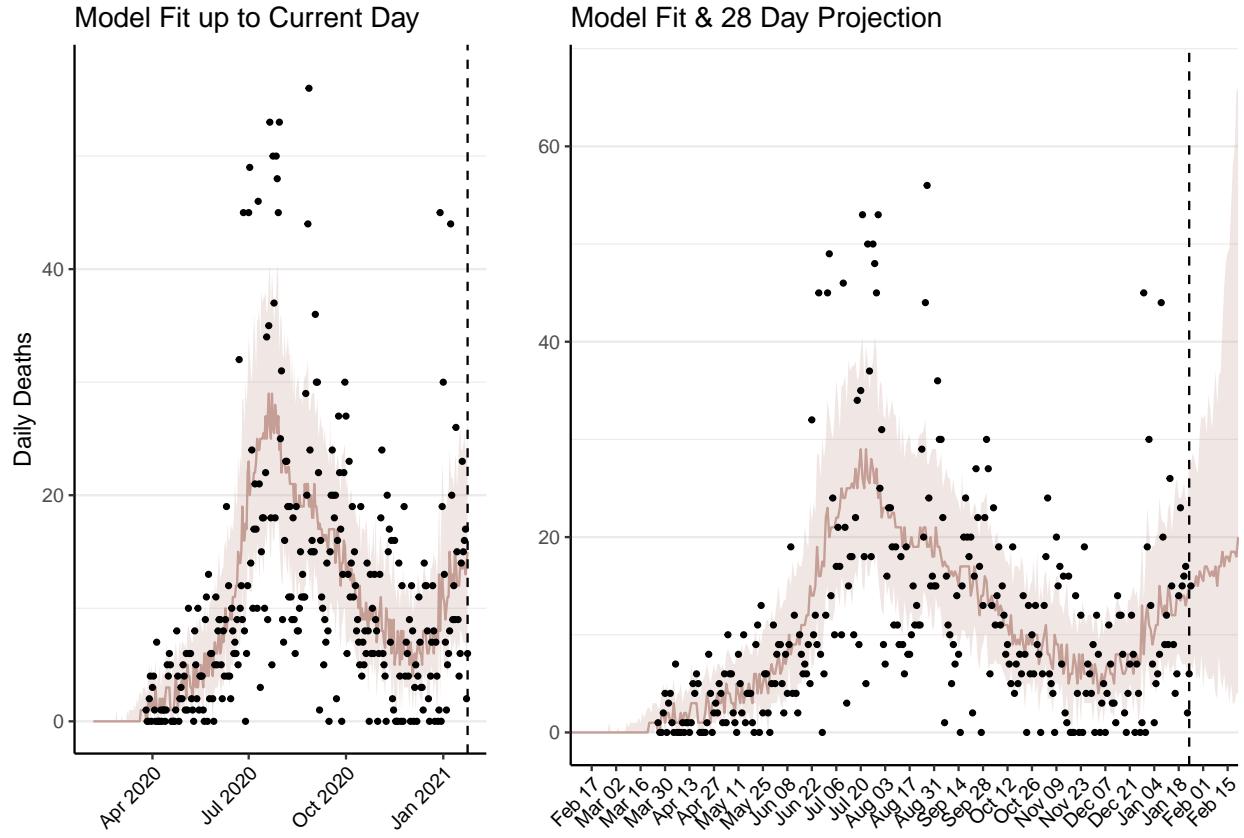


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 594 (95% CI: 561-627) patients requiring treatment with high-pressure oxygen at the current date to 811 (95% CI: 711-911) hospital beds being required on 2021-02-21 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 208 (95% CI: 196-219) patients requiring treatment with mechanical ventilation at the current date to 280 (95% CI: 250-311) by 2021-02-21. 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.**

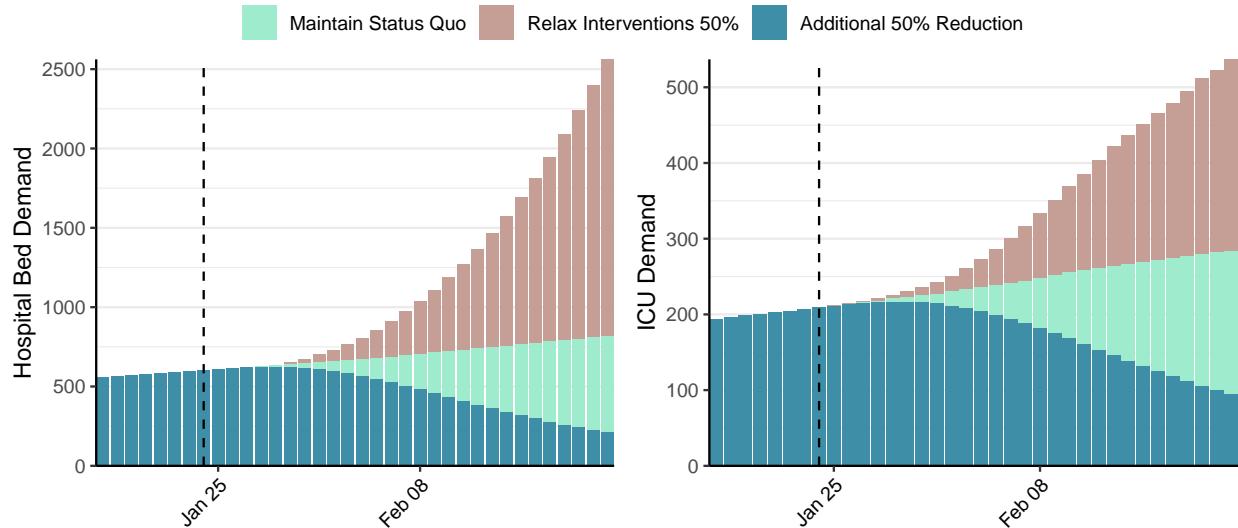


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 8,166 (95% CI: 7,514-8,818) at the current date to 915 (95% CI: 789-1,041) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 8,166 (95% CI: 7,514-8,818) at the current date to 55,083 (95% CI: 47,744-62,423) by 2021-02-21.

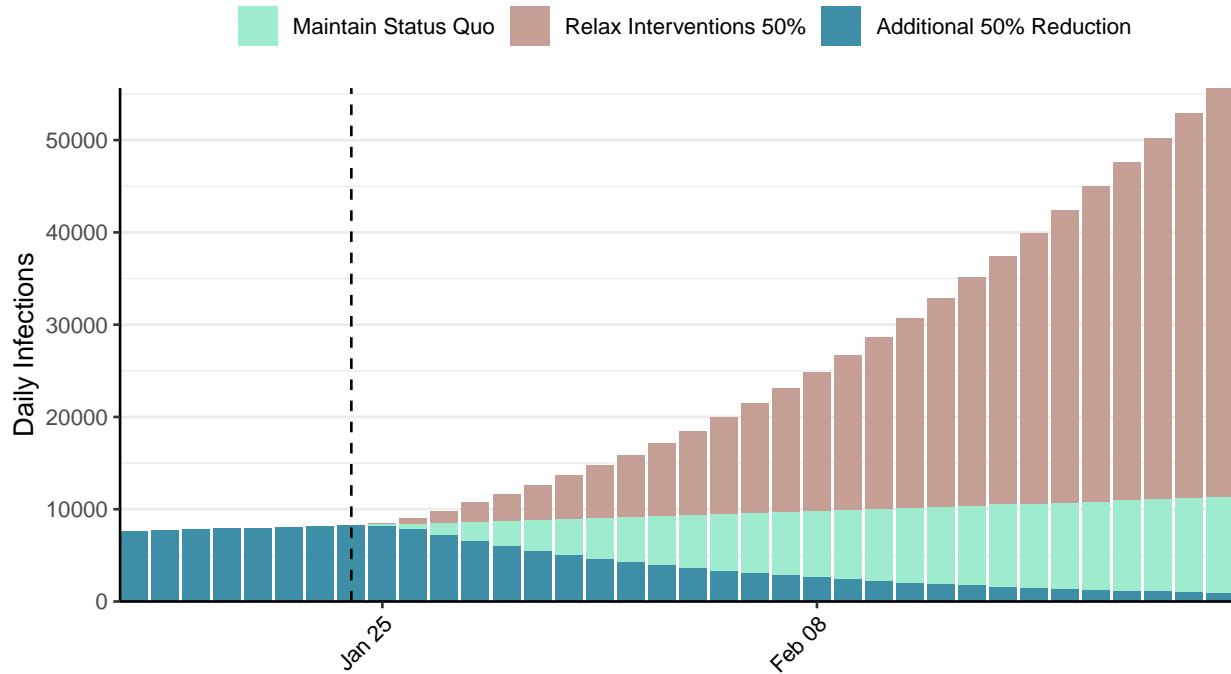


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Haiti, 2021-01-24 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	1.46 (95% CI: 1.14-1.83)

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. Haiti is not shown in the following plot as only 0 deaths have been reported to date**

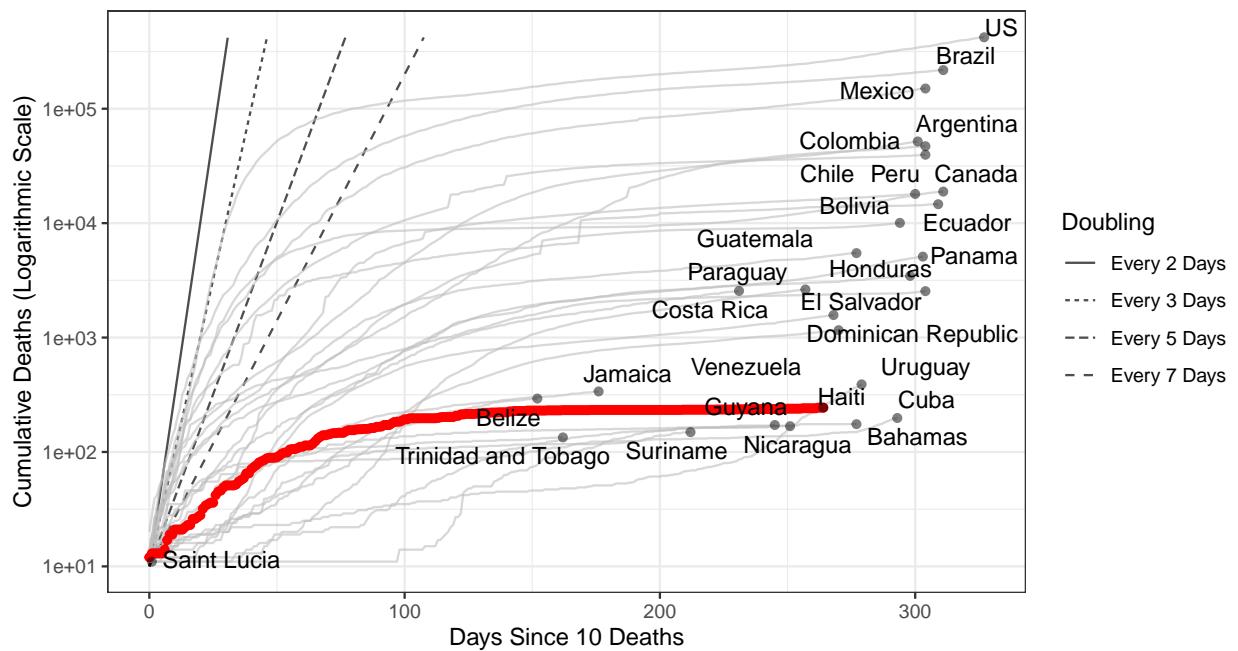


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 12,049 (95% CI: 10,930-13,168) 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

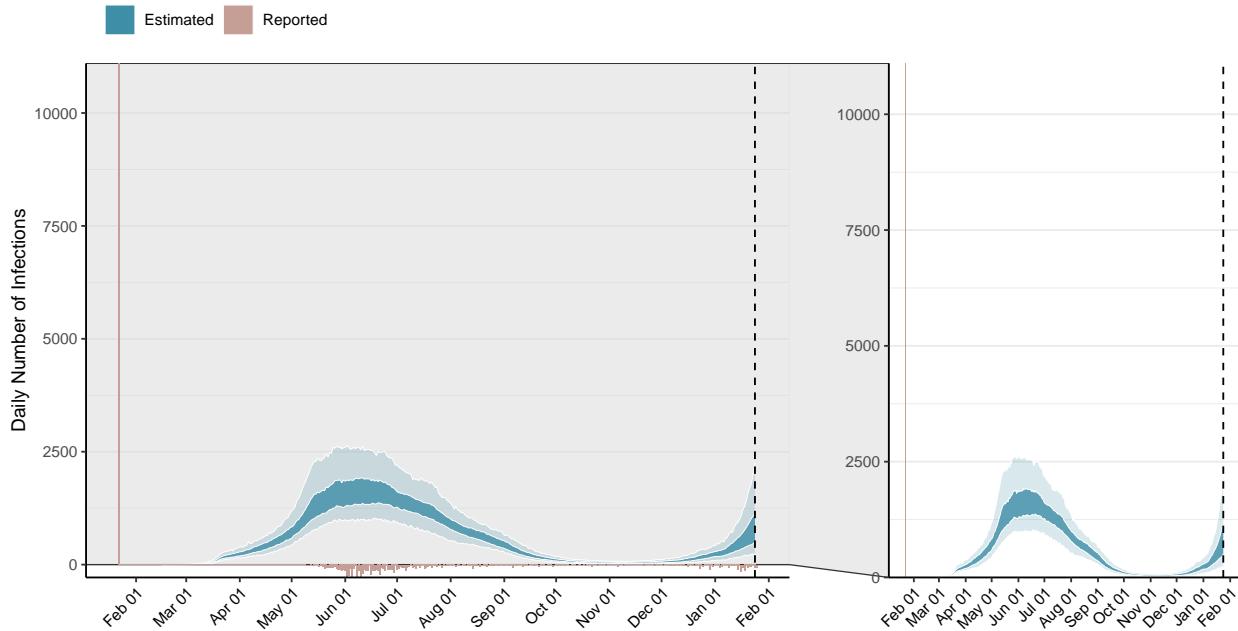


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

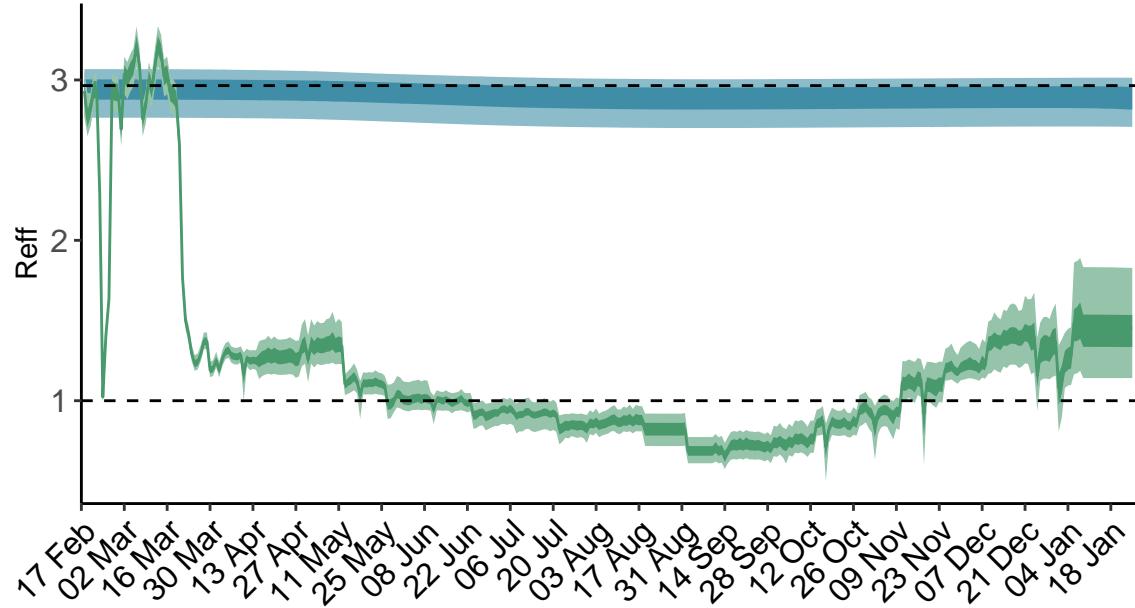


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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. Haiti 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.](#)

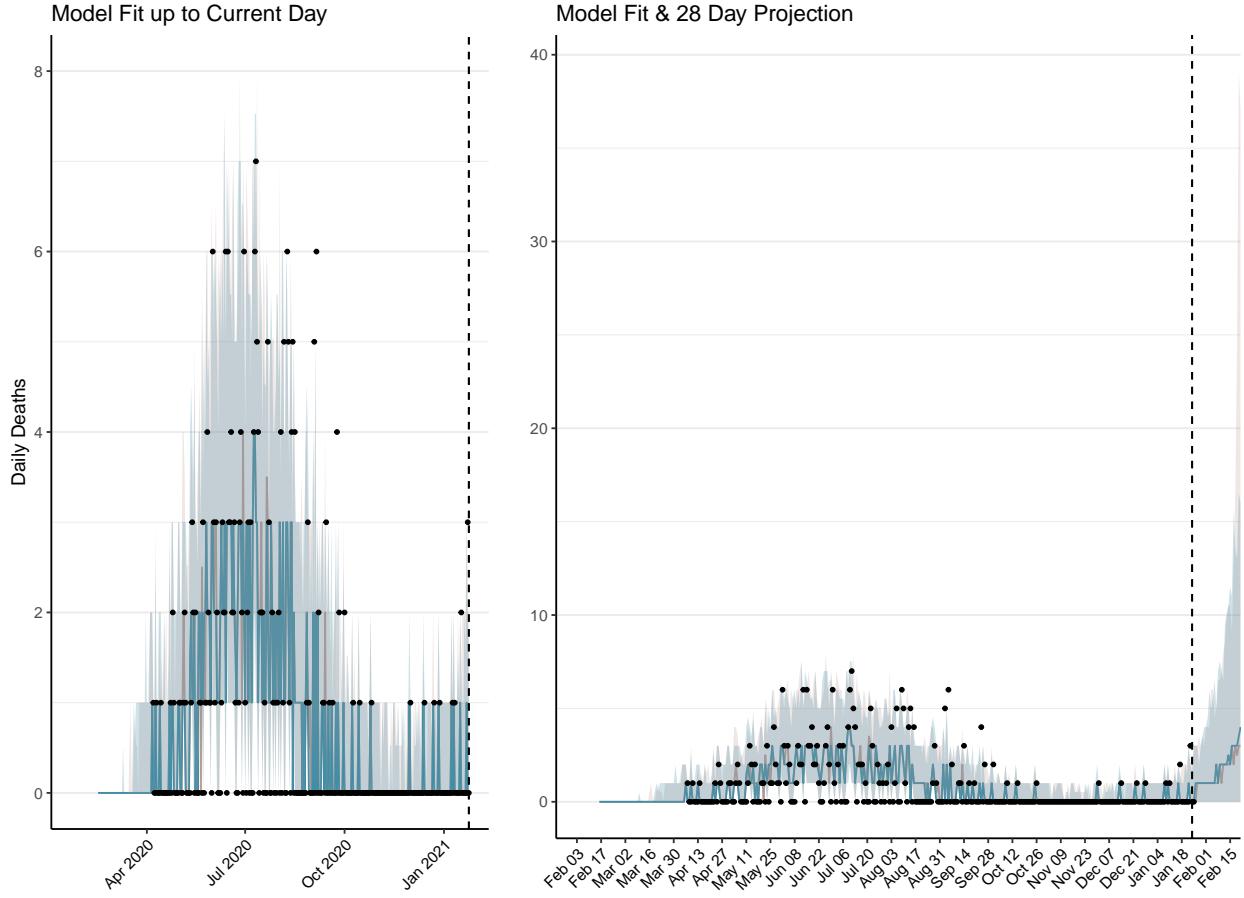


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 33 (95% CI: 30-37) patients requiring treatment with high-pressure oxygen at the current date to 234 (95% CI: 188-281) hospital beds being required on 2021-02-21 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 72 (95% CI: 59-84) by 2021-02-21. 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.**

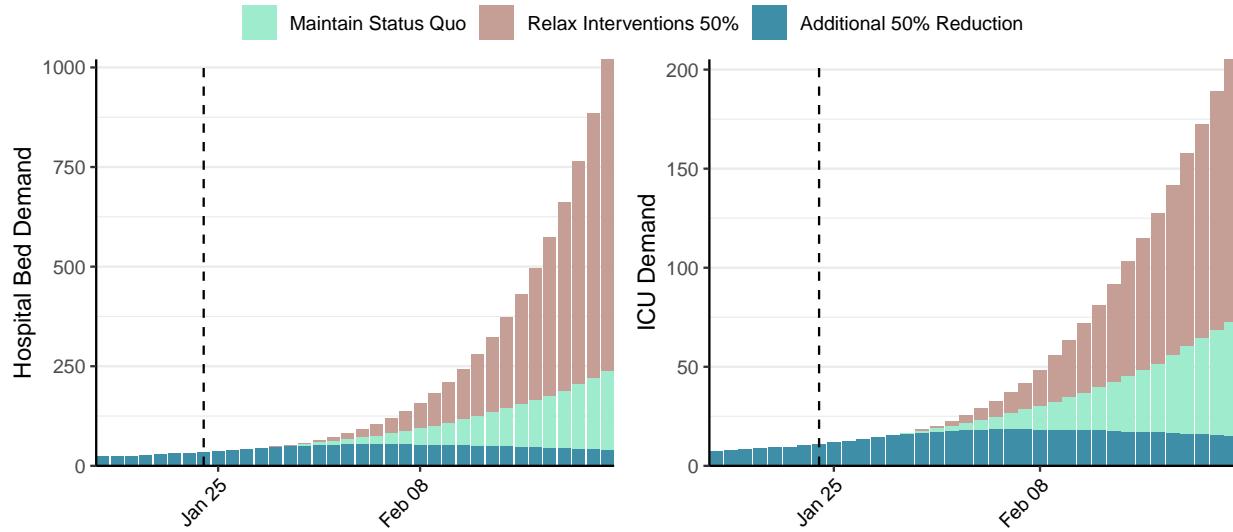


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 883 (95% CI: 777-990) at the current date to 359 (95% CI: 284-434) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 883 (95% CI: 777-990) at the current date to 44,800 (95% CI: 34,885-54,715) by 2021-02-21.

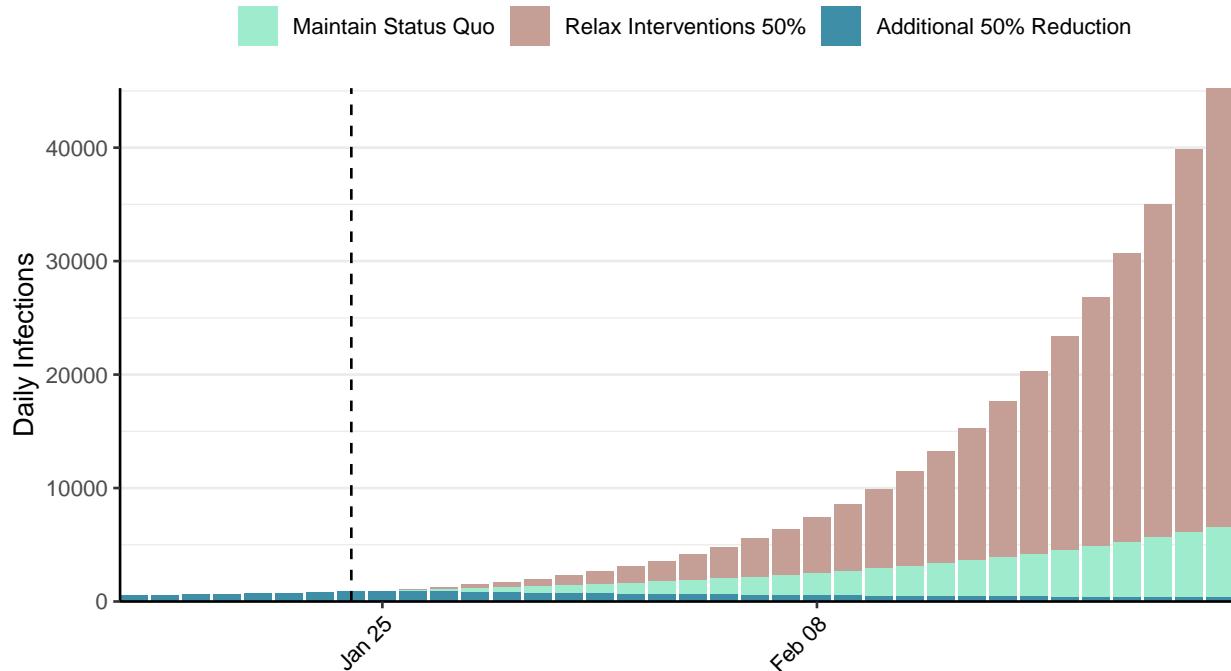


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Indonesia, 2021-01-24 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}
9,994	9,994	297	297	1.19 (95% CI: 1.02-1.42)

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.

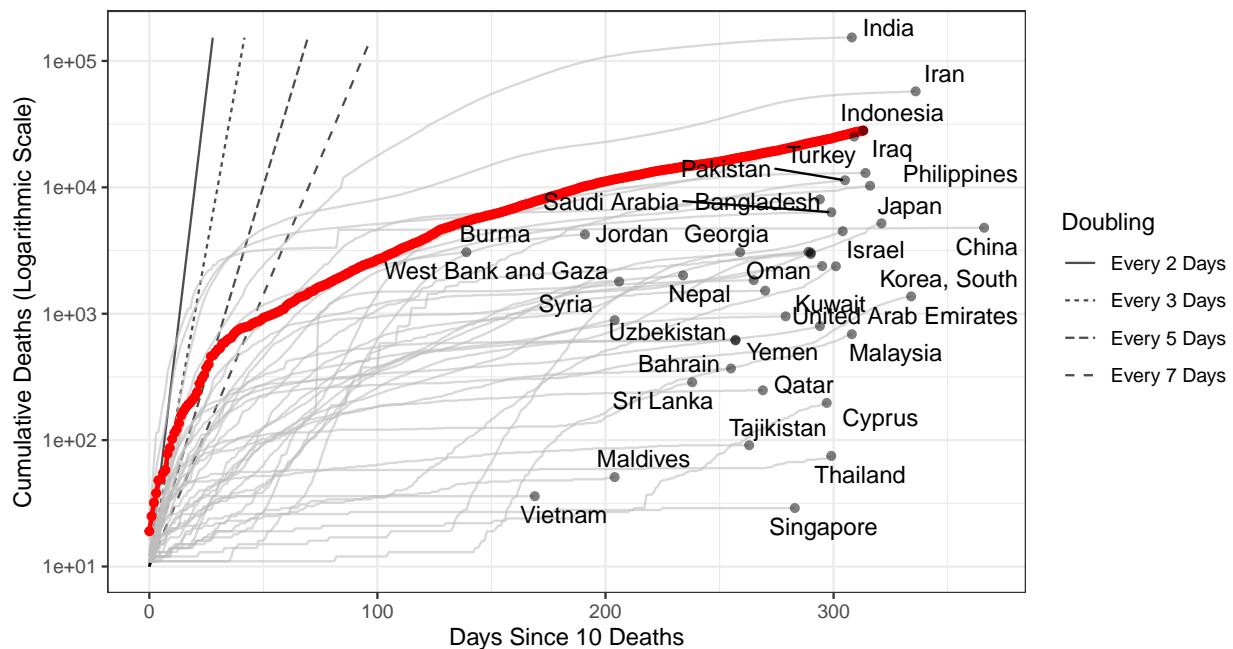


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 3,486,451 (95% CI: 3,375,299-3,597,603) 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

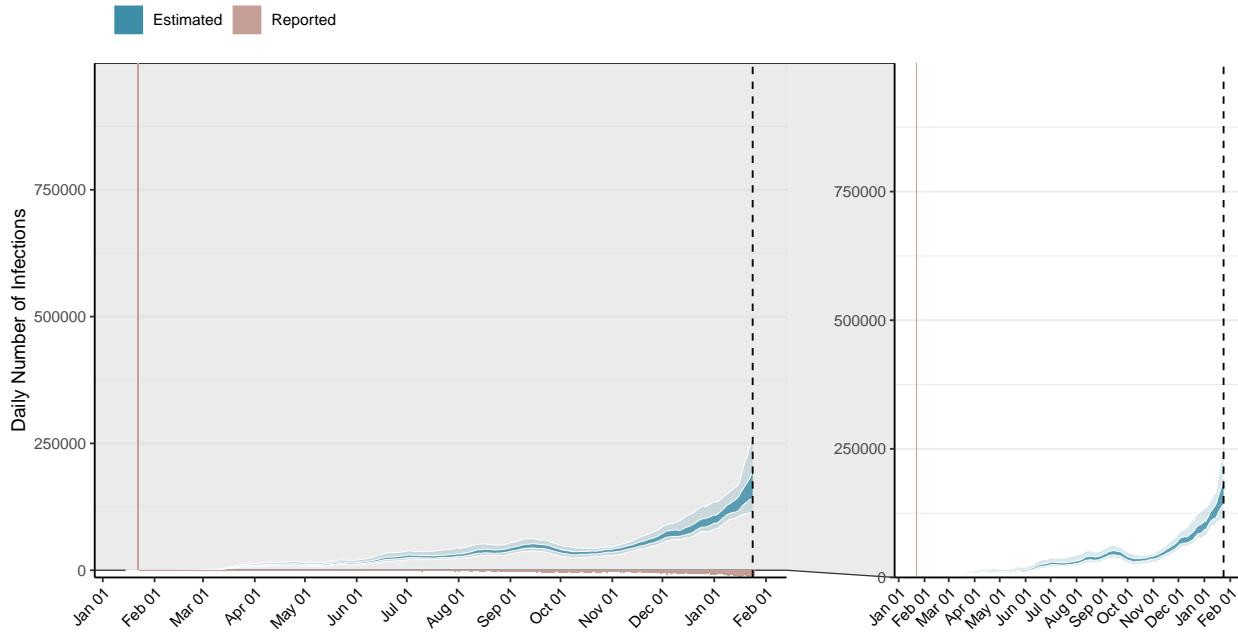


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

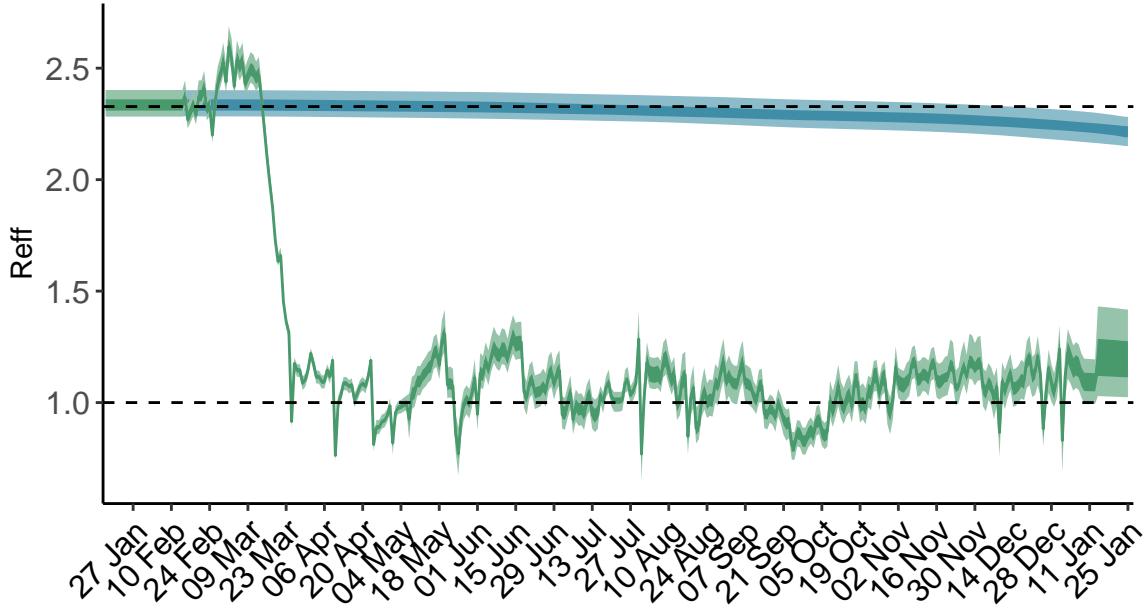


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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. 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.](#)

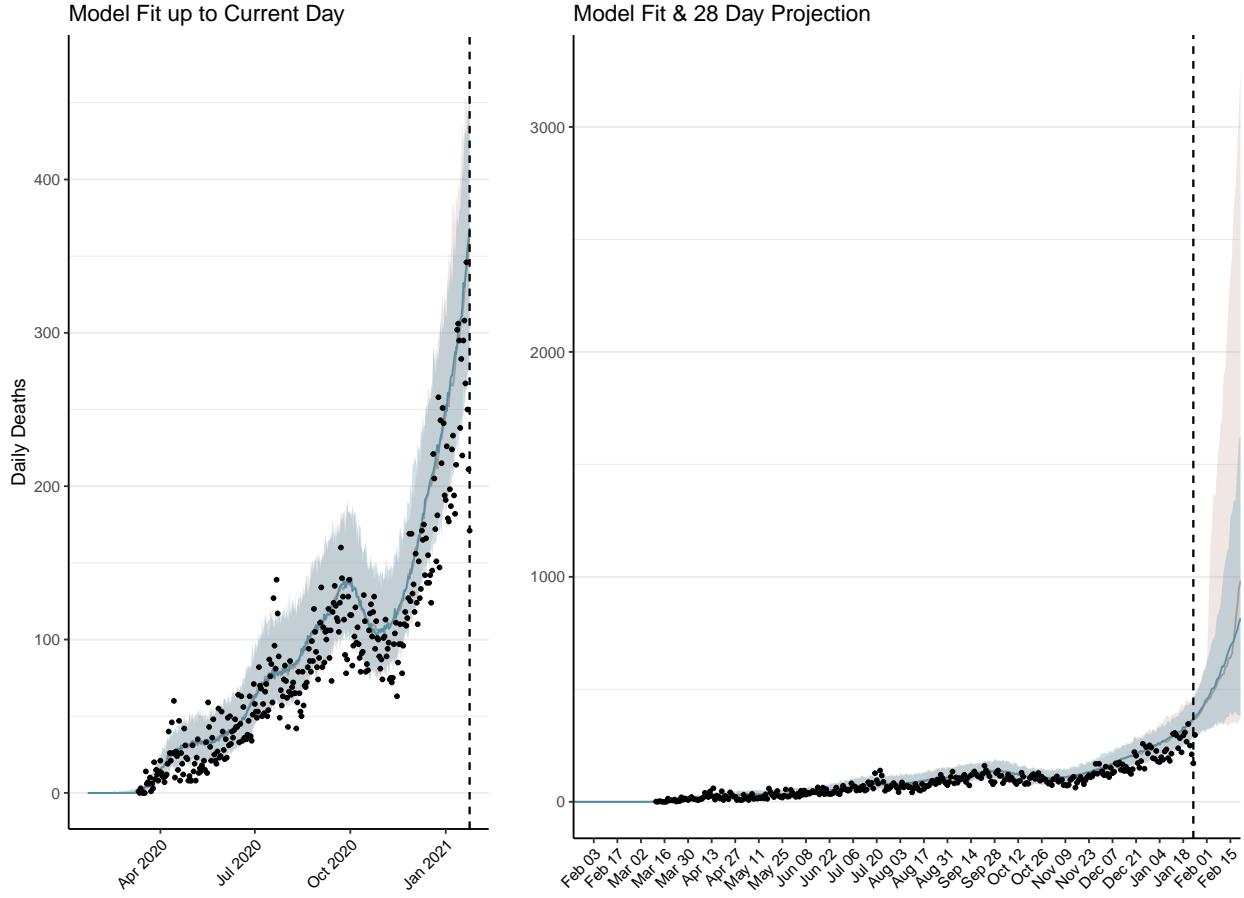


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 15,539 (95% CI: 15,026-16,051) patients requiring treatment with high-pressure oxygen at the current date to 34,922 (95% CI: 31,455-38,389) hospital beds being required on 2021-02-21 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 5,906 (95% CI: 5,720-6,092) patients requiring treatment with mechanical ventilation at the current date to 10,175 (95% CI: 9,708-10,642) by 2021-02-21. 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.

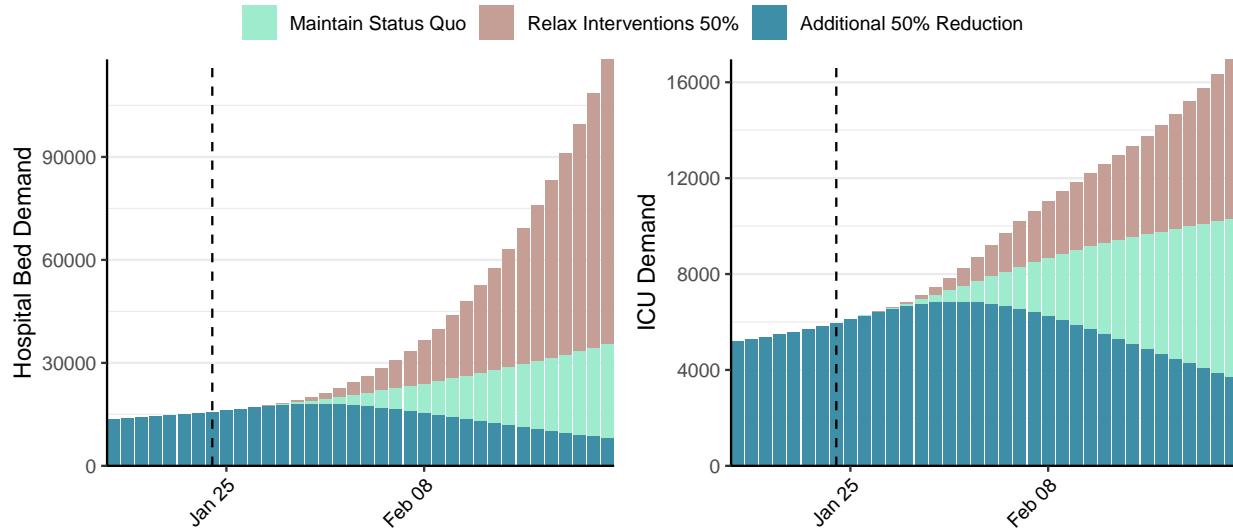


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 171,468 (95% CI: 163,096-179,840) at the current date to 29,140 (95% CI: 25,712-32,569) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 171,468 (95% CI: 163,096-179,840) at the current date to 2,148,933 (95% CI: 1,905,200-2,392,666) by 2021-02-21.

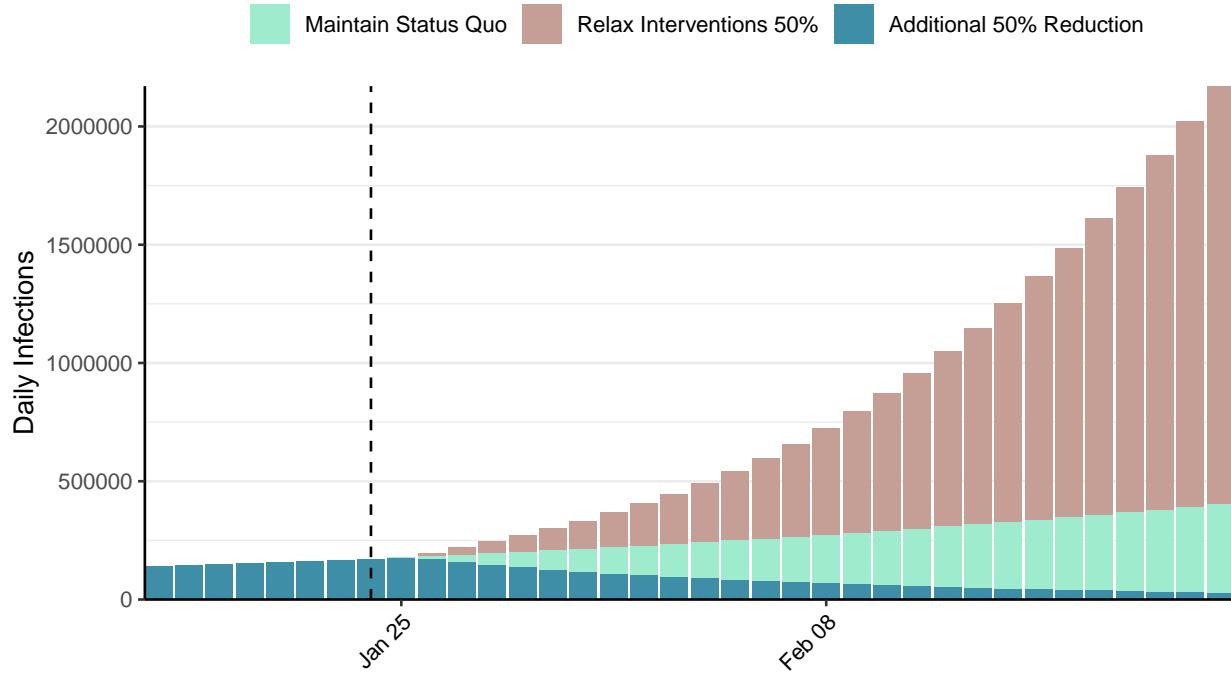


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for India, 2021-01-24 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}
9,102	9,102	117	117	0.91 (95% CI: 0.71-1.11)

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.

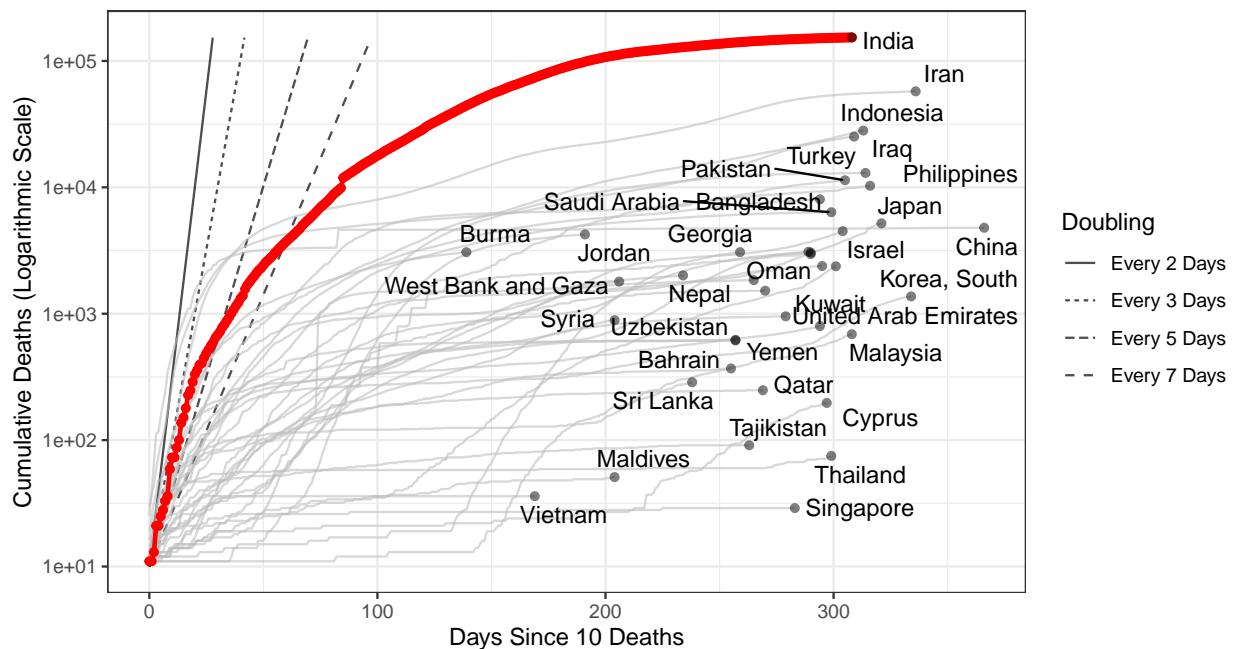


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 1,427,643 (95% CI: 1,363,510-1,491,777) 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

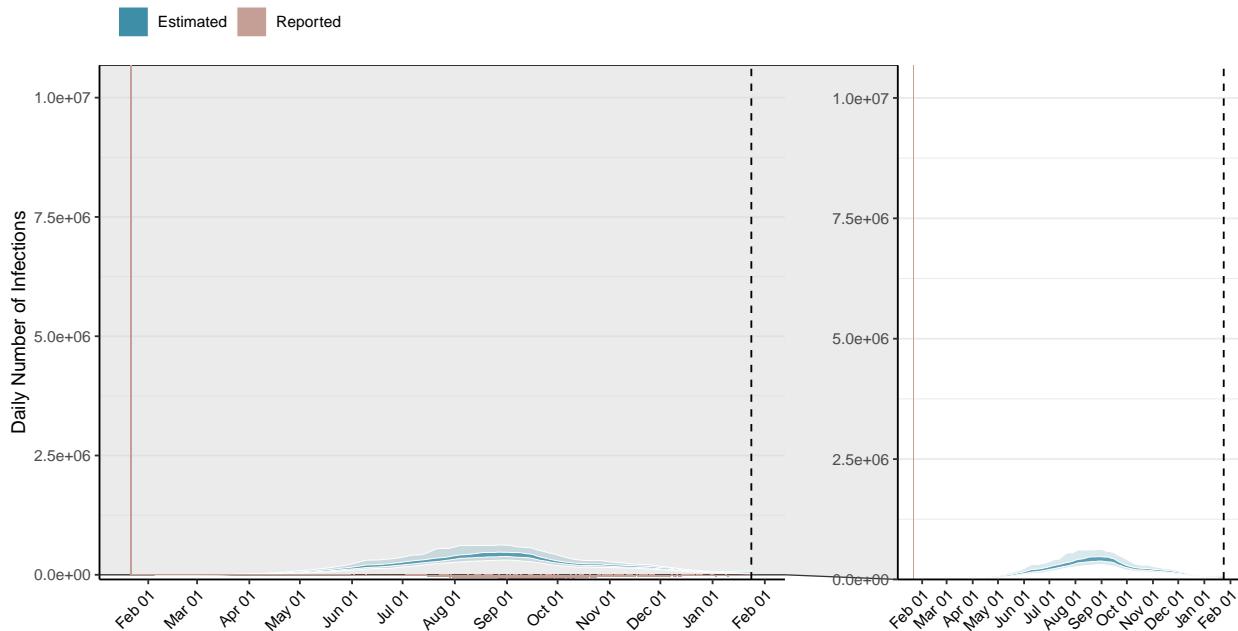


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

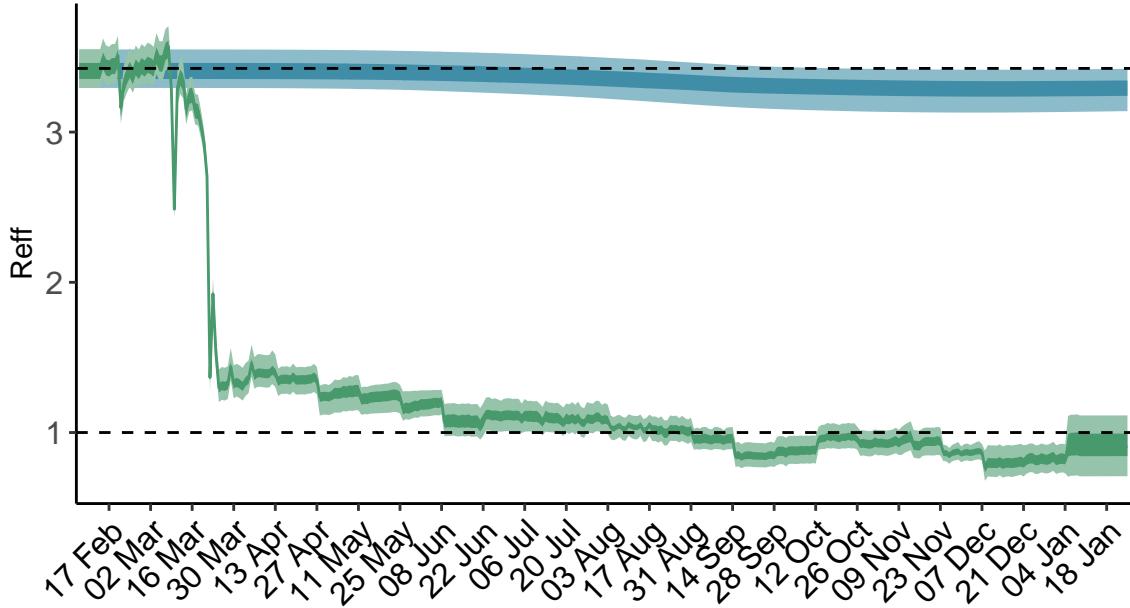


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

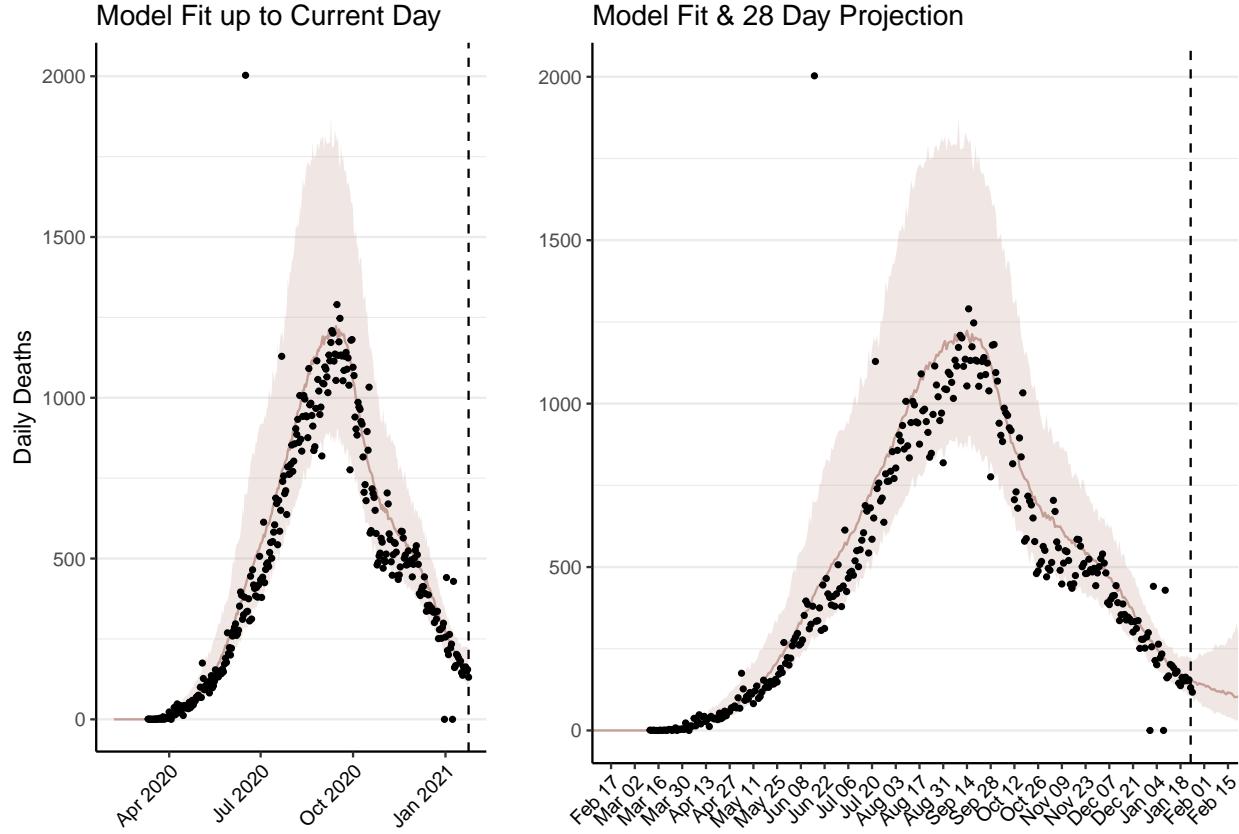


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 5,576 (95% CI: 5,296-5,856) patients requiring treatment with high-pressure oxygen at the current date to 4,511 (95% CI: 3,892-5,131) hospital beds being required on 2021-02-21 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 2,319 (95% CI: 2,216-2,421) patients requiring treatment with mechanical ventilation at the current date to 1,810 (95% CI: 1,581-2,038) by 2021-02-21. 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.**

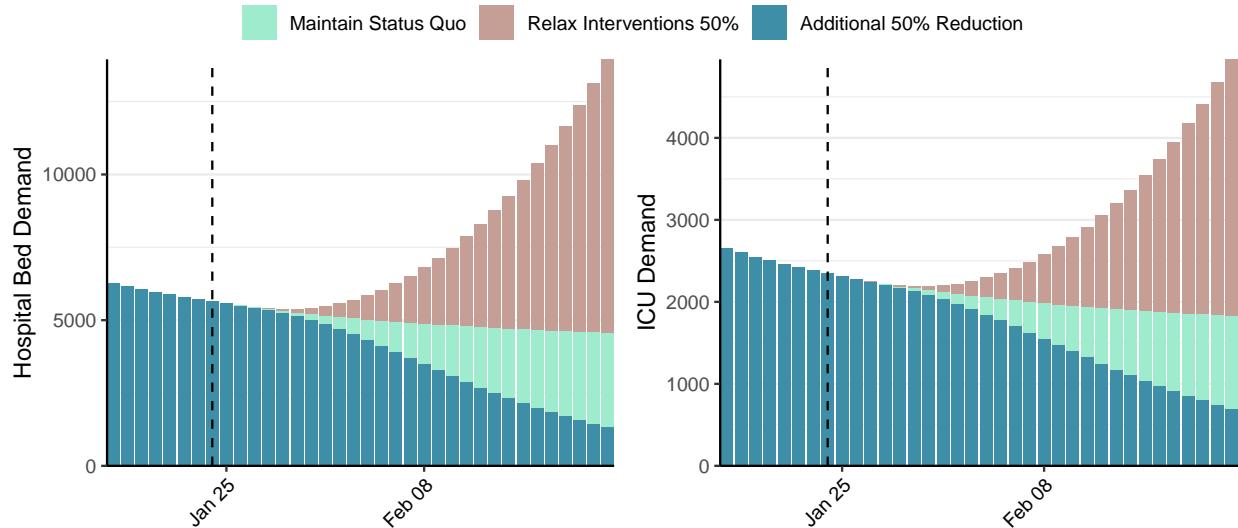


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 43,627 (95% CI: 39,937-47,318) at the current date to 3,290 (95% CI: 2,775-3,805) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 43,627 (95% CI: 39,937-47,318) at the current date to 226,495 (95% CI: 184,116-268,875) by 2021-02-21.

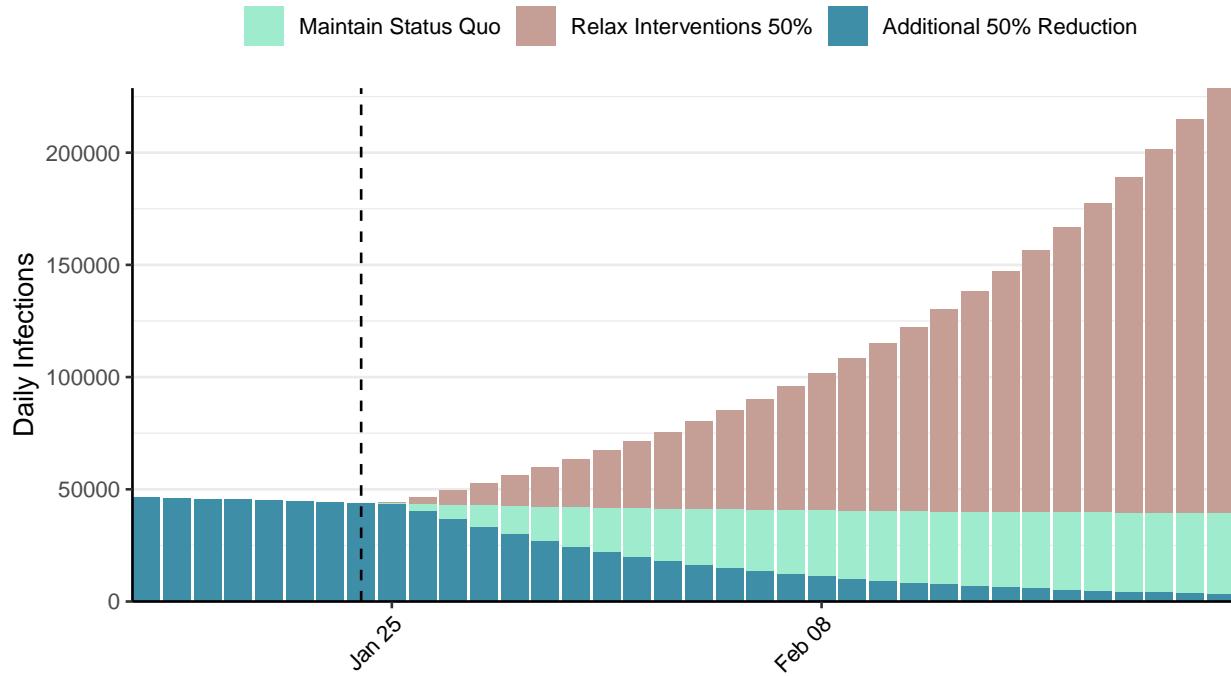


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Iraq, 2021-01-24 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}
813	813	7	7	0.9 (95% CI: 0.77-1.11)

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. Iraq is not shown in the following plot as only 7 deaths have been reported to date**

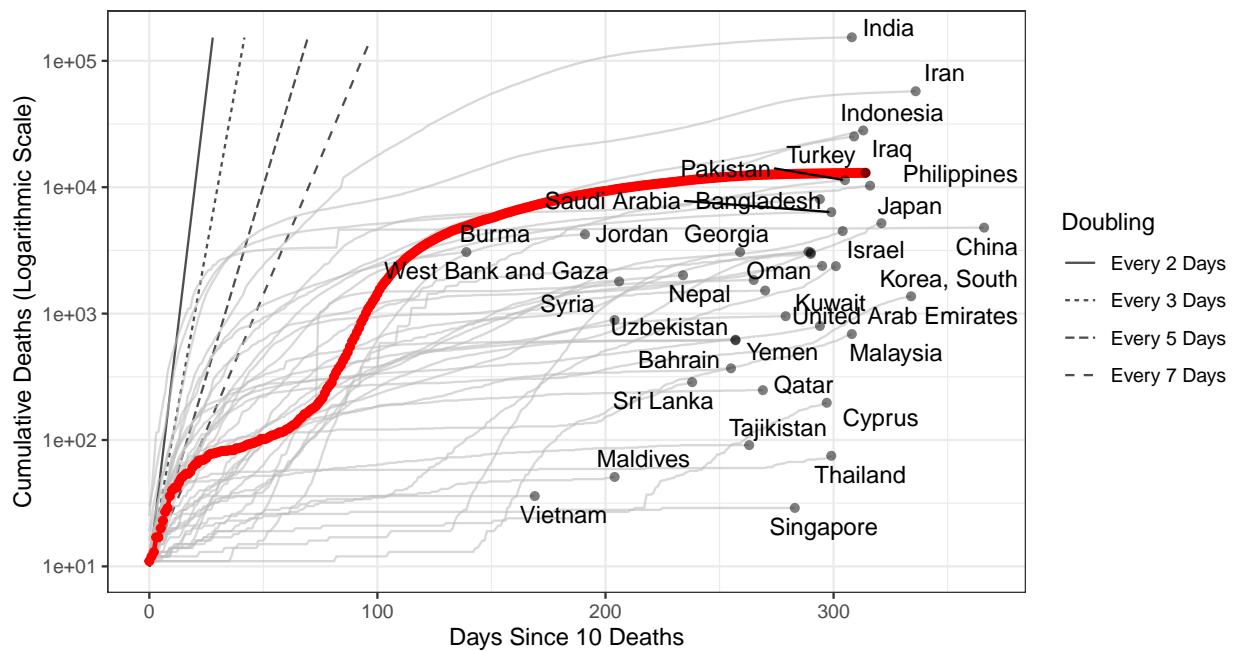


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 47,303 (95% CI: 43,960-50,647) 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

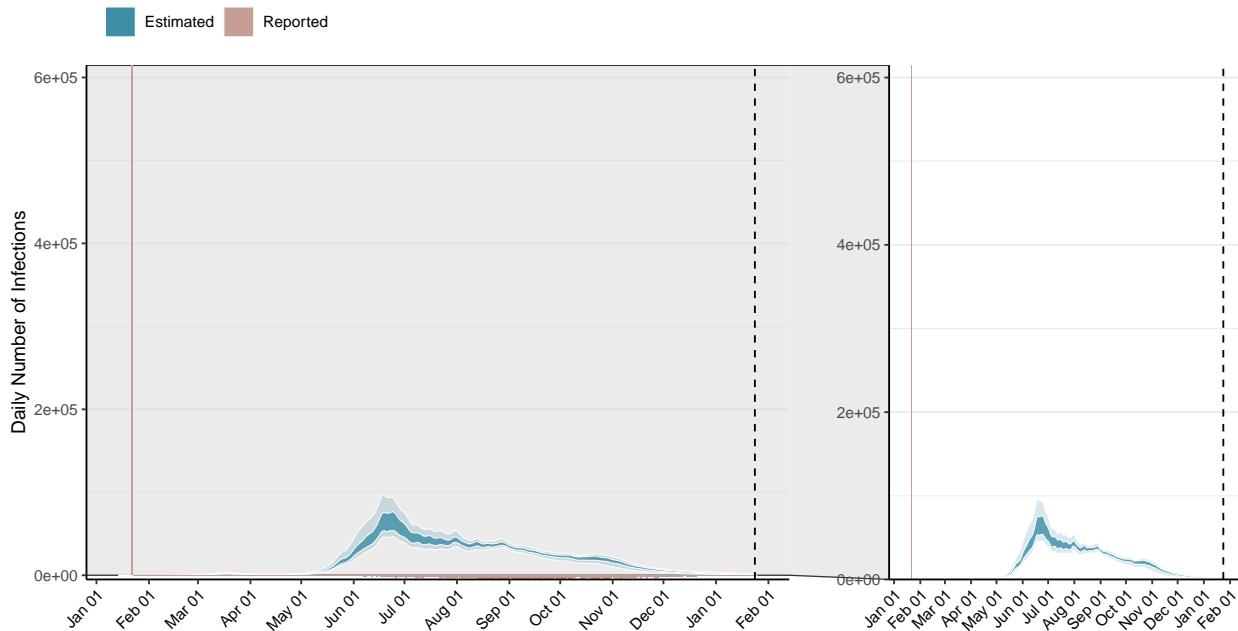


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

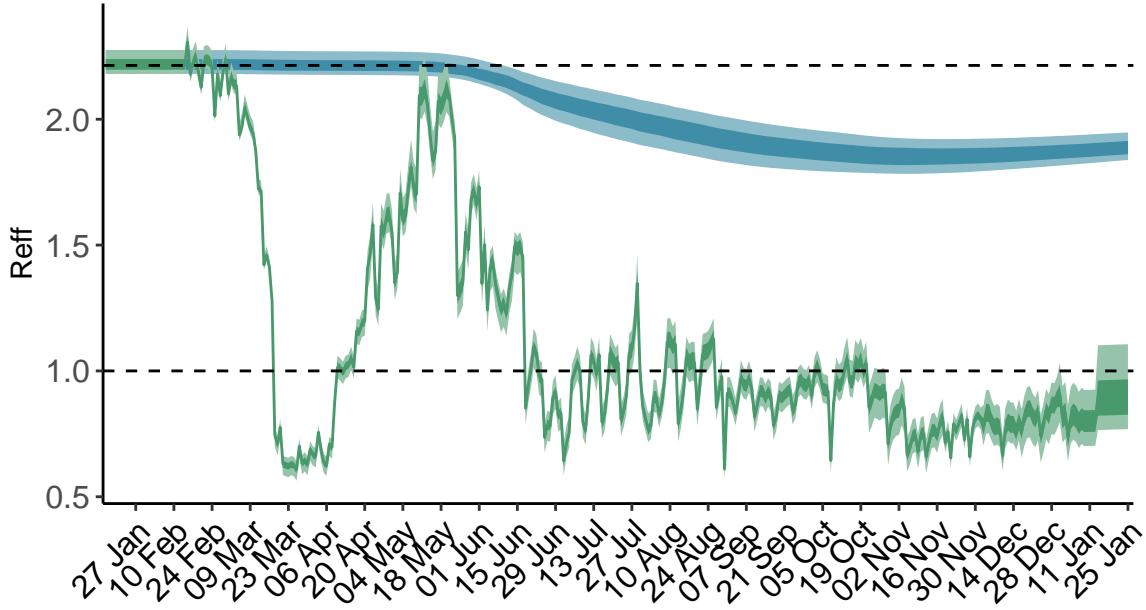


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

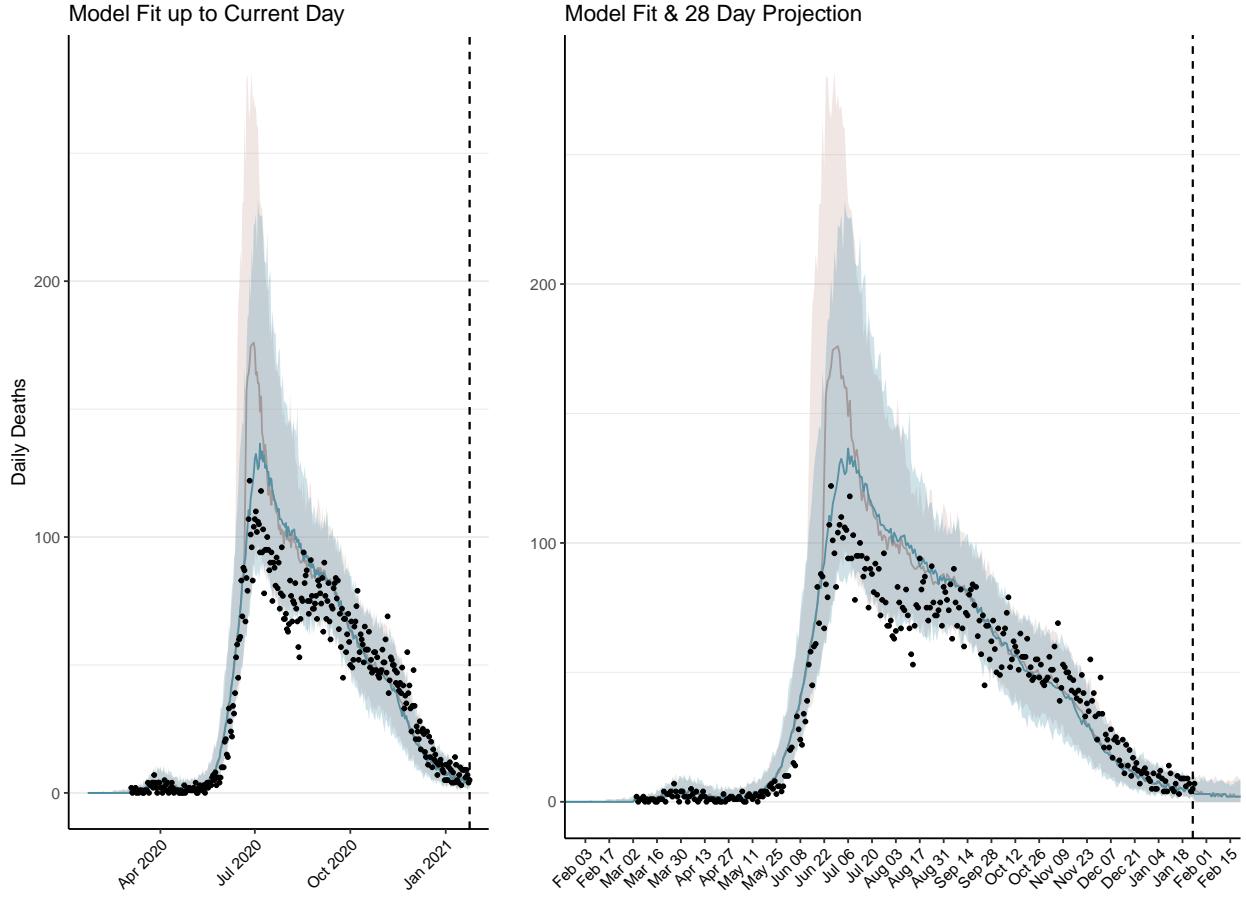


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 154 (95% CI: 142-167) patients requiring treatment with high-pressure oxygen at the current date to 112 (95% CI: 96-128) hospital beds being required on 2021-02-21 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 64 (95% CI: 60-69) patients requiring treatment with mechanical ventilation at the current date to 44 (95% CI: 38-51) by 2021-02-21. 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.**

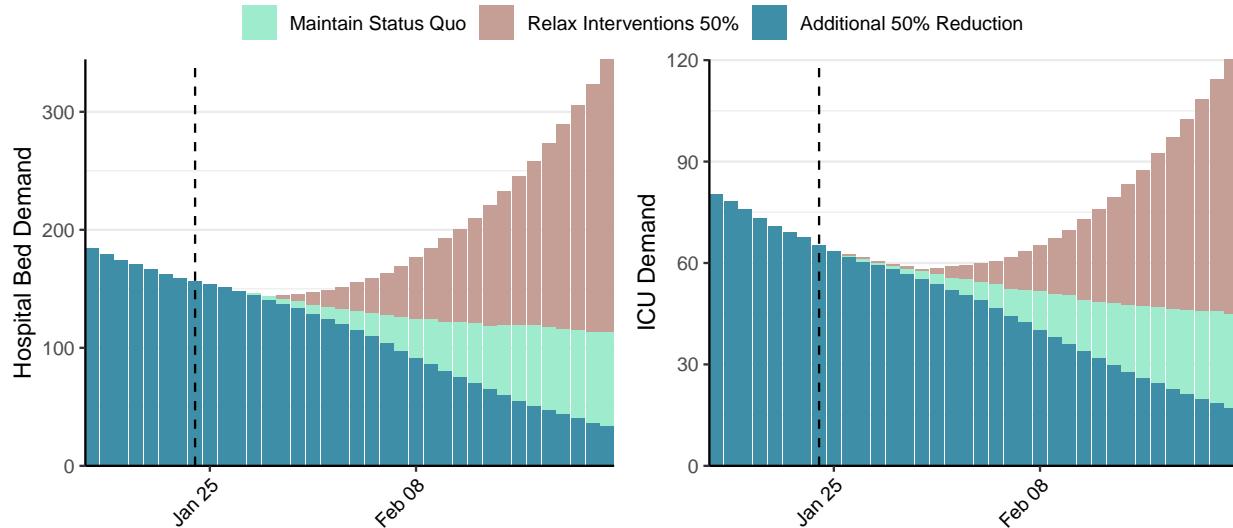


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 1,314 (95% CI: 1,188-1,440) at the current date to 94 (95% CI: 79-108) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,314 (95% CI: 1,188-1,440) at the current date to 6,323 (95% CI: 5,152-7,494) by 2021-02-21.

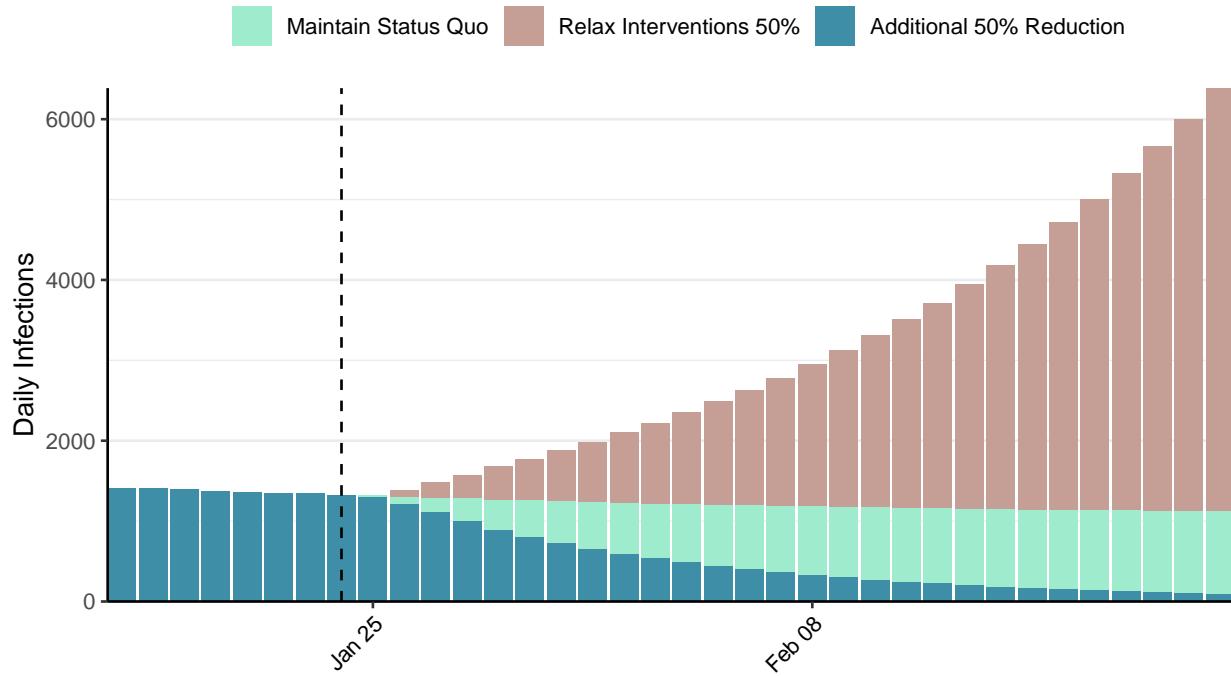


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Jamaica, 2021-01-24 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}
133	133	2	2	1.12 (95% CI: 0.95-1.3)

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. Jamaica is not shown in the following plot as only 2 deaths have been reported to date**

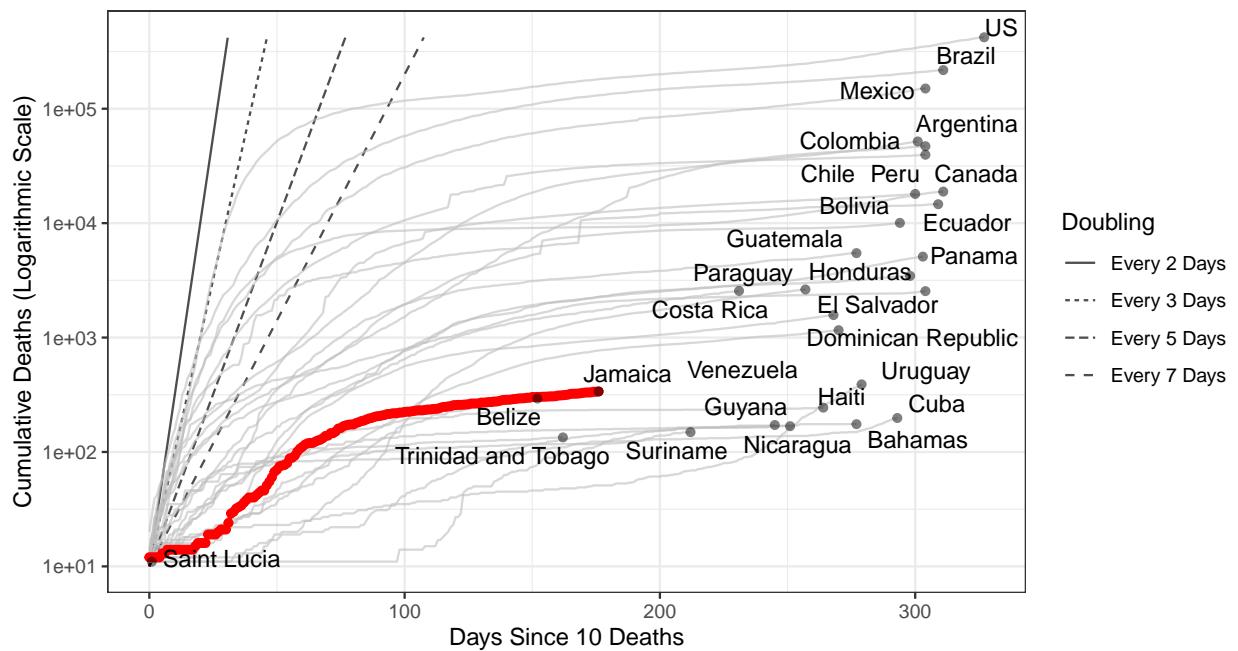


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 24,594 (95% CI: 23,181-26,006) 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

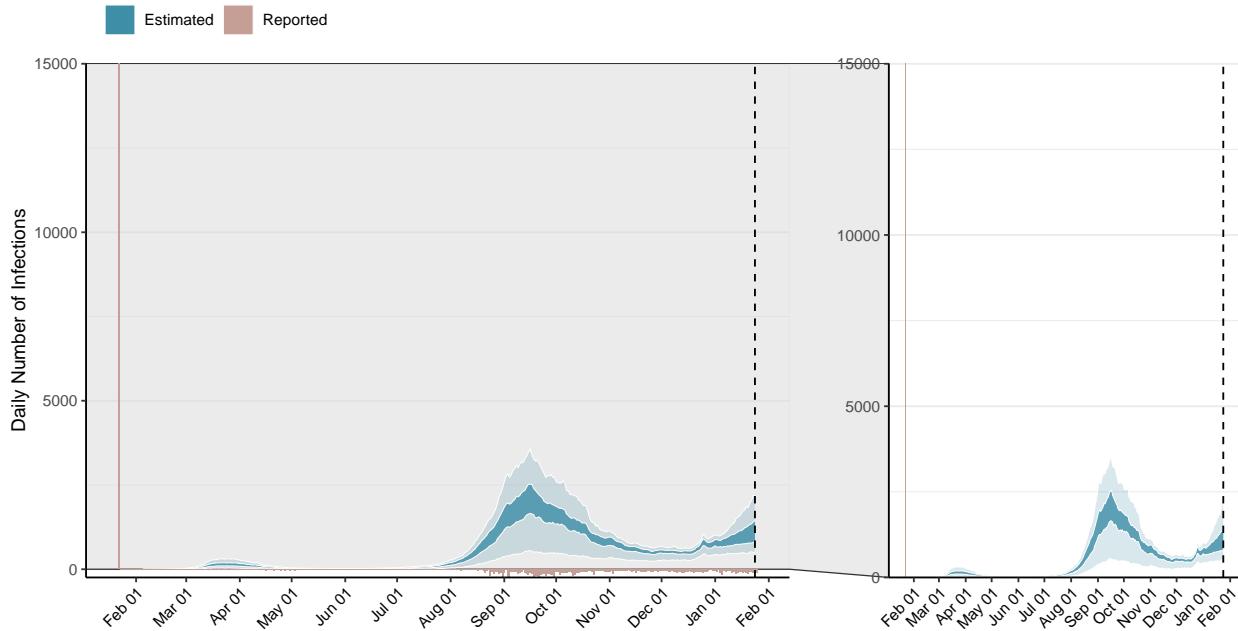


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

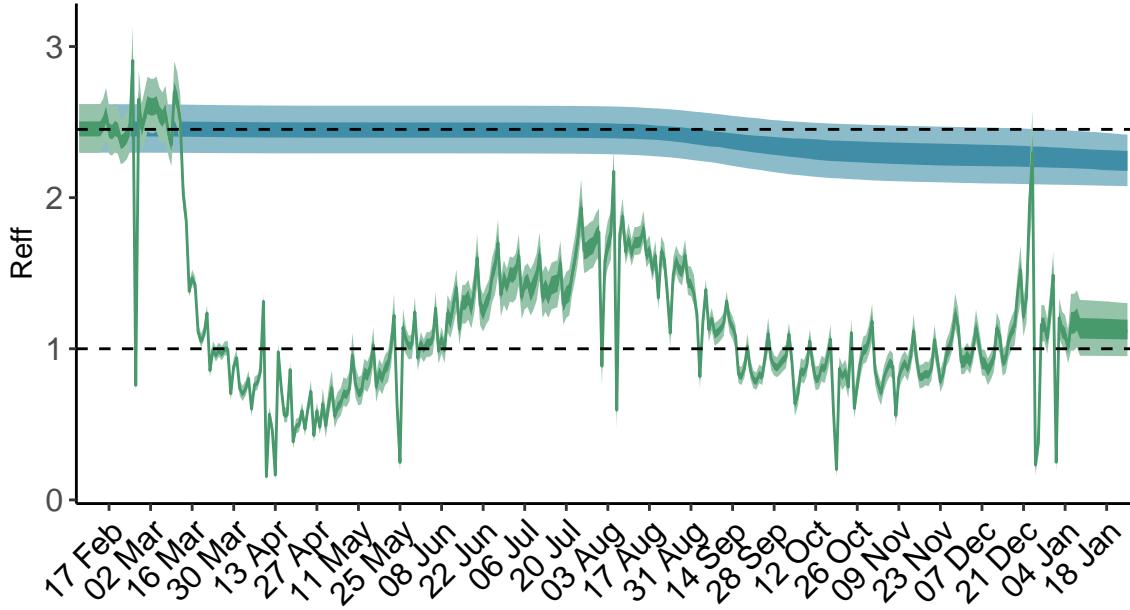


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

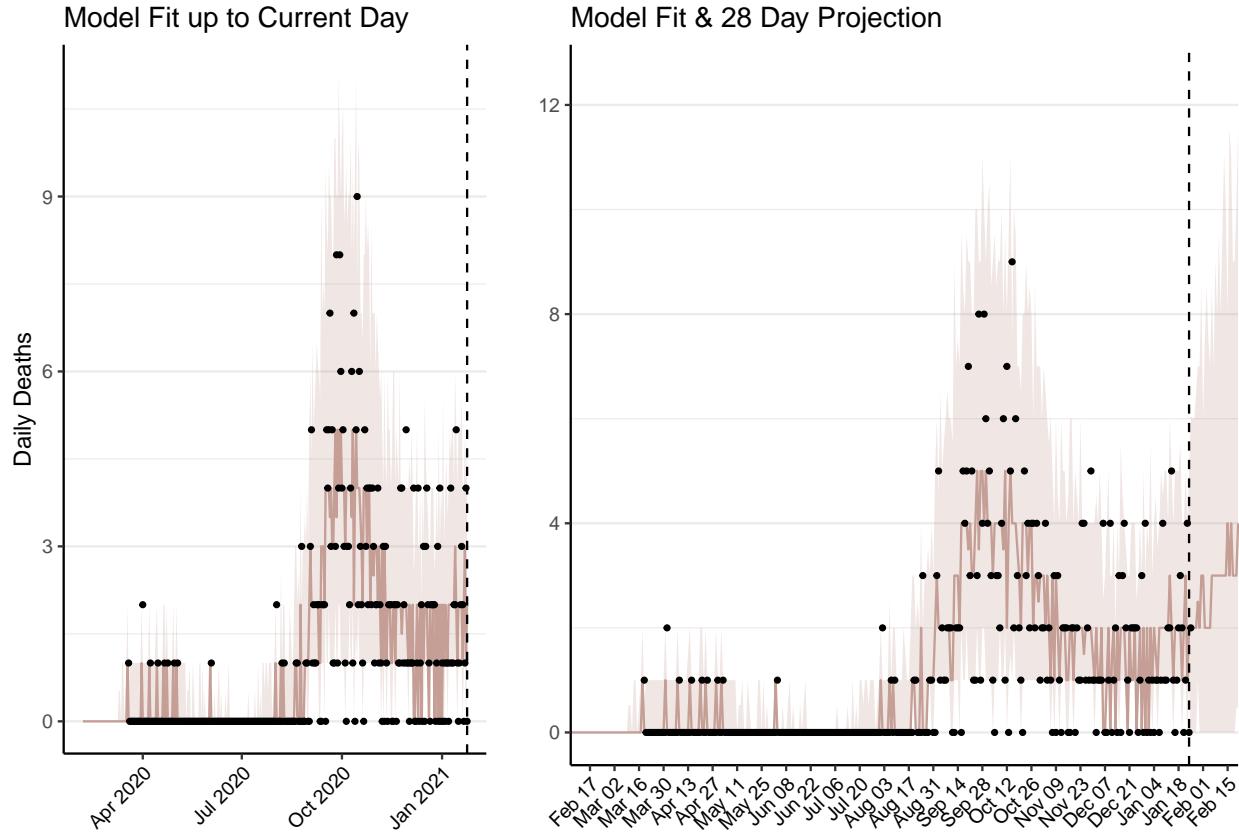


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 90 (95% CI: 84-95) patients requiring treatment with high-pressure oxygen at the current date to 164 (95% CI: 143-185) hospital beds being required on 2021-02-21 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 31 (95% CI: 29-33) patients requiring treatment with mechanical ventilation at the current date to 56 (95% CI: 50-63) by 2021-02-21. 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.**

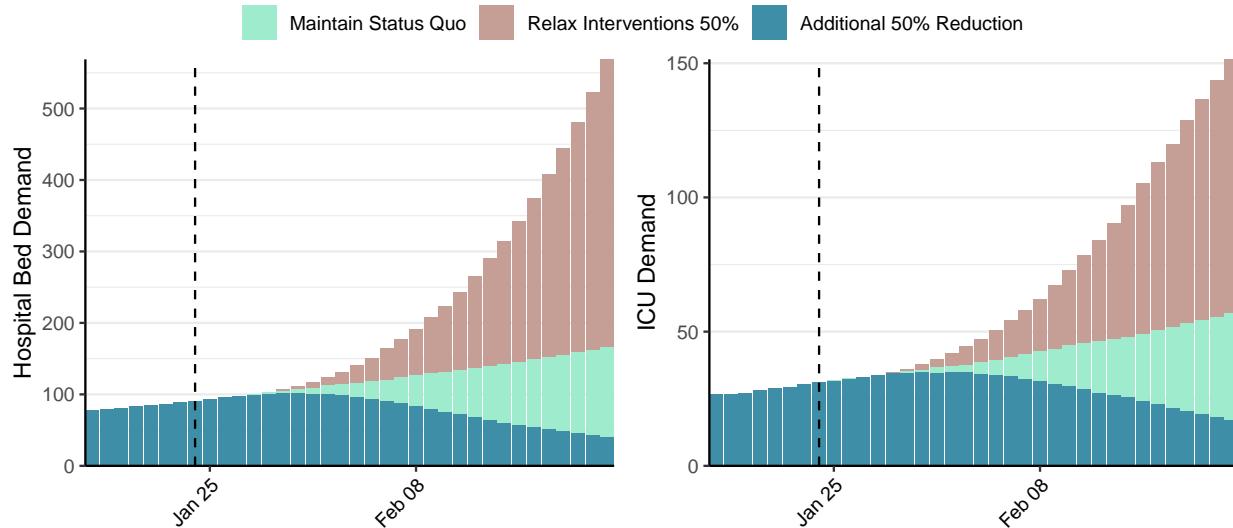


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 1,146 (95% CI: 1,051-1,241) at the current date to 158 (95% CI: 136-180) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,146 (95% CI: 1,051-1,241) at the current date to 11,794 (95% CI: 10,198-13,390) by 2021-02-21.

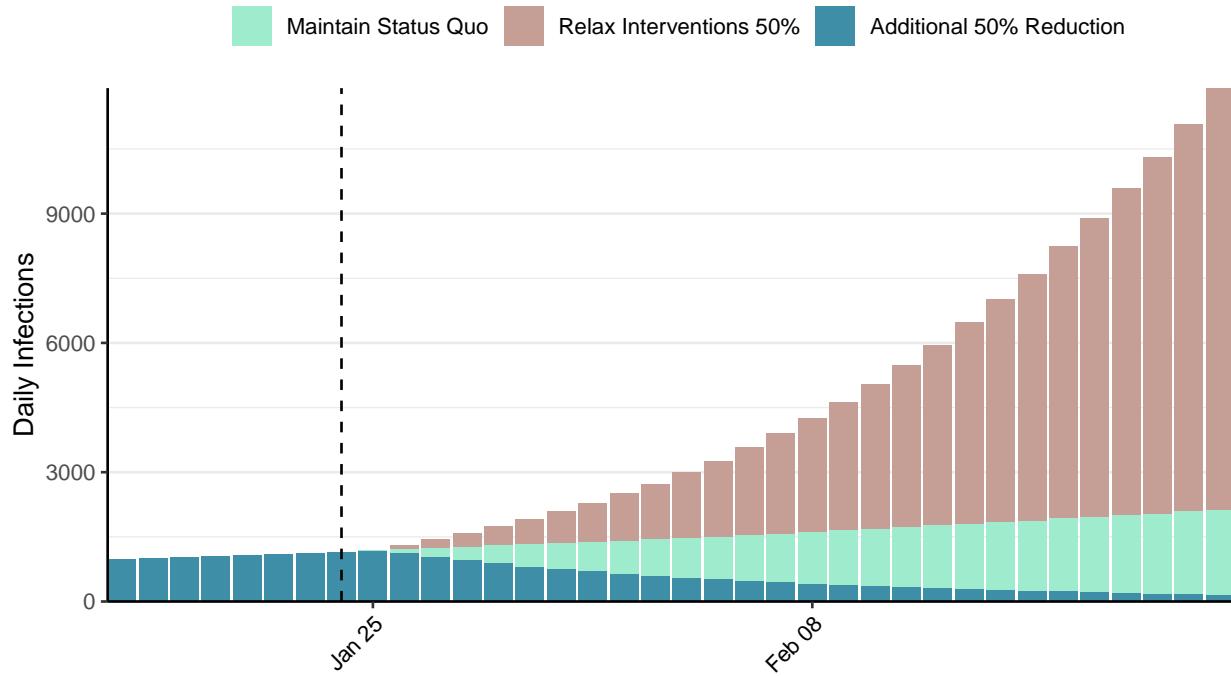


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Jordan, 2021-01-24 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}
845	845	15	15	0.85 (95% CI: 0.67-1.05)

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.

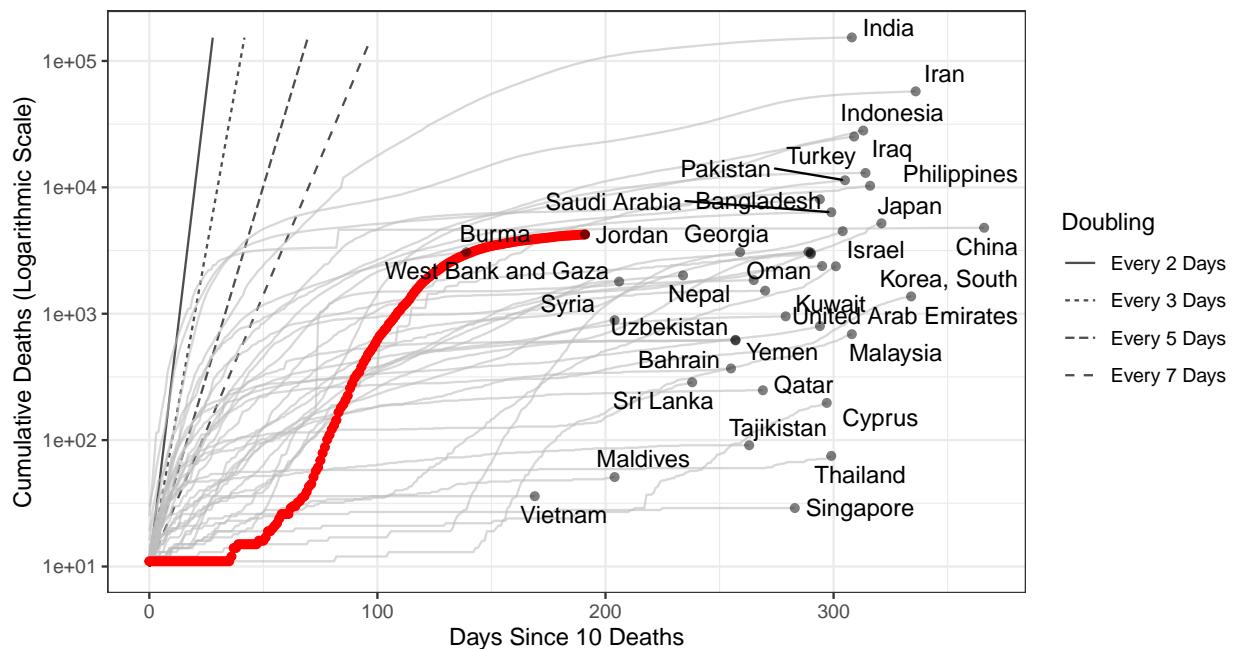


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 98,631 (95% CI: 92,170-105,091) 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

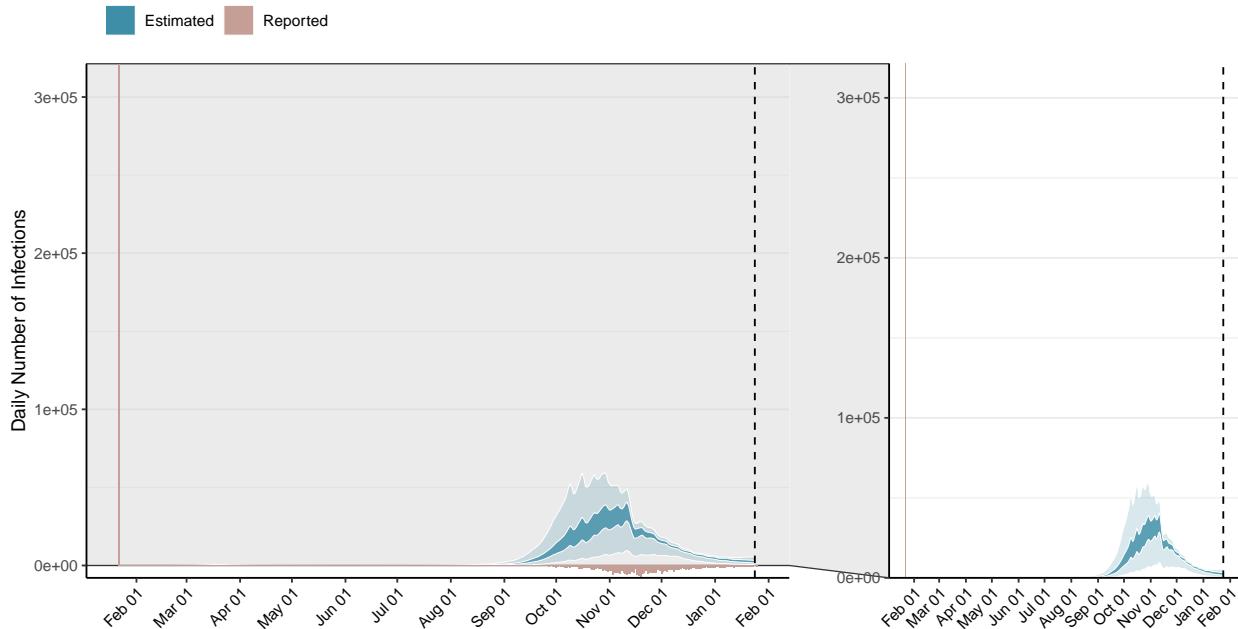


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

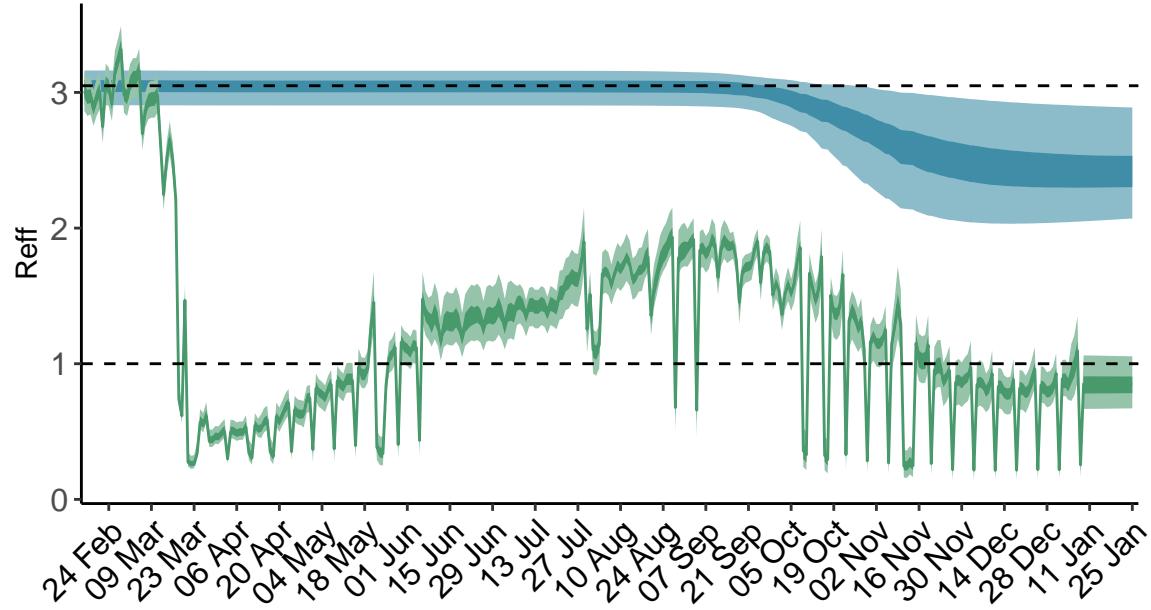


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

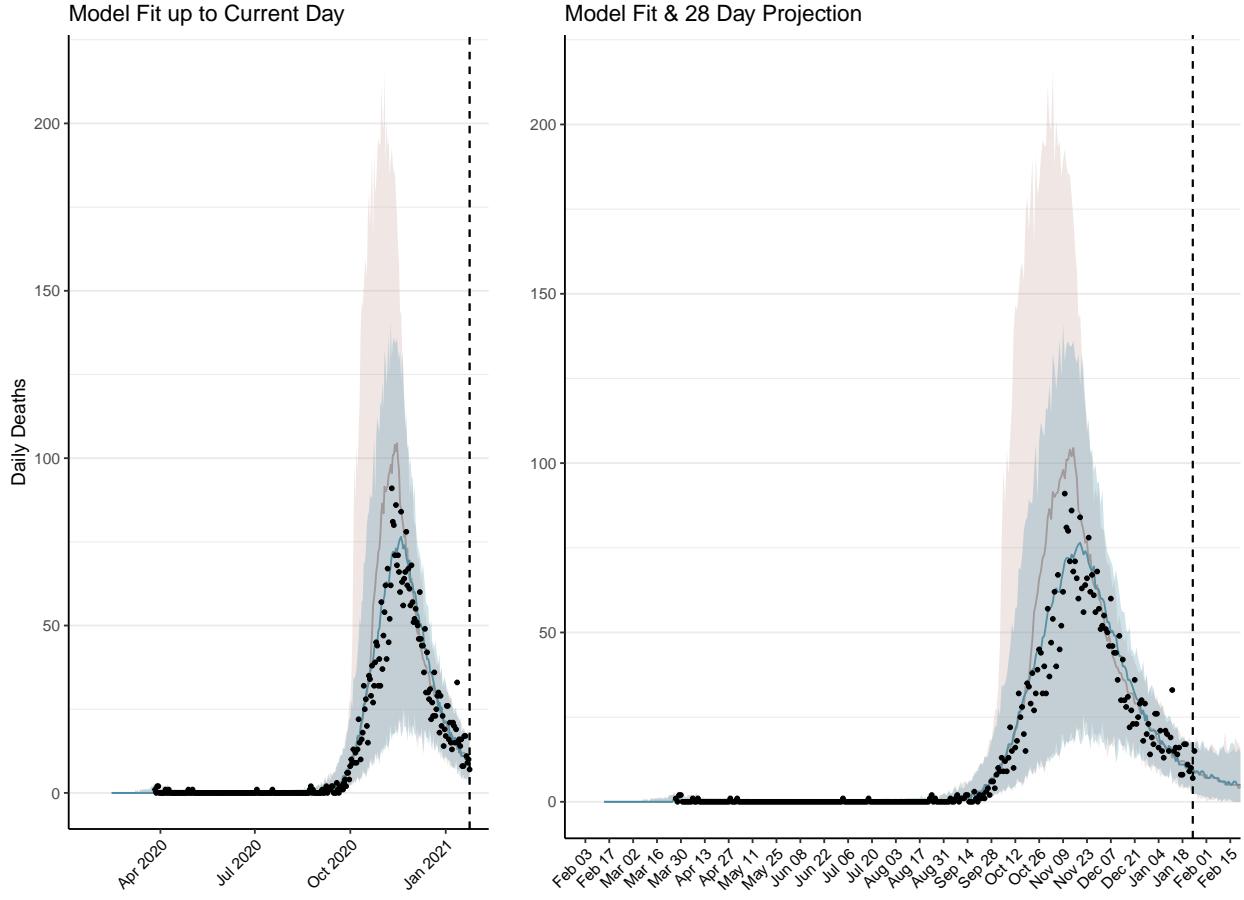


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 345 (95% CI: 320-370) patients requiring treatment with high-pressure oxygen at the current date to 209 (95% CI: 179-239) hospital beds being required on 2021-02-21 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 148 (95% CI: 138-157) patients requiring treatment with mechanical ventilation at the current date to 85 (95% CI: 74-96) by 2021-02-21. 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.**

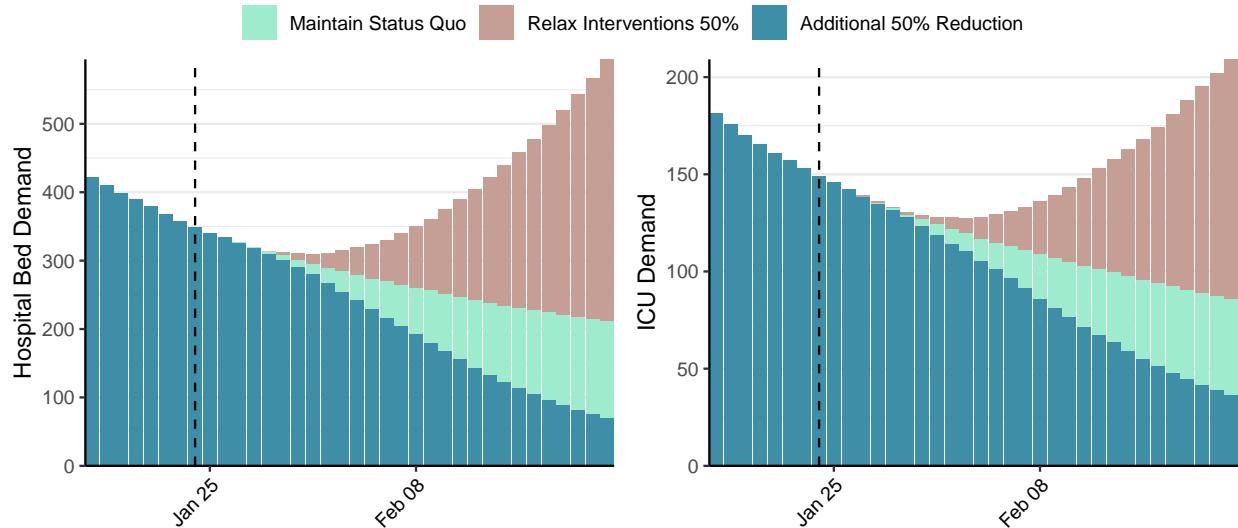


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 2,599 (95% CI: 2,348-2,851) at the current date to 153 (95% CI: 128-177) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,599 (95% CI: 2,348-2,851) at the current date to 9,055 (95% CI: 7,372-10,737) by 2021-02-21.

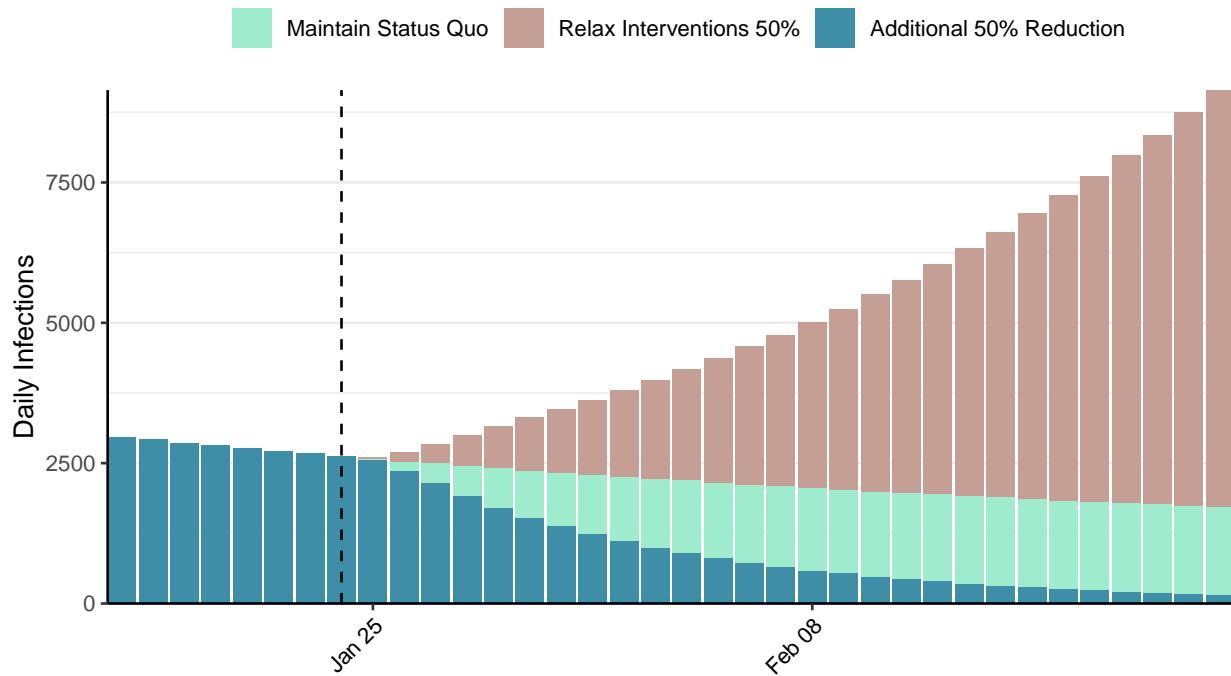


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

Download the report for Kazakhstan, 2021-01-24 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}
1,274	1,274	3	3	0.88 (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. Kazakhstan is not shown in the following plot as only 3 deaths have been reported to date**

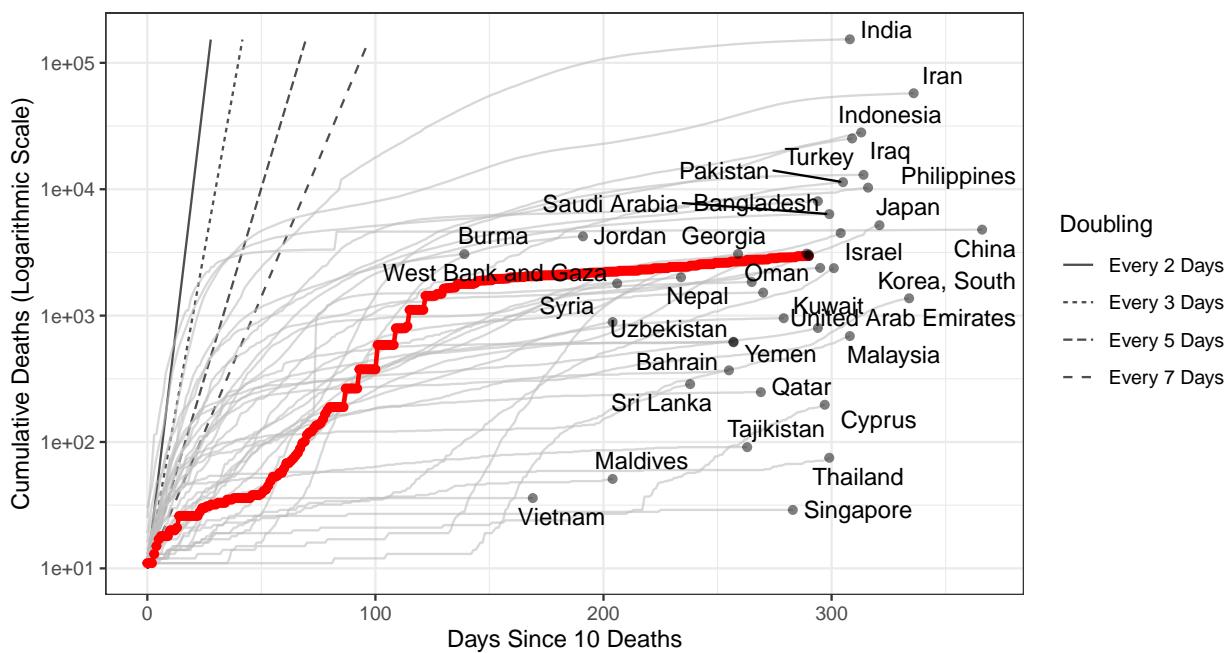


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 89,030 (95% CI: 84,291-93,770) 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

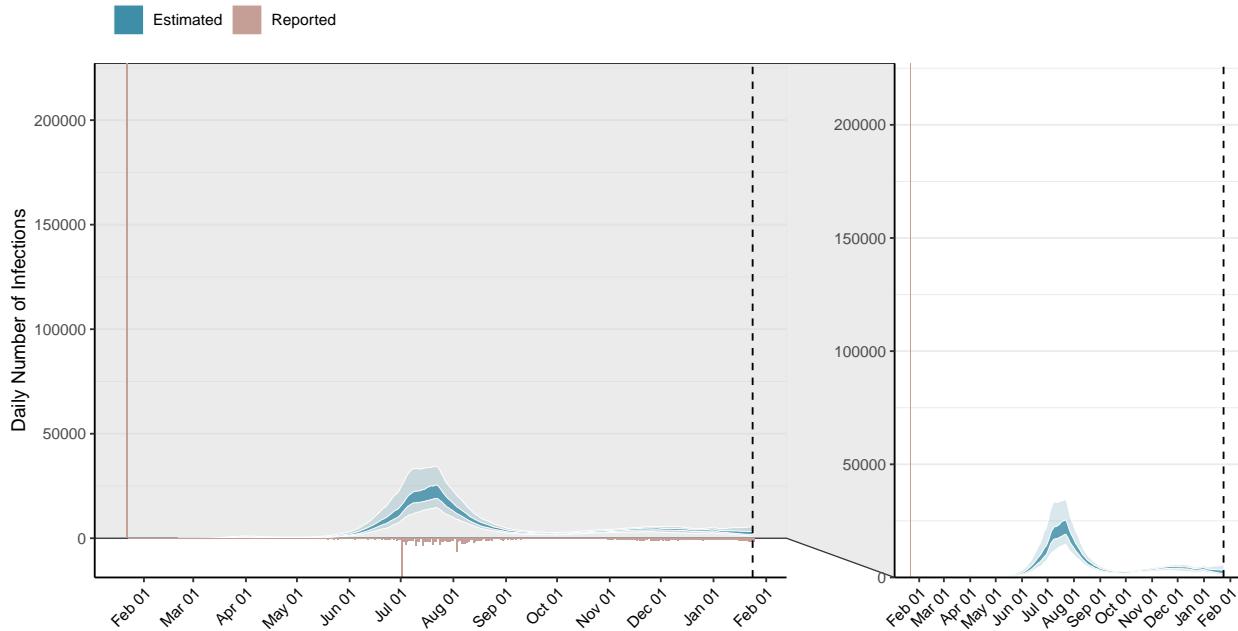


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

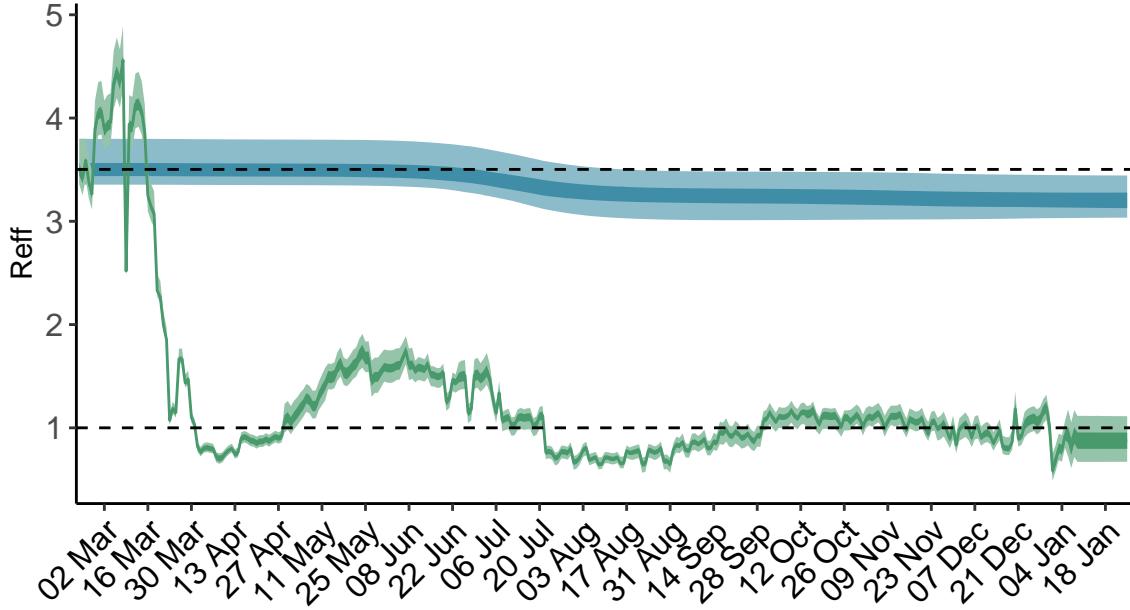


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

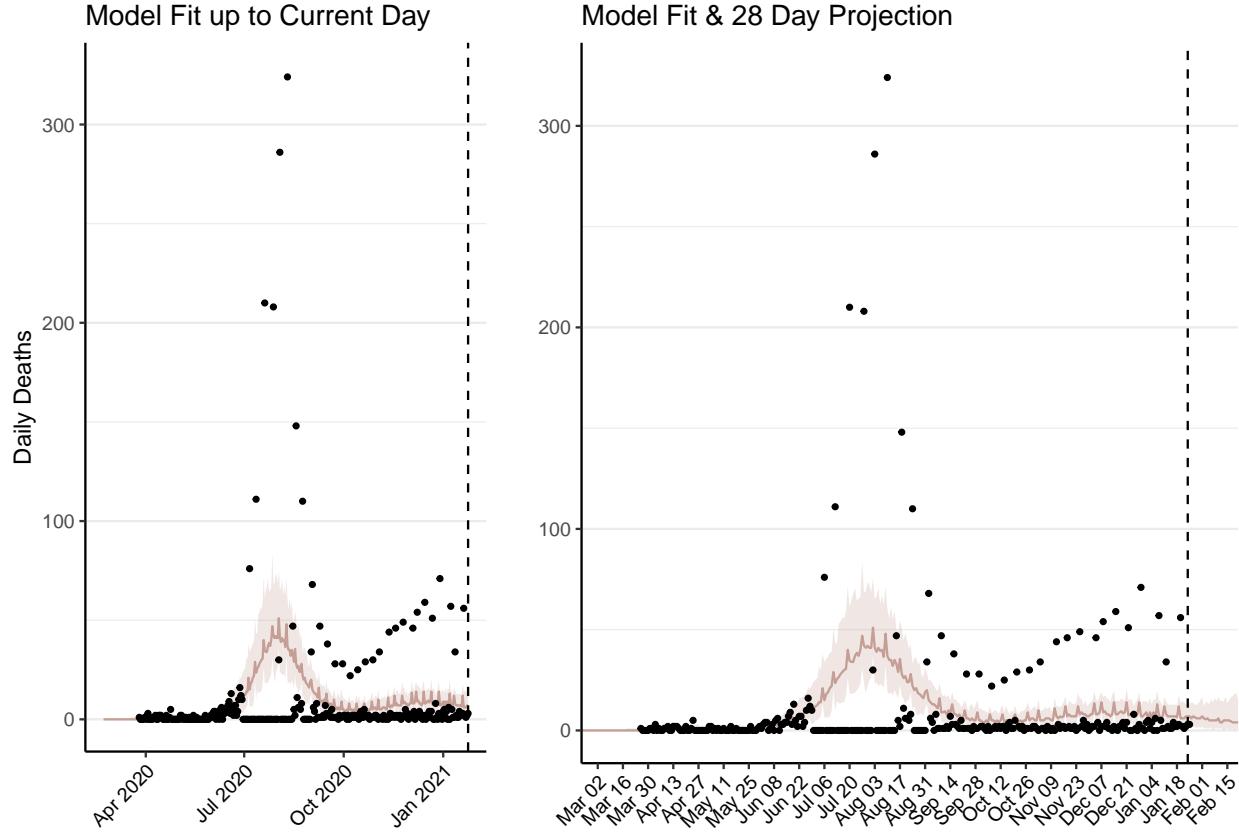


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 281 (95% CI: 265-298) patients requiring treatment with high-pressure oxygen at the current date to 212 (95% CI: 178-246) hospital beds being required on 2021-02-21 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 111 (95% CI: 105-117) patients requiring treatment with mechanical ventilation at the current date to 85 (95% CI: 72-98) by 2021-02-21. 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.**

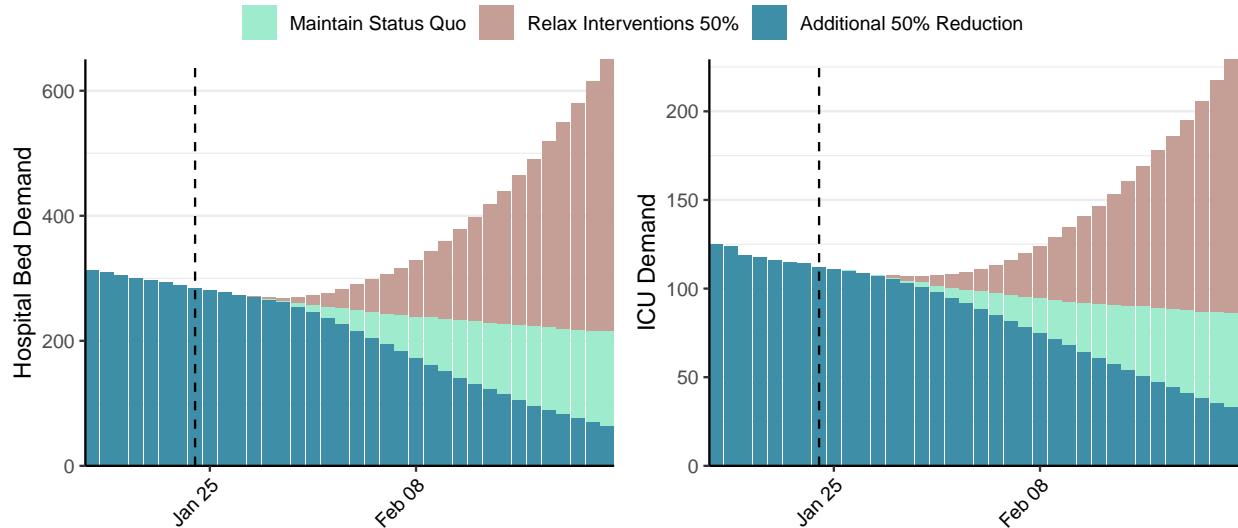


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 2,597 (95% CI: 2,343-2,851) at the current date to 184 (95% CI: 150-218) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,597 (95% CI: 2,343-2,851) at the current date to 12,148 (95% CI: 9,505-14,790) by 2021-02-21.

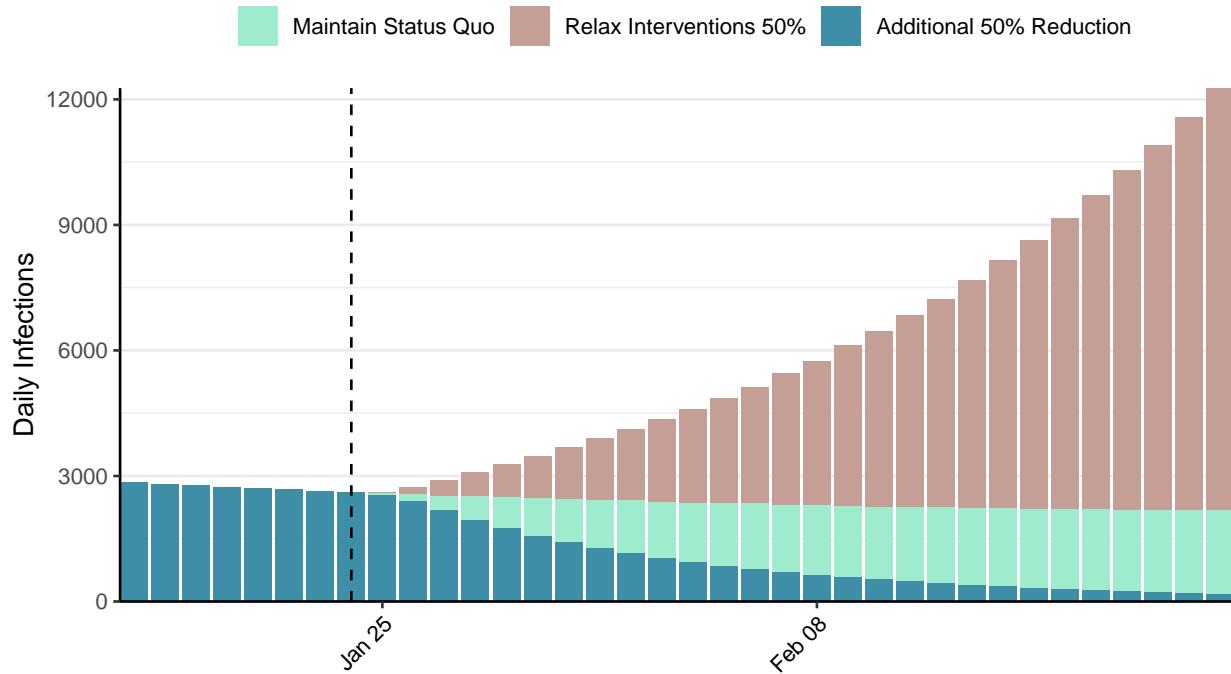


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Kenya, 2021-01-24 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}
69	69	0	0	0.84 (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. Kenya is not shown in the following plot as only 0 deaths have been reported to date**

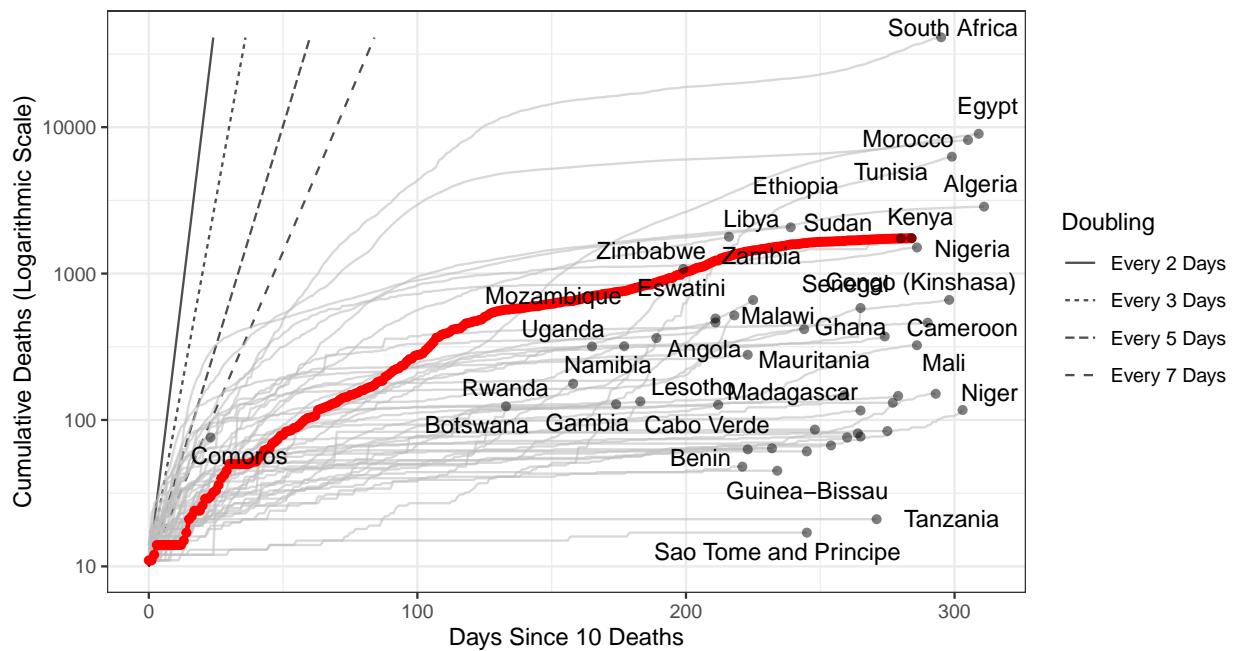


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 31,070 (95% CI: 29,105-33,035) 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

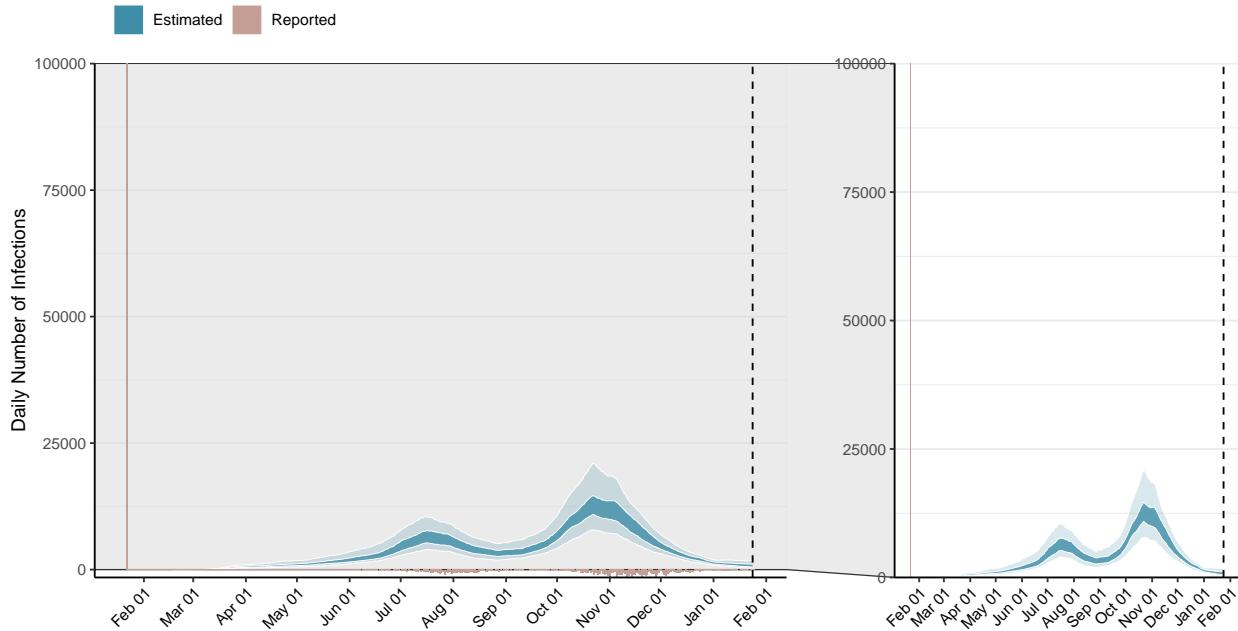


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

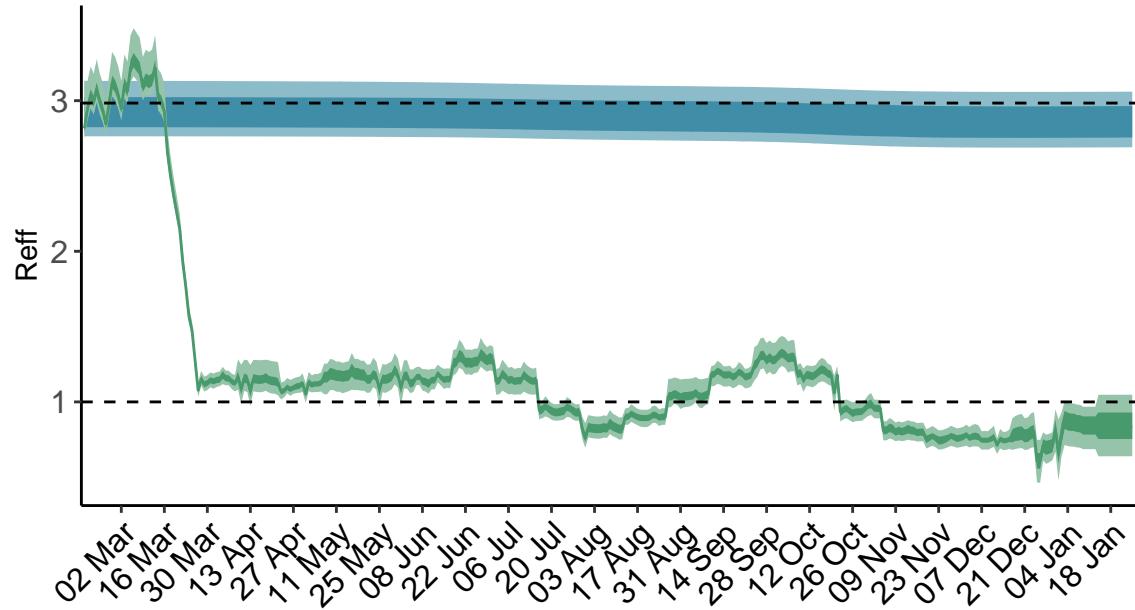


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

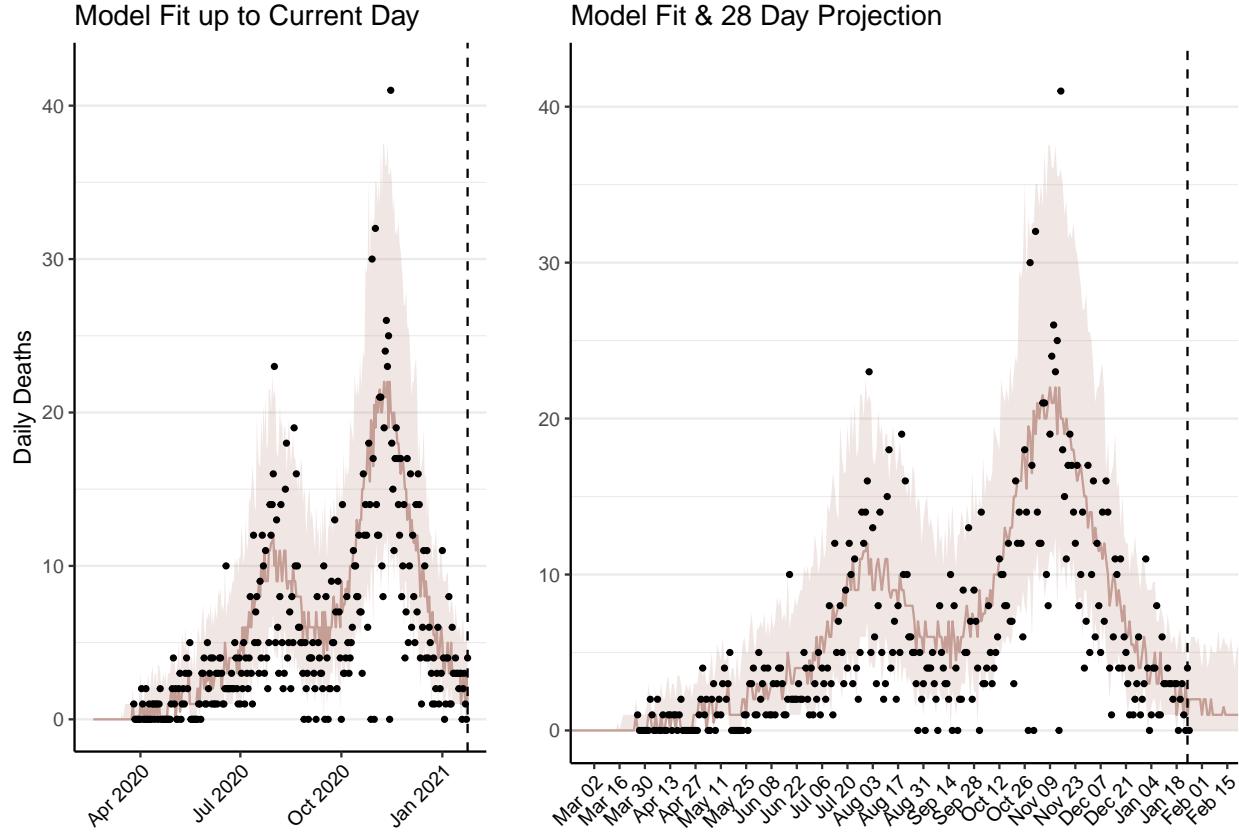


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 83 (95% CI: 78-89) patients requiring treatment with high-pressure oxygen at the current date to 55 (95% CI: 42-67) hospital beds being required on 2021-02-21 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 36 (95% CI: 34-39) patients requiring treatment with mechanical ventilation at the current date to 23 (95% CI: 19-28) by 2021-02-21. 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.**

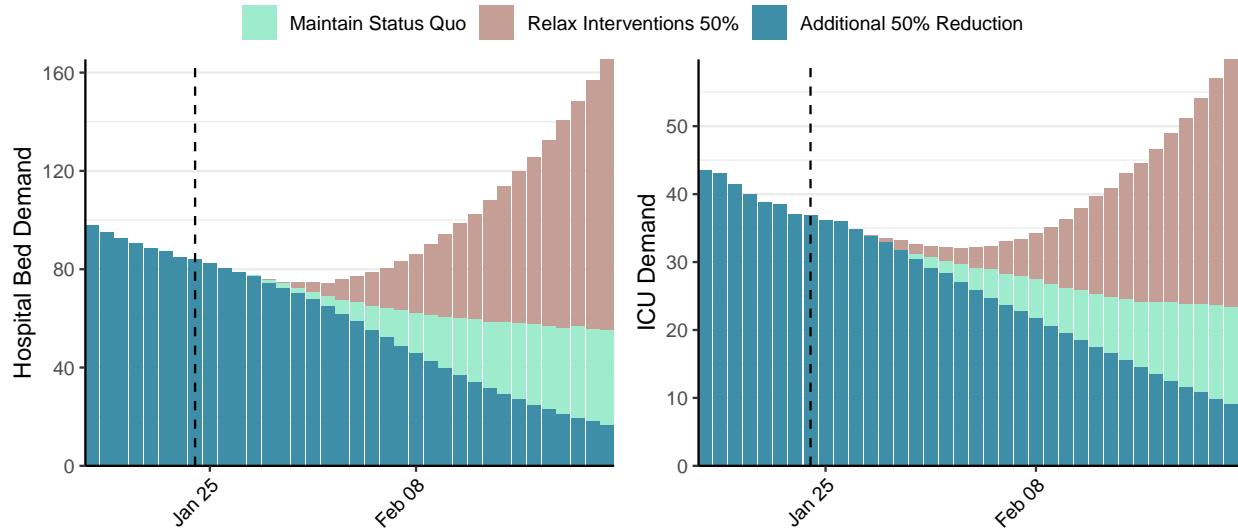


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 835 (95% CI: 742-928) at the current date to 56 (95% CI: 42-70) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 835 (95% CI: 742-928) at the current date to 3,761 (95% CI: 2,497-5,025) by 2021-02-21.

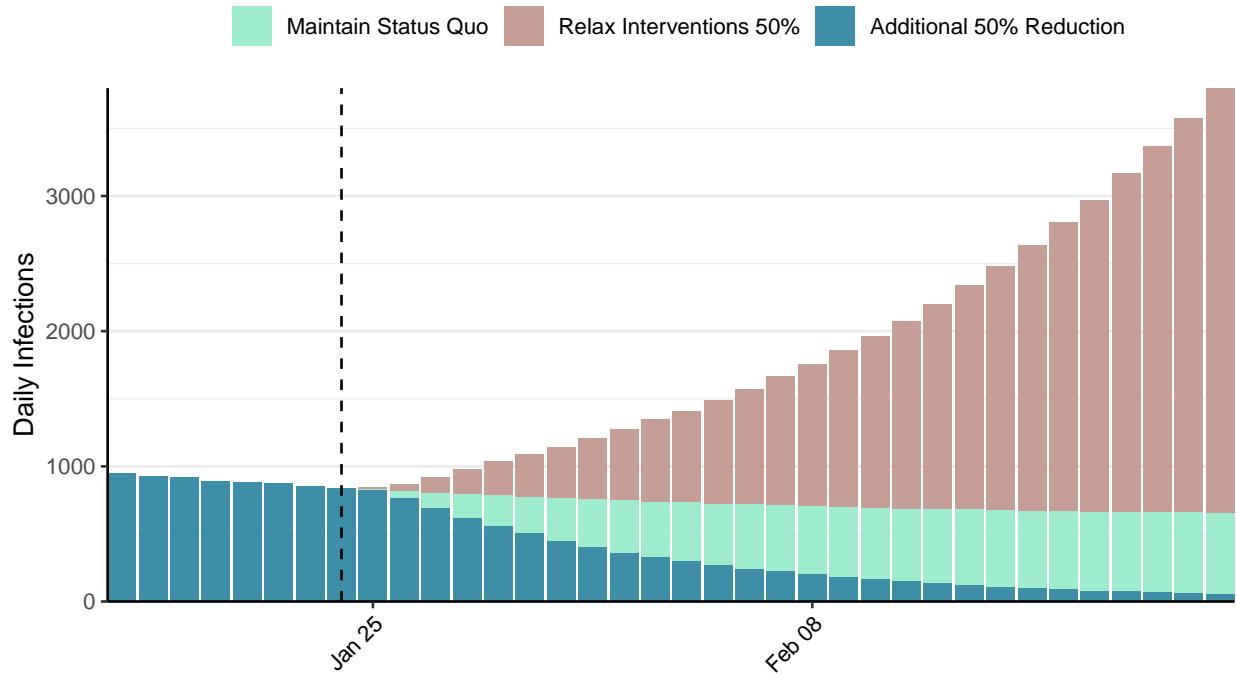


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Kyrgyz Republic, 2021-01-24

[Download the report for Kyrgyz Republic, 2021-01-24 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}
71	71	1	1	0.81 (95% CI: 0.71-0.96)

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 1 deaths have been reported to date**

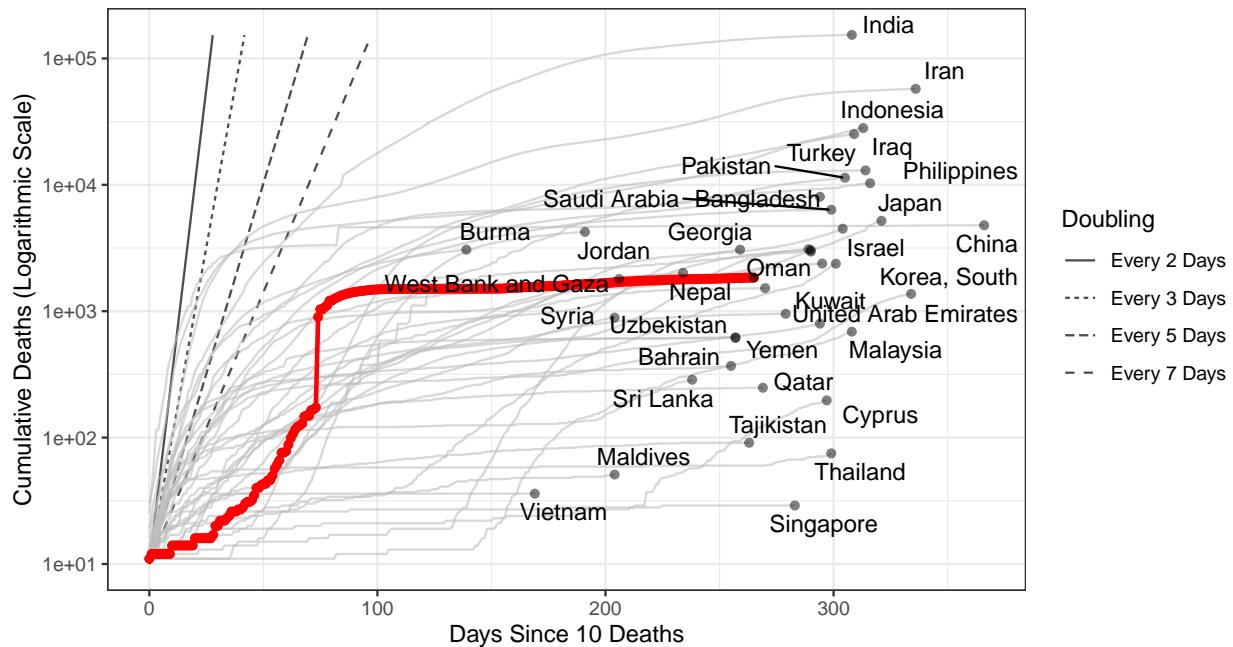


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 37,388 (95% CI: 34,897-39,880) 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).

Plot on right zoomed in on reported cases

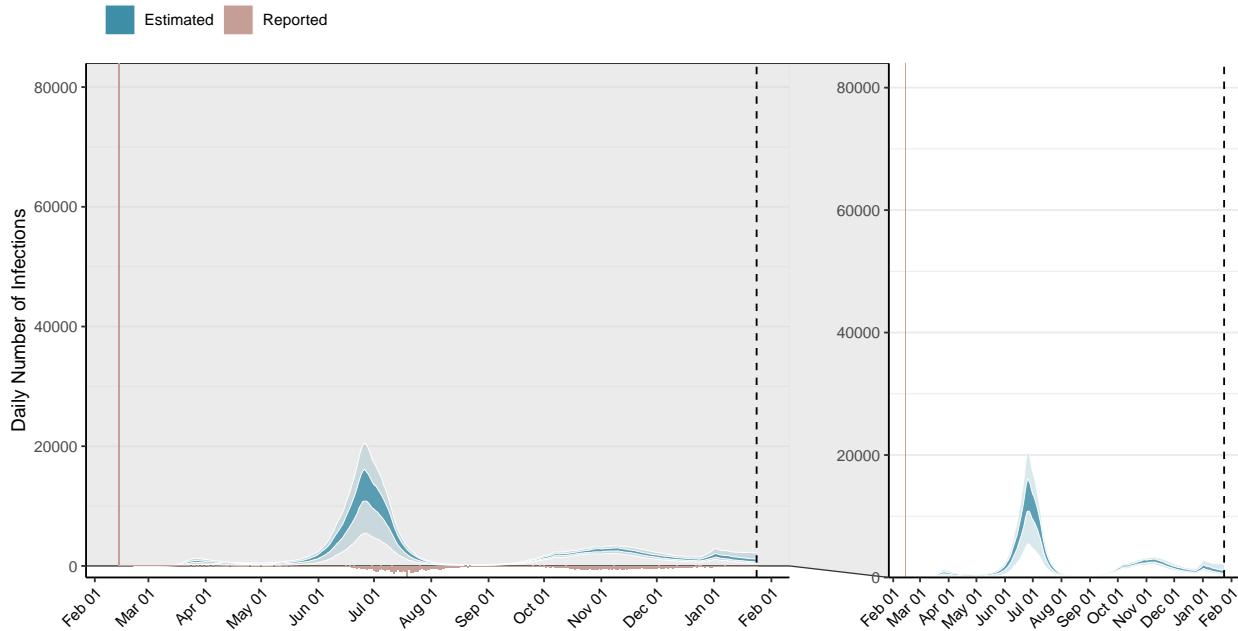


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

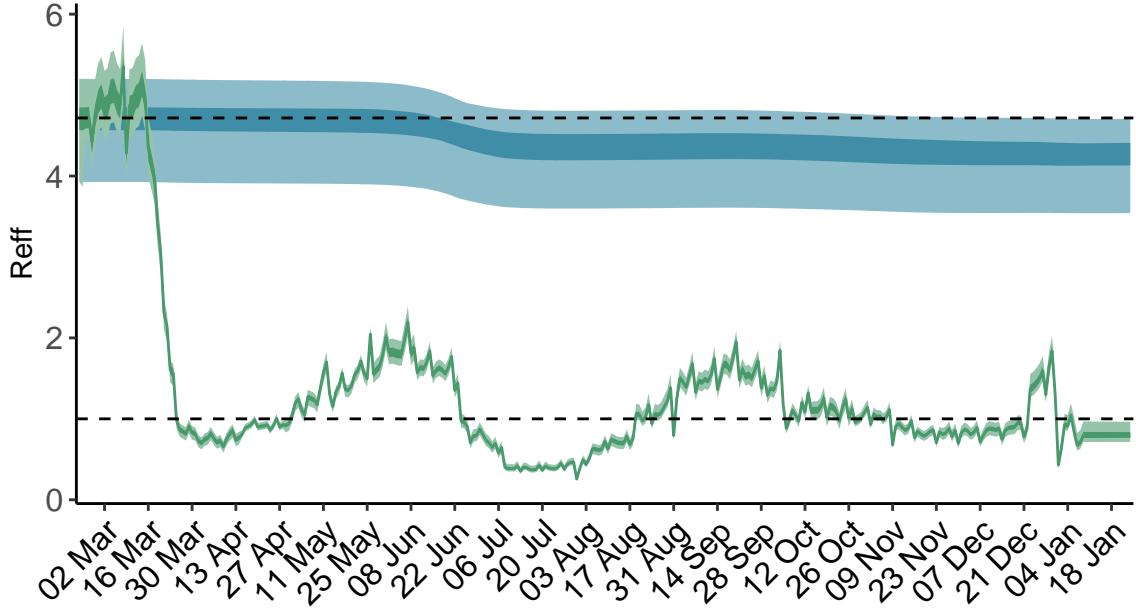


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

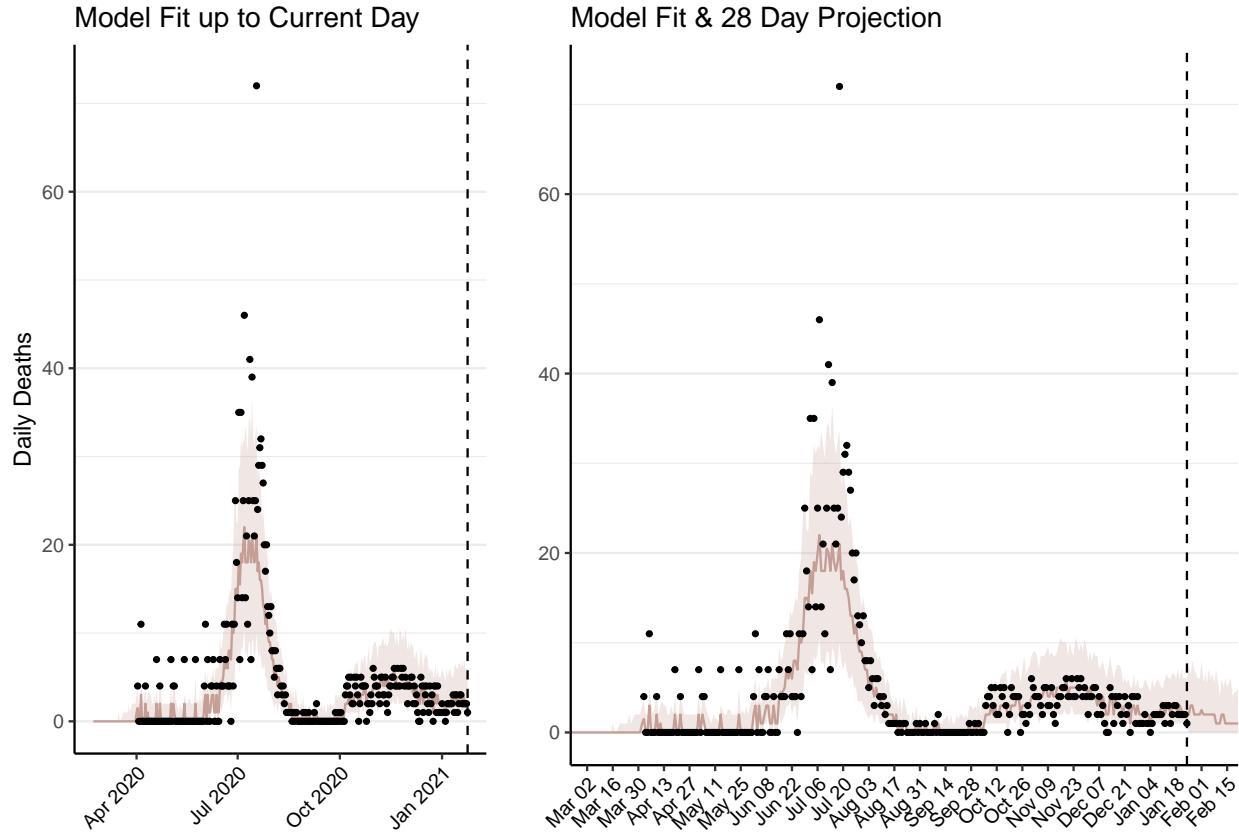


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 104 (95% CI: 96-112) patients requiring treatment with high-pressure oxygen at the current date to 53 (95% CI: 45-60) hospital beds being required on 2021-02-21 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 41 (95% CI: 38-45) patients requiring treatment with mechanical ventilation at the current date to 22 (95% CI: 19-25) by 2021-02-21. 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.**

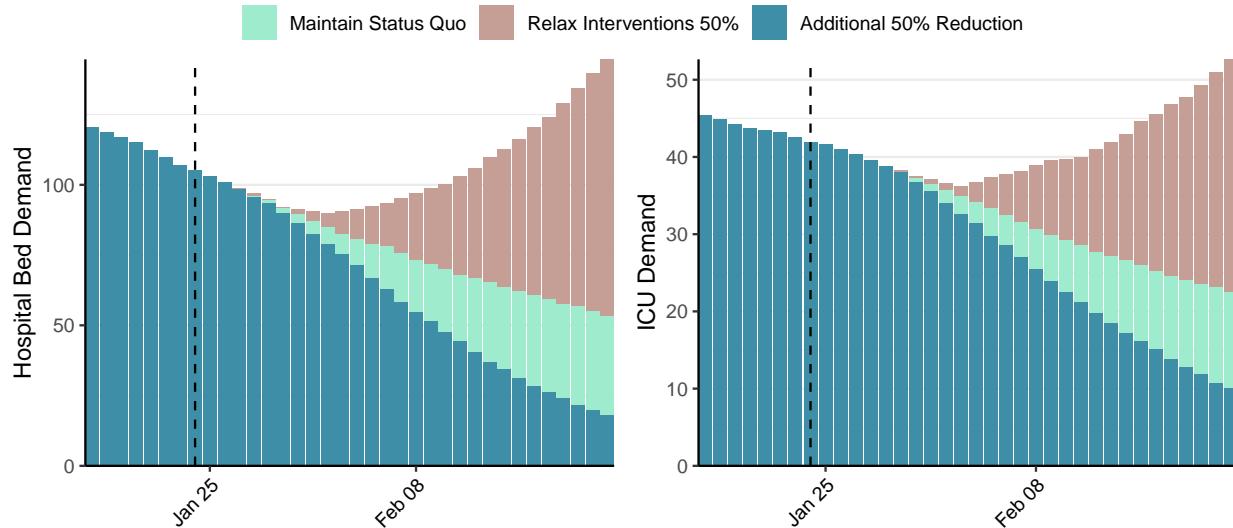


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 943 (95% CI: 852-1,035) at the current date to 46 (95% CI: 38-54) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 943 (95% CI: 852-1,035) at the current date to 2,524 (95% CI: 2,036-3,012) by 2021-02-21.

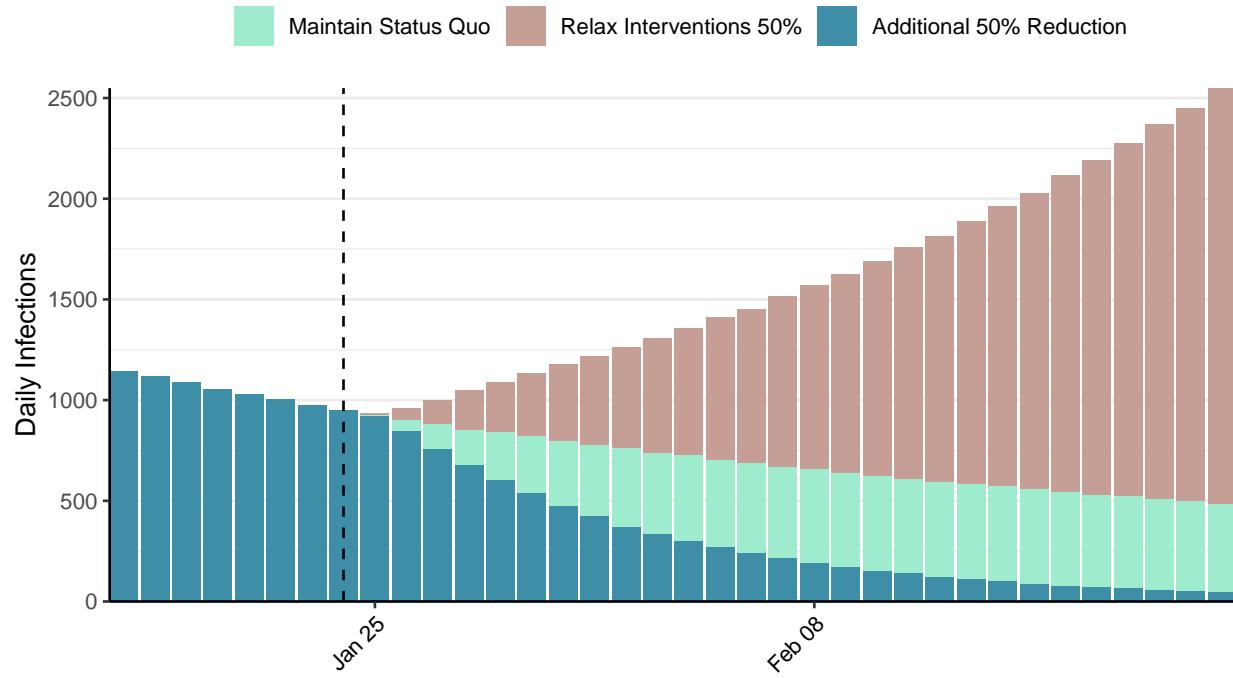


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: South Korea, 2021-01-24

[Download the report for South Korea, 2021-01-24 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}
354	354	11	11	0.66 (95% CI: 0.57-0.77)

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.

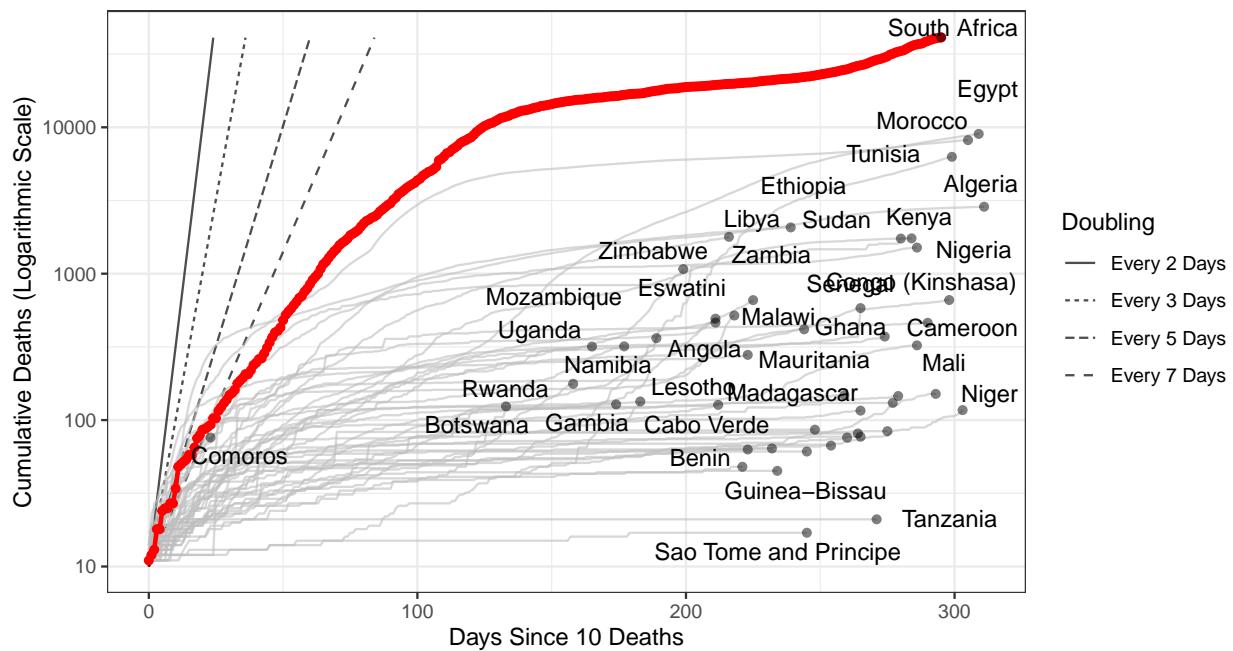


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 174,976 (95% CI: 167,471-182,482) 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

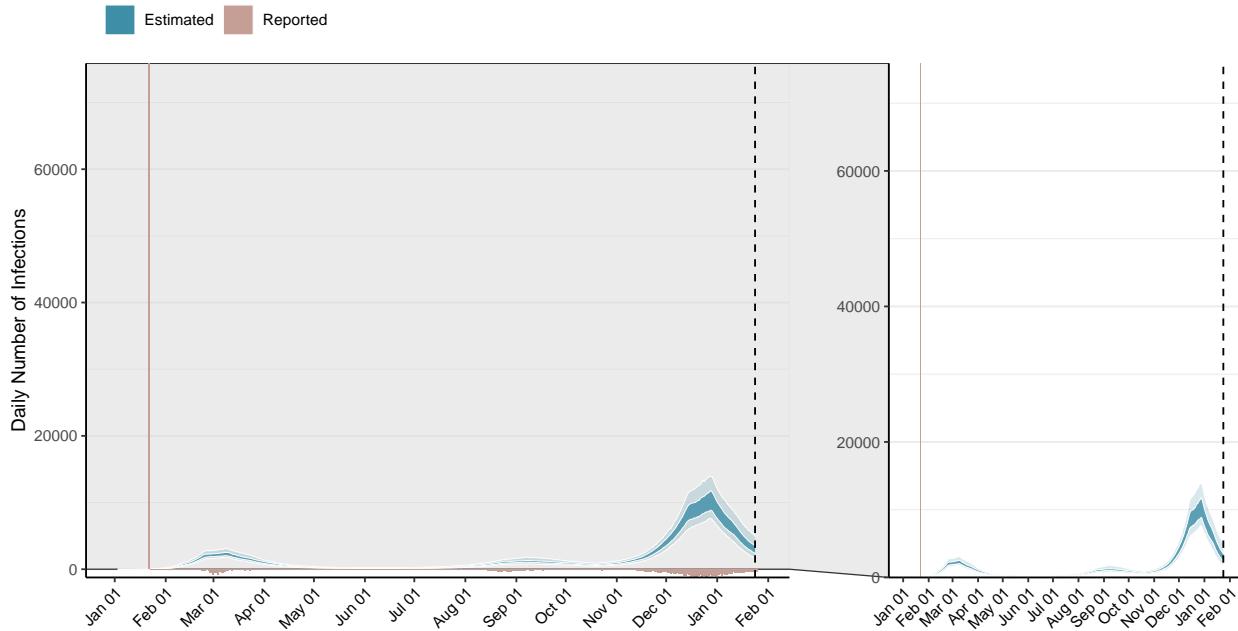


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

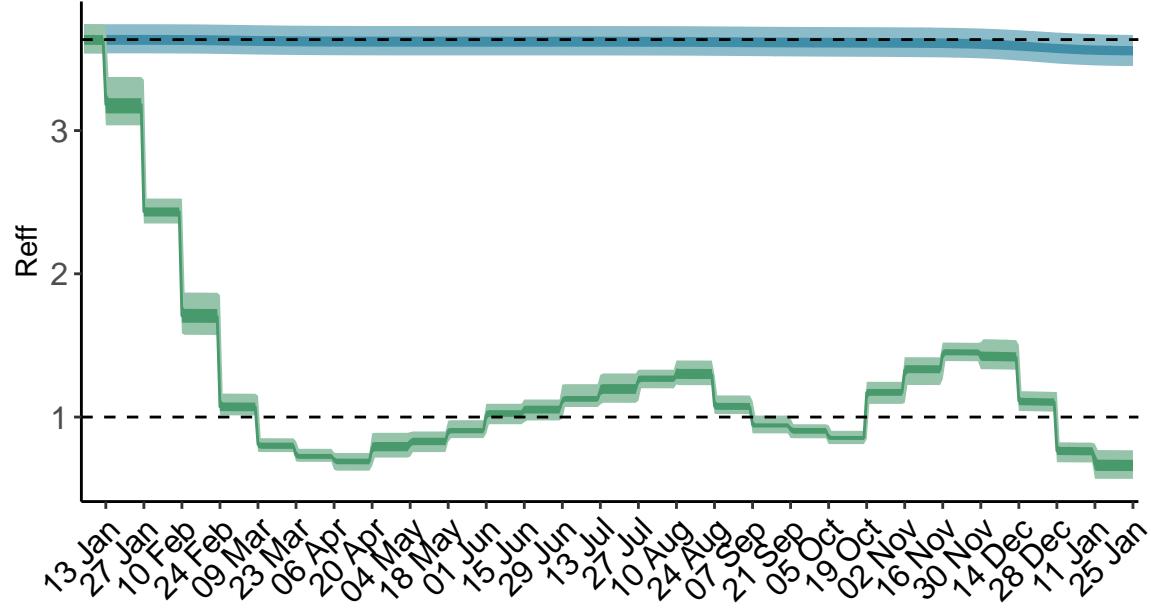


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

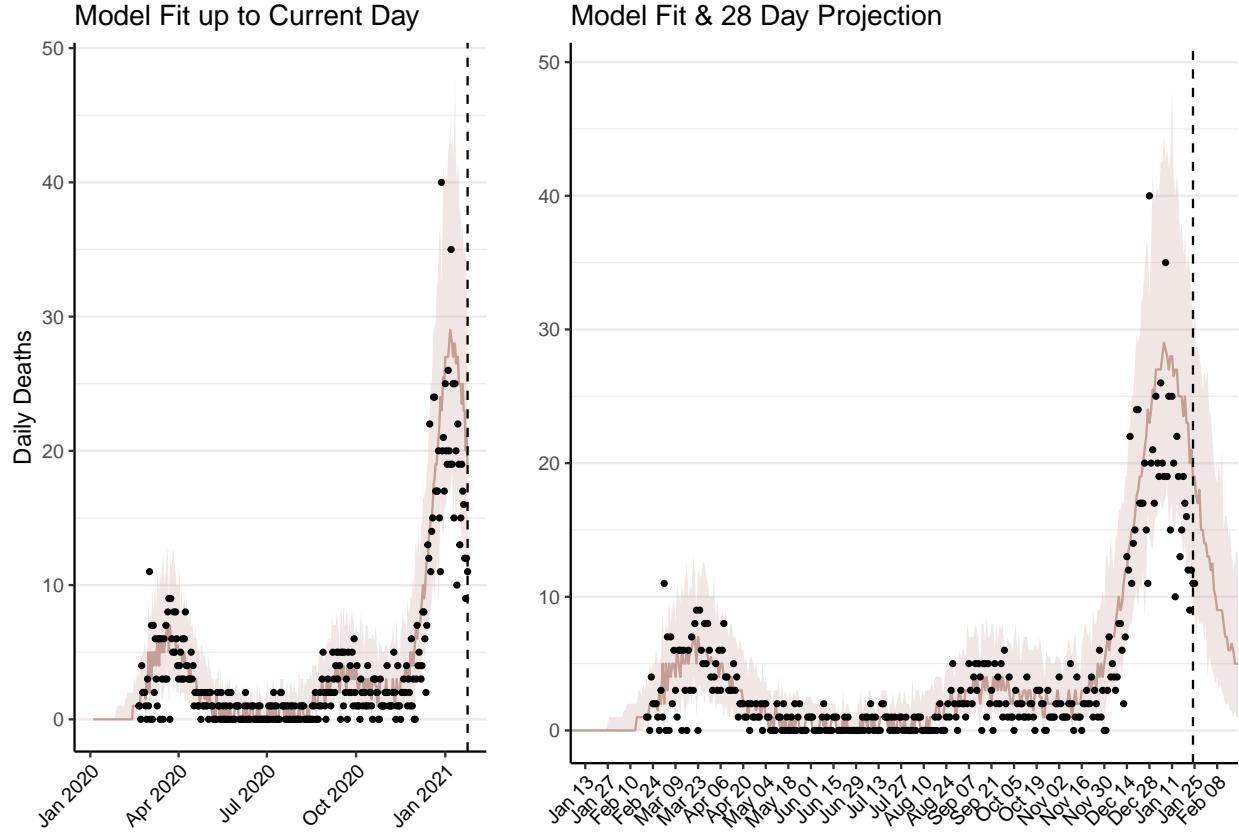


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 663 (95% CI: 633-693) patients requiring treatment with high-pressure oxygen at the current date to 161 (95% CI: 148-175) hospital beds being required on 2021-02-21 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 278 (95% CI: 266-290) patients requiring treatment with mechanical ventilation at the current date to 74 (95% CI: 68-80) by 2021-02-21. 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.**

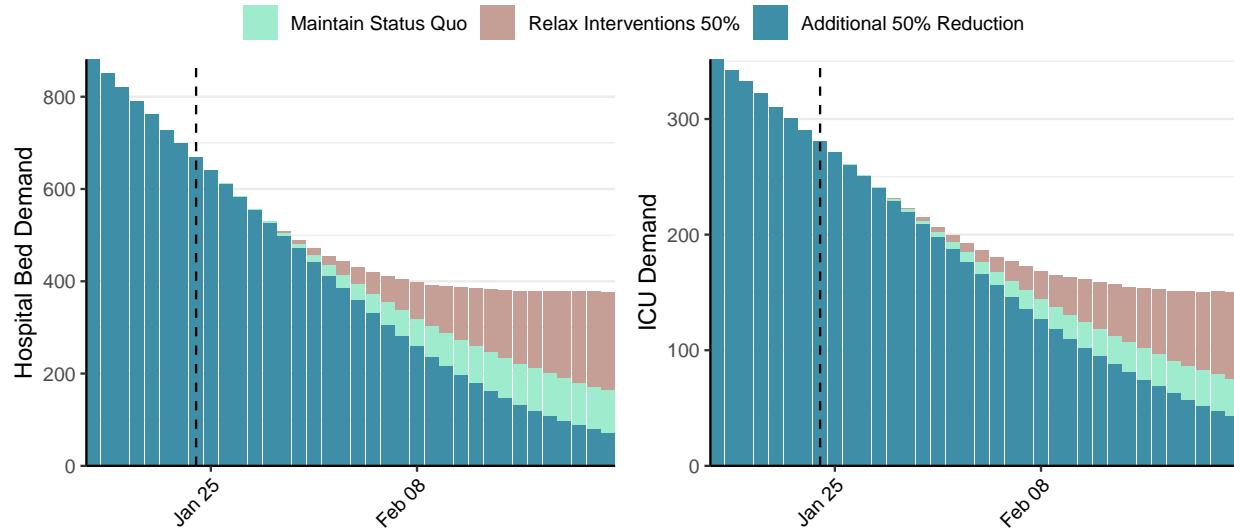


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 2,943 (95% CI: 2,766-3,121) at the current date to 75 (95% CI: 67-83) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,943 (95% CI: 2,766-3,121) at the current date to 3,199 (95% CI: 2,781-3,618) by 2021-02-21.

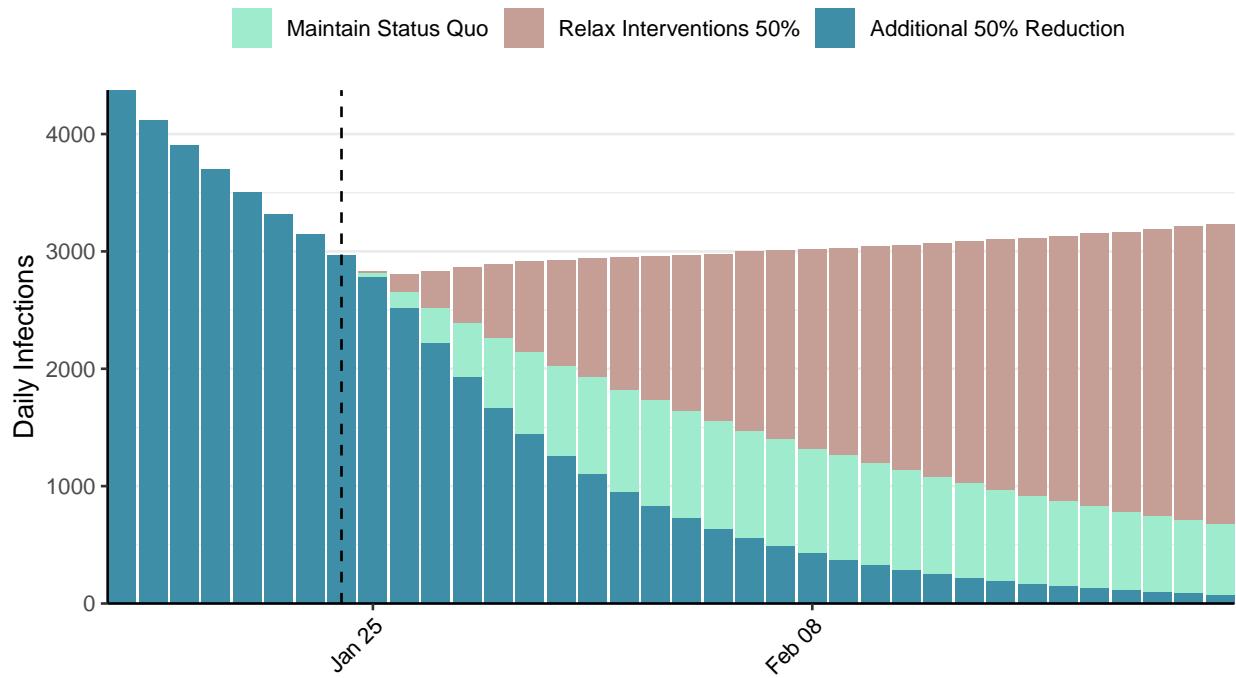


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

Download the report for Lebanon, 2021-01-24 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}
2,652	2,652	54	54	0.87 (95% CI: 0.76-1)

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.

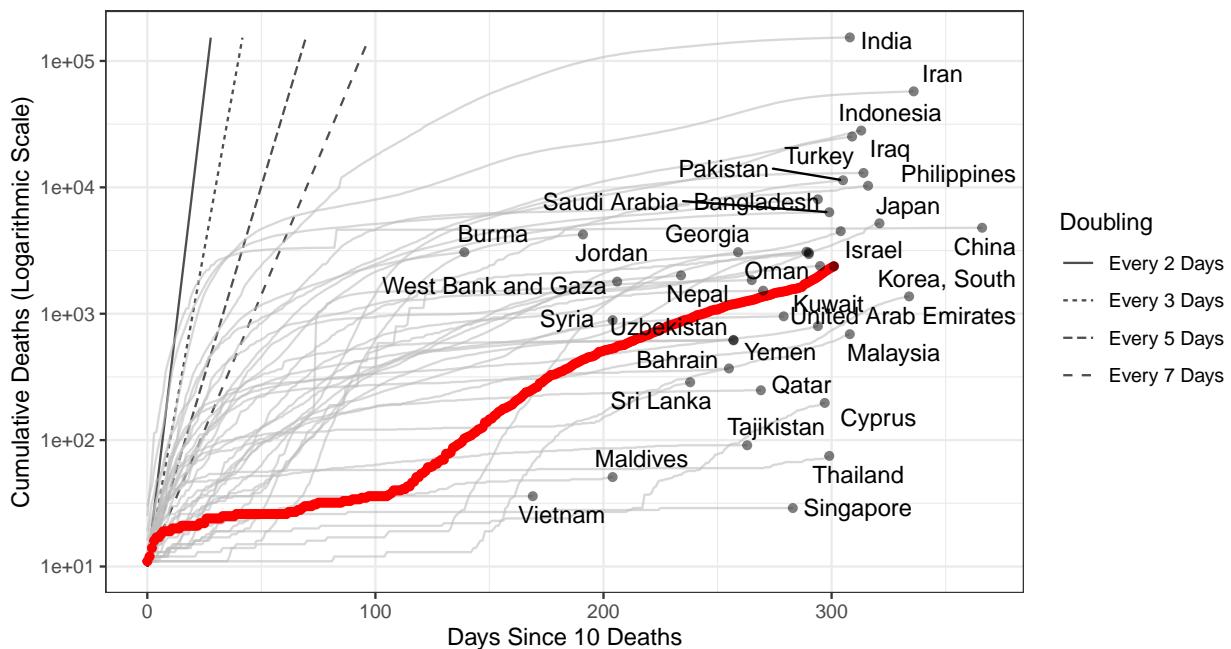


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 370,390 (95% CI: 360,333-380,447) 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

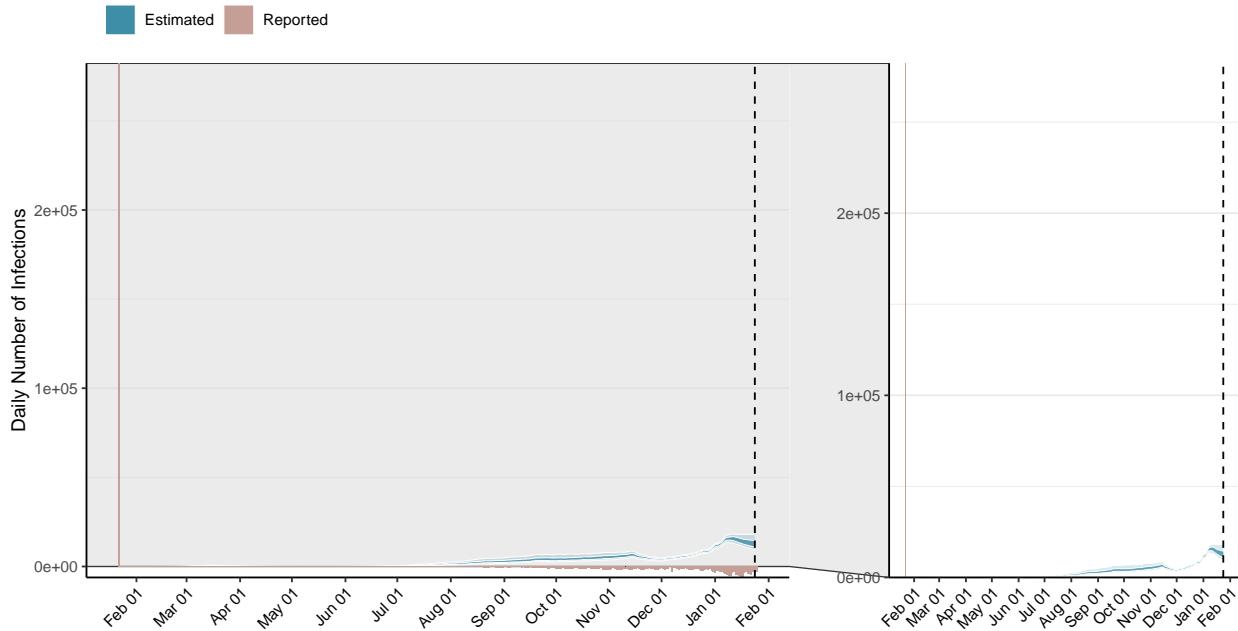


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

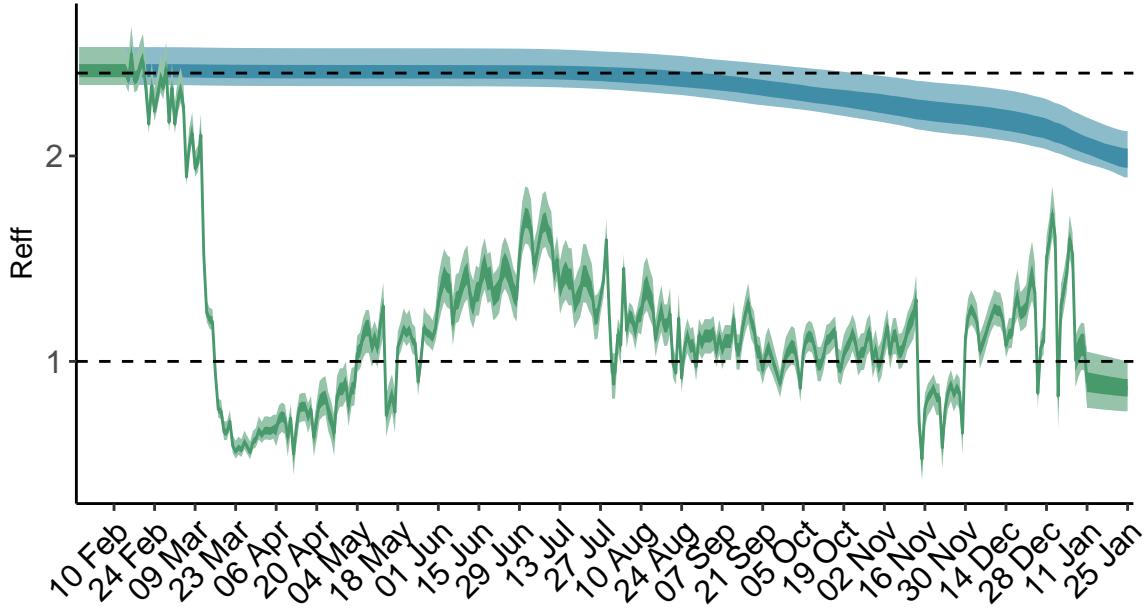


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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. 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.](#)

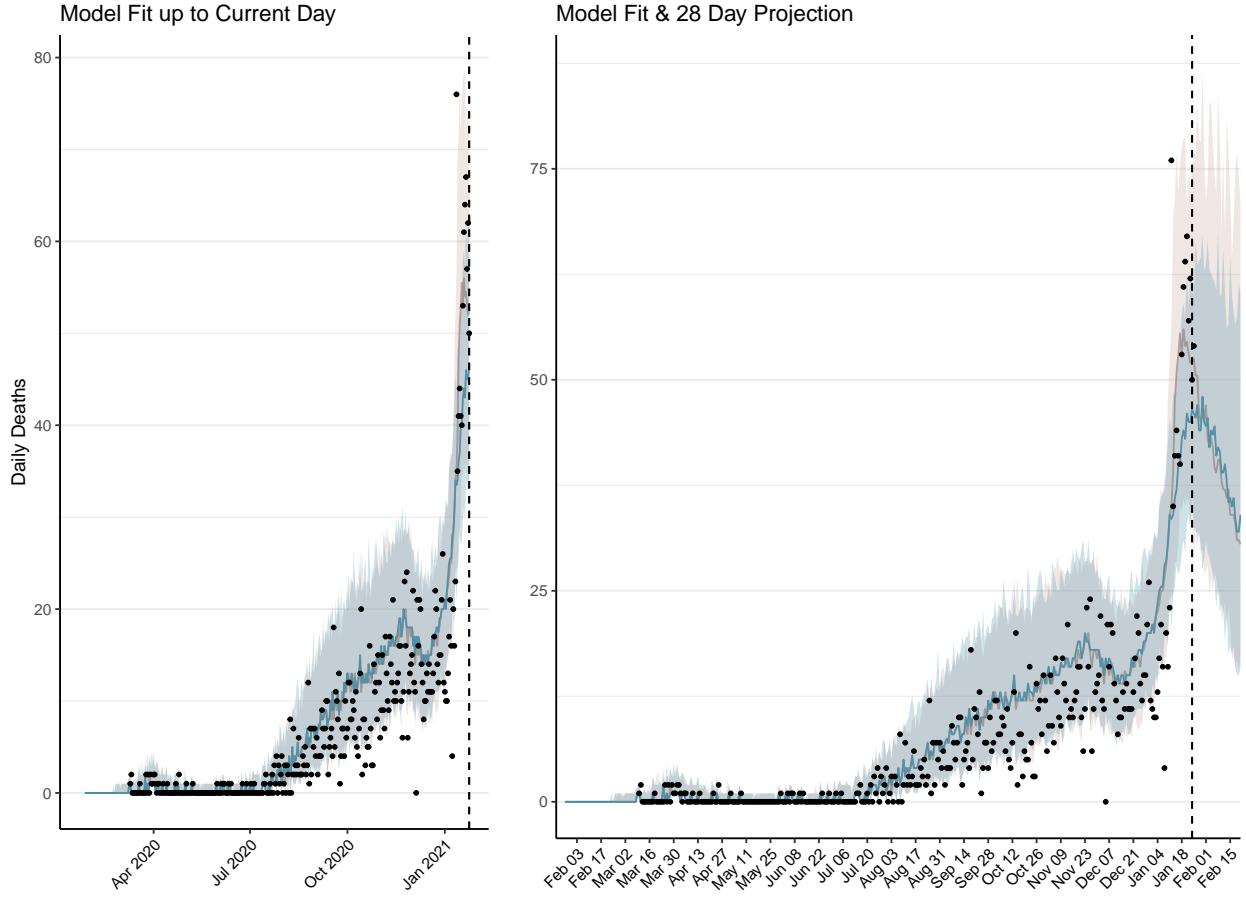


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 1,751 (95% CI: 1,700-1,802) patients requiring treatment with high-pressure oxygen at the current date to 1,187 (95% CI: 1,104-1,269) hospital beds being required on 2021-02-21 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 528 (95% CI: 517-539) patients requiring treatment with mechanical ventilation at the current date to 426 (95% CI: 407-445) by 2021-02-21. 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.**

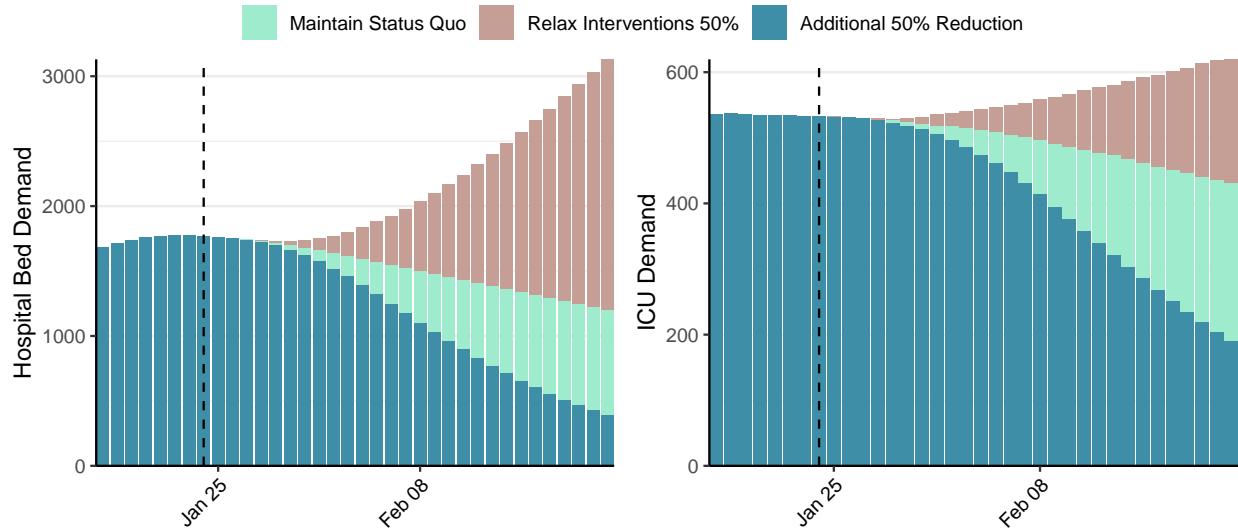


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 12,623 (95% CI: 12,071-13,175) at the current date to 716 (95% CI: 656-775) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 12,623 (95% CI: 12,071-13,175) at the current date to 32,785 (95% CI: 30,113-35,457) by 2021-02-21.

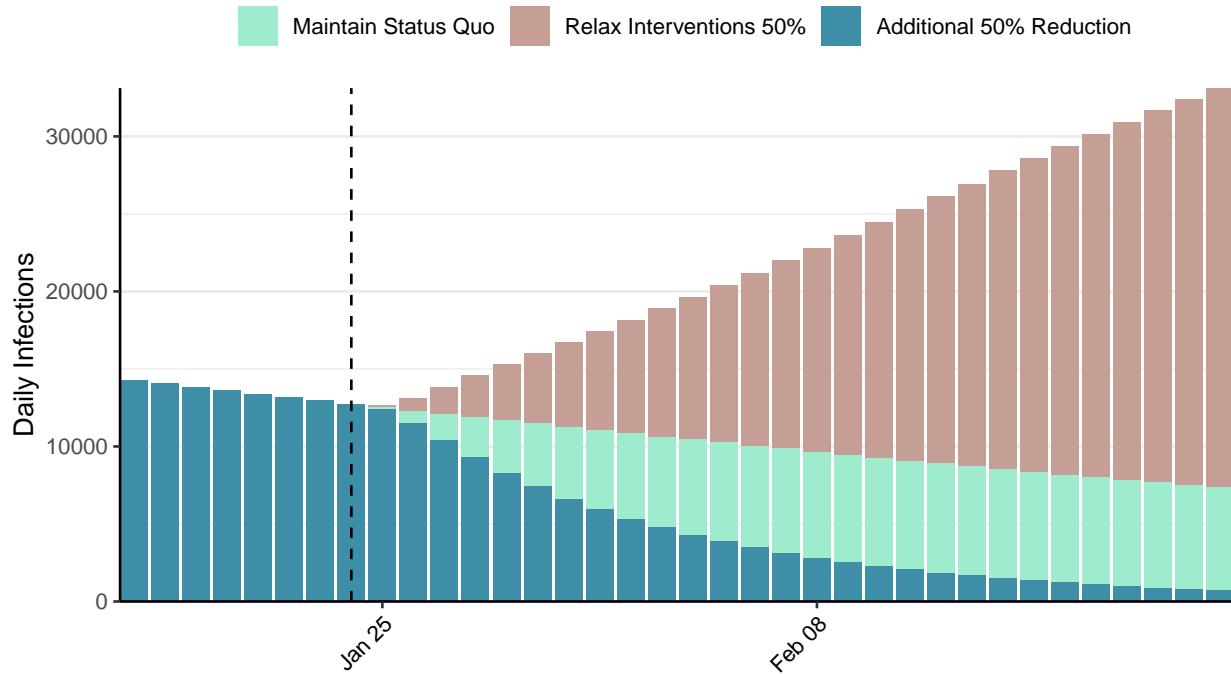


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Liberia, 2021-01-24 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}
13	13	0	0	0.97 (95% CI: 0.67-1.3)

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. Liberia is not shown in the following plot as only 0 deaths have been reported to date**

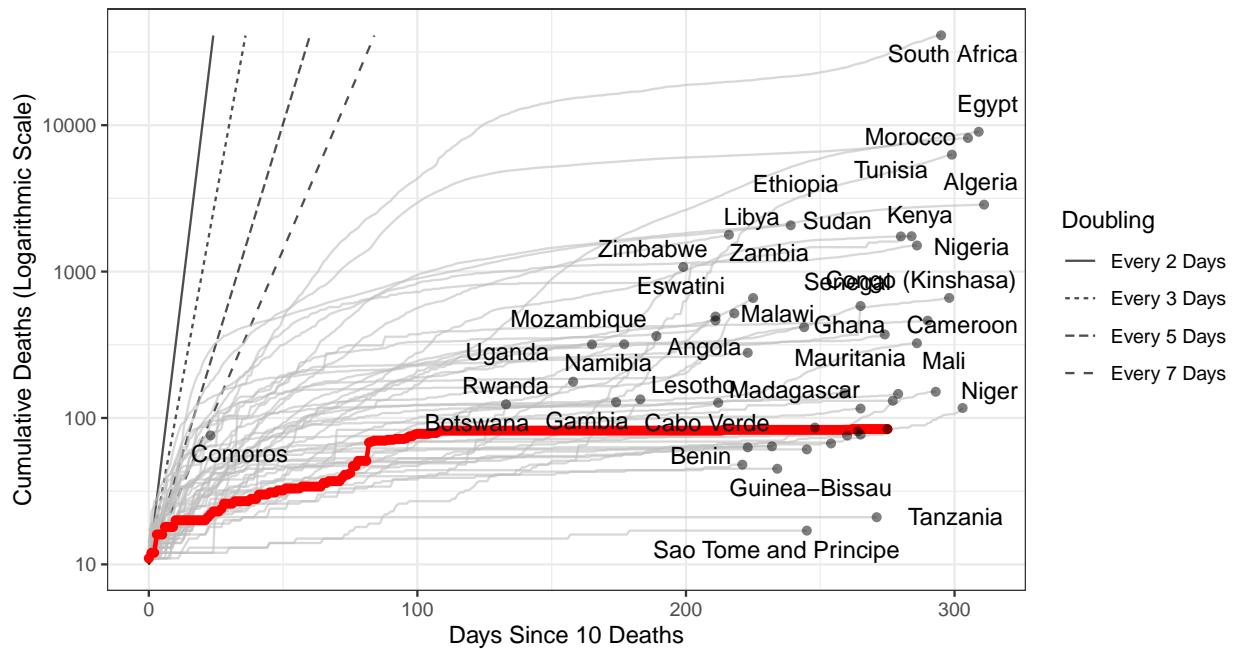


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 162 (95% CI: 76-249) 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).

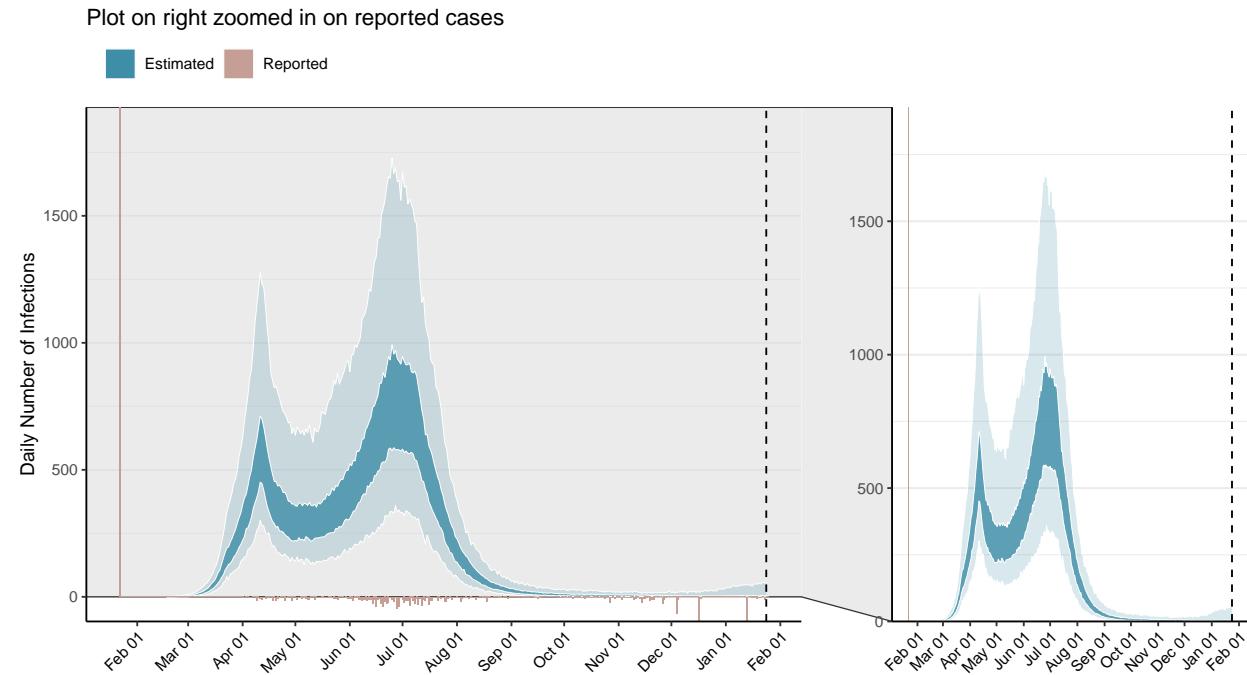


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

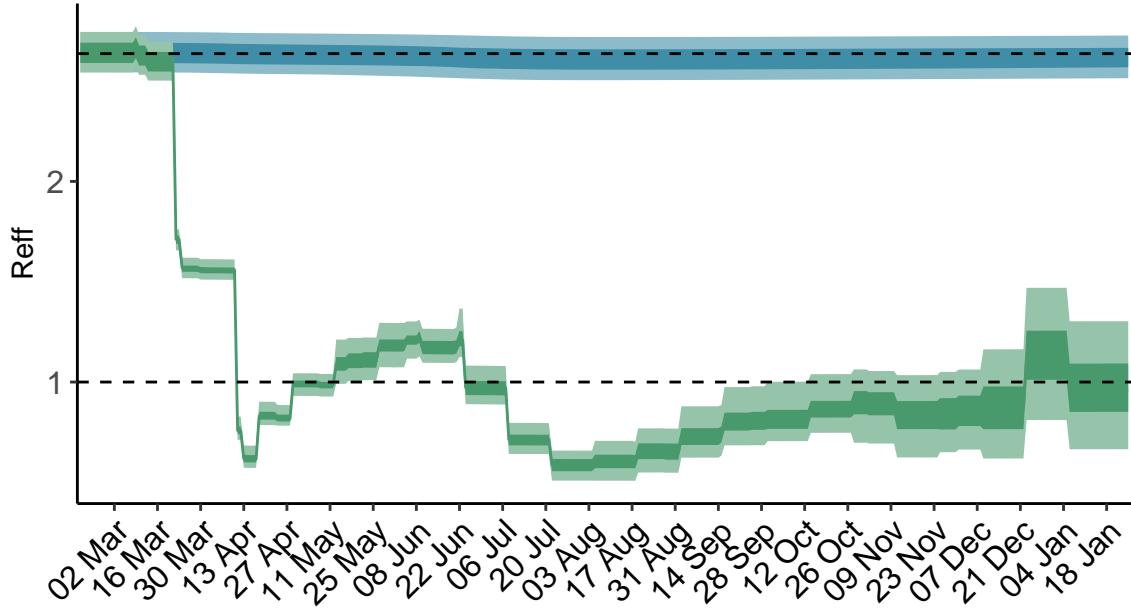


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

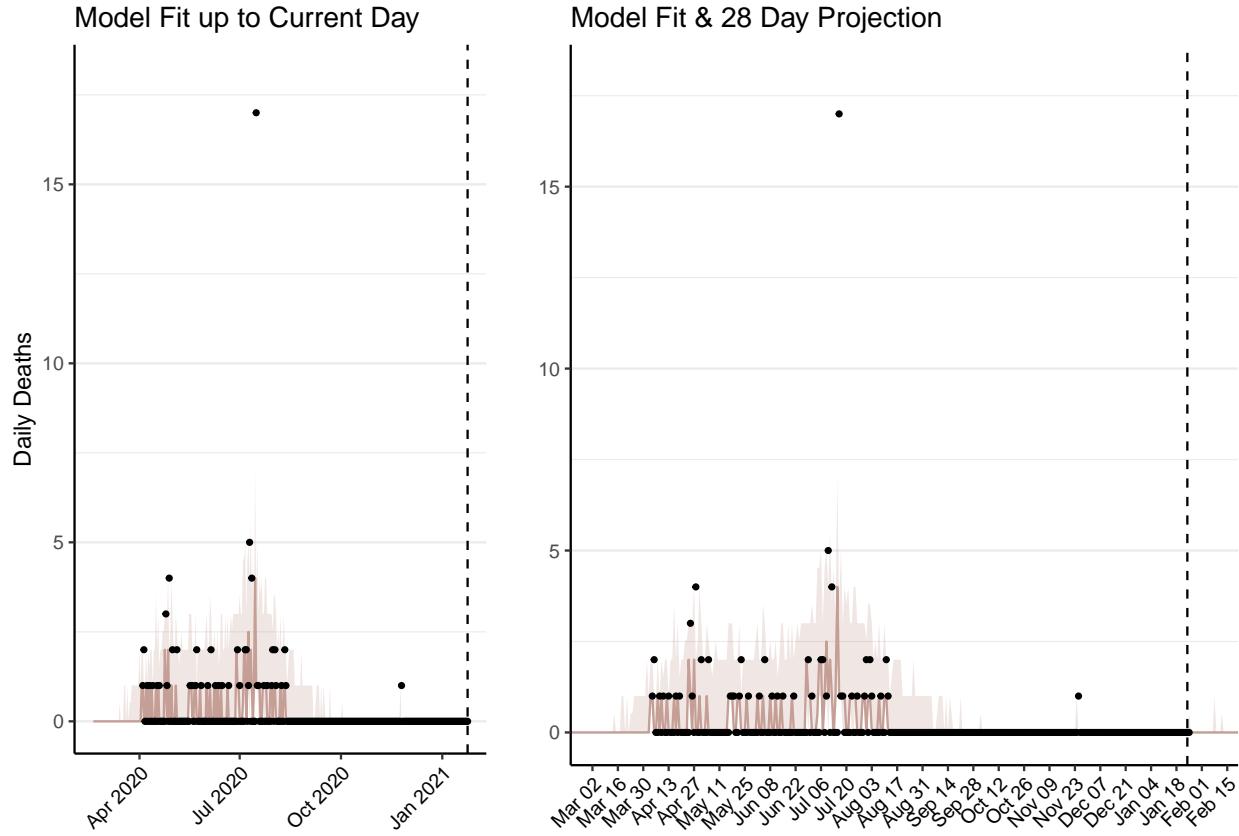


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 1 (95% CI: 0-1) patients requiring treatment with high-pressure oxygen at the current date to 1 (95% CI: 0-2) hospital beds being required on 2021-02-21 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: 0-1) by 2021-02-21. 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.**

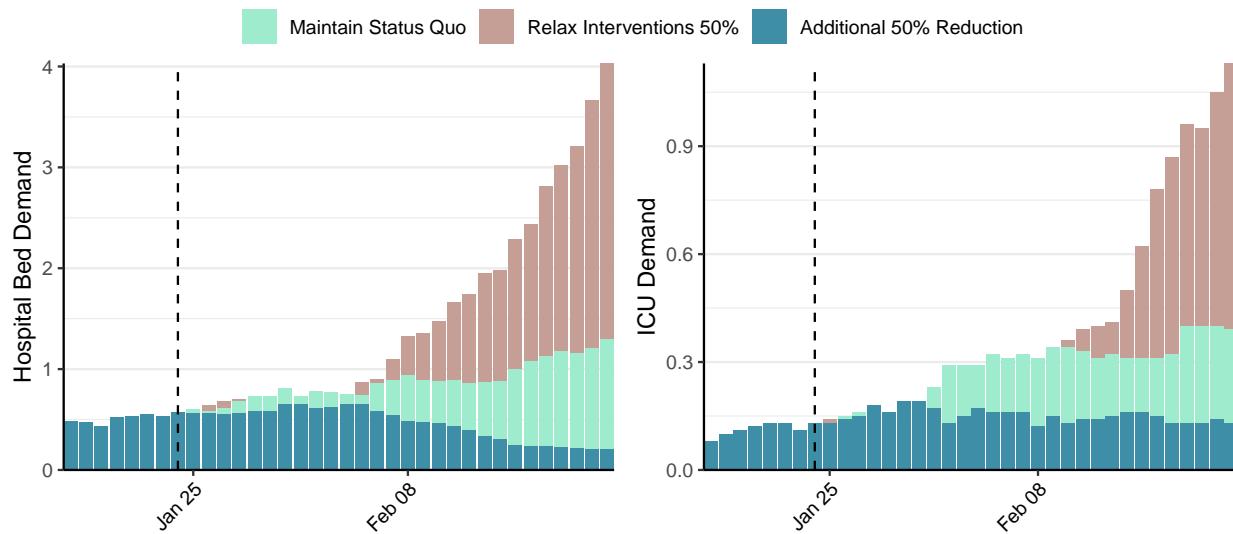
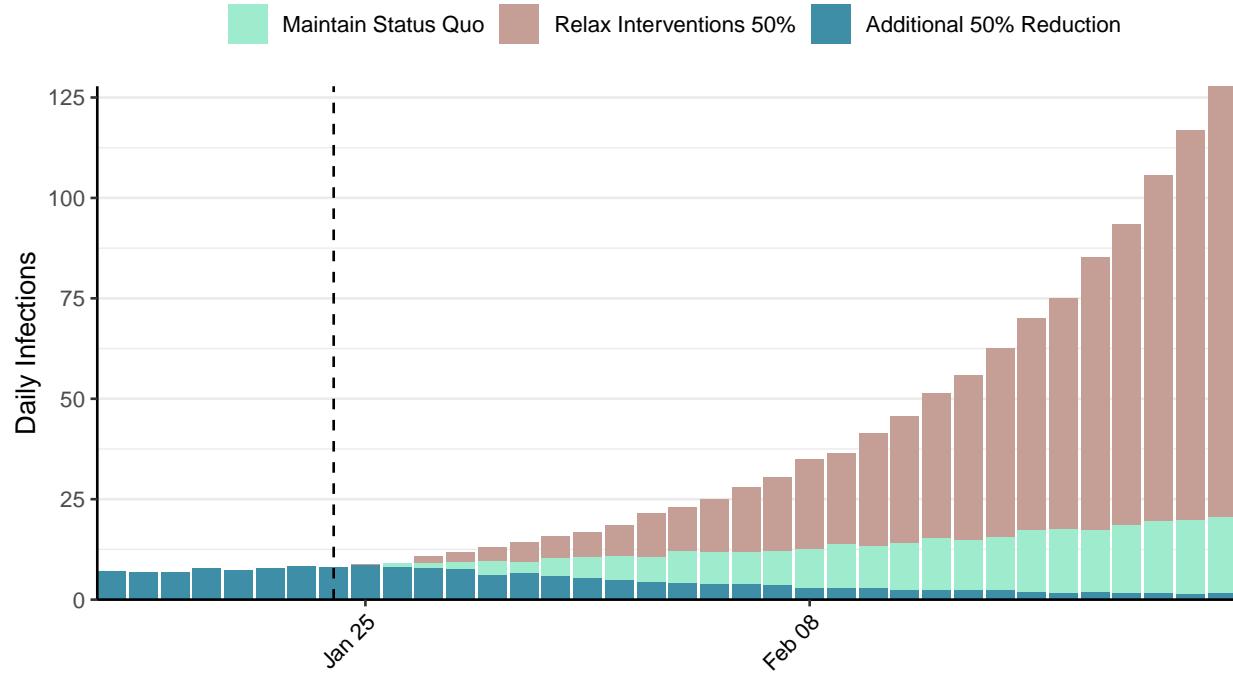


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 8 (95% CI: 3-13) at the current date to 2 (95% CI: 0-3) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 8 (95% CI: 3-13) at the current date to 127 (95% CI: 19-234) by 2021-02-21.



Situation Report for COVID-19: Libya, 2021-01-24

[Download the report for Libya, 2021-01-24 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}
741	741	19	19	1.11 (95% CI: 0.96-1.31)

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.

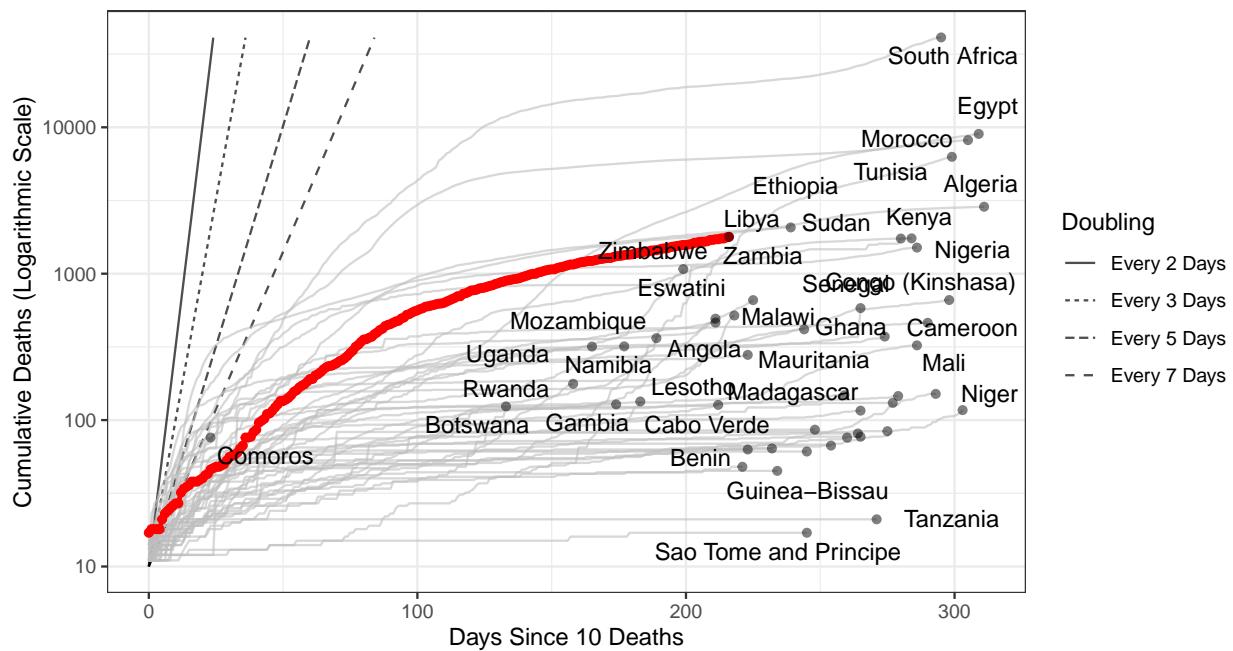


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 139,867 (95% CI: 133,685-146,048) 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

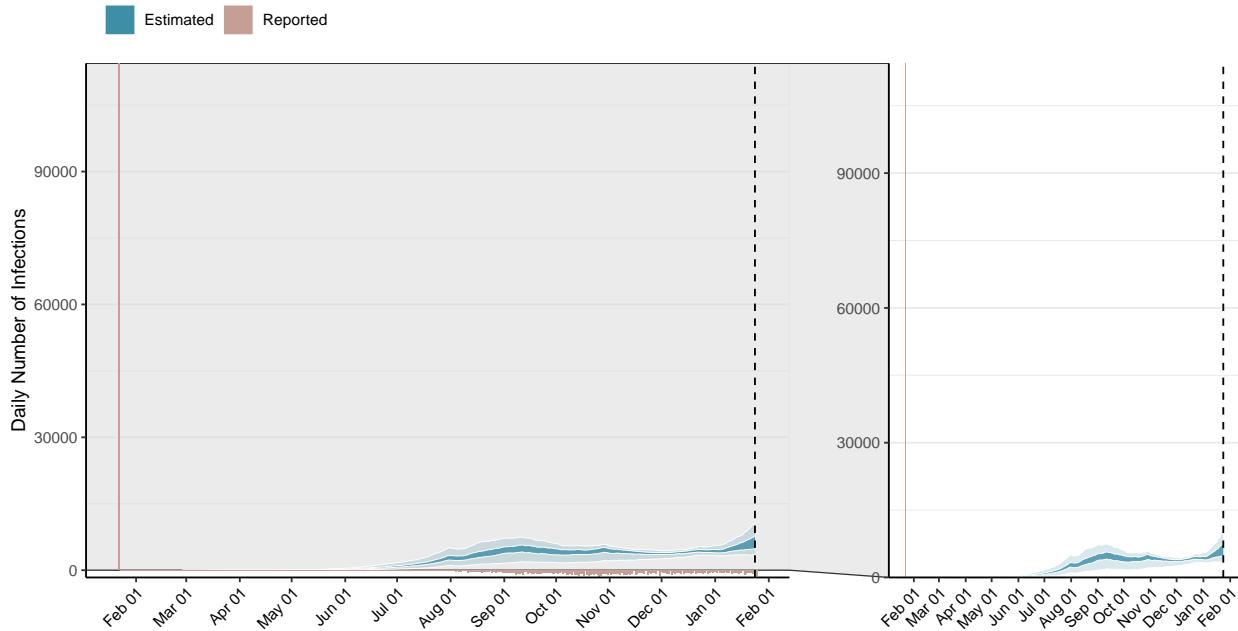


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

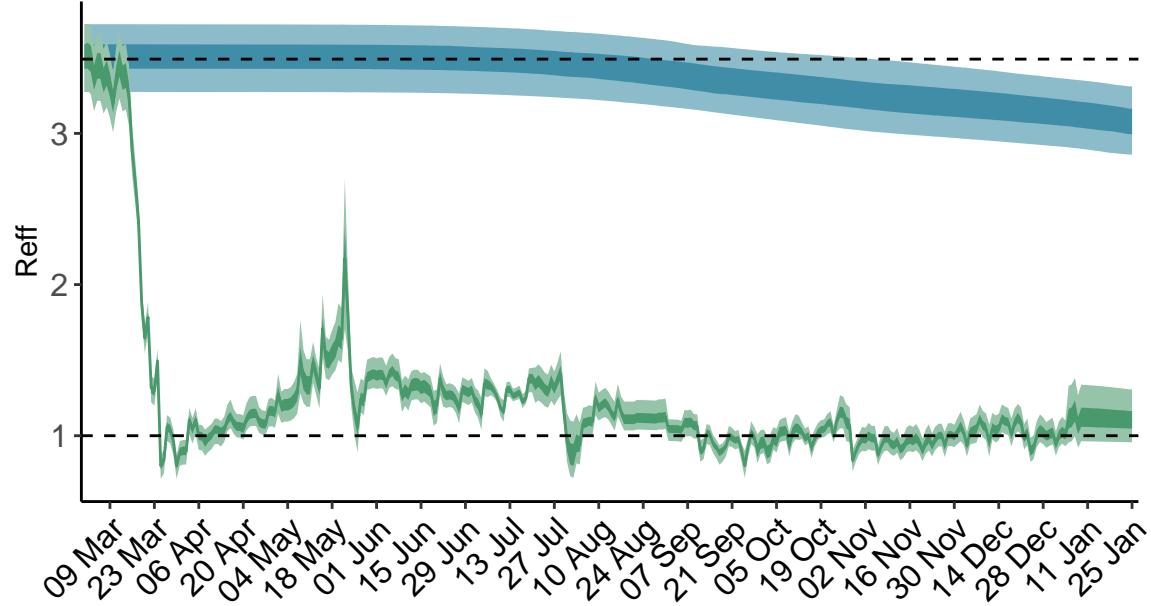


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

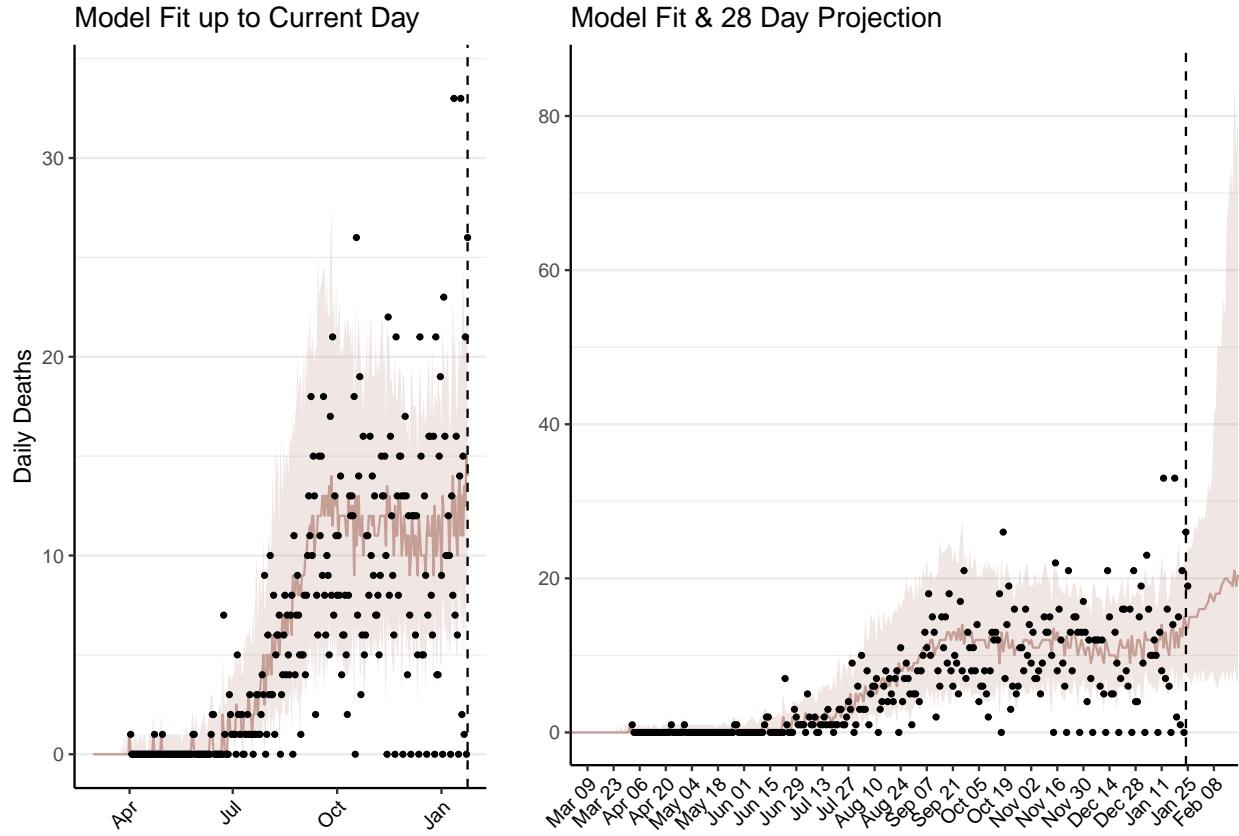


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 596 (95% CI: 567-625) patients requiring treatment with high-pressure oxygen at the current date to 1,005 (95% CI: 893-1,117) hospital beds being required on 2021-02-21 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 224 (95% CI: 214-234) patients requiring treatment with mechanical ventilation at the current date to 348 (95% CI: 321-376) by 2021-02-21. 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.**

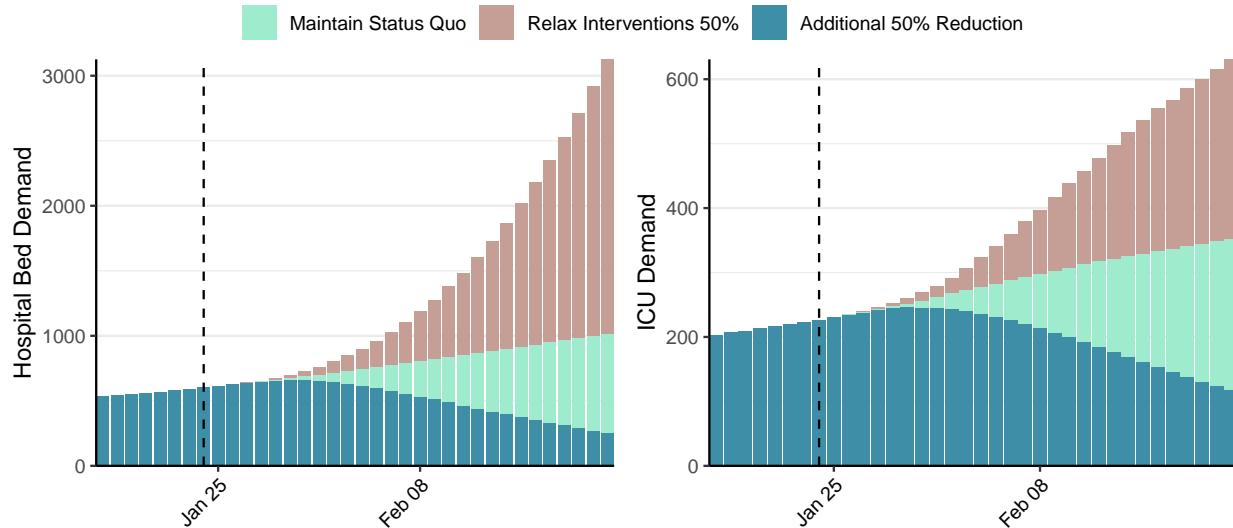


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 6,338 (95% CI: 5,891-6,785) at the current date to 842 (95% CI: 731-953) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 6,338 (95% CI: 5,891-6,785) at the current date to 51,966 (95% CI: 46,215-57,717) by 2021-02-21.

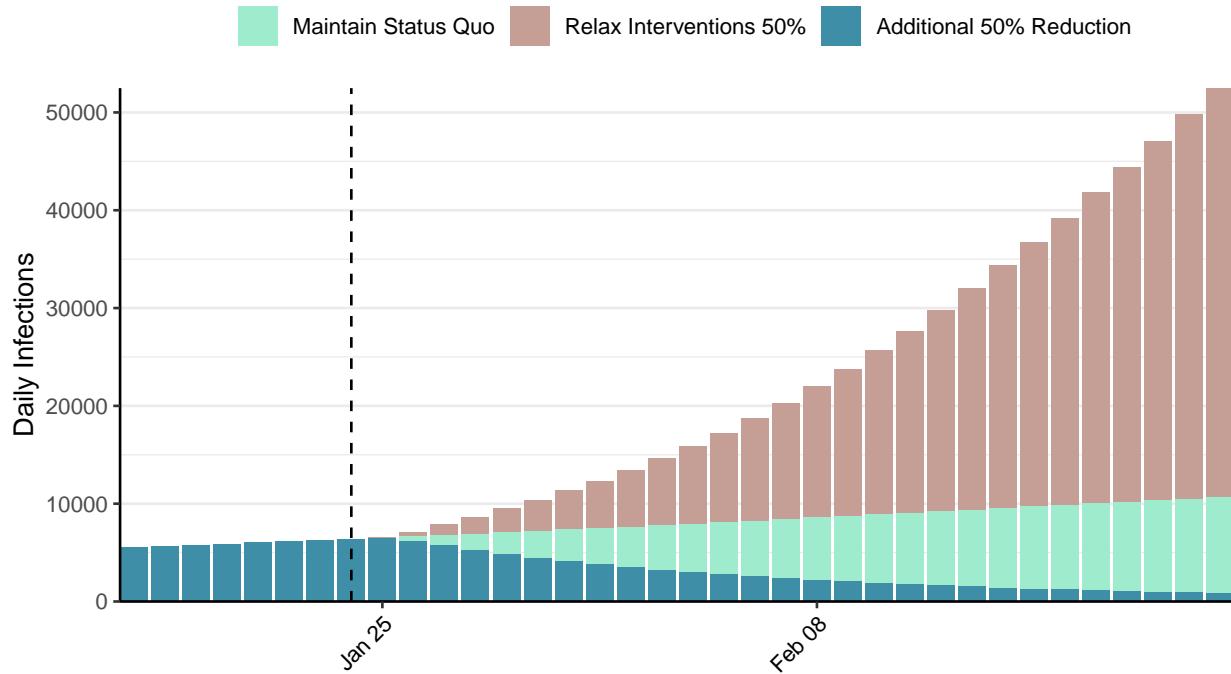


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for St. Lucia, 2021-01-24 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}
76	76	0	0	1.24 (95% CI: 0.92-1.63)

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**

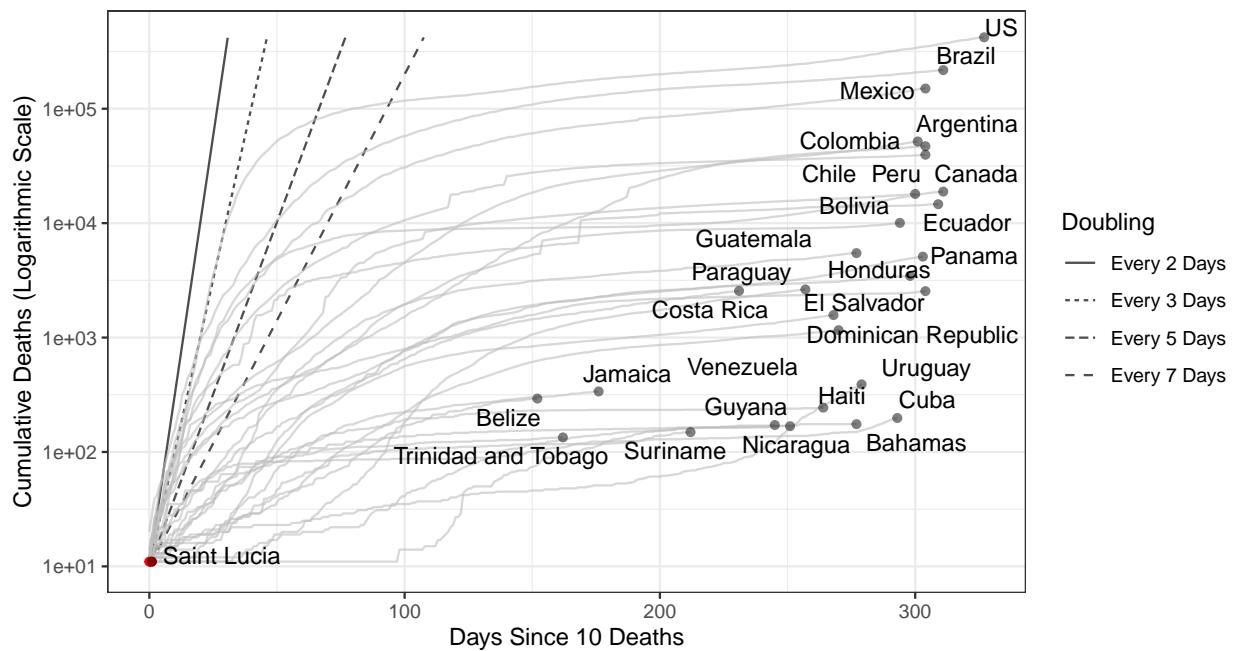


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 6,299 (95% CI: 5,492-7,106) 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

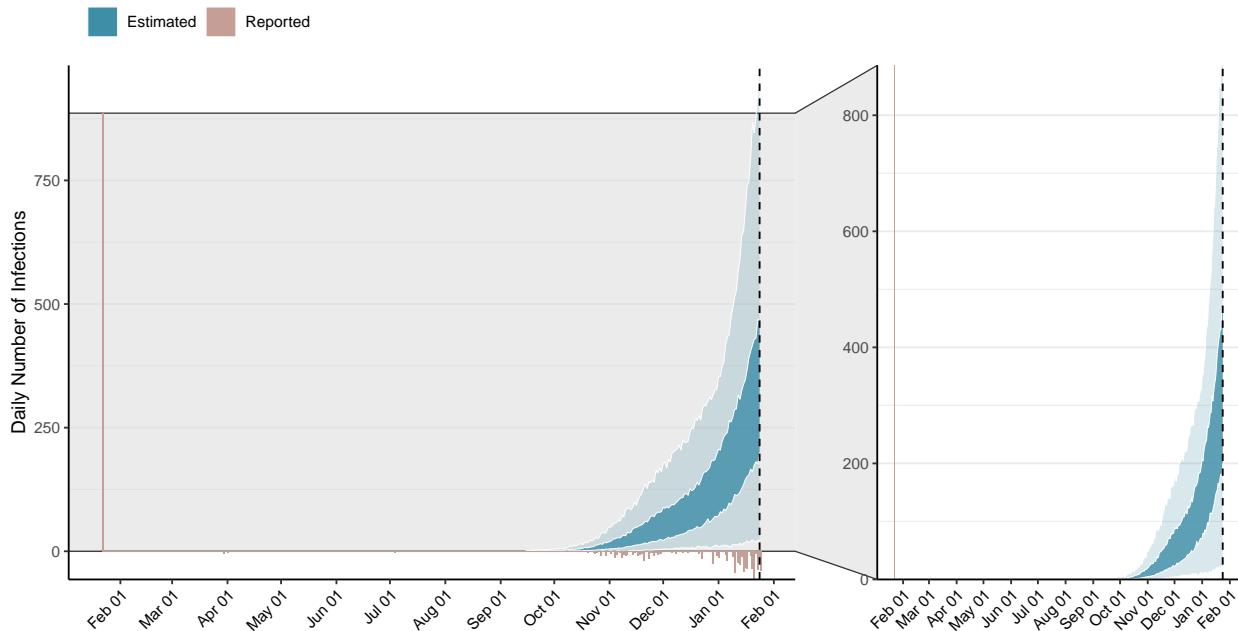


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

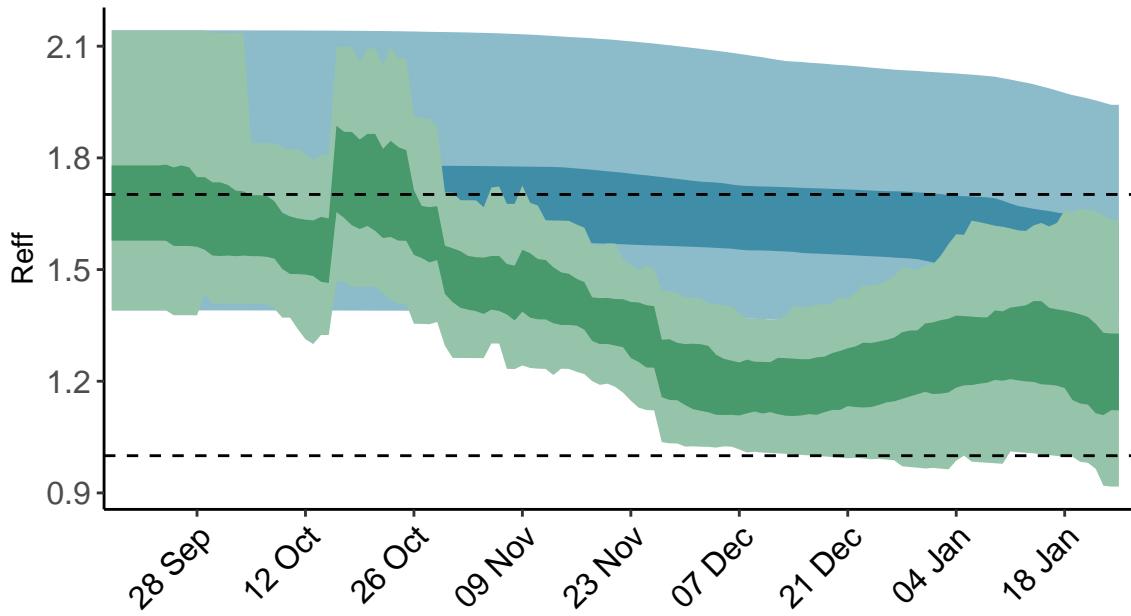


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

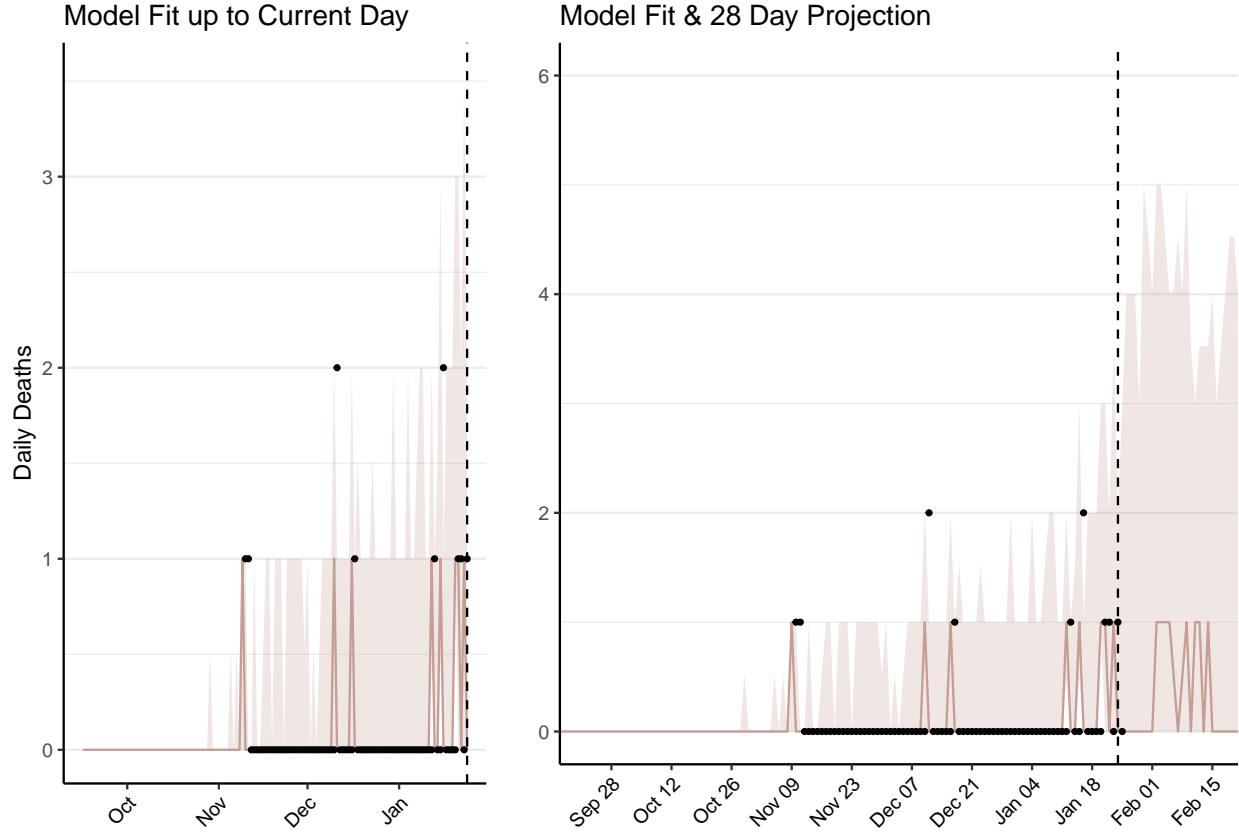


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 27 (95% CI: 23-31) patients requiring treatment with high-pressure oxygen at the current date to 18 (95% CI: 14-23) hospital beds being required on 2021-02-21 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: 7-10) patients requiring treatment with mechanical ventilation at the current date to 7 (95% CI: 6-8) by 2021-02-21. 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.**

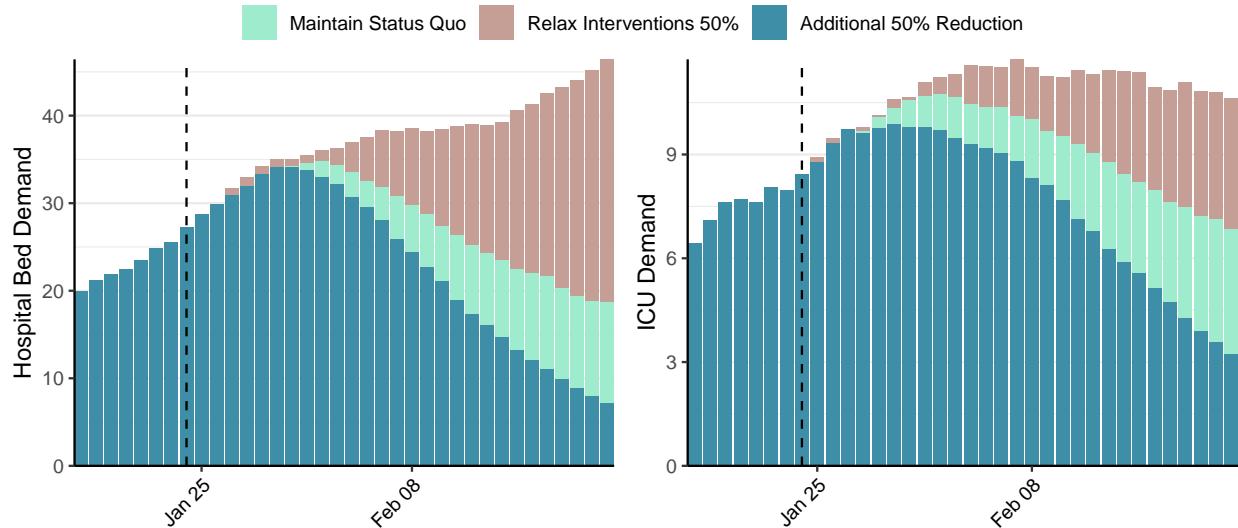


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 370 (95% CI: 318-422) at the current date to 12 (95% CI: 8-16) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 370 (95% CI: 318-422) at the current date to 485 (95% CI: 300-669) by 2021-02-21.

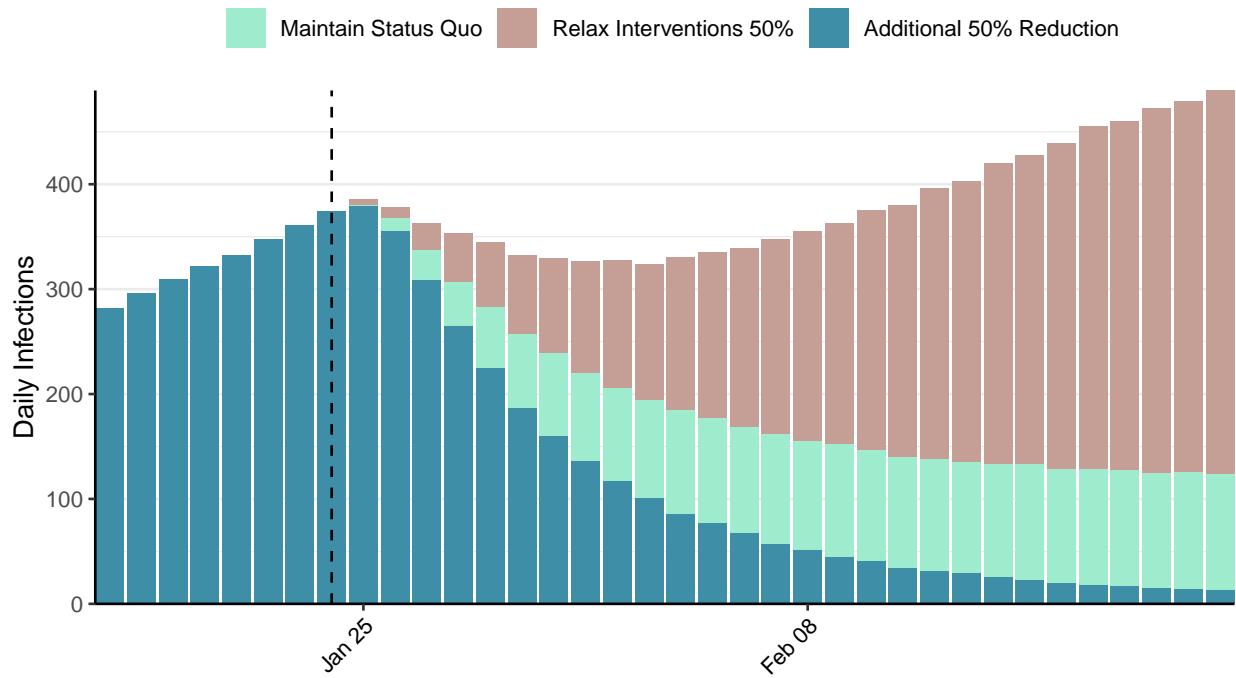


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Sri Lanka, 2021-01-24

[Download the report for Sri Lanka, 2021-01-24 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}
737	737	4	4	1.02 (95% CI: 0.82-1.23)

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. Sri Lanka is not shown in the following plot as only 4 deaths have been reported to date**

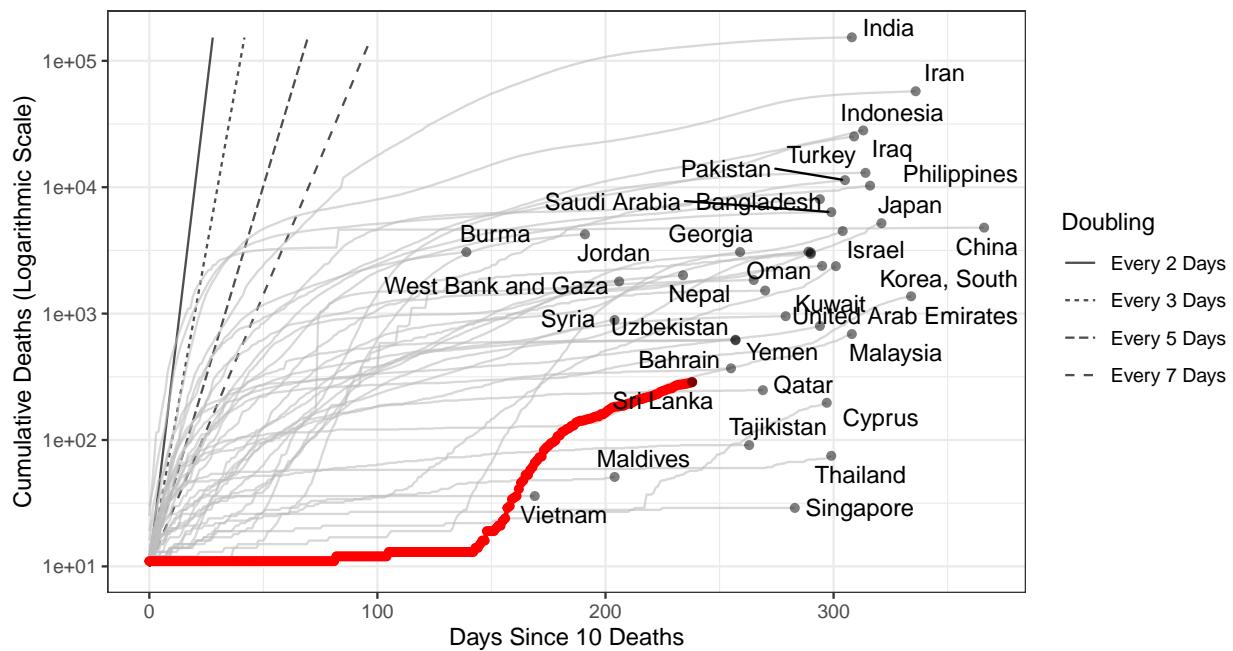


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 49,841 (95% CI: 42,308-57,374) 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

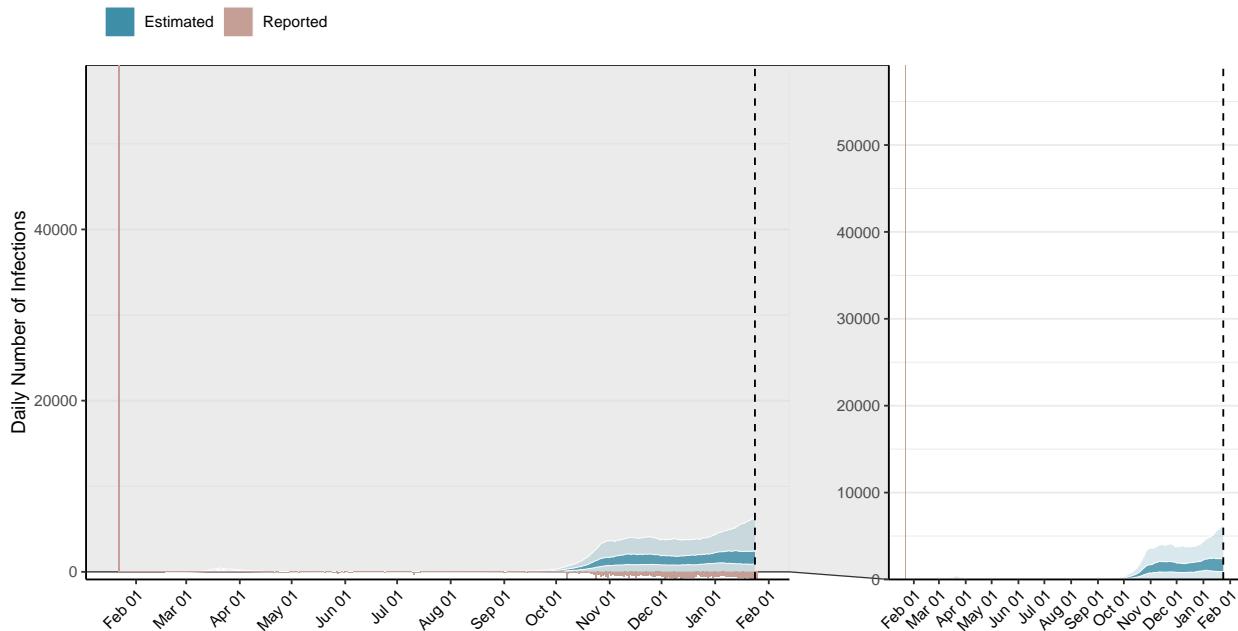


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

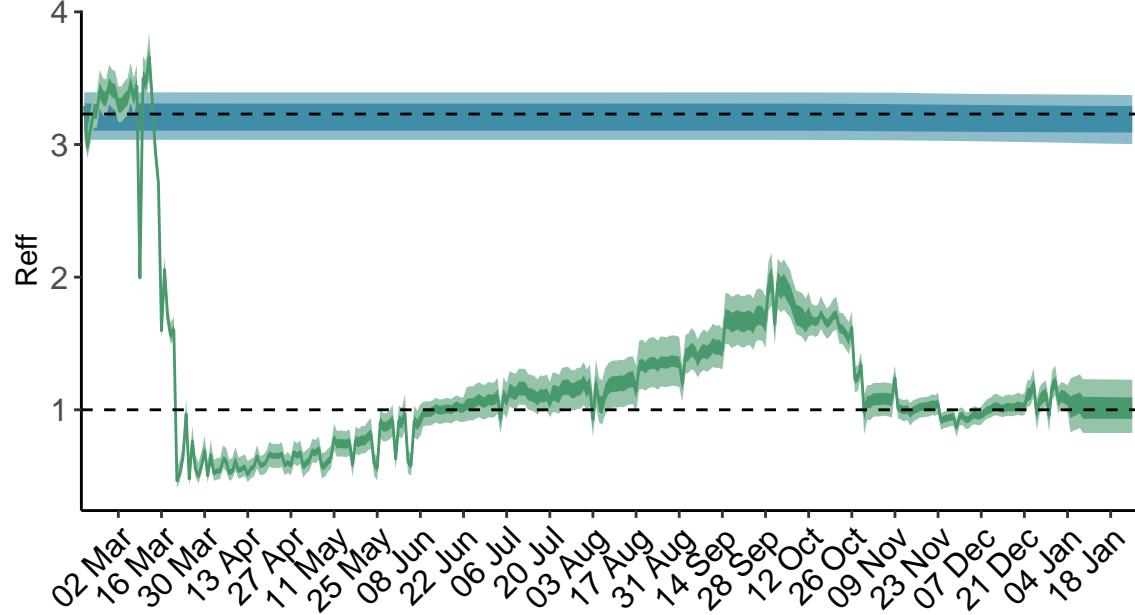


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

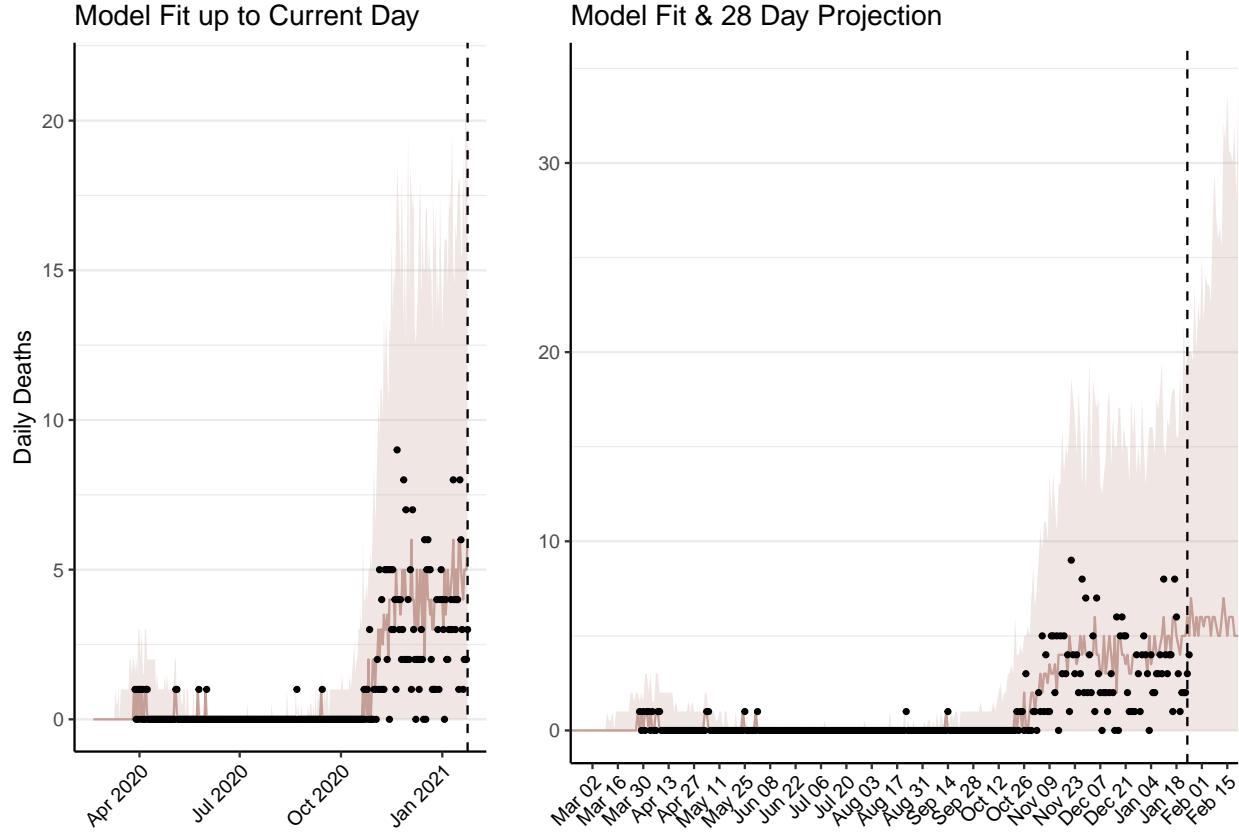


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 242 (95% CI: 204-279) patients requiring treatment with high-pressure oxygen at the current date to 322 (95% CI: 249-395) hospital beds being required on 2021-02-21 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 93 (95% CI: 79-108) patients requiring treatment with mechanical ventilation at the current date to 123 (95% CI: 96-151) by 2021-02-21. 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.**

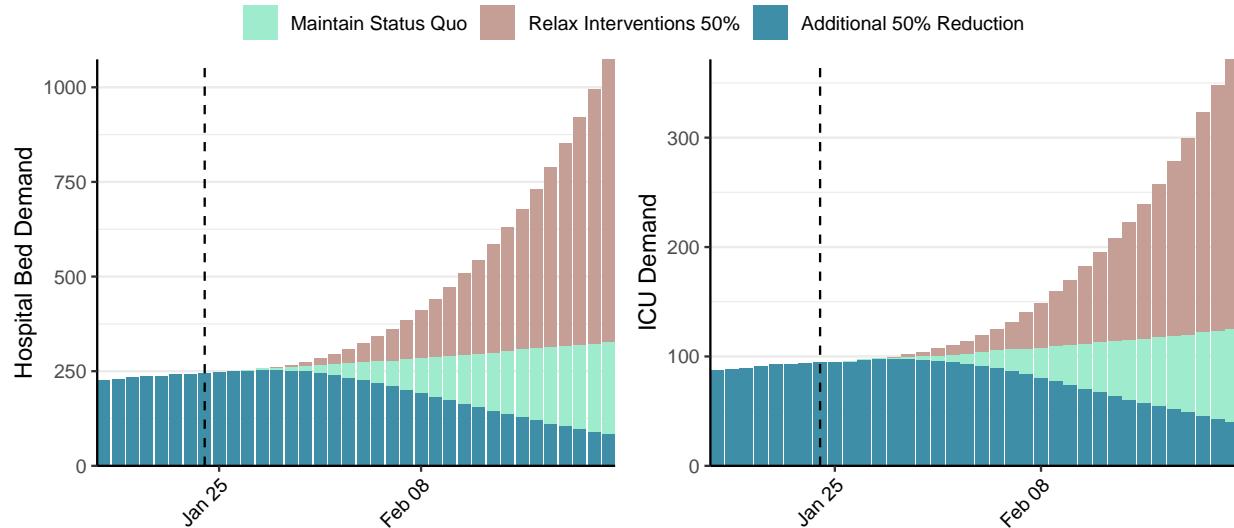


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 1,990 (95% CI: 1,644-2,337) at the current date to 212 (95% CI: 161-263) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,990 (95% CI: 1,644-2,337) at the current date to 16,656 (95% CI: 12,229-21,083) by 2021-02-21.

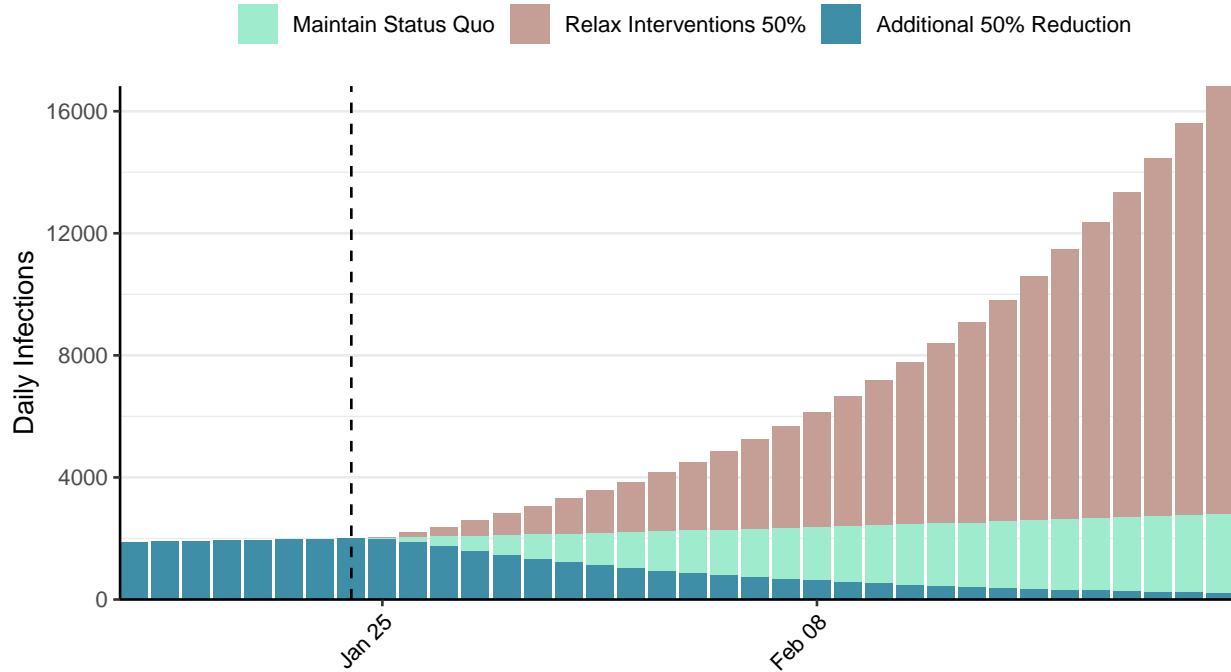


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Lesotho, 2021-01-24 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}
388	388	11	11	0.91 (95% CI: 0.73-1.02)

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.

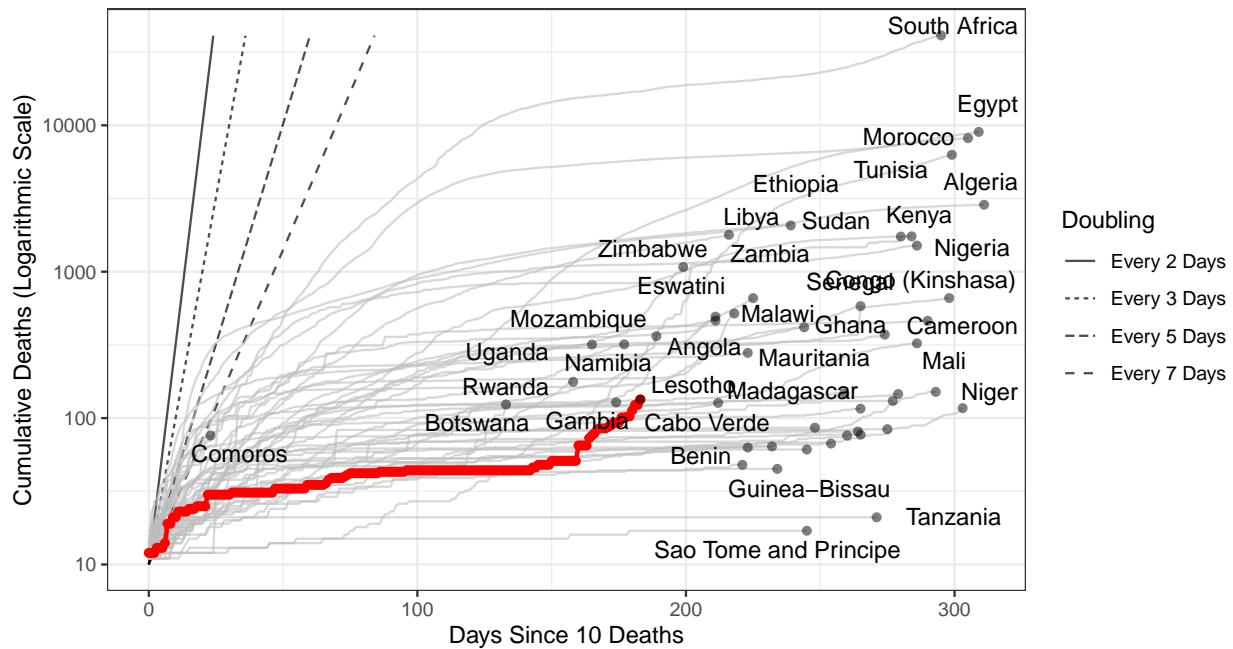


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 72,581 (95% CI: 67,710-77,451) 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).

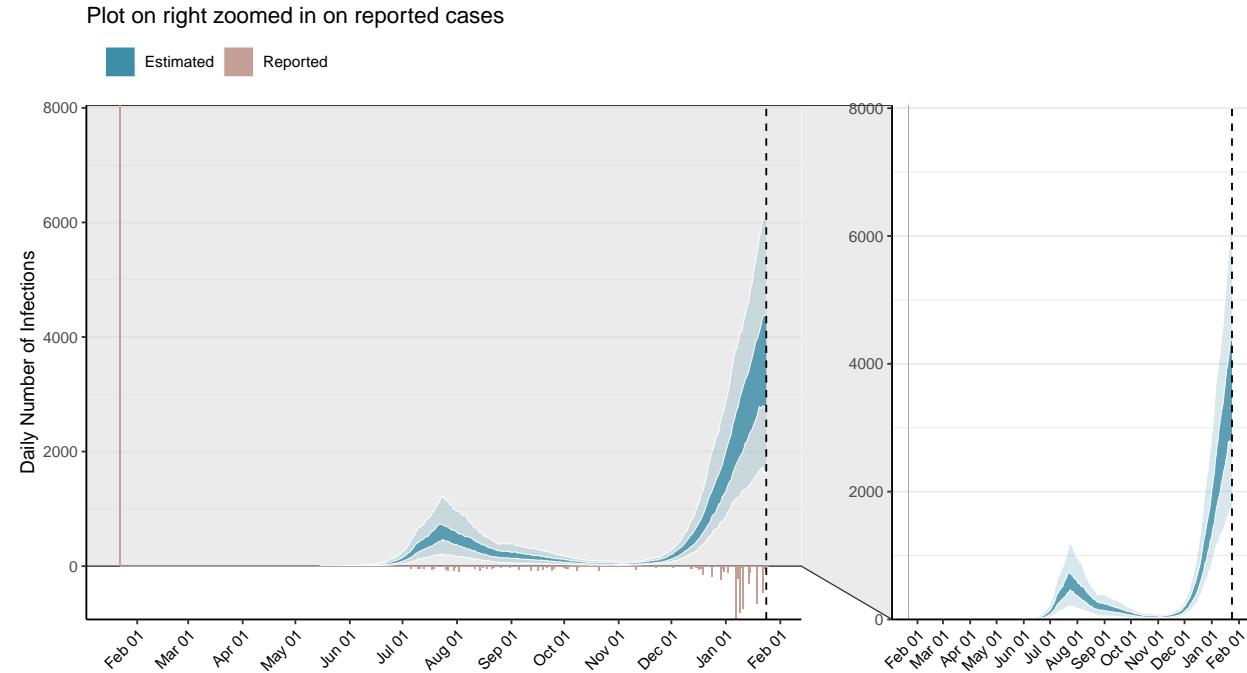


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

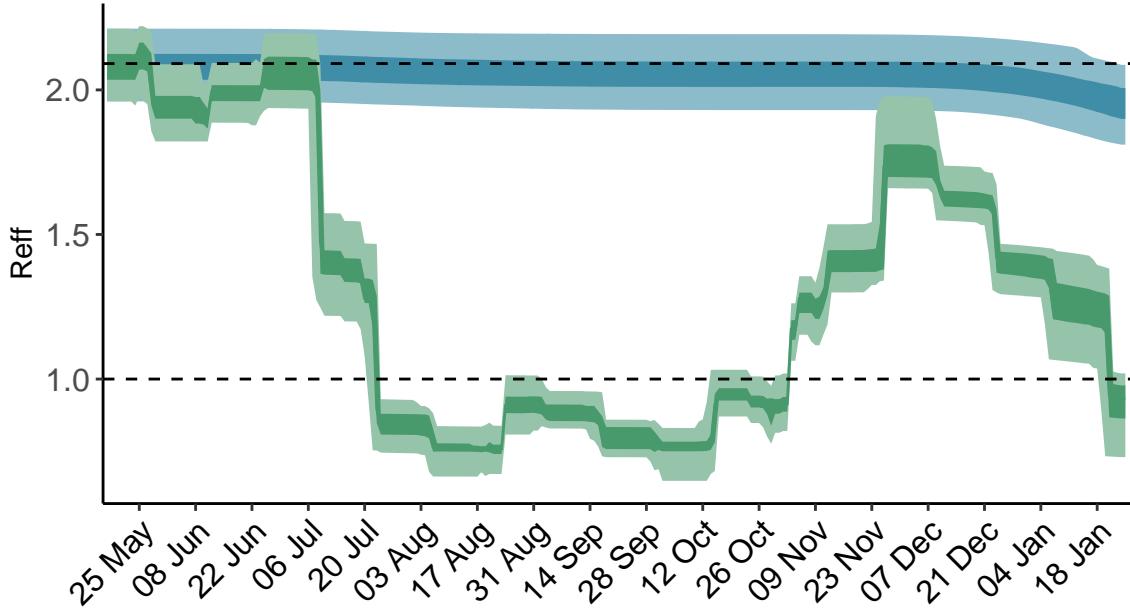


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

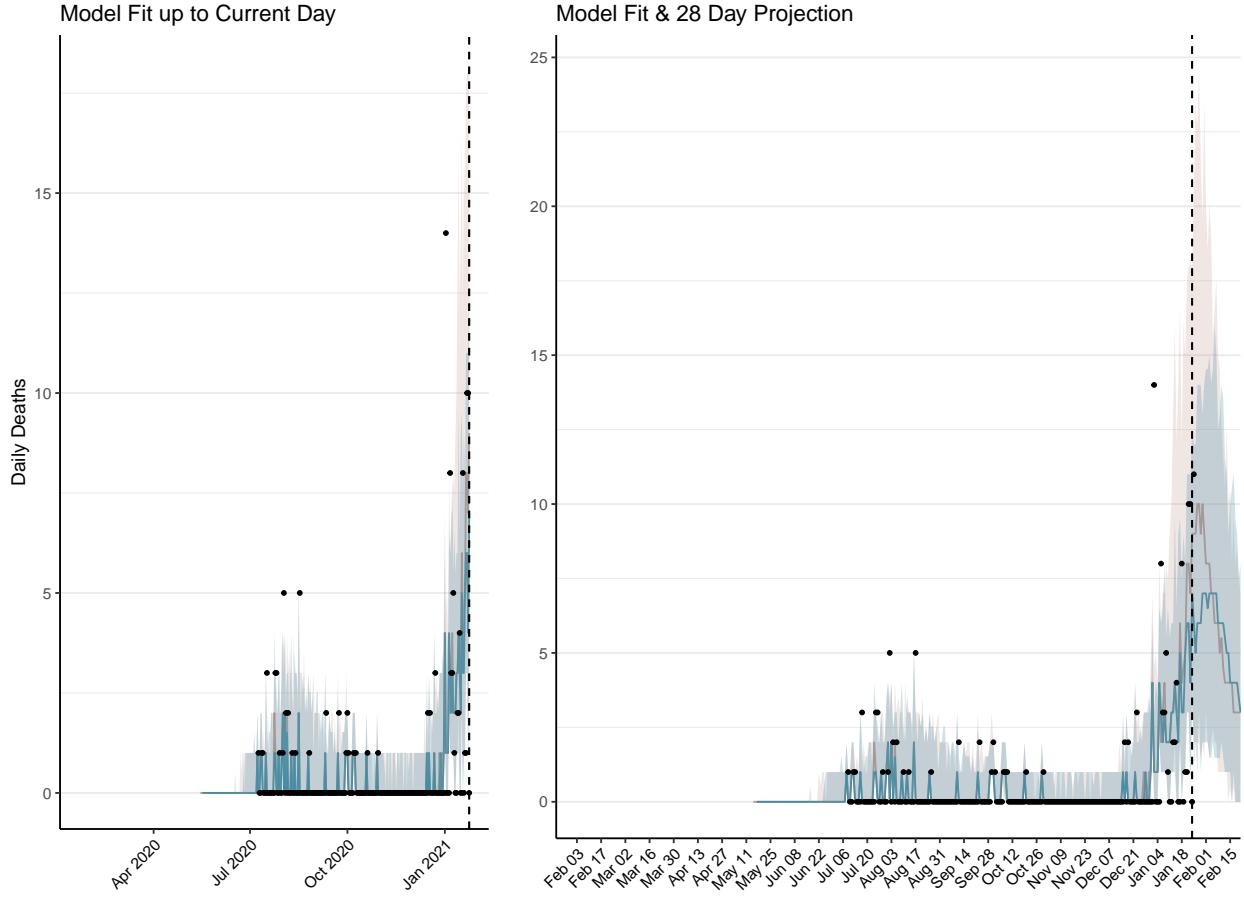


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 265 (95% CI: 247-284) patients requiring treatment with high-pressure oxygen at the current date to 99 (95% CI: 90-108) hospital beds being required on 2021-02-21 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 69 (95% CI: 67-72) patients requiring treatment with mechanical ventilation at the current date to 39 (95% CI: 37-42) by 2021-02-21. 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.**

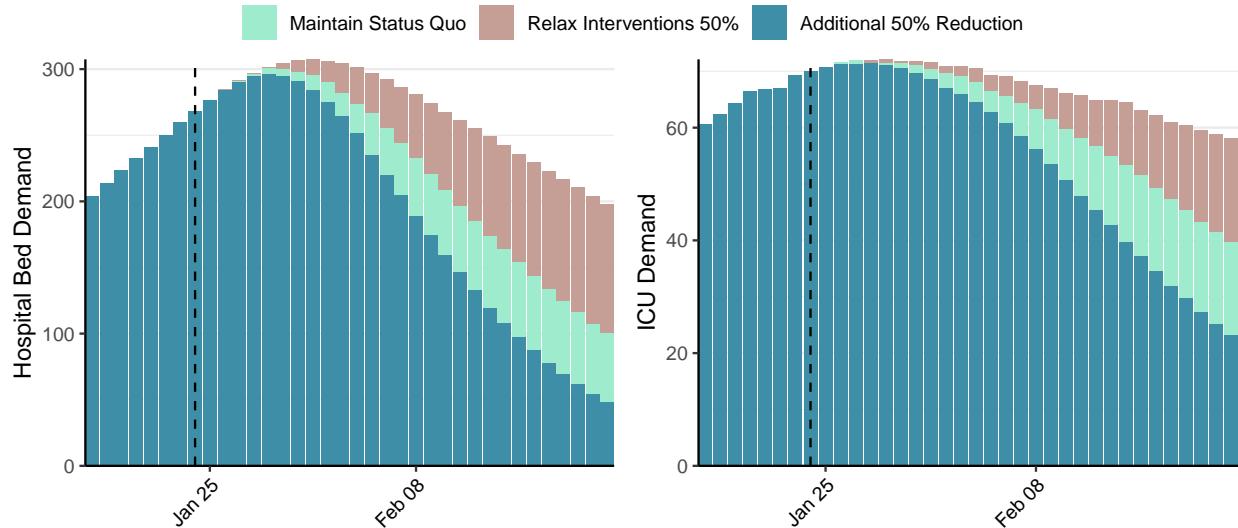


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 3,630 (95% CI: 3,341-3,918) at the current date to 51 (95% CI: 45-57) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,630 (95% CI: 3,341-3,918) at the current date to 1,515 (95% CI: 1,309-1,720) by 2021-02-21.

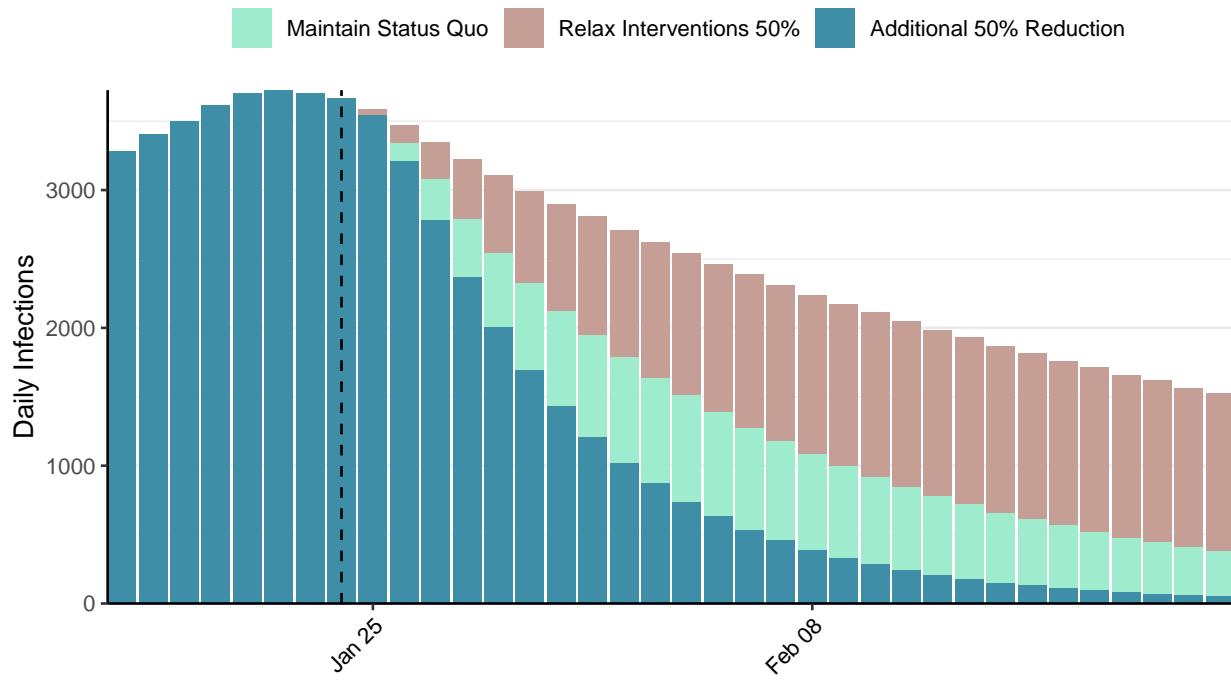


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Morocco, 2021-01-24 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}
337	337	22	22	0.76 (95% CI: 0.57-0.98)

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.

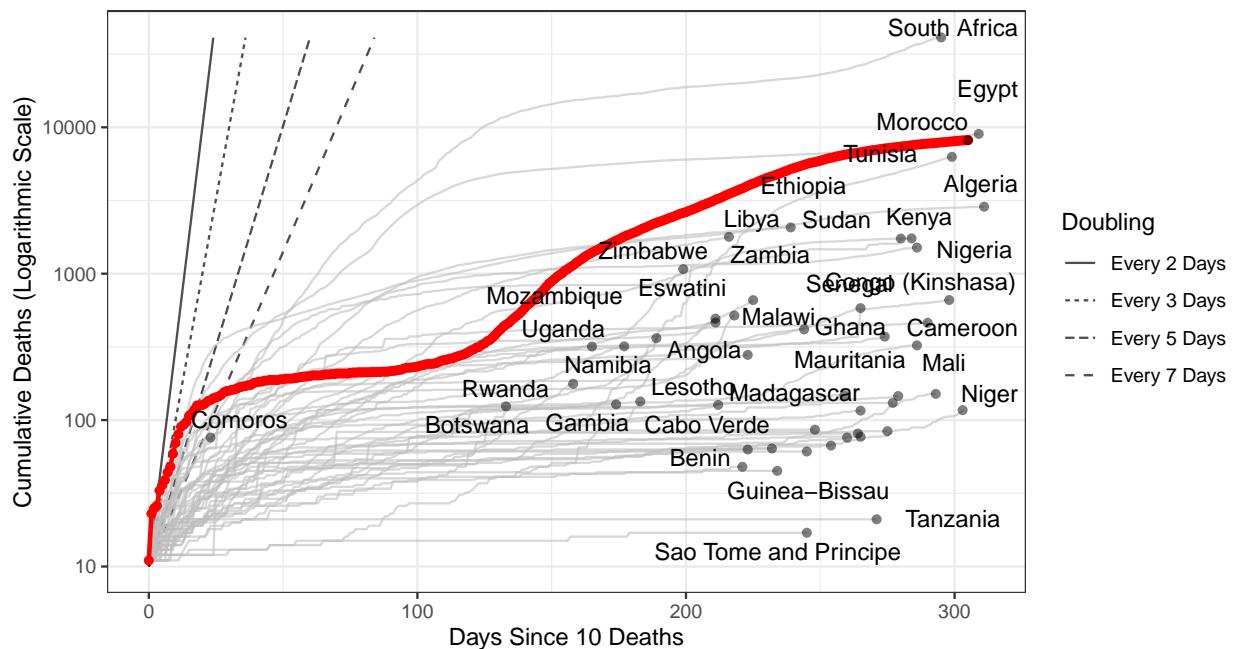


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 227,560 (95% CI: 217,594–237,526) 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

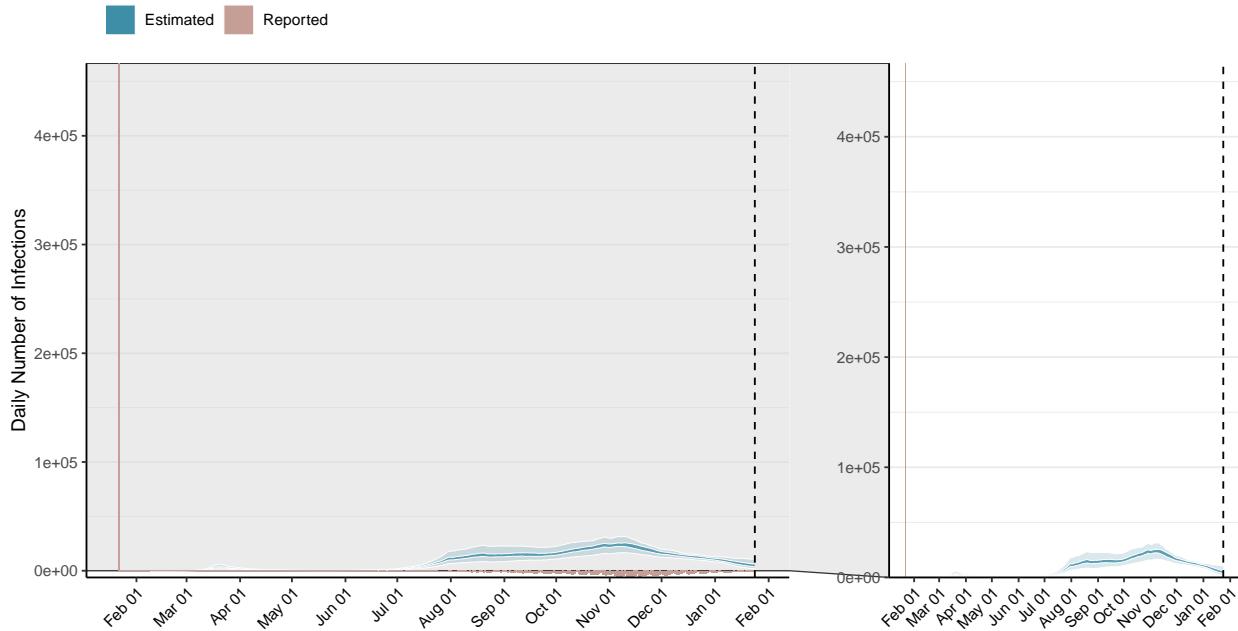


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

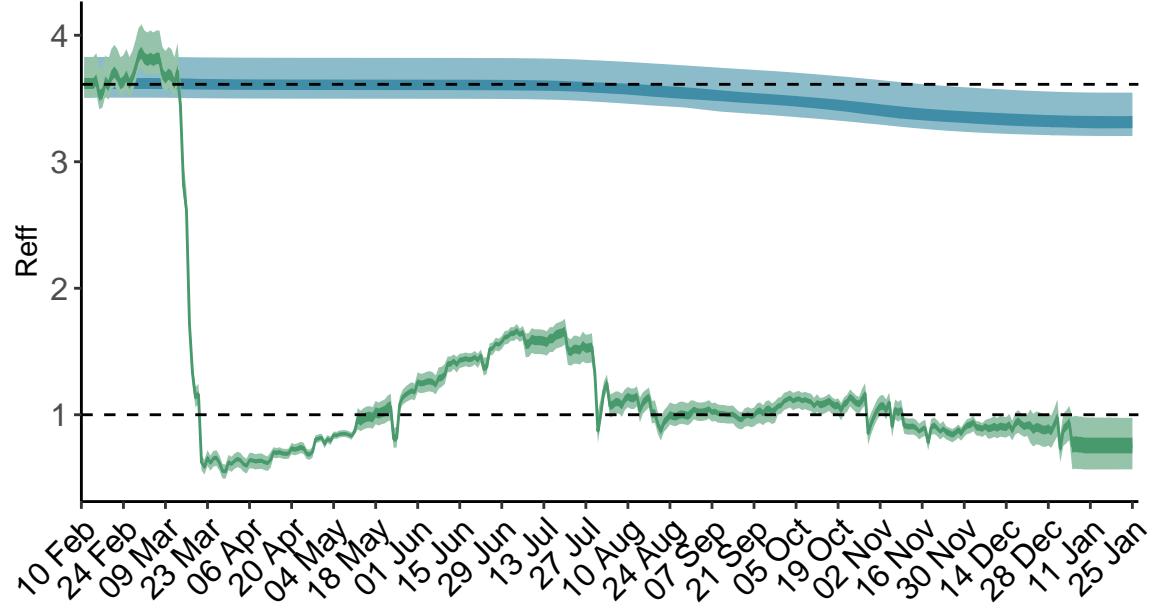


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

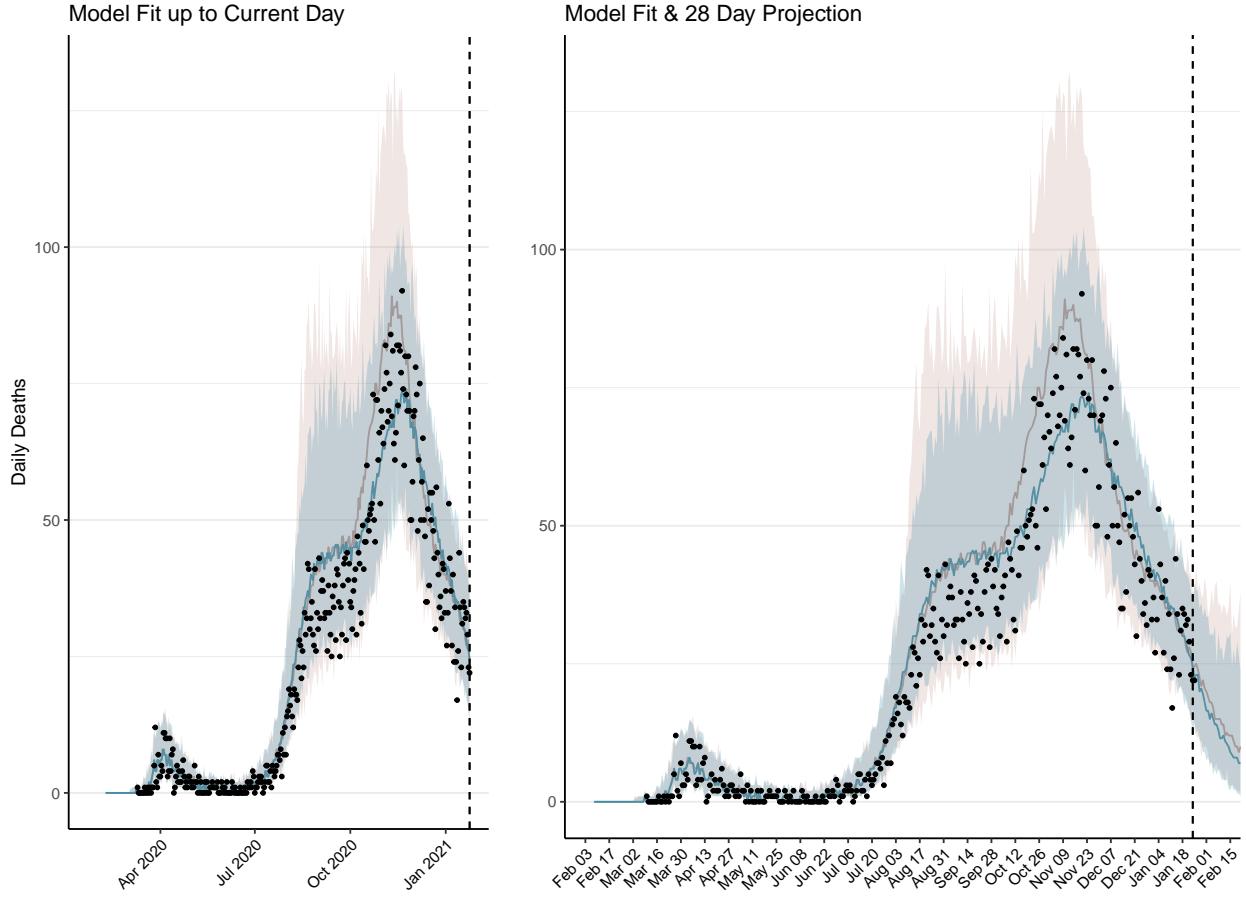


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 934 (95% CI: 887-981) patients requiring treatment with high-pressure oxygen at the current date to 403 (95% CI: 341-465) hospital beds being required on 2021-02-21 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 395 (95% CI: 377-413) patients requiring treatment with mechanical ventilation at the current date to 173 (95% CI: 149-197) by 2021-02-21. 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.**

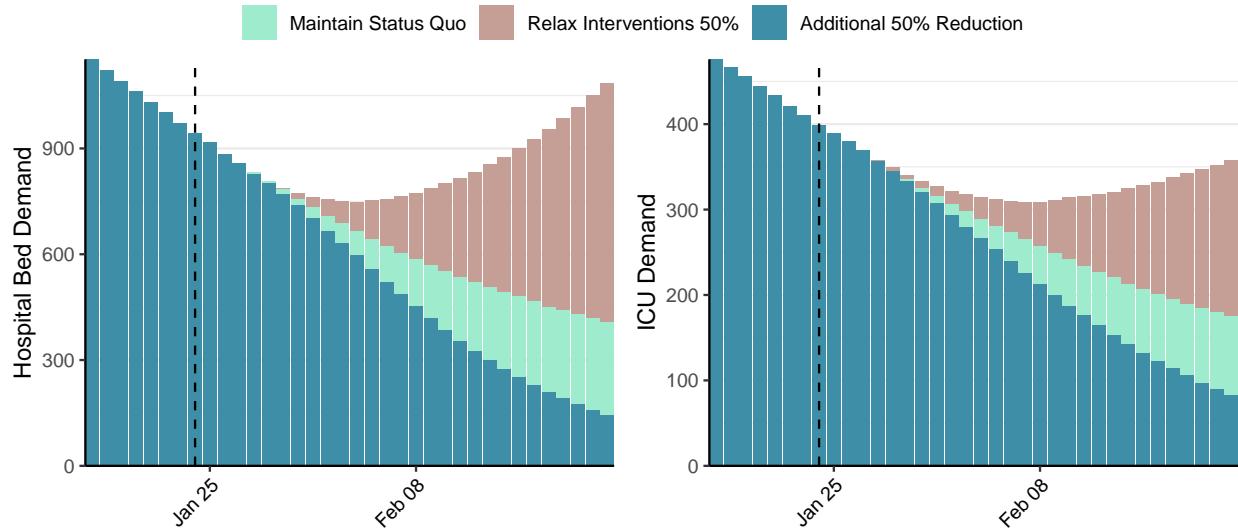


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 5,086 (95% CI: 4,621-5,550) at the current date to 224 (95% CI: 182-267) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 5,086 (95% CI: 4,621-5,550) at the current date to 12,450 (95% CI: 9,464-15,436) by 2021-02-21.

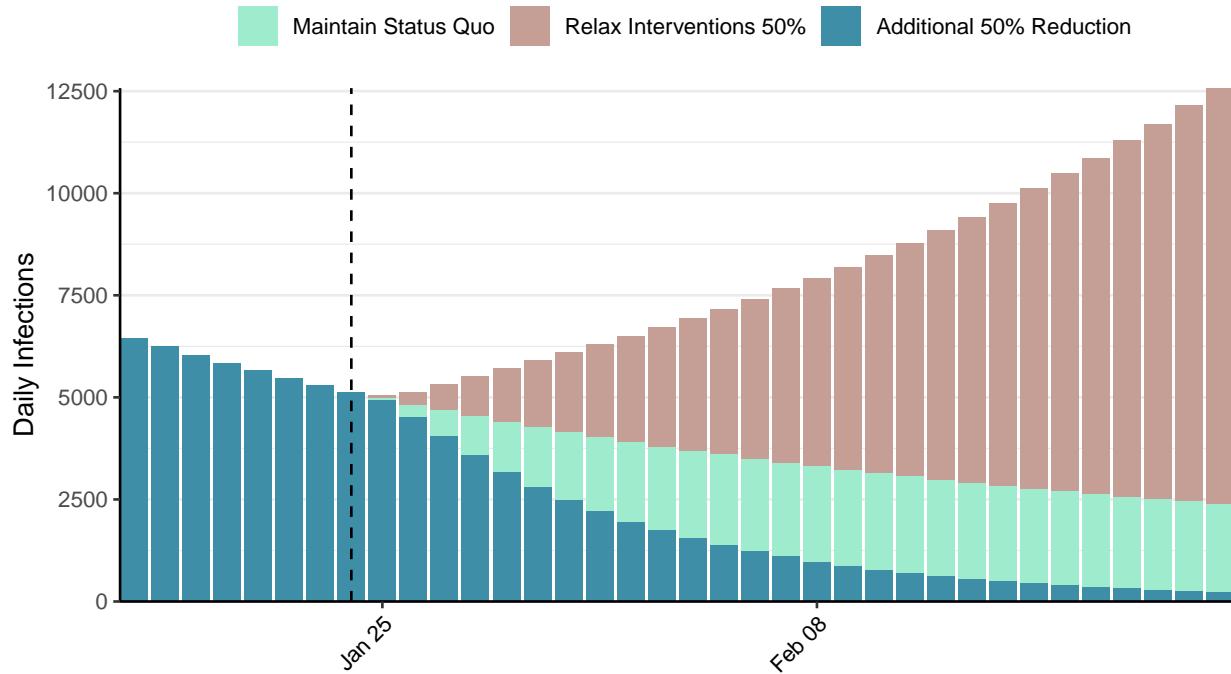


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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: Moldova, 2021-01-24

[Download the report for Moldova, 2021-01-24 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}
224	224	7	7	0.83 (95% CI: 0.7-0.99)

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. Moldova is not shown in the following plot as only 7 deaths have been reported to date**

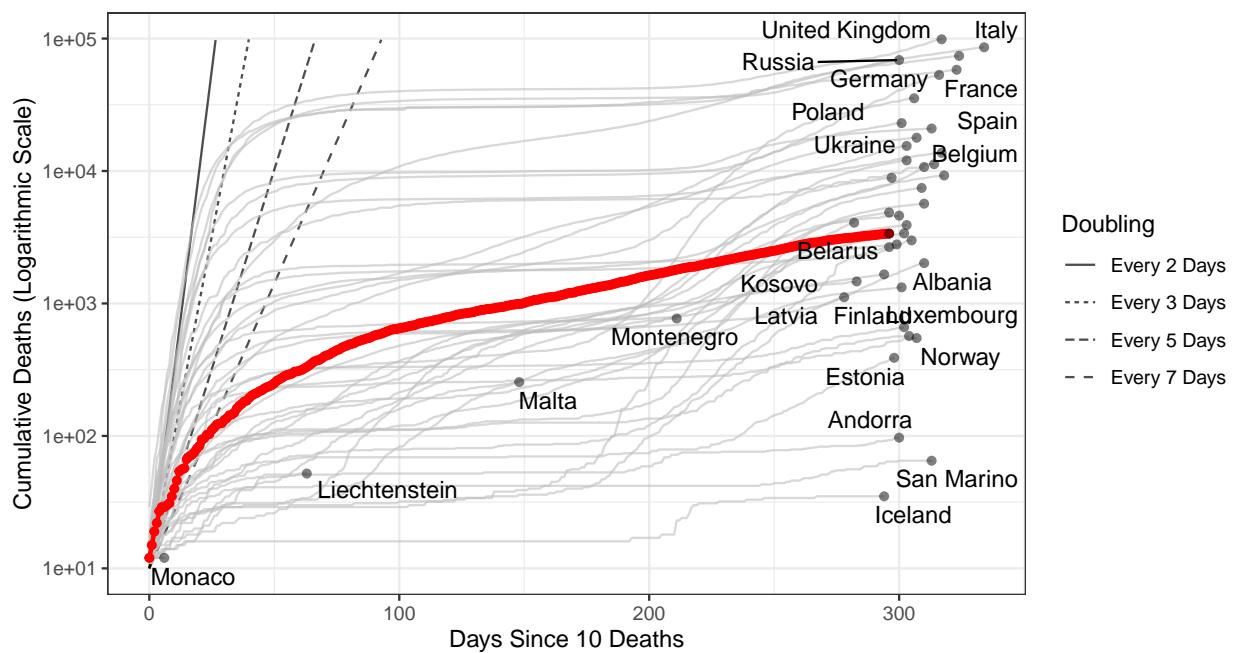


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 119,973 (95% CI: 115,227-124,718) 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).

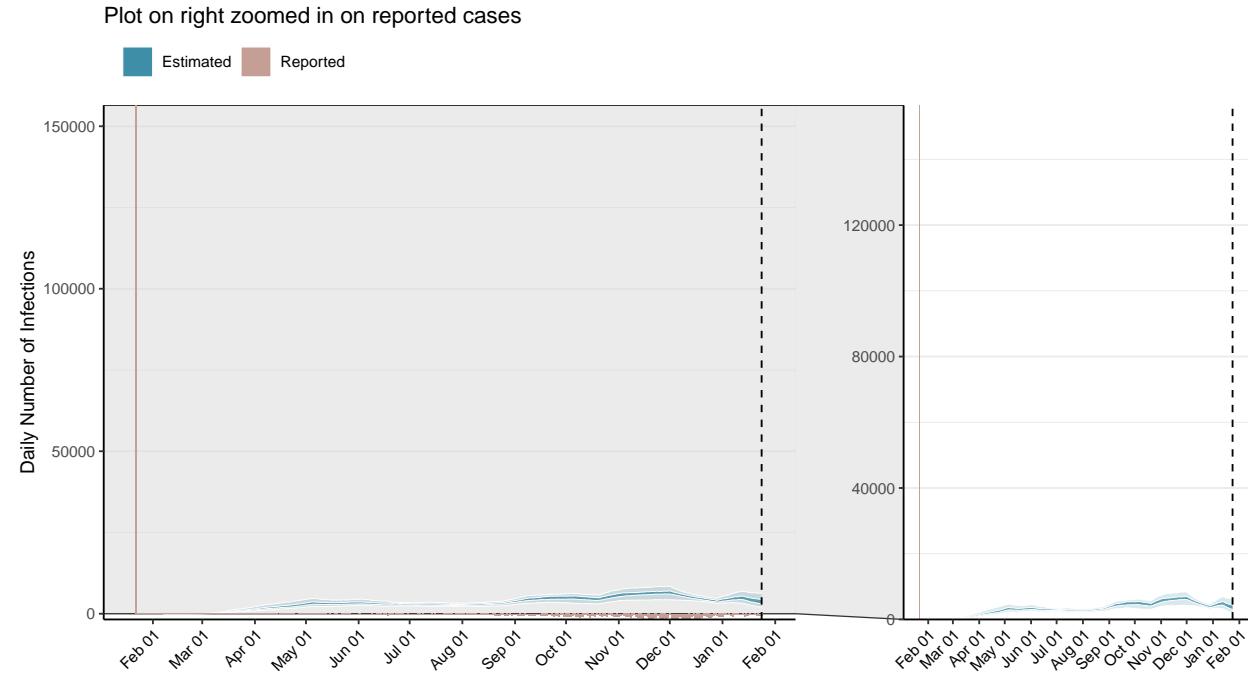


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

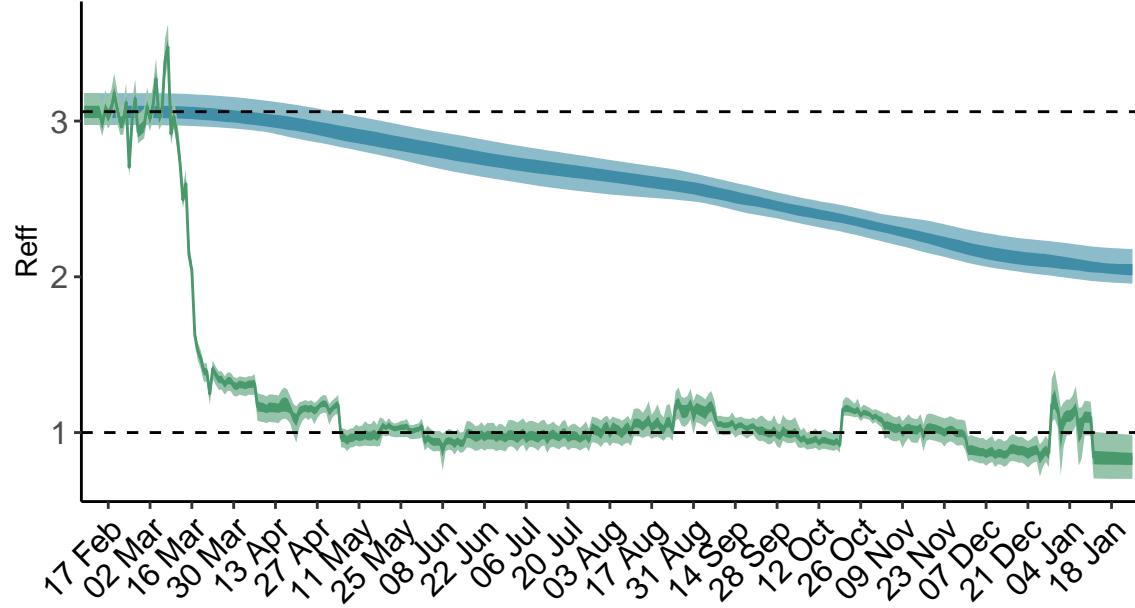


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

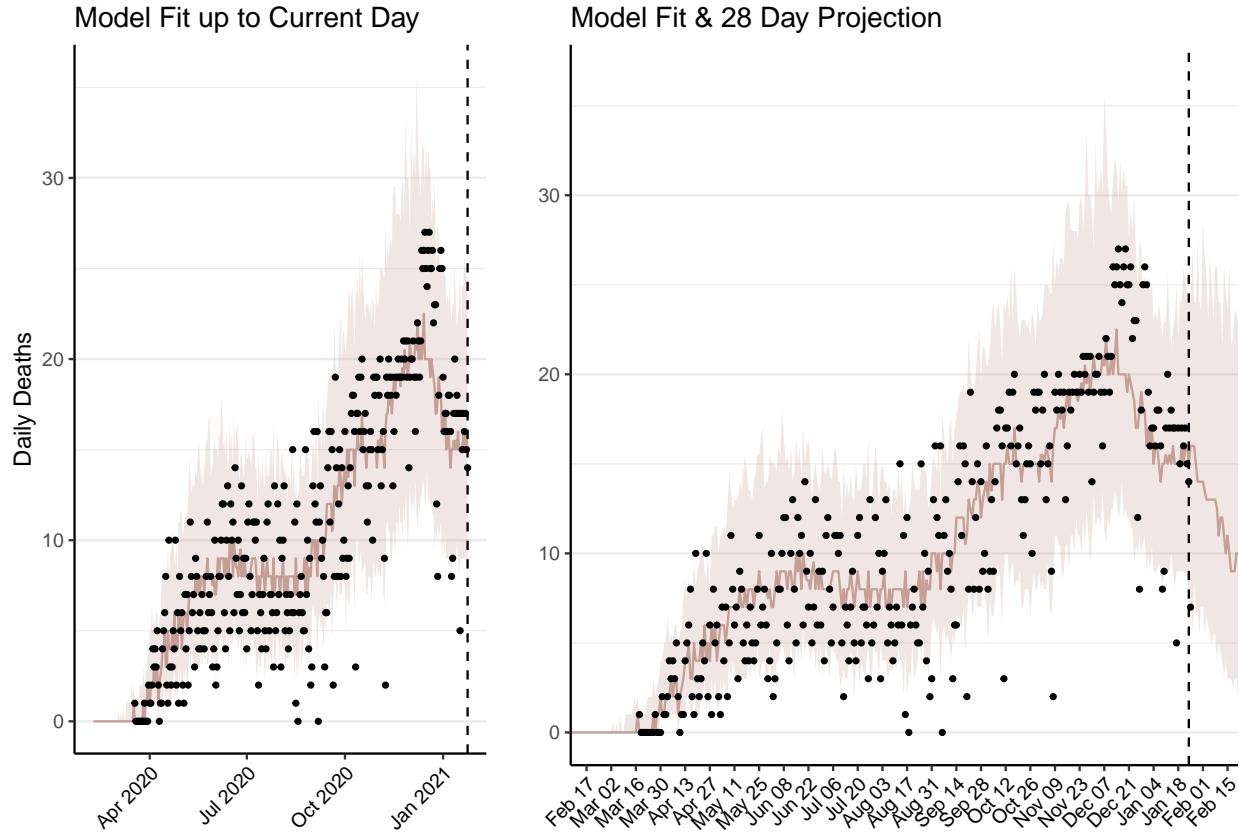


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 584 (95% CI: 559-608) patients requiring treatment with high-pressure oxygen at the current date to 341 (95% CI: 308-375) hospital beds being required on 2021-02-21 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 228 (95% CI: 218-238) patients requiring treatment with mechanical ventilation at the current date to 143 (95% CI: 130-156) by 2021-02-21. 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.**

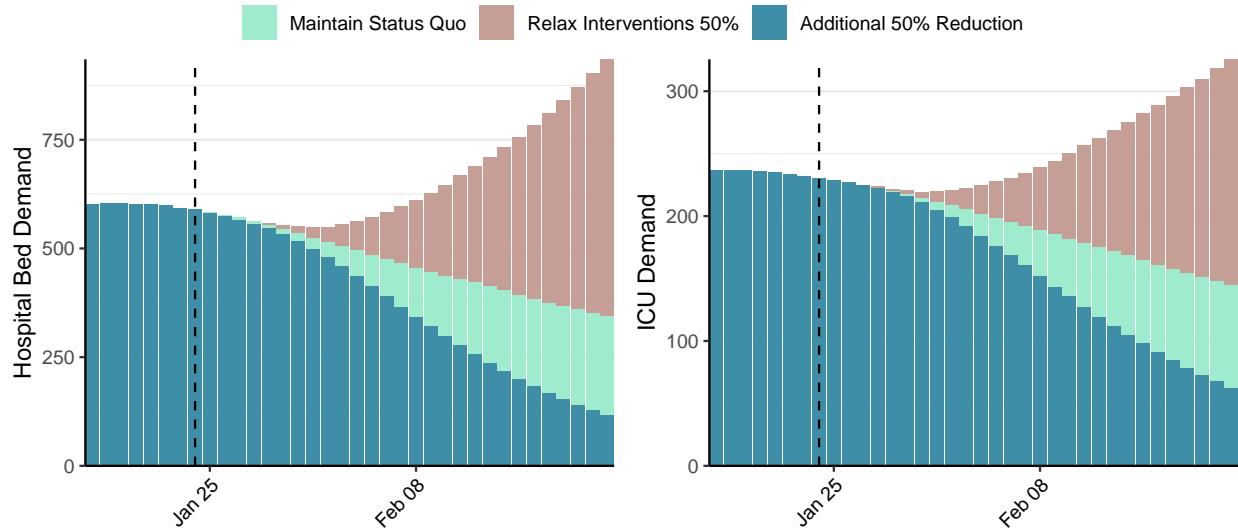


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 3,656 (95% CI: 3,424-3,888) at the current date to 195 (95% CI: 172-217) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,656 (95% CI: 3,424-3,888) at the current date to 9,507 (95% CI: 8,379-10,635) by 2021-02-21.

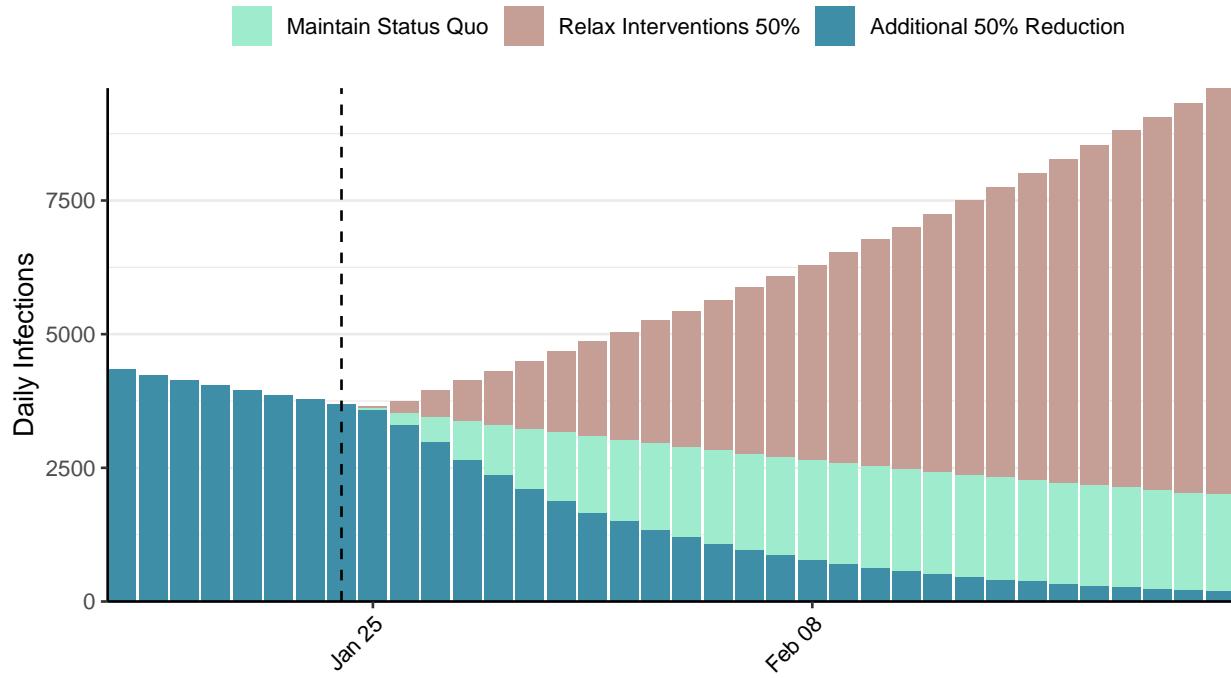


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Madagascar, 2021-01-24 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: 1.04-1.72)

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. Madagascar is not shown in the following plot as only 0 deaths have been reported to date**

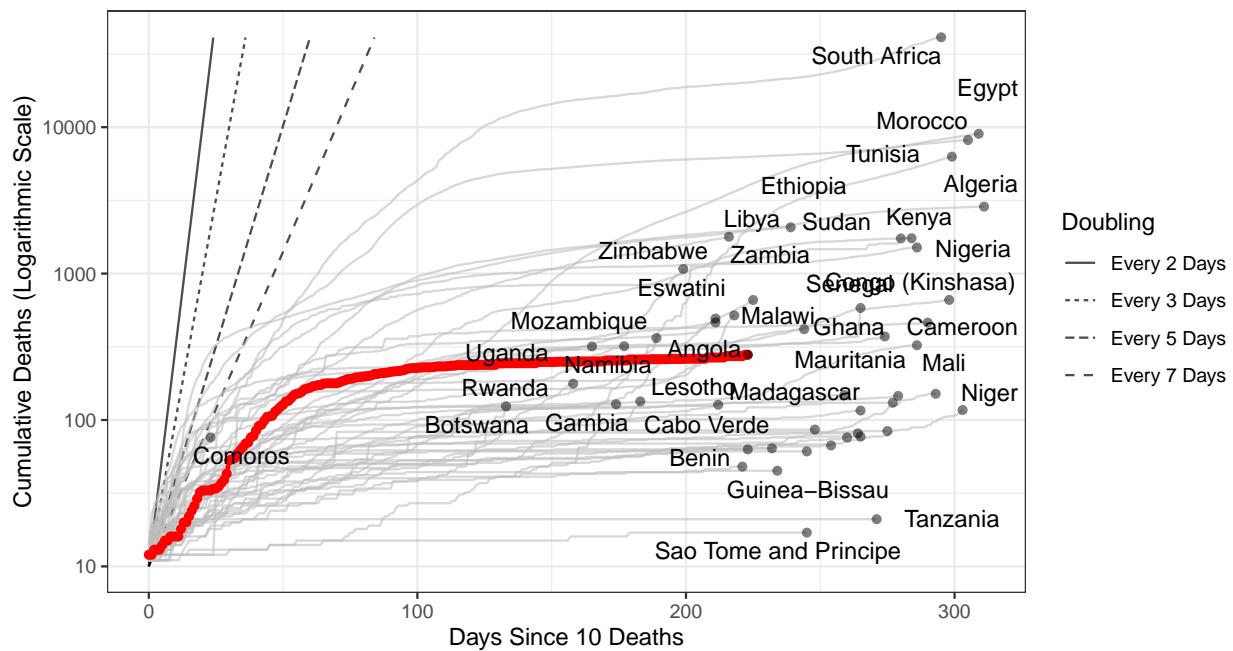


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 27,697 (95% CI: 24,847-30,546) 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

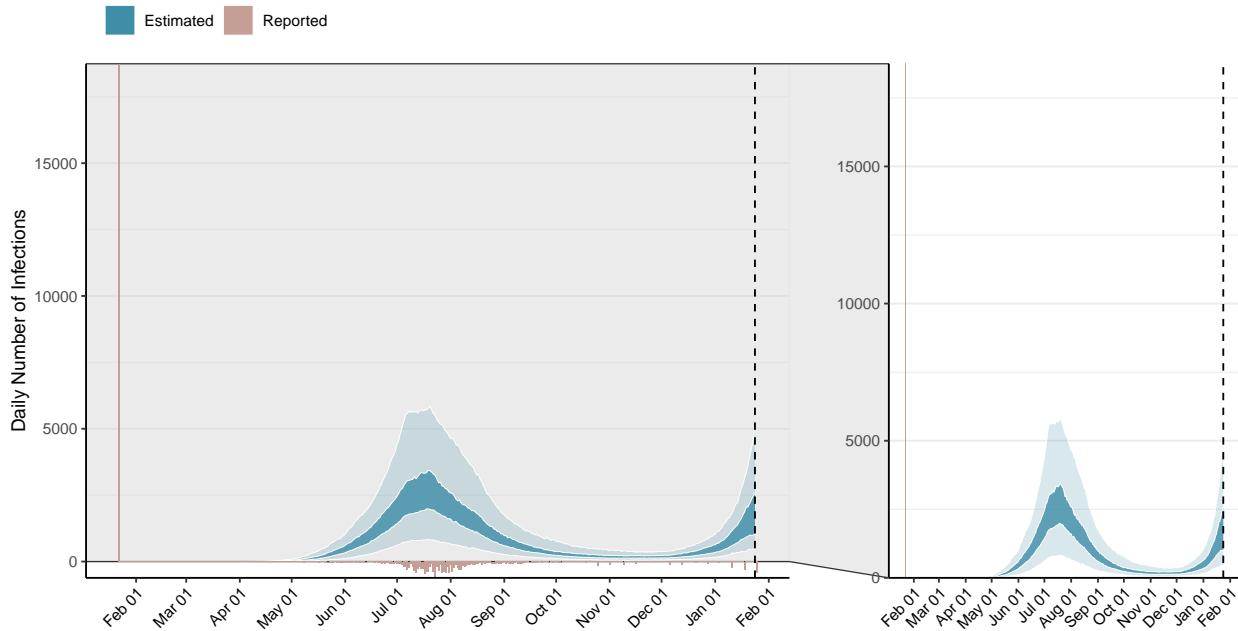


Figure 2: Daily number of infections estimated by fitting to the current total of deaths. Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

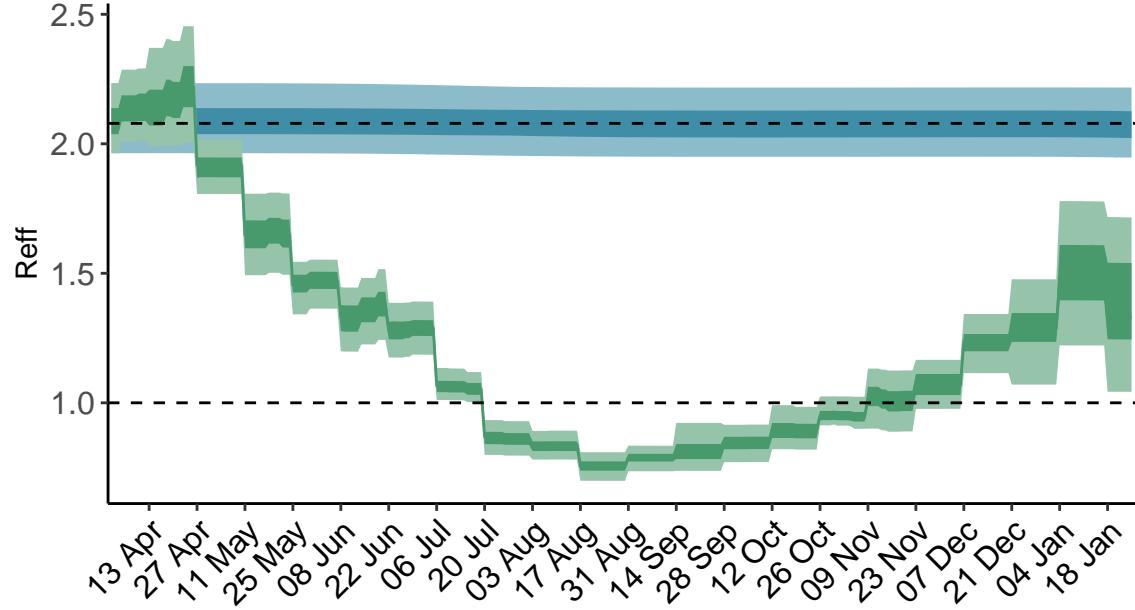


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

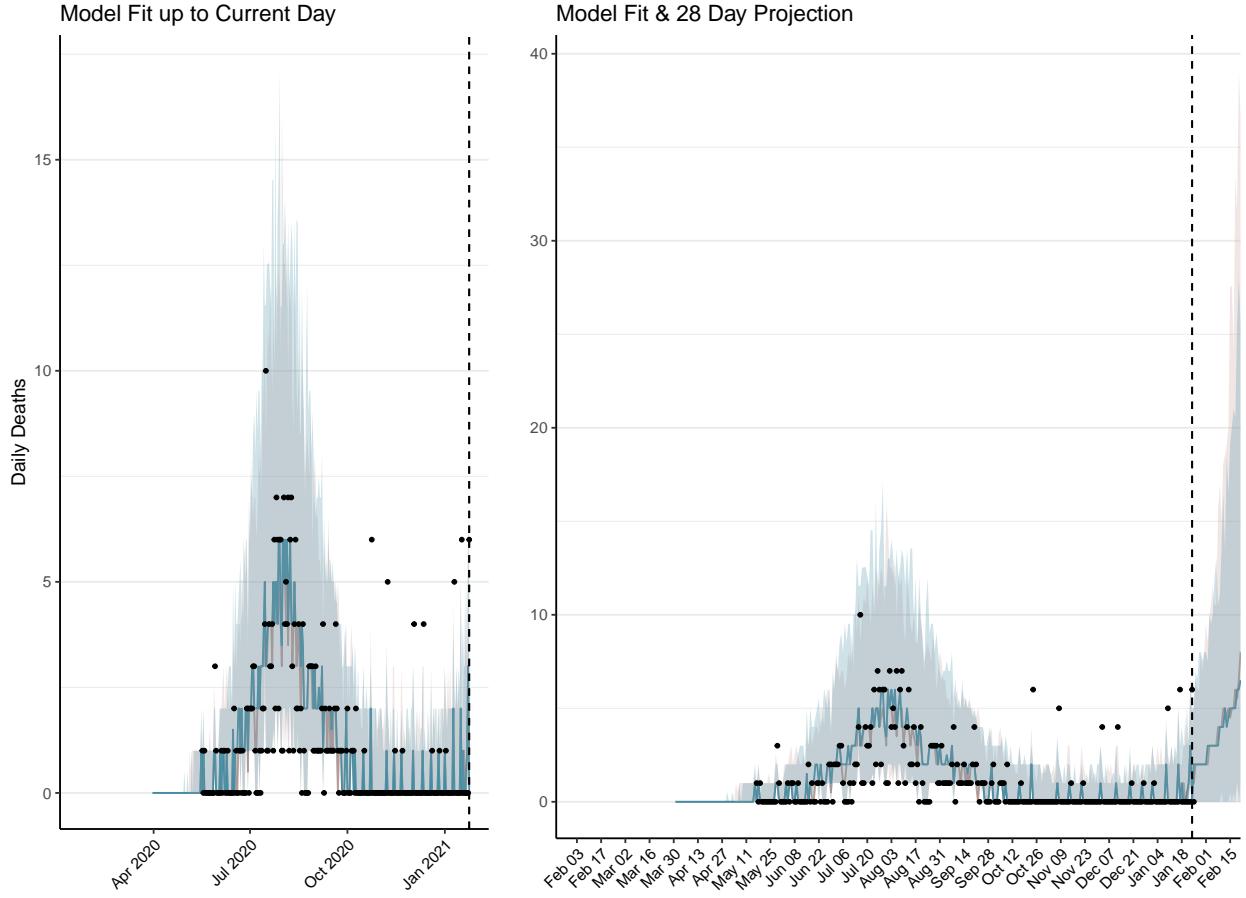


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 88 (95% CI: 79-98) patients requiring treatment with high-pressure oxygen at the current date to 513 (95% CI: 392-634) hospital beds being required on 2021-02-21 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 32 (95% CI: 28-35) patients requiring treatment with mechanical ventilation at the current date to 174 (95% CI: 140-209) by 2021-02-21. 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.**

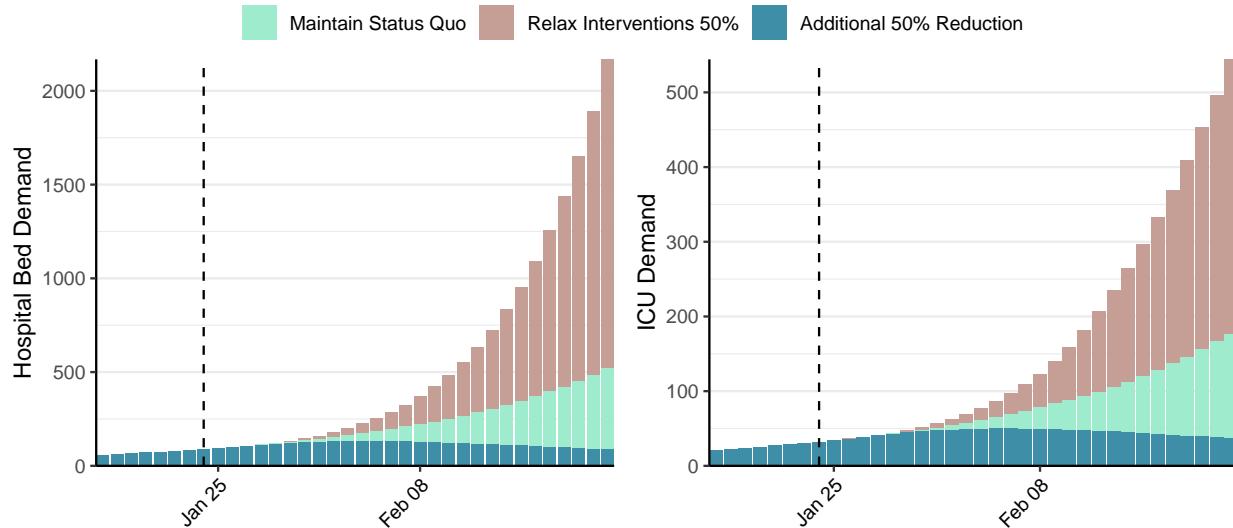


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 1,984 (95% CI: 1,736-2,232) at the current date to 708 (95% CI: 522-894) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,984 (95% CI: 1,736-2,232) at the current date to 86,621 (95% CI: 61,556-111,687) by 2021-02-21.

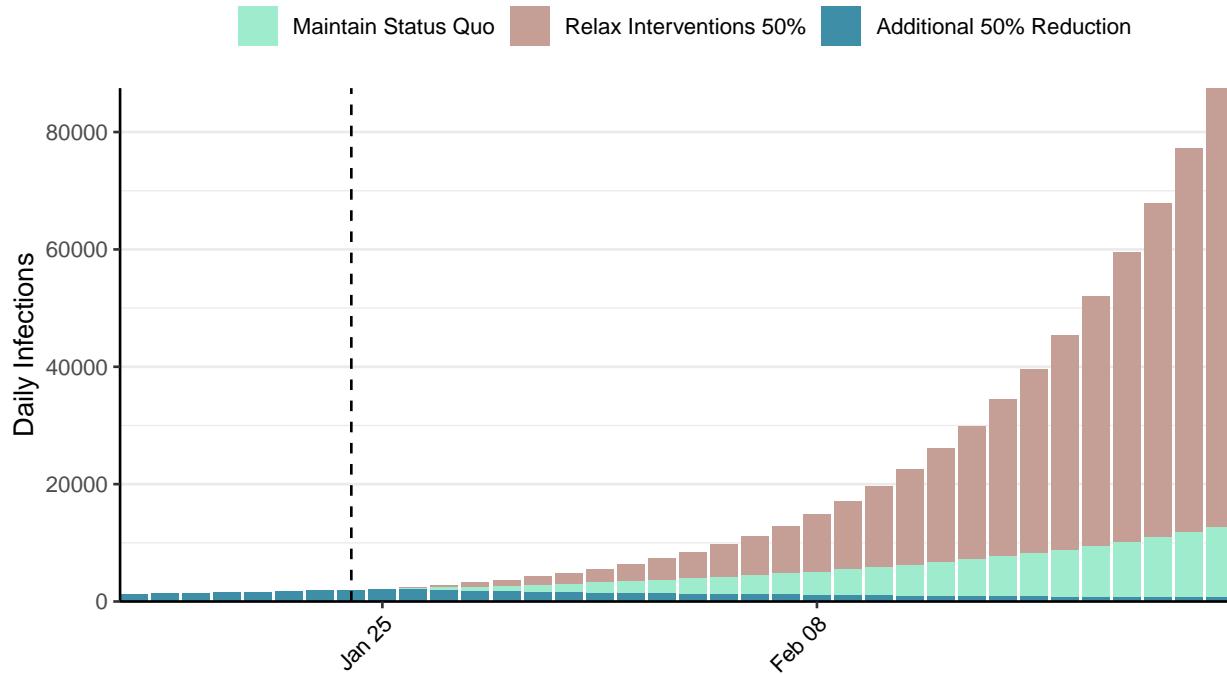


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Maldives, 2021-01-24 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}
109	109	0	0	1.31 (95% CI: 1.07-1.6)

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. Maldives is not shown in the following plot as only 0 deaths have been reported to date**

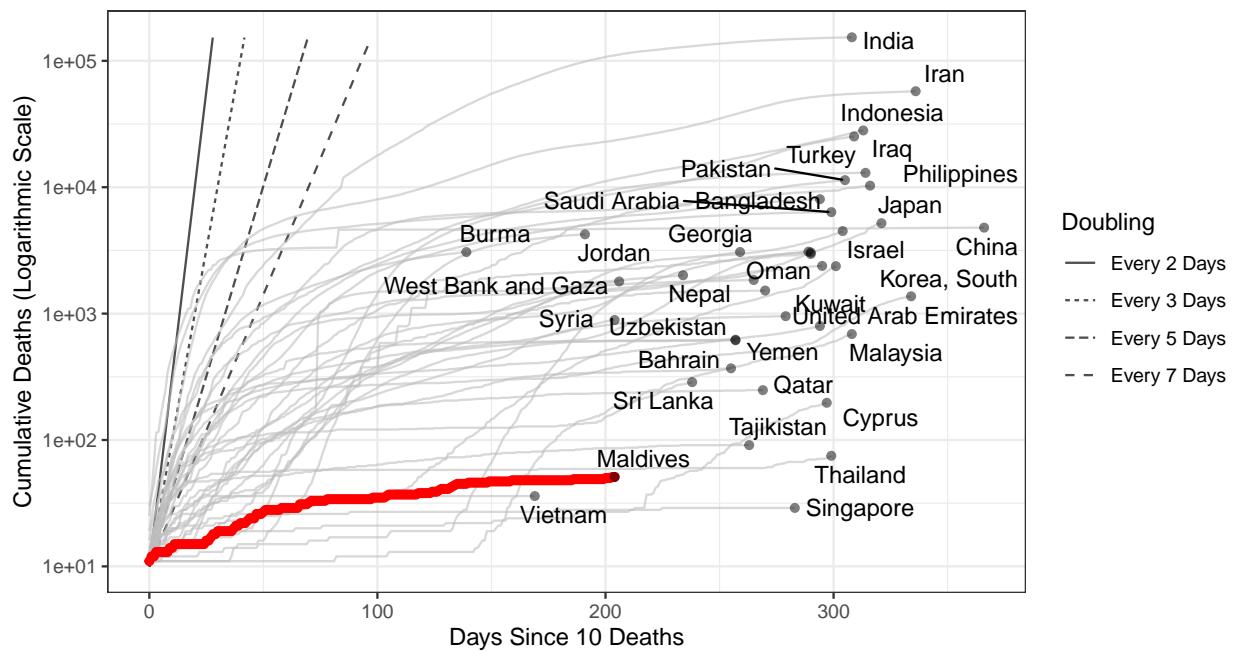


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 2,017 (95% CI: 1,833-2,201) 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

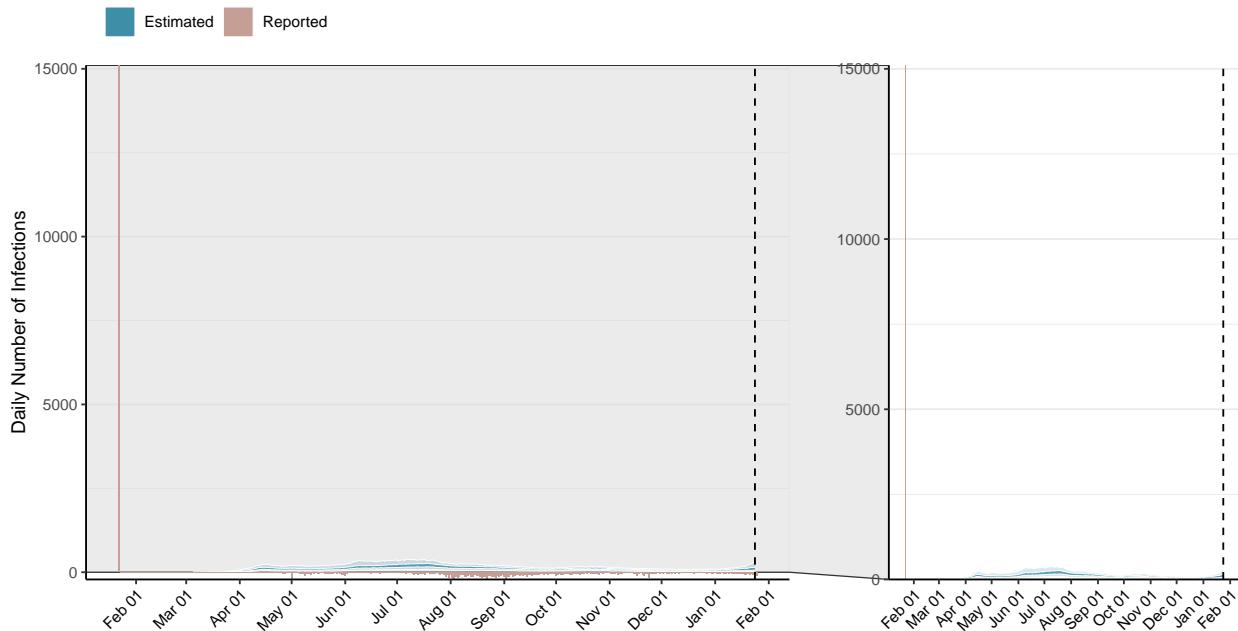


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

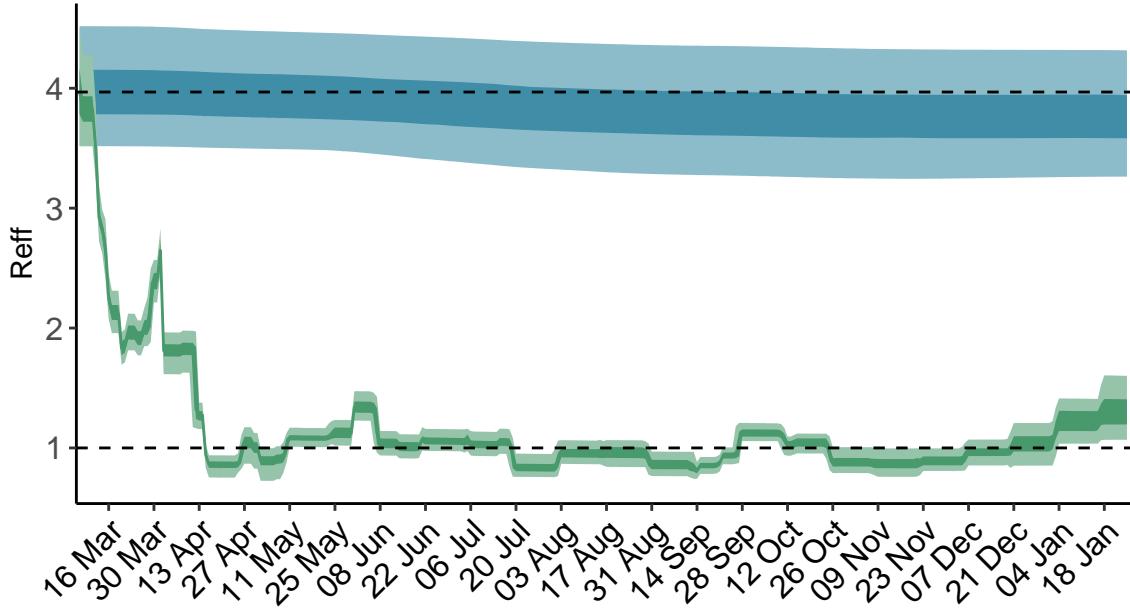


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

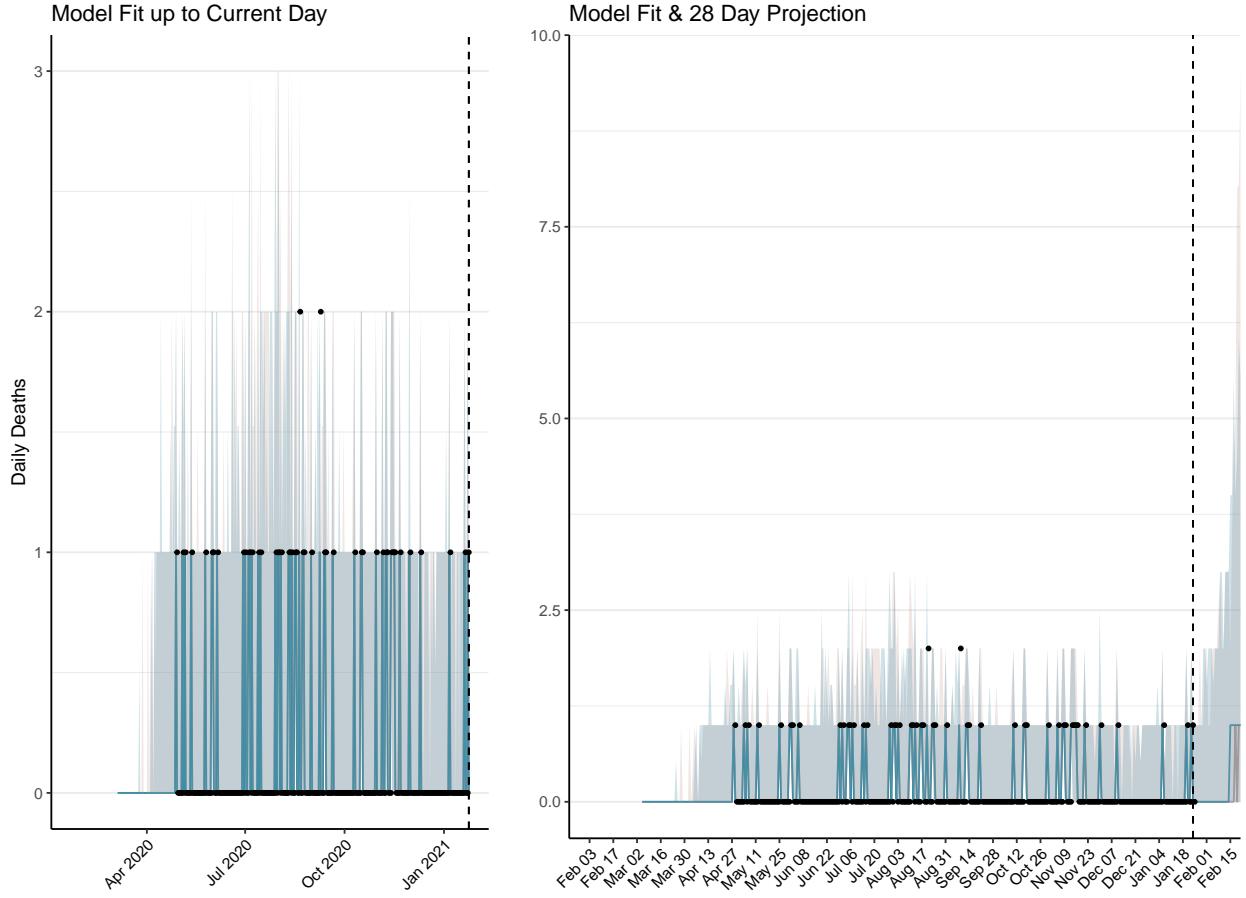


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 8 (95% CI: 7-9) patients requiring treatment with high-pressure oxygen at the current date to 54 (95% CI: 44-65) hospital beds being required on 2021-02-21 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 16 (95% CI: 14-18) by 2021-02-21. 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.**

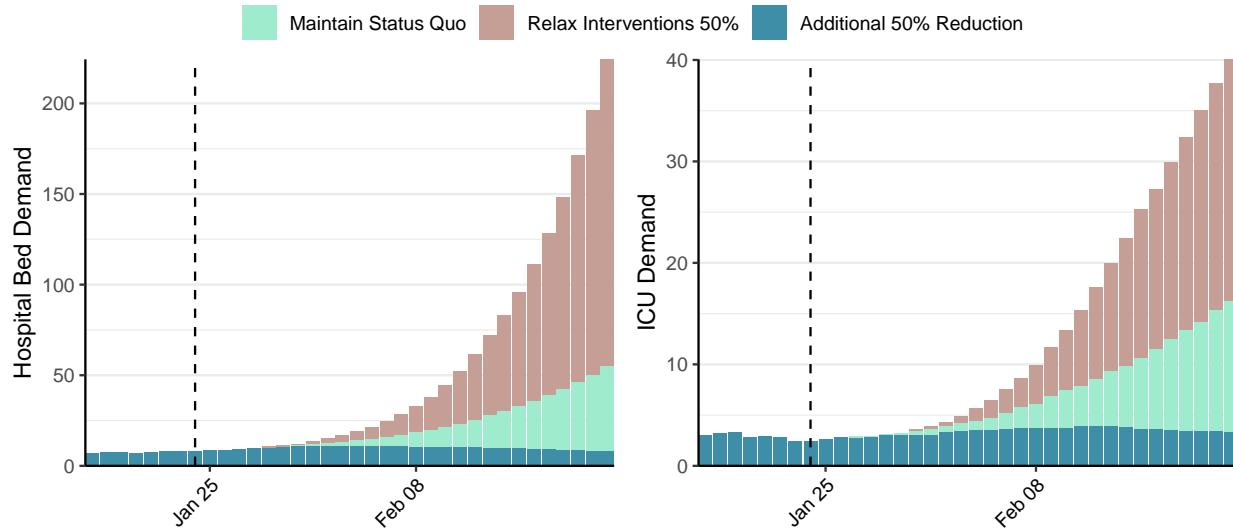


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 116 (95% CI: 102-130) at the current date to 62 (95% CI: 49-75) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 116 (95% CI: 102-130) at the current date to 6,542 (95% CI: 5,531-7,552) by 2021-02-21.

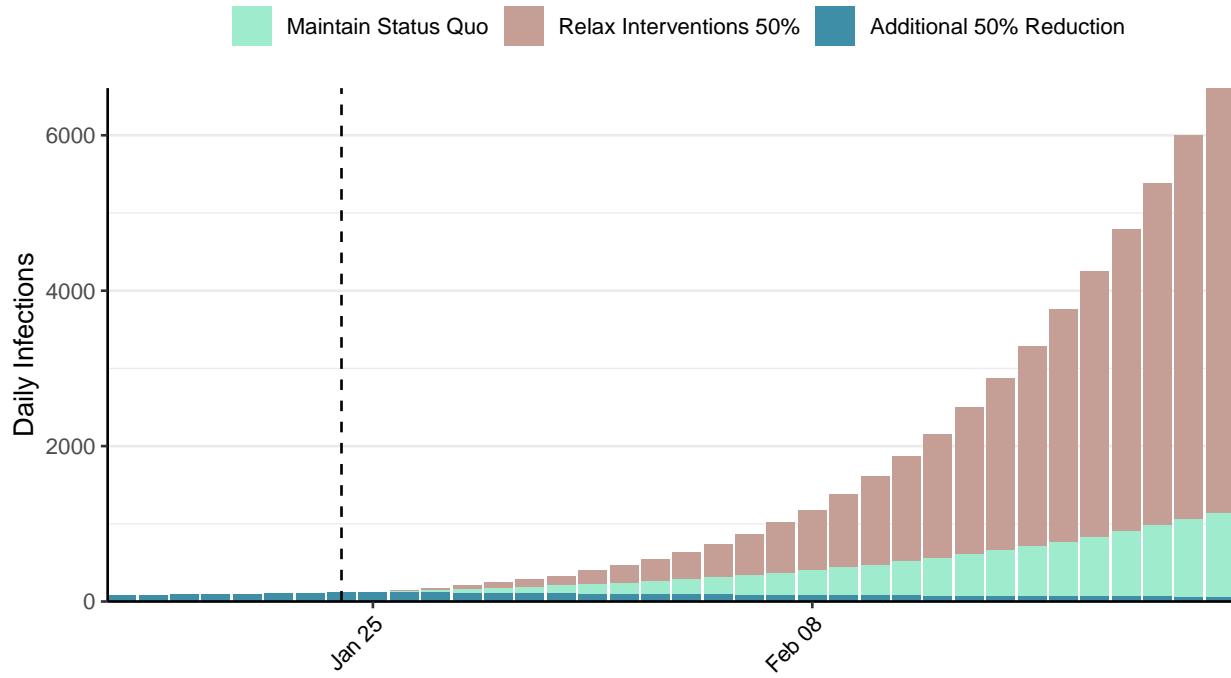


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Mexico, 2021-01-24

[Download the report for Mexico, 2021-01-24 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}
10,872	10,872	530	530	1.13 (95% CI: 0.99-1.28)

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.

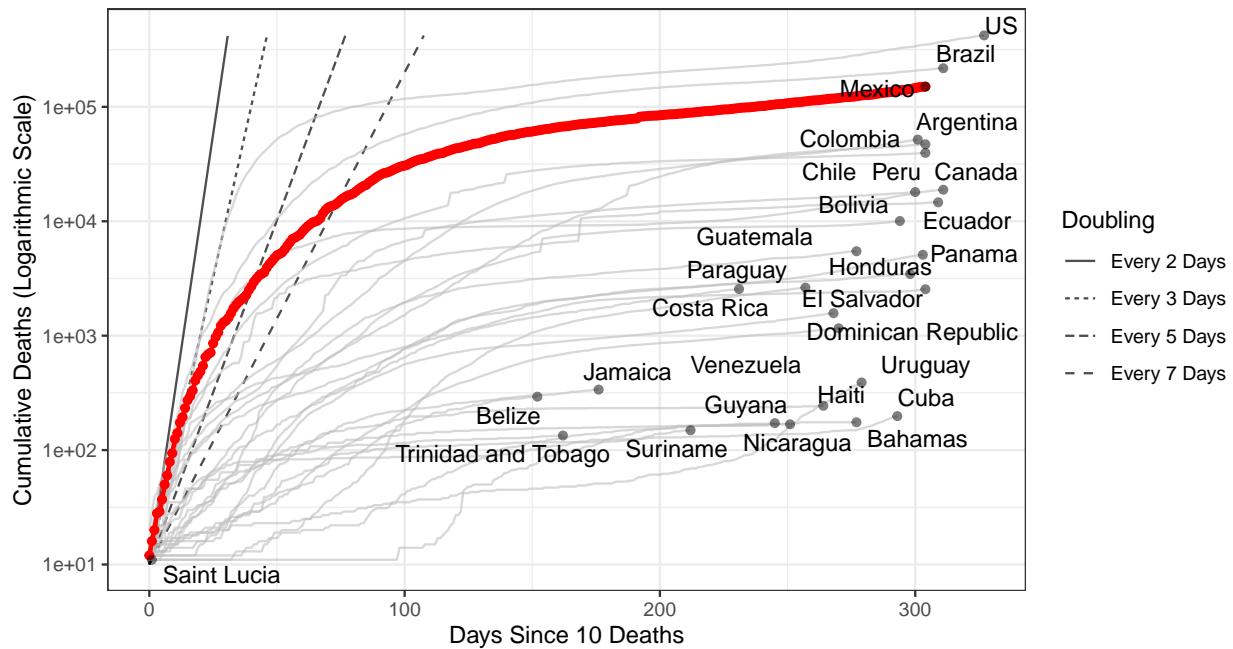


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 9,106,424 (95% CI: 8,806,123-9,406,725) 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

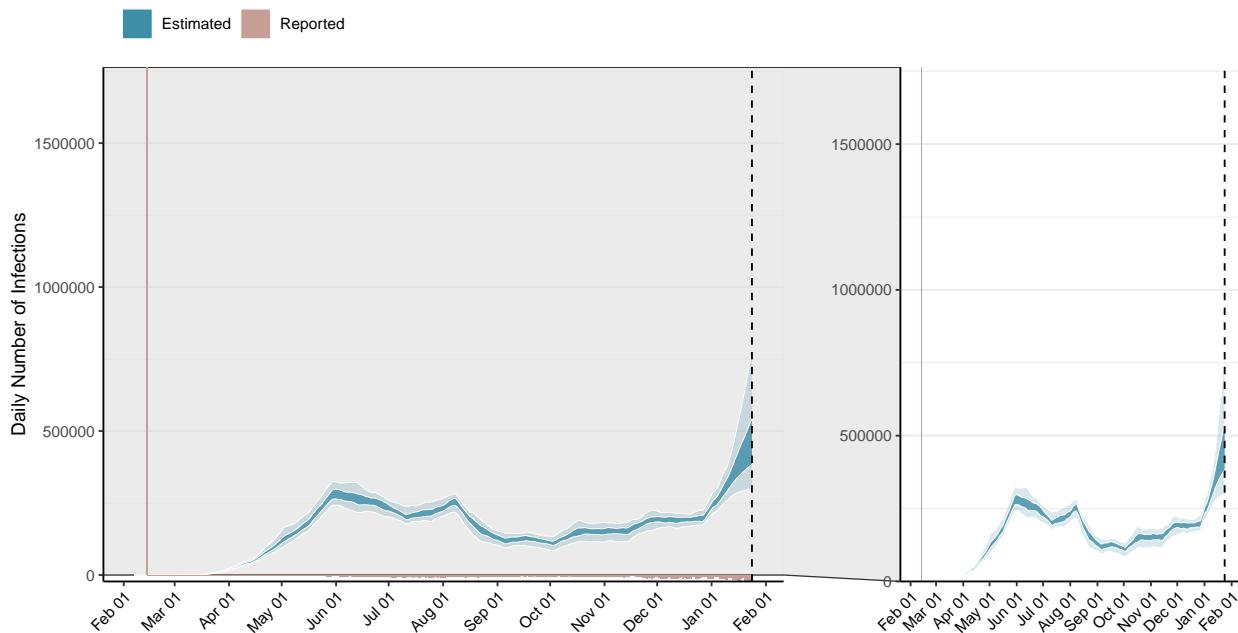


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

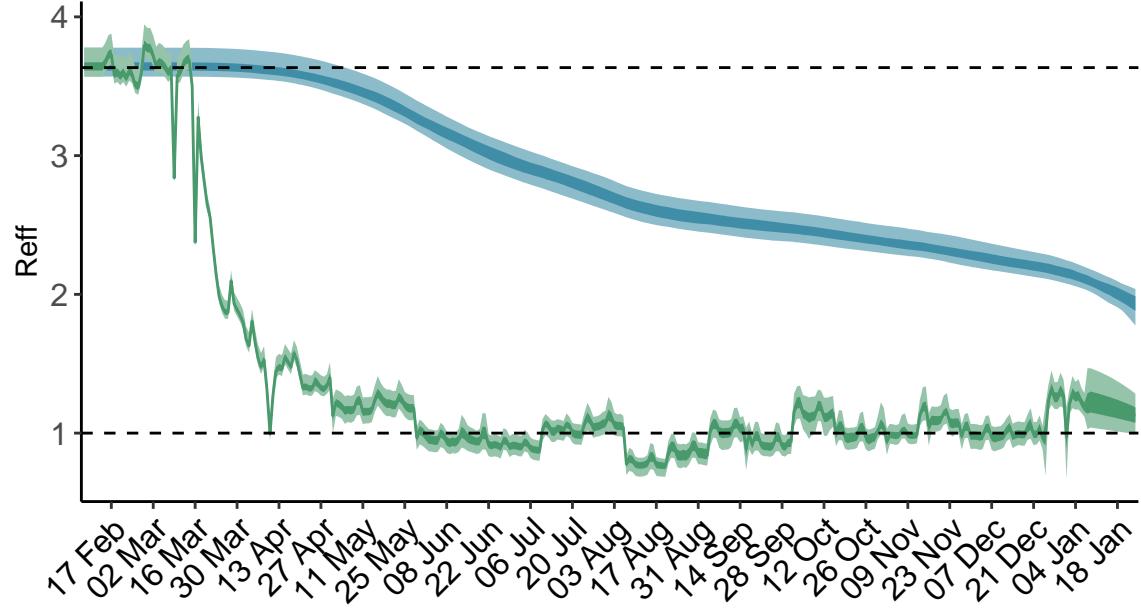


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

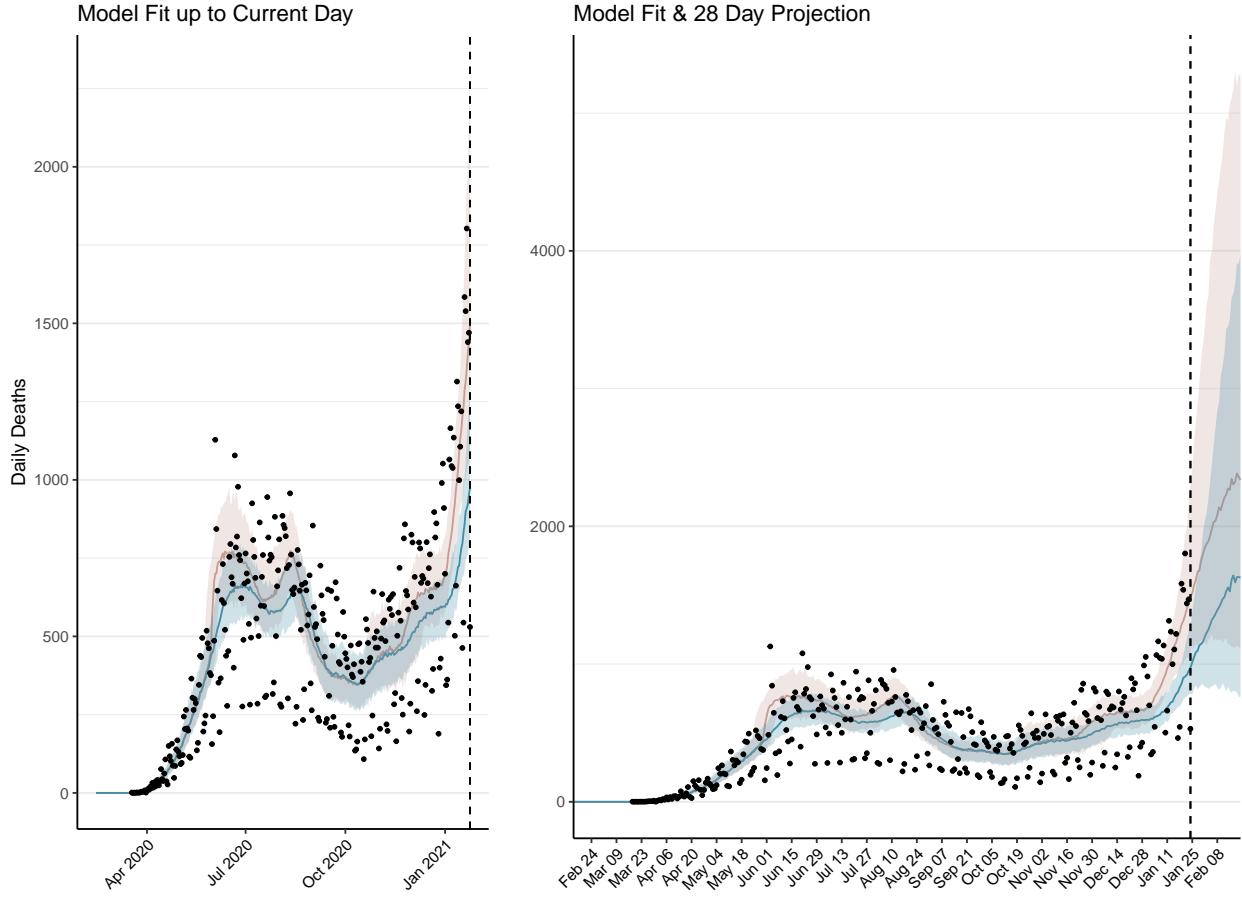


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 38,998 (95% CI: 37,602-40,395) patients requiring treatment with high-pressure oxygen at the current date to 65,848 (95% CI: 60,863-70,833) hospital beds being required on 2021-02-21 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 7,198 (95% CI: 7,038-7,359) patients requiring treatment with mechanical ventilation at the current date to 8,426 (95% CI: 8,132-8,720) by 2021-02-21. 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.

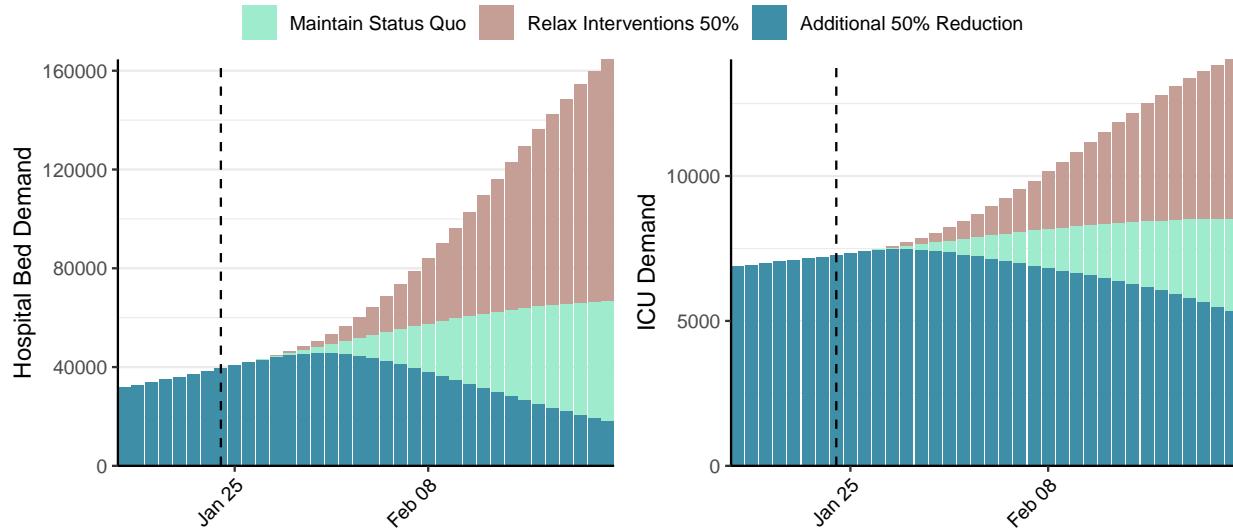


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 465,003 (95% CI: 439,611-490,396) at the current date to 59,115 (95% CI: 53,781-64,450) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 465,003 (95% CI: 439,611-490,396) at the current date to 1,503,300 (95% CI: 1,452,934-1,553,667) by 2021-02-21.

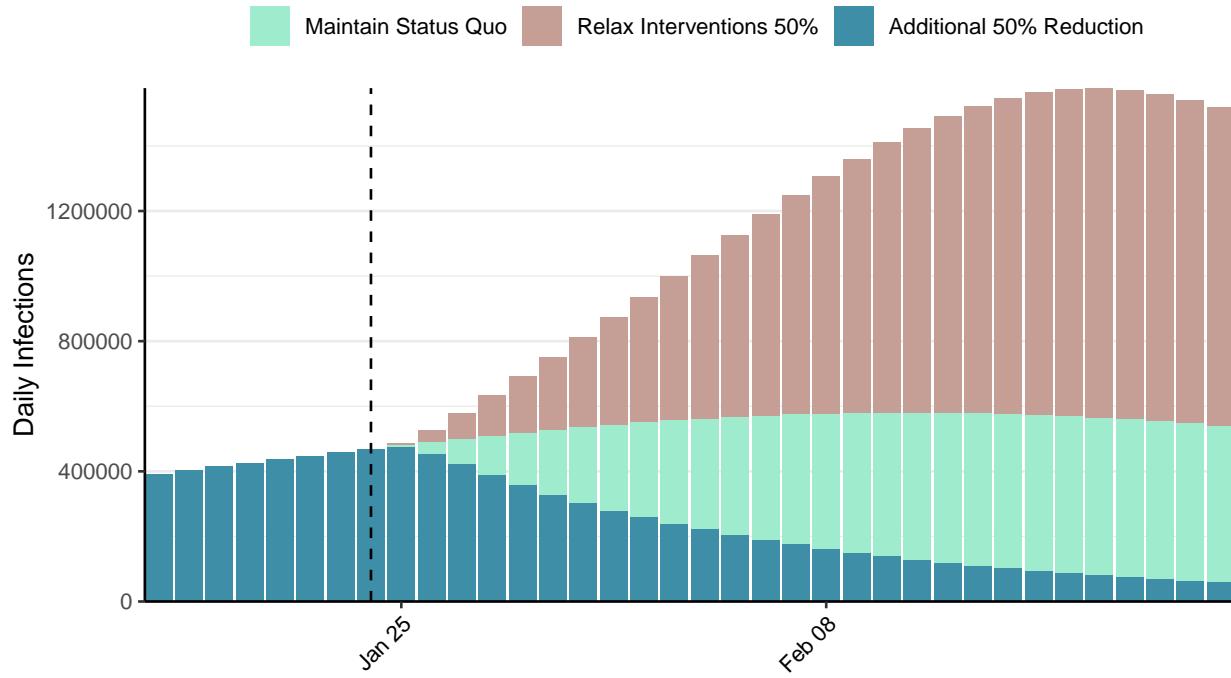


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for North Macedonia, 2021-01-24 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}
63	63	6	6	0.89 (95% CI: 0.72-1.04)

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. North Macedonia is not shown in the following plot as only 6 deaths have been reported to date**

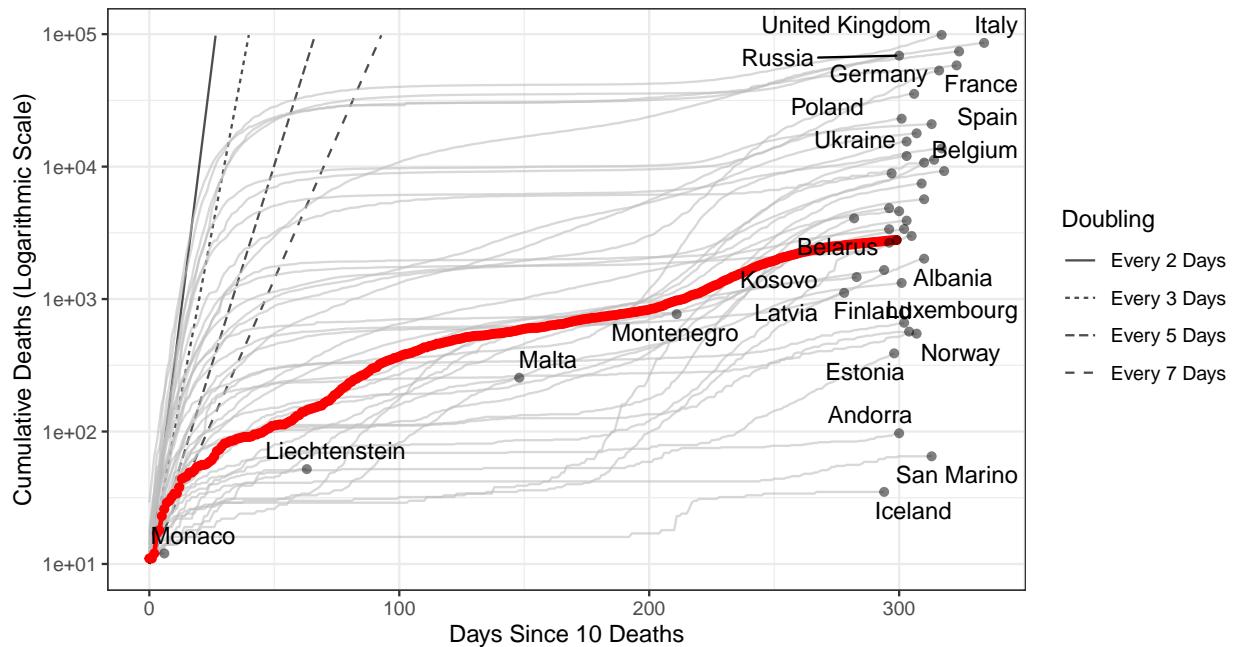


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 57,461 (95% CI: 55,453-59,469) 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

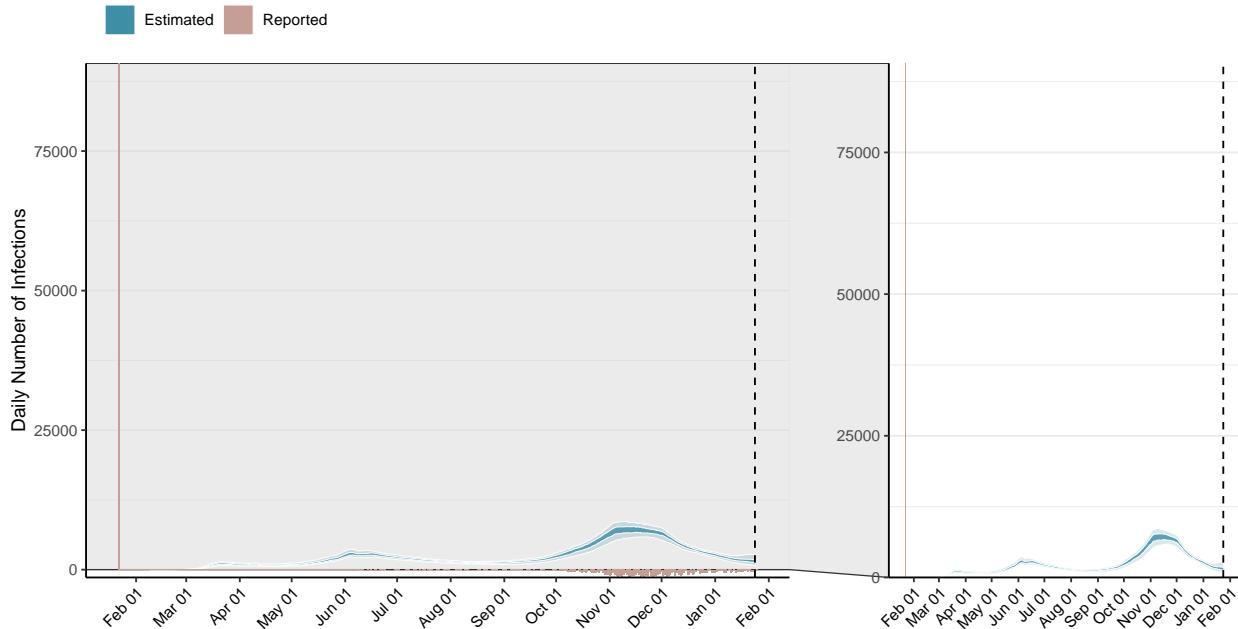


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

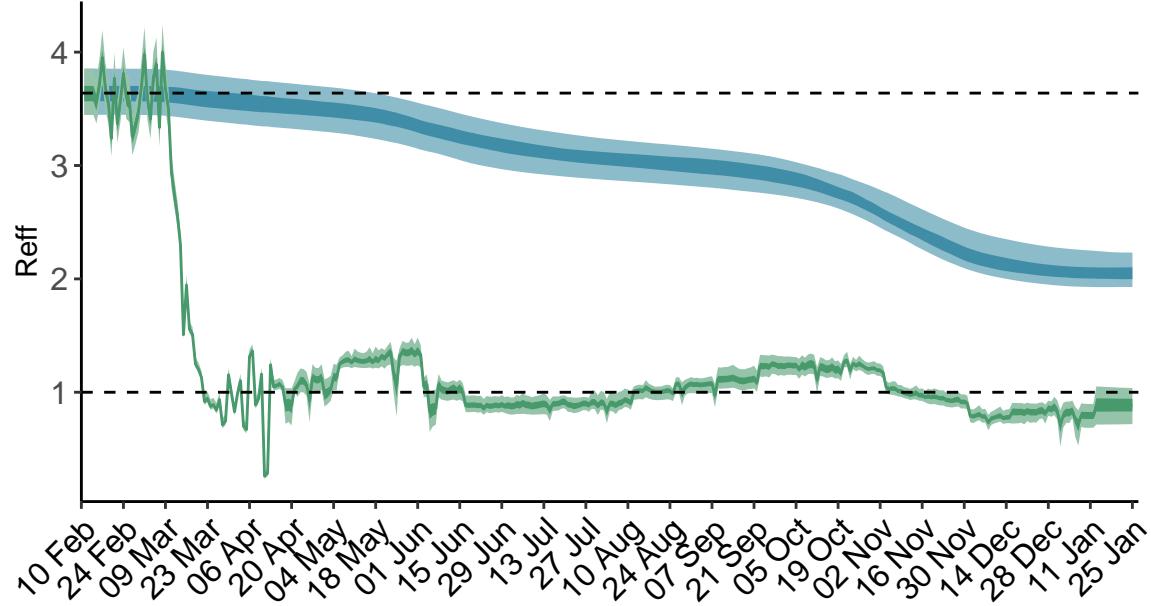


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

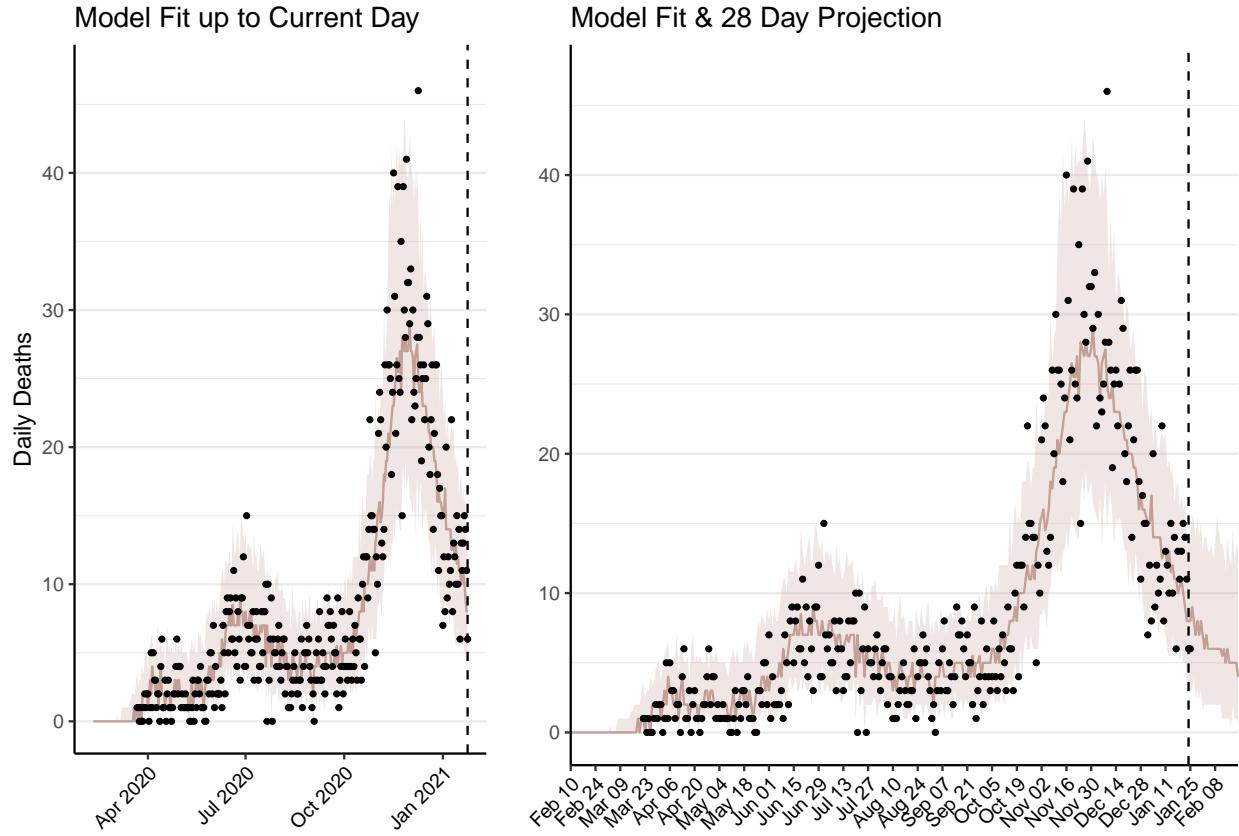


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 294 (95% CI: 283-306) patients requiring treatment with high-pressure oxygen at the current date to 194 (95% CI: 171-216) hospital beds being required on 2021-02-21 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: 121-131) patients requiring treatment with mechanical ventilation at the current date to 79 (95% CI: 71-88) by 2021-02-21. 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.**

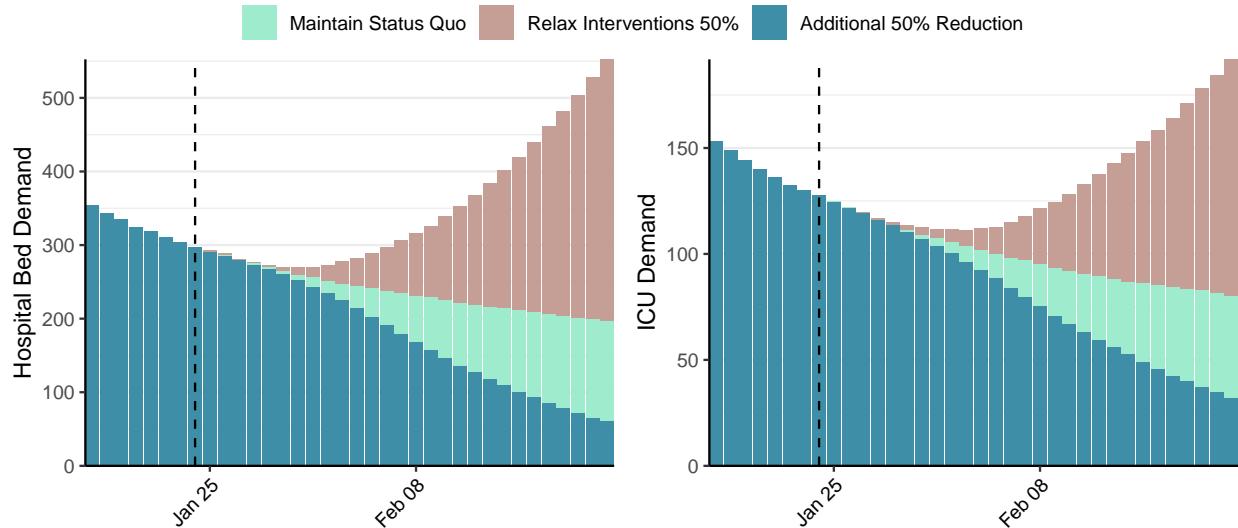


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 1,537 (95% CI: 1,437-1,637) at the current date to 102 (95% CI: 87-117) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,537 (95% CI: 1,437-1,637) at the current date to 5,432 (95% CI: 4,690-6,174) by 2021-02-21.

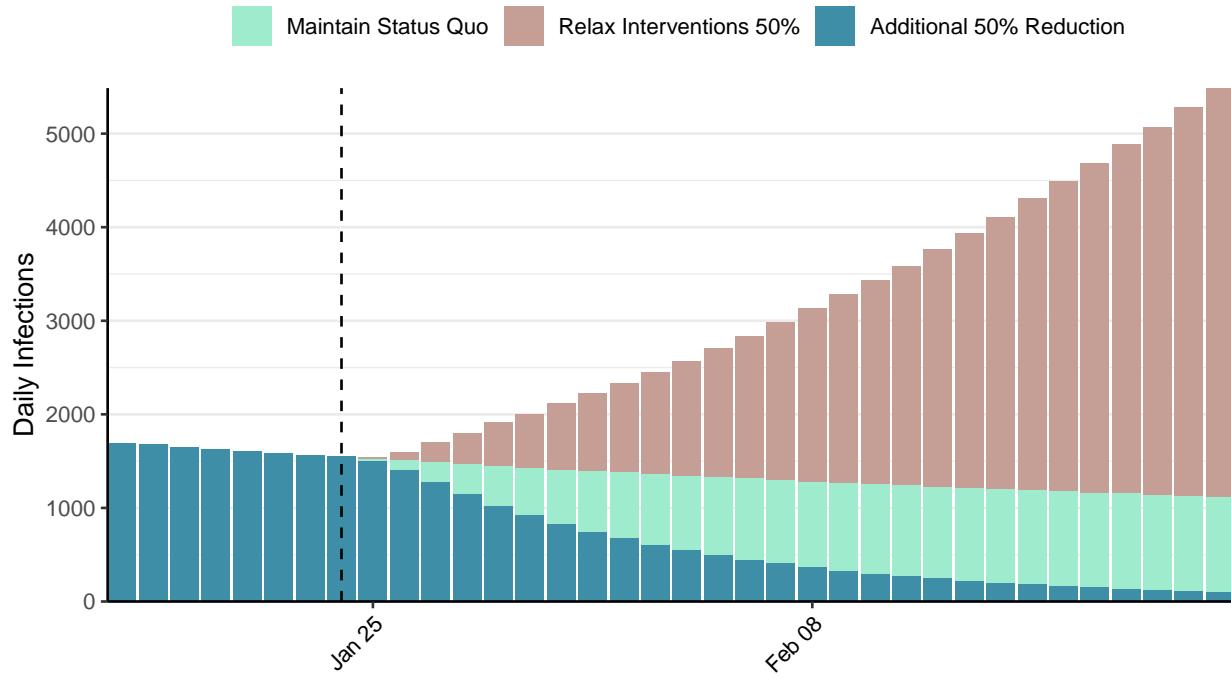


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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: Mali, 2021-01-24

[Download the report for Mali, 2021-01-24 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}
12	12	1	1	0.65 (95% CI: 0.5-0.84)

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. Mali is not shown in the following plot as only 1 deaths have been reported to date**

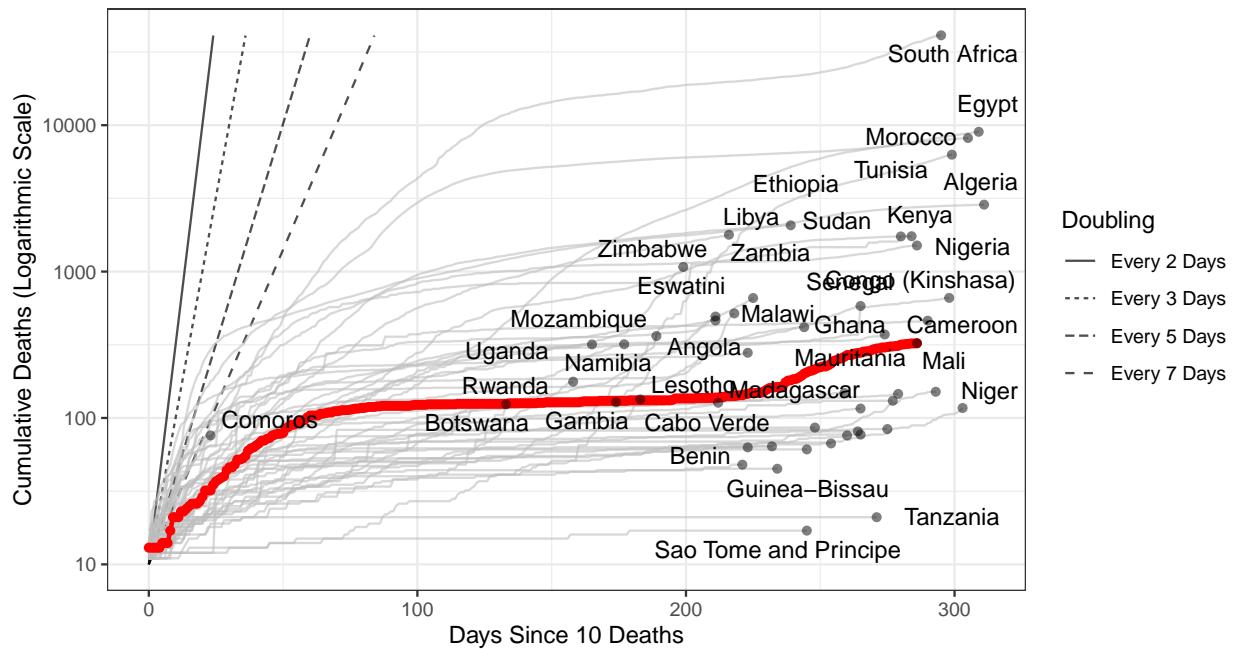


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 36,646 (95% CI: 34,004-39,289) 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).

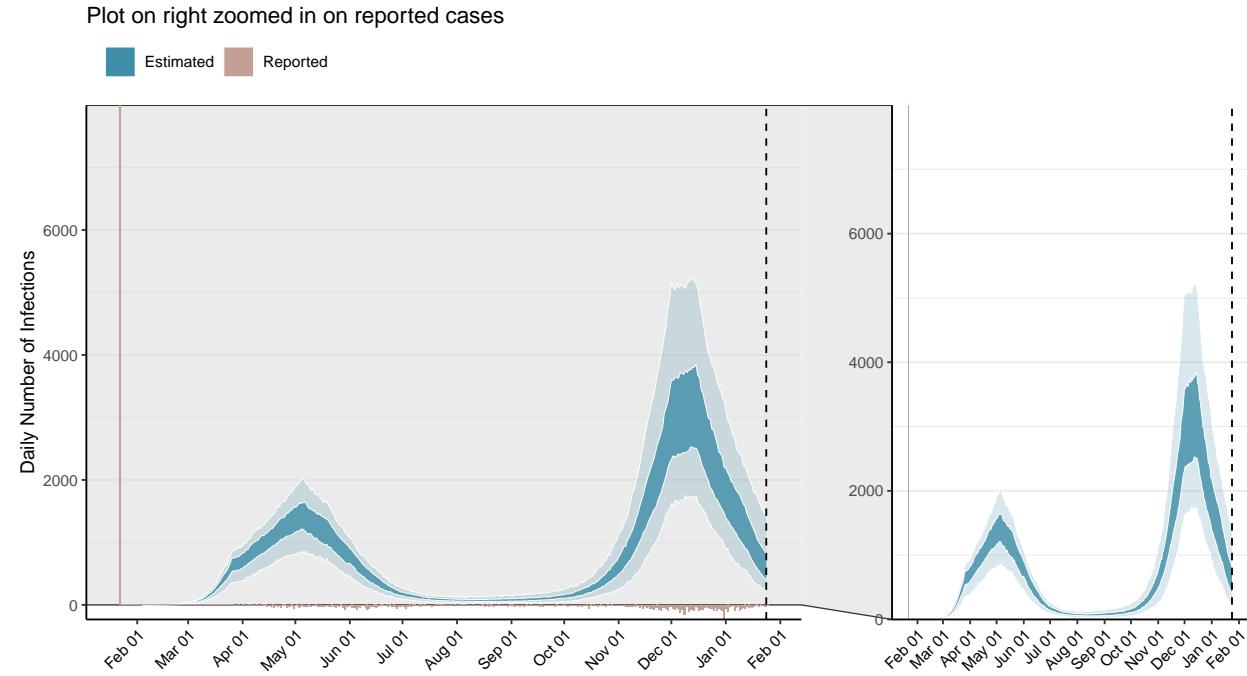


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

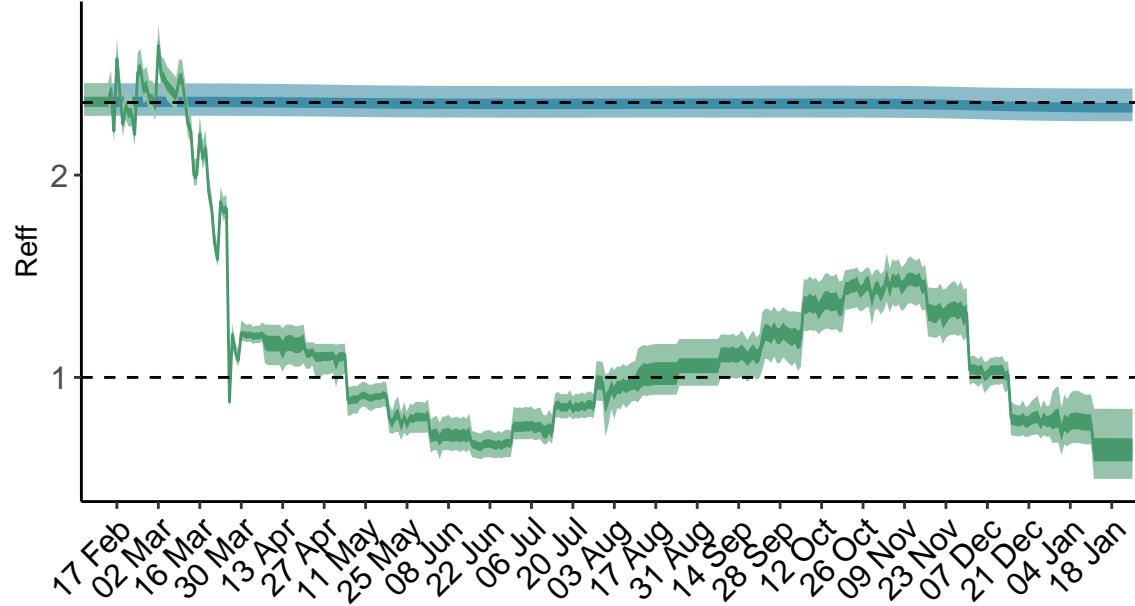


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

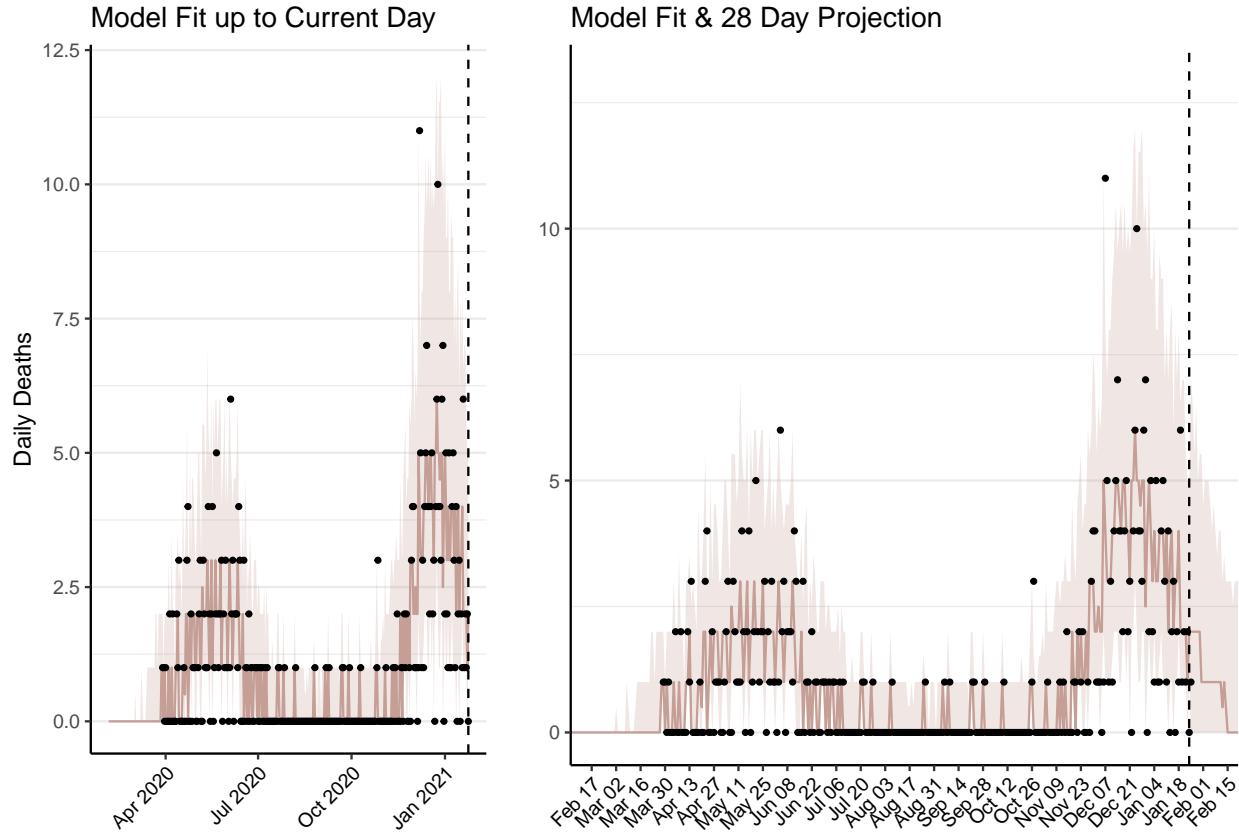


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 88 (95% CI: 82-95) patients requiring treatment with high-pressure oxygen at the current date to 22 (95% CI: 19-26) hospital beds being required on 2021-02-21 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 39 (95% CI: 36-42) patients requiring treatment with mechanical ventilation at the current date to 10 (95% CI: 9-12) by 2021-02-21. 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.**

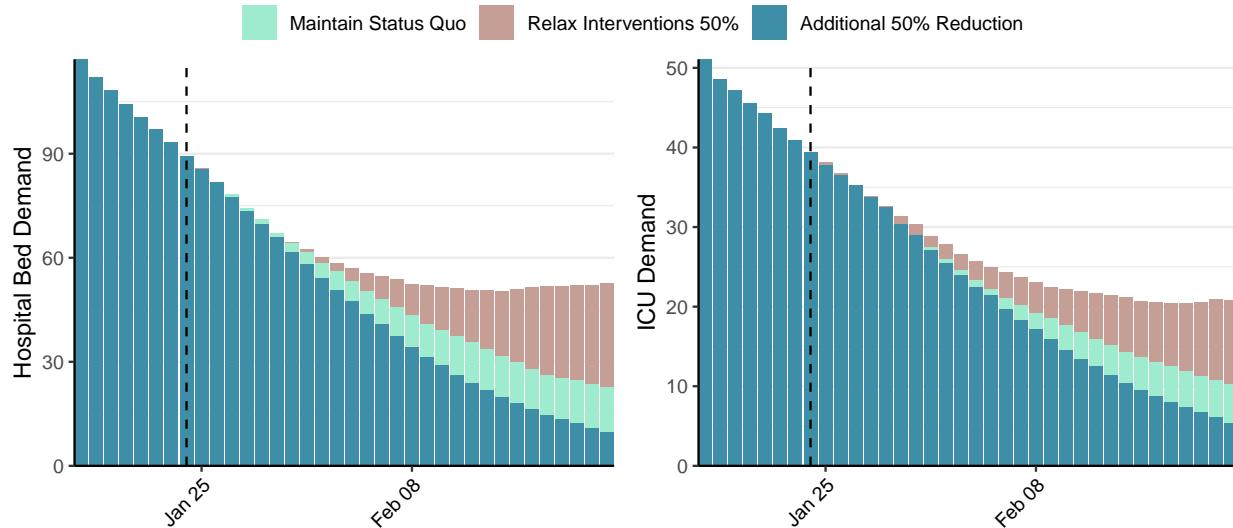


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 639 (95% CI: 570-707) at the current date to 17 (95% CI: 14-20) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 639 (95% CI: 570-707) at the current date to 789 (95% CI: 598-980) by 2021-02-21.

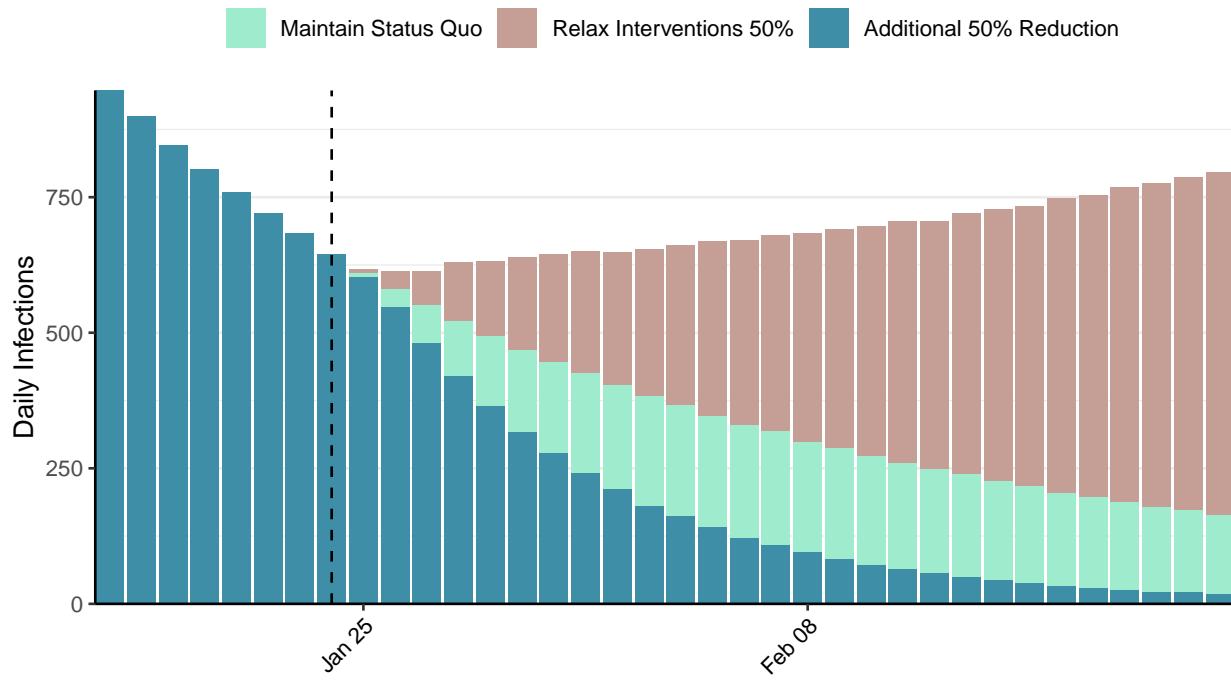


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Myanmar, 2021-01-24 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}
383	383	7	7	1.08 (95% CI: 0.92-1.29)

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. Myanmar is not shown in the following plot as only 7 deaths have been reported to date**

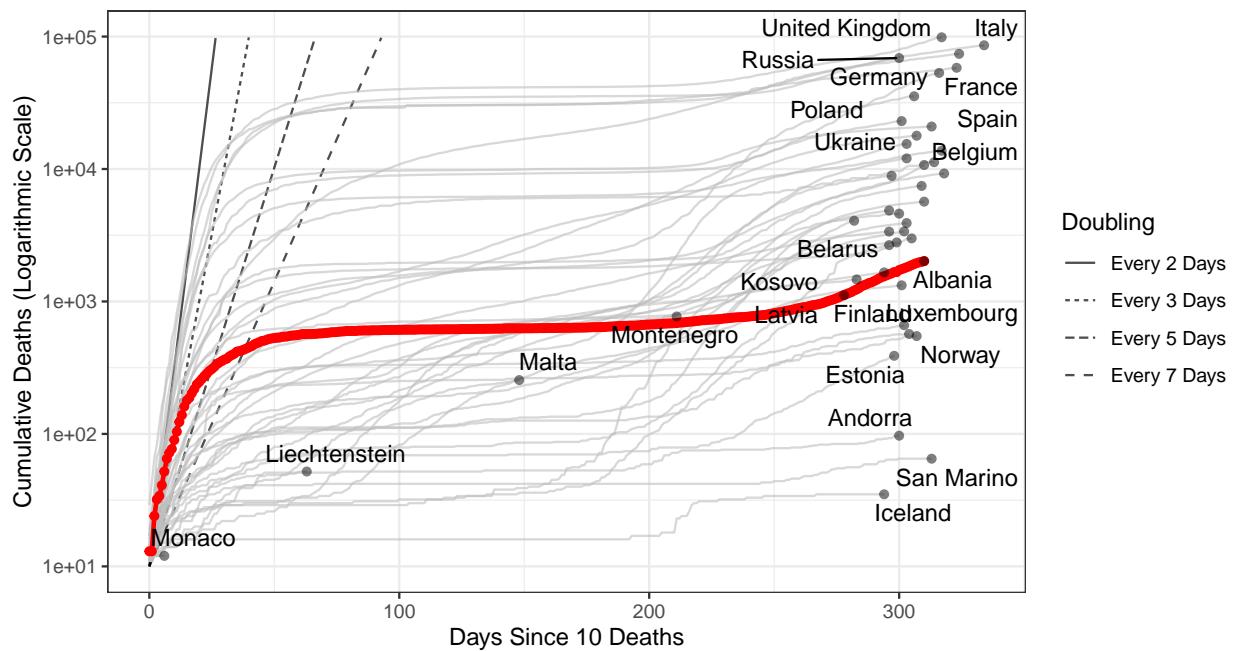


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 178,445 (95% CI: 170,393-186,497) 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

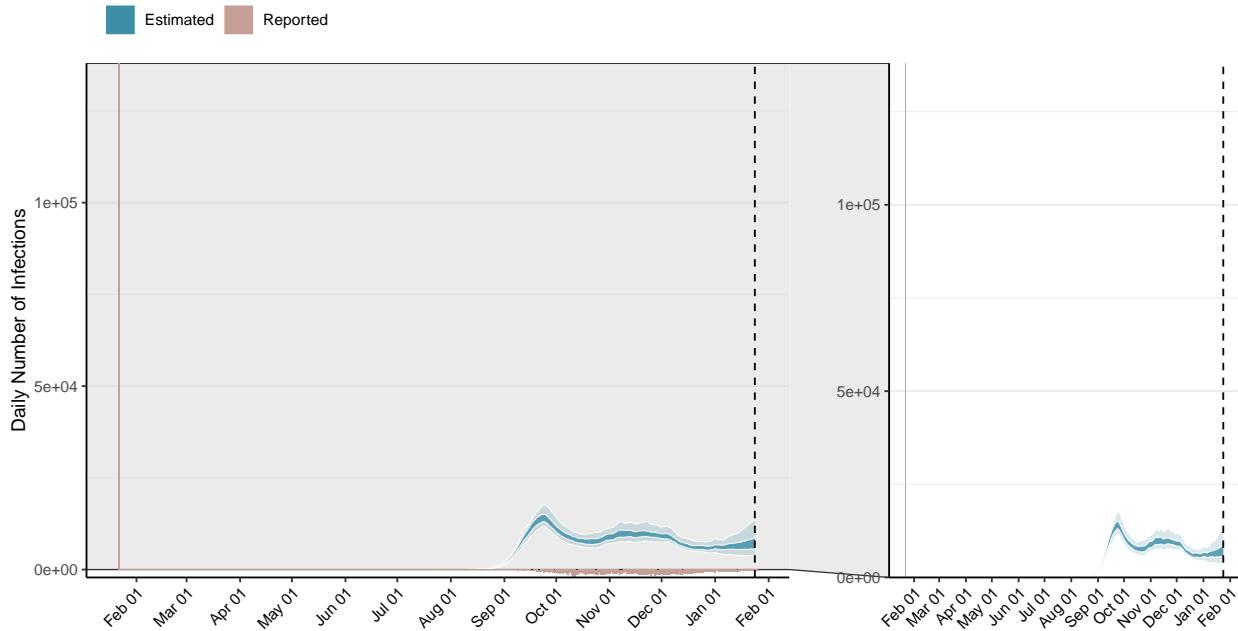


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

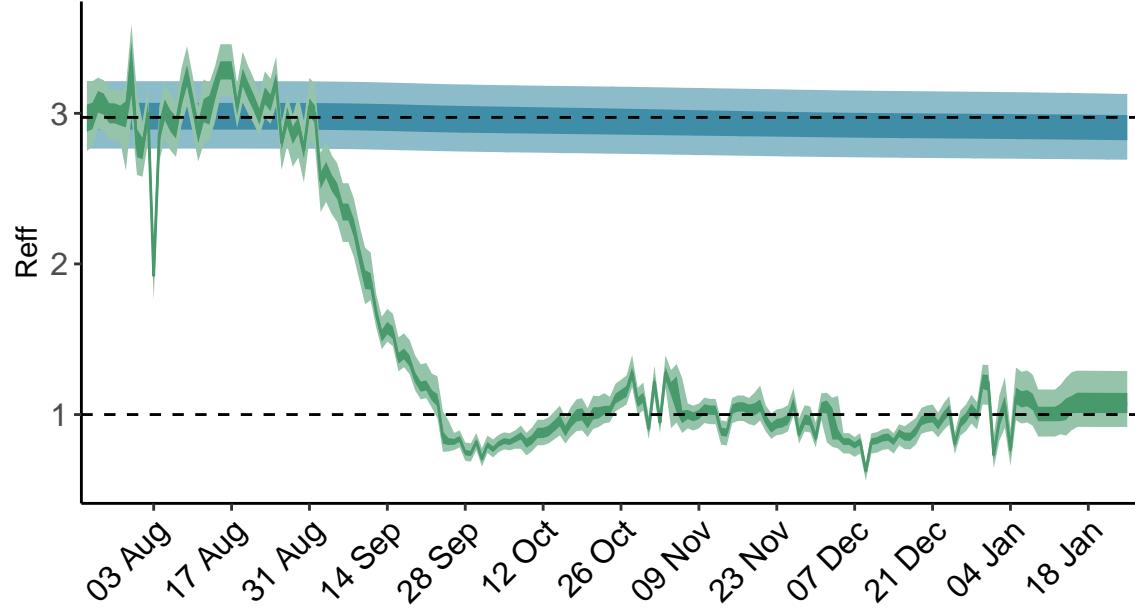


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

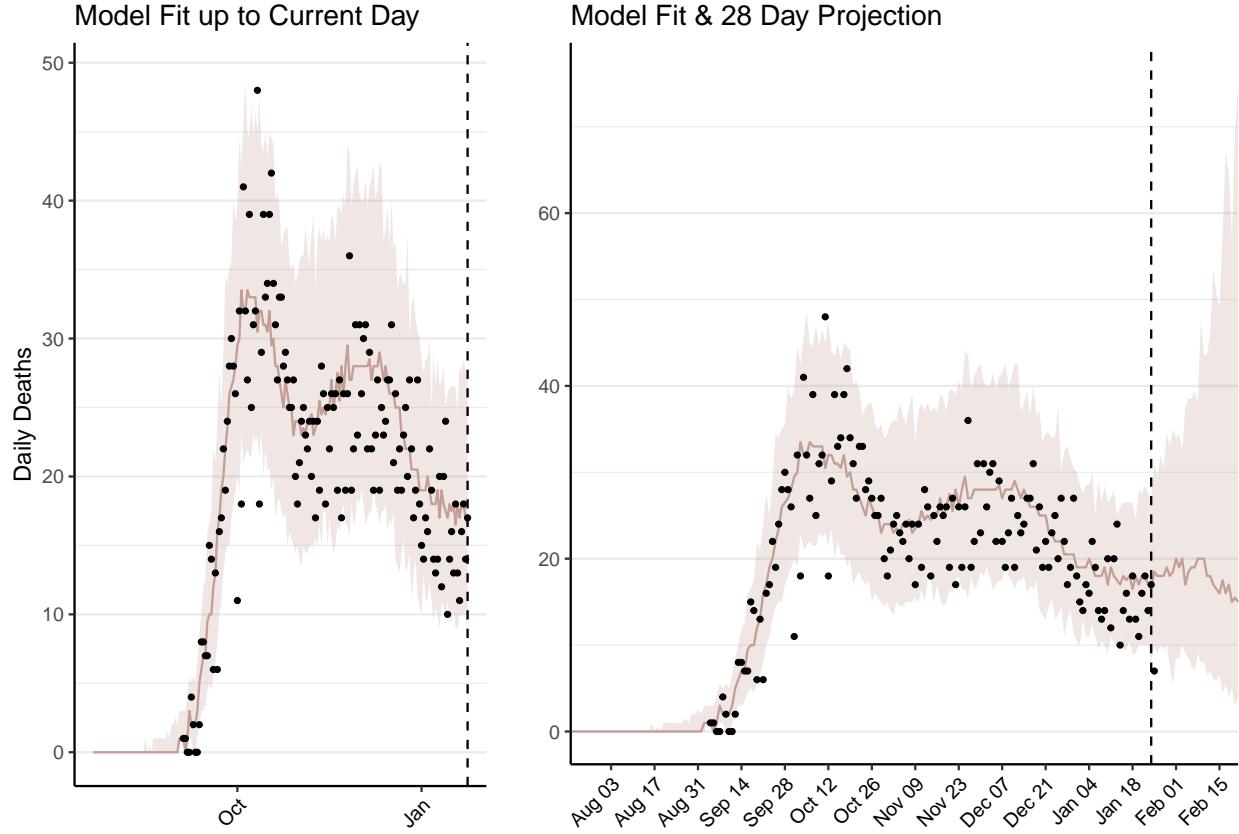


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 762 (95% CI: 724-801) patients requiring treatment with high-pressure oxygen at the current date to 889 (95% CI: 622-1,156) hospital beds being required on 2021-02-21 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 299 (95% CI: 286-313) patients requiring treatment with mechanical ventilation at the current date to 339 (95% CI: 265-413) by 2021-02-21. 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.**

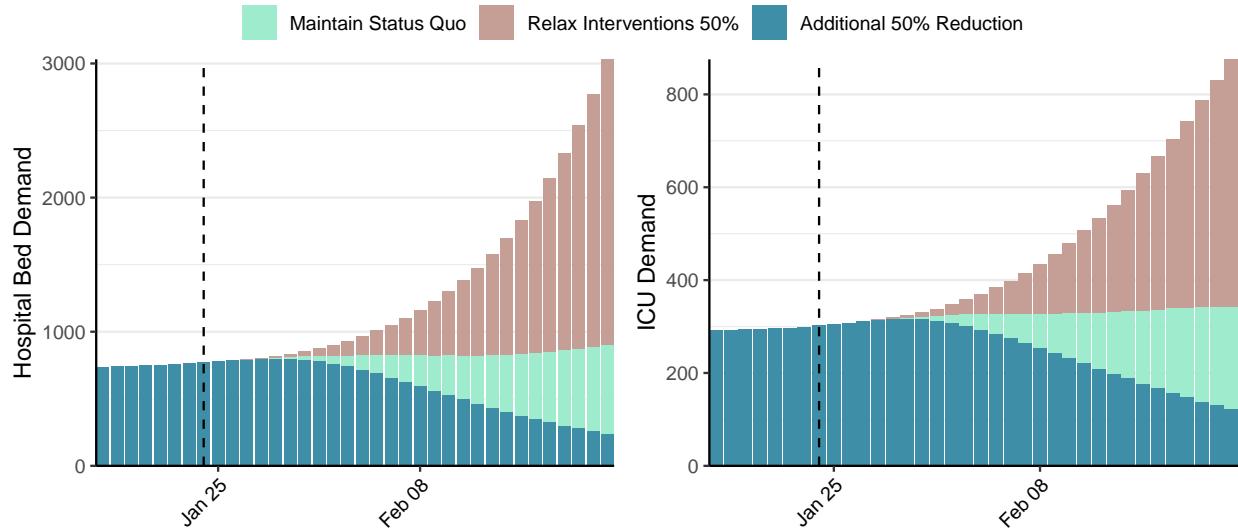


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 7,356 (95% CI: 6,843-7,870) at the current date to 675 (95% CI: 394-955) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 7,356 (95% CI: 6,843-7,870) at the current date to 60,608 (95% CI: 20,601-100,615) by 2021-02-21.

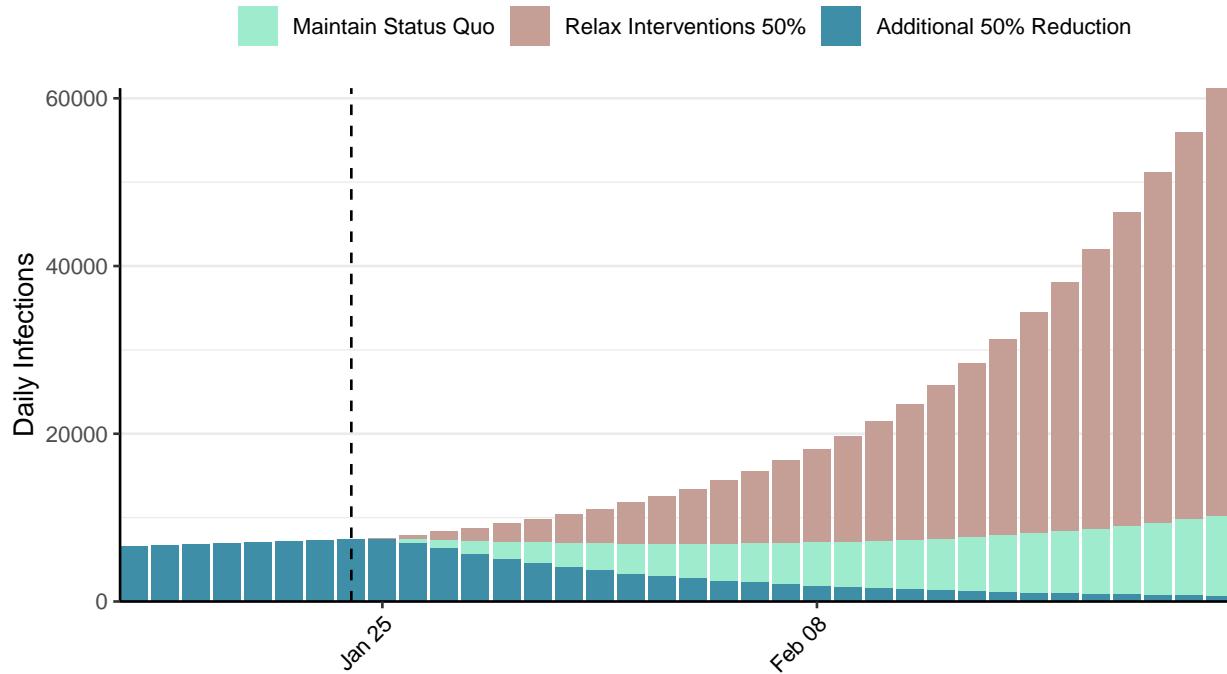


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Montenegro, 2021-01-24 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}
381	381	2	2	0.98 (95% CI: 0.84-1.12)

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. Montenegro is not shown in the following plot as only 2 deaths have been reported to date**

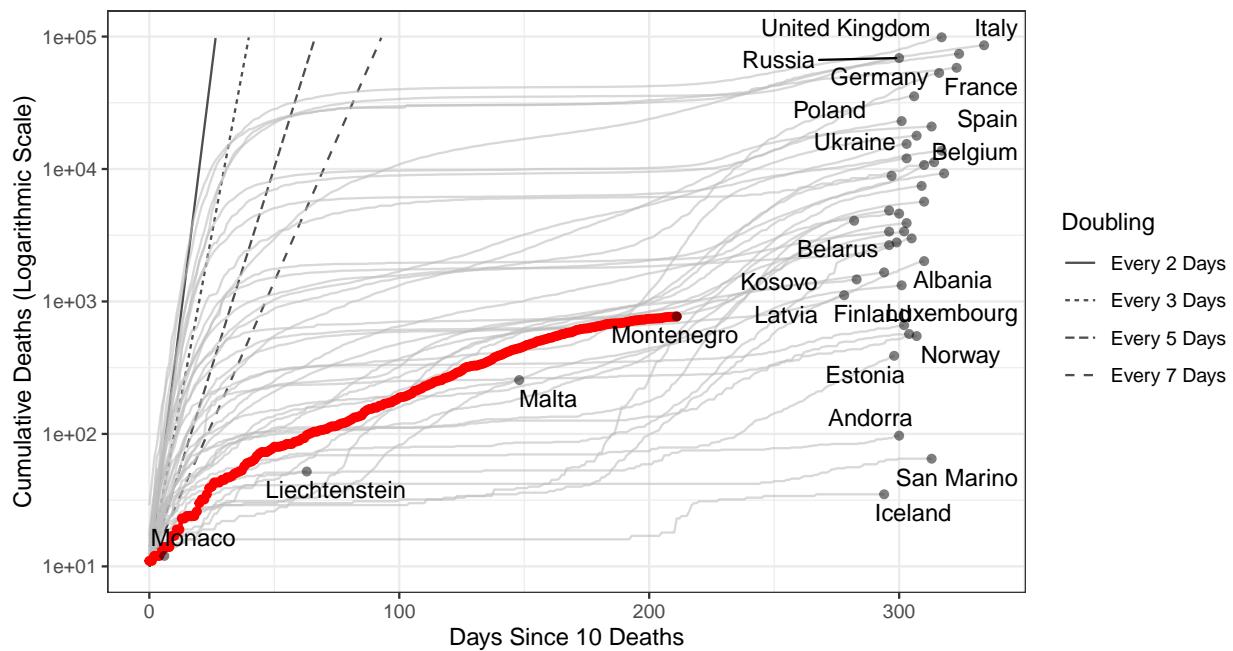


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 22,587 (95% CI: 21,752-23,422) 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

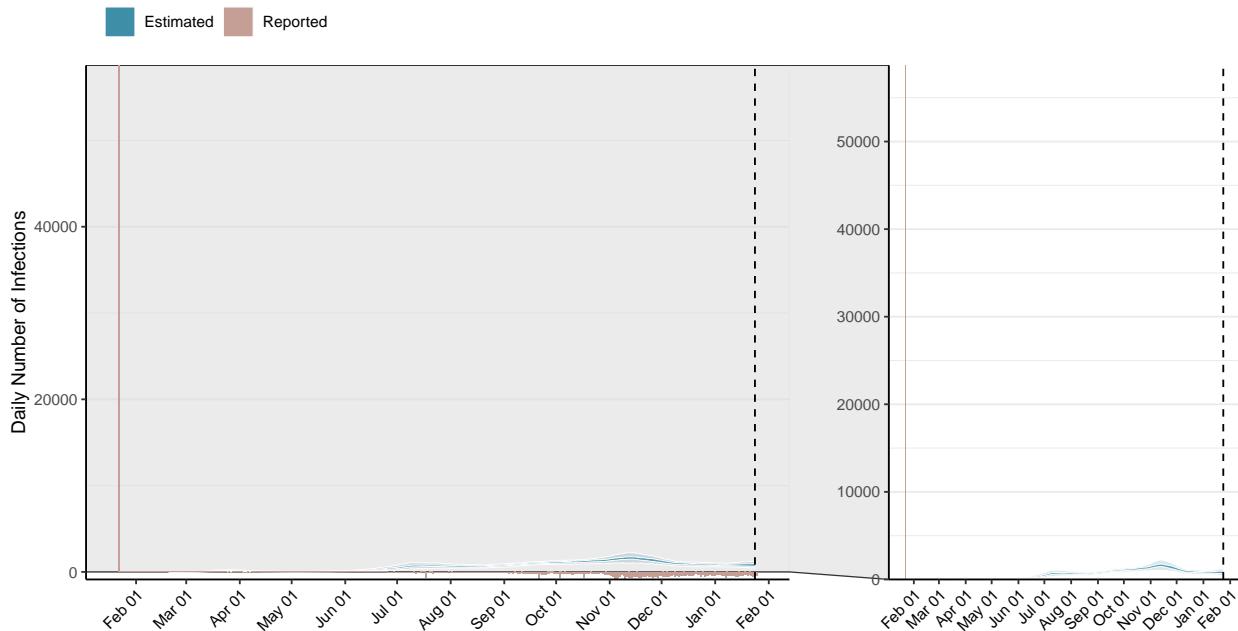


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

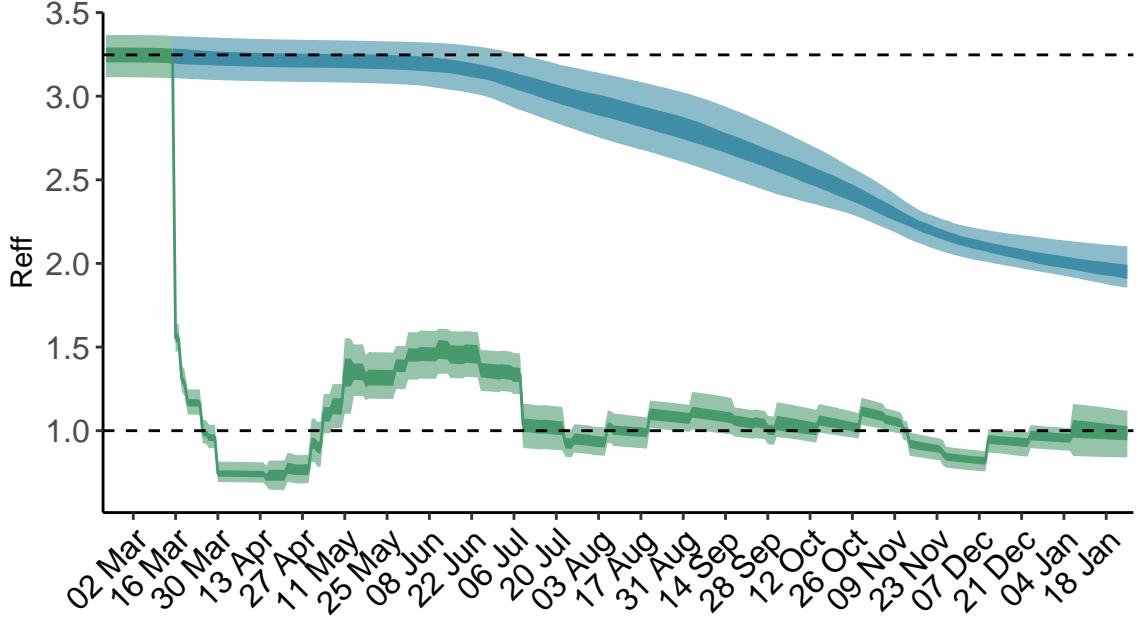


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

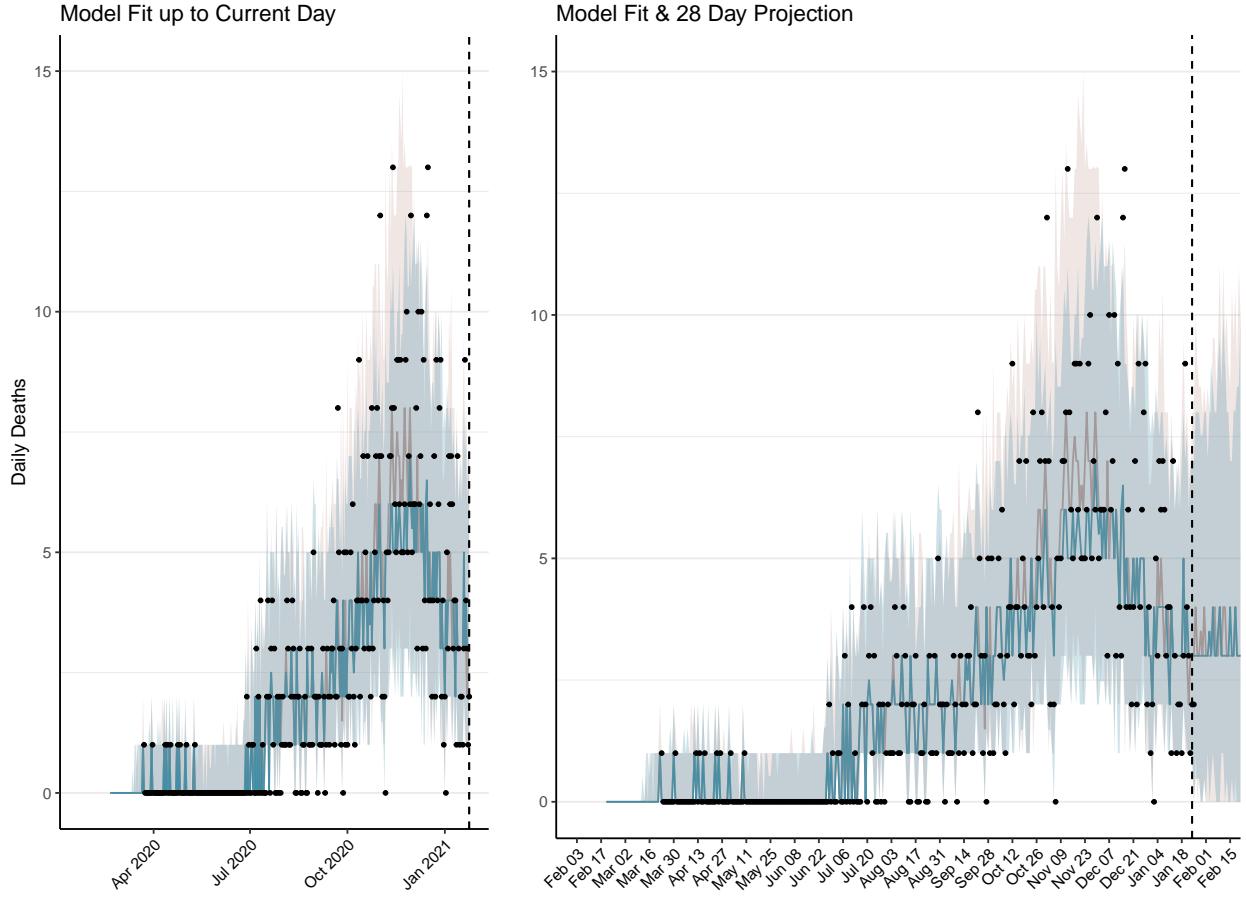


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 122 (95% CI: 117-127) patients requiring treatment with high-pressure oxygen at the current date to 124 (95% CI: 114-135) hospital beds being required on 2021-02-21 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 42 (95% CI: 41-44) patients requiring treatment with mechanical ventilation at the current date to 40 (95% CI: 37-42) by 2021-02-21. 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.**

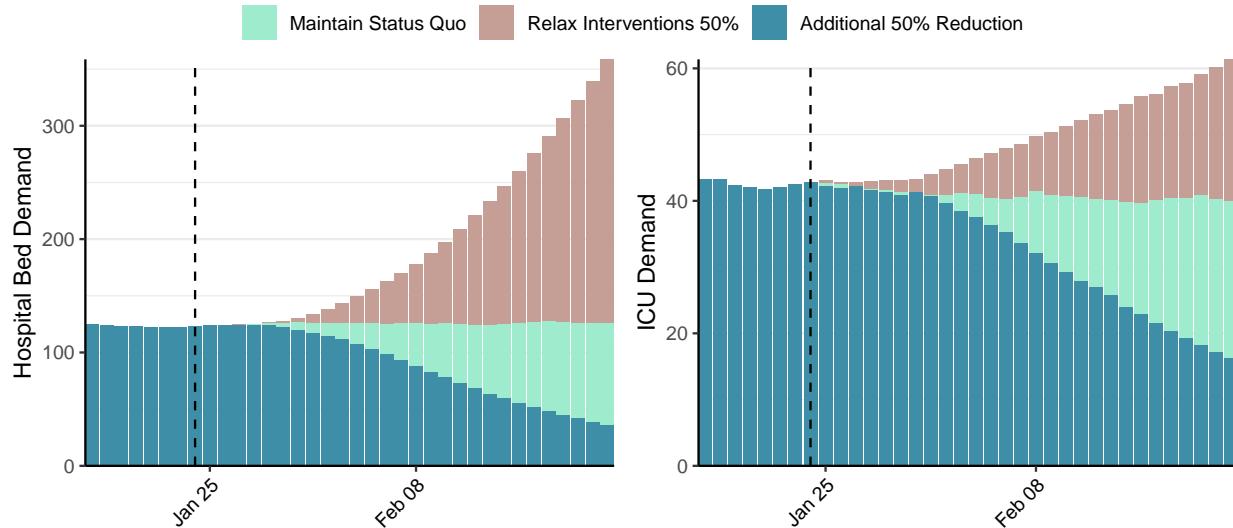


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 807 (95% CI: 762-852) at the current date to 70 (95% CI: 63-76) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 807 (95% CI: 762-852) at the current date to 3,475 (95% CI: 3,196-3,755) by 2021-02-21.

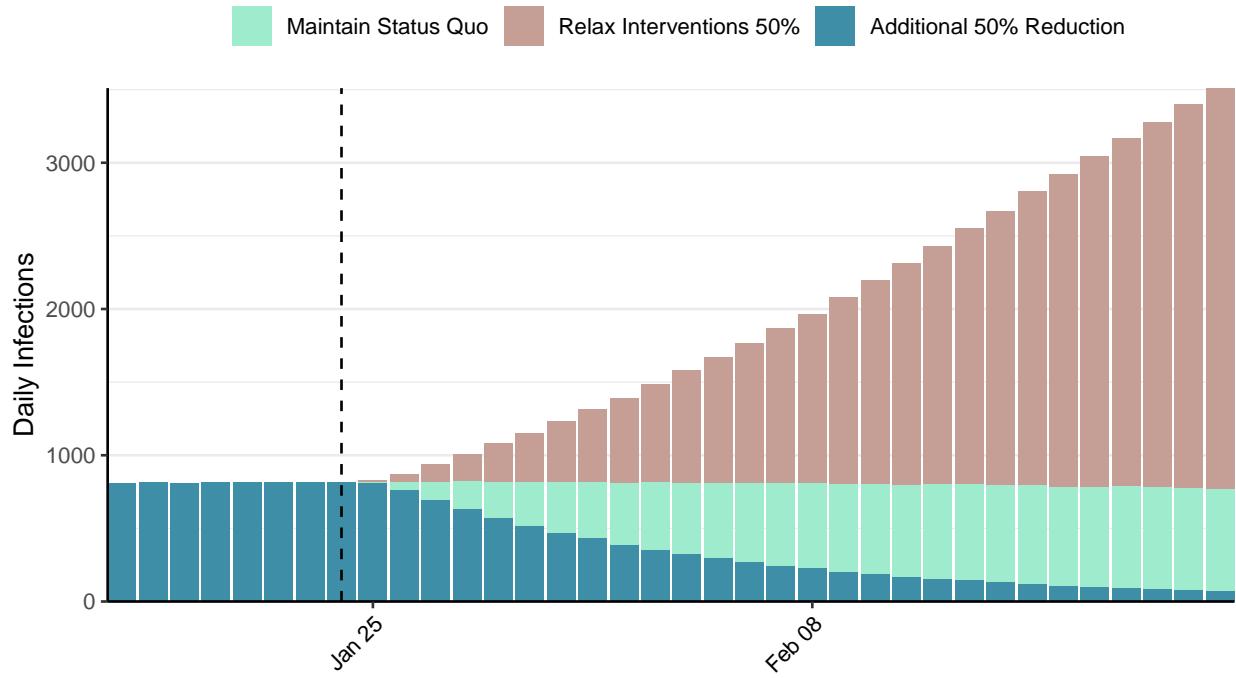


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Mongolia, 2021-01-24 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}
13	13	0	0	1.48 (95% CI: 1.17-1.95)

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. Mongolia is not shown in the following plot as only 0 deaths have been reported to date**

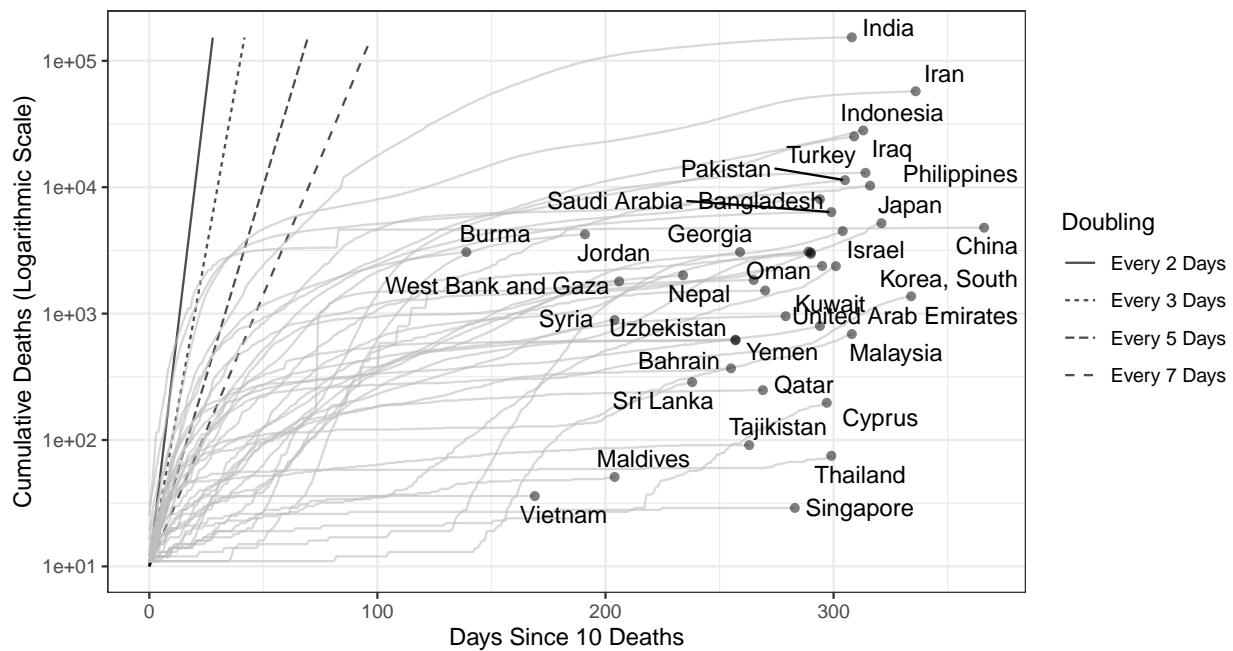


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 3,216 (95% CI: 2,628-3,803) 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).

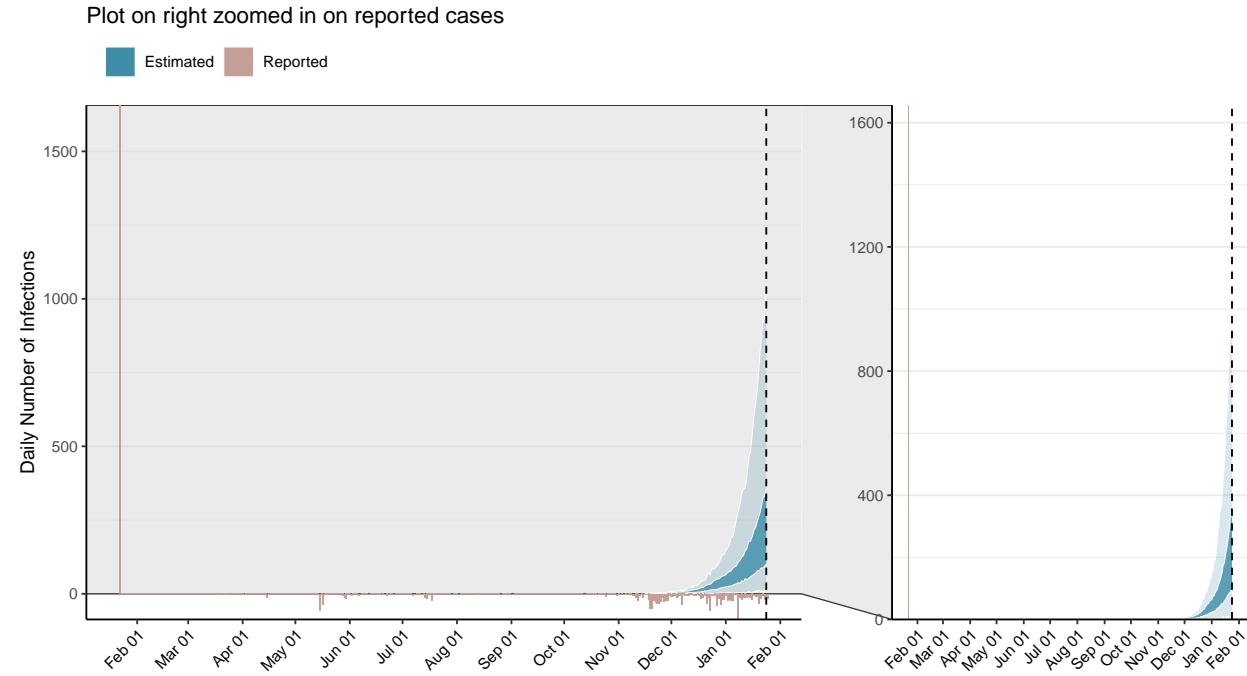


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

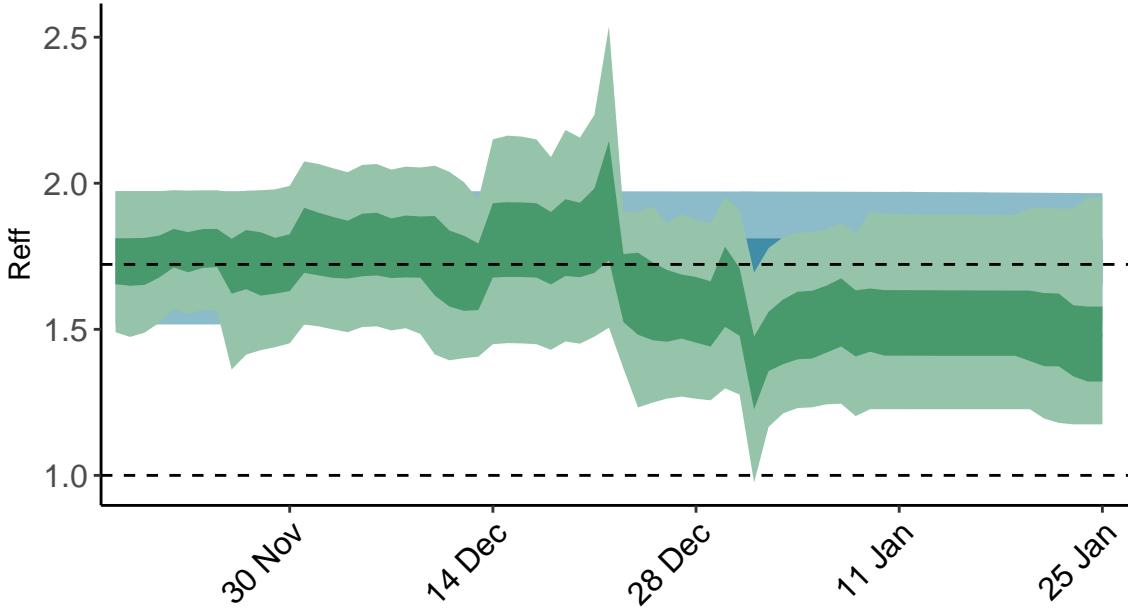


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

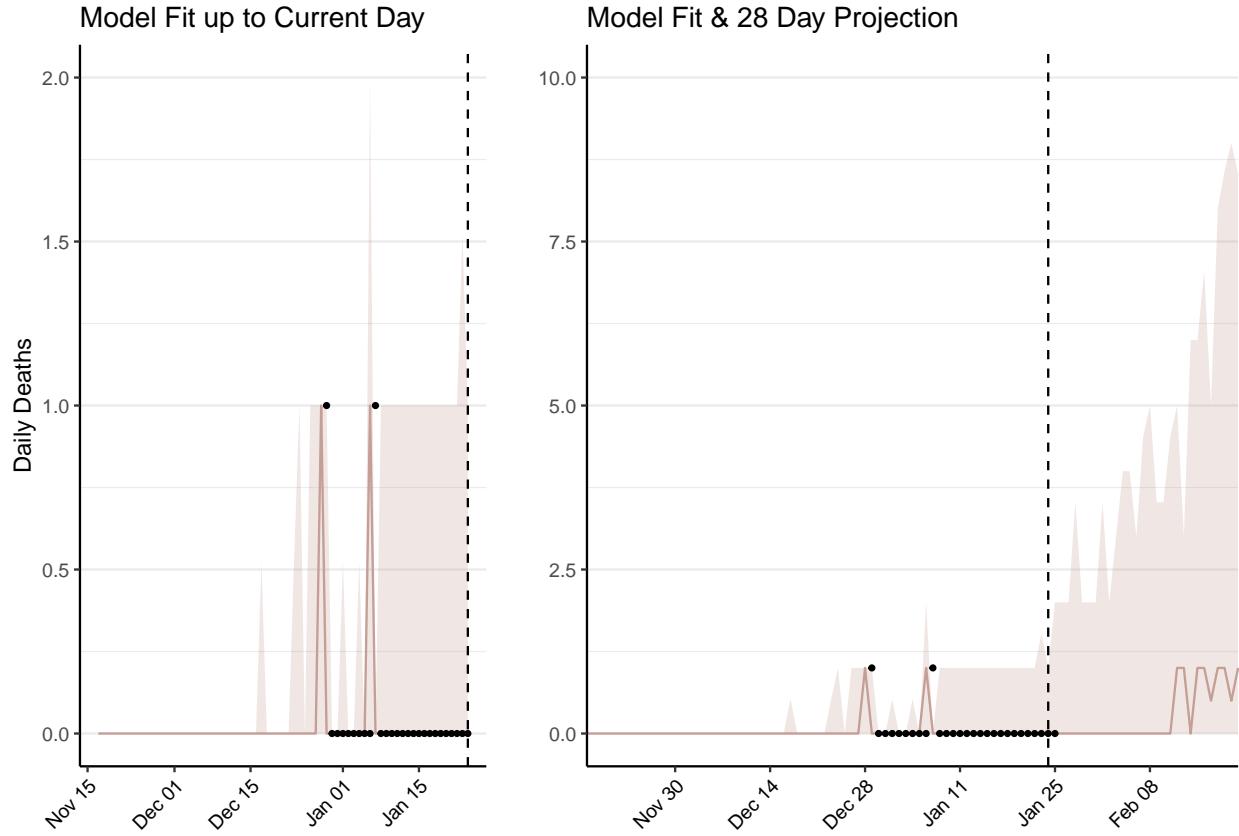


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 15 (95% CI: 12-18) patients requiring treatment with high-pressure oxygen at the current date to 87 (95% CI: 63-112) hospital beds being required on 2021-02-21 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 31 (95% CI: 23-40) by 2021-02-21. 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.**

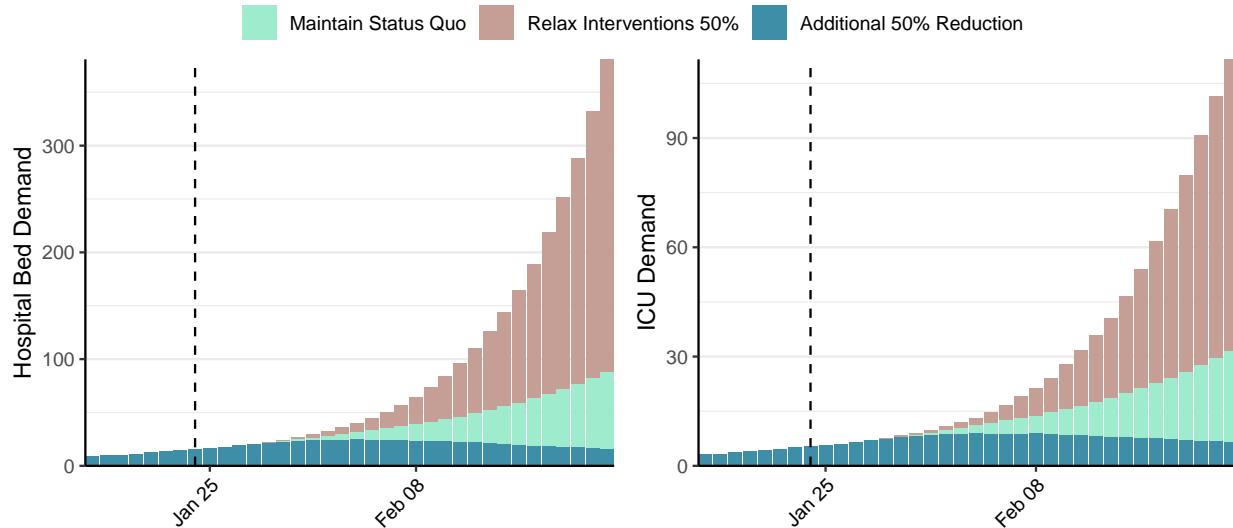


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 262 (95% CI: 208-316) at the current date to 85 (95% CI: 59-111) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 262 (95% CI: 208-316) at the current date to 10,880 (95% CI: 7,028-14,732) by 2021-02-21.

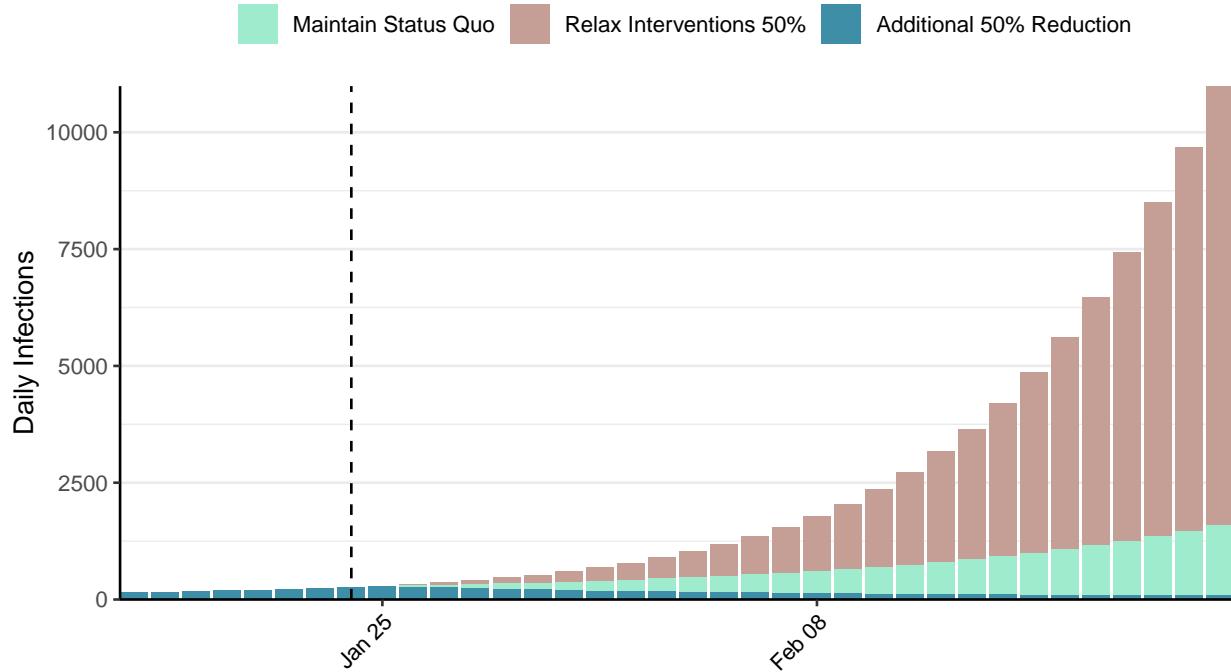


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Mozambique, 2021-01-24 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}
363	363	58	58	1.62 (95% CI: 1.41-1.82)

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.

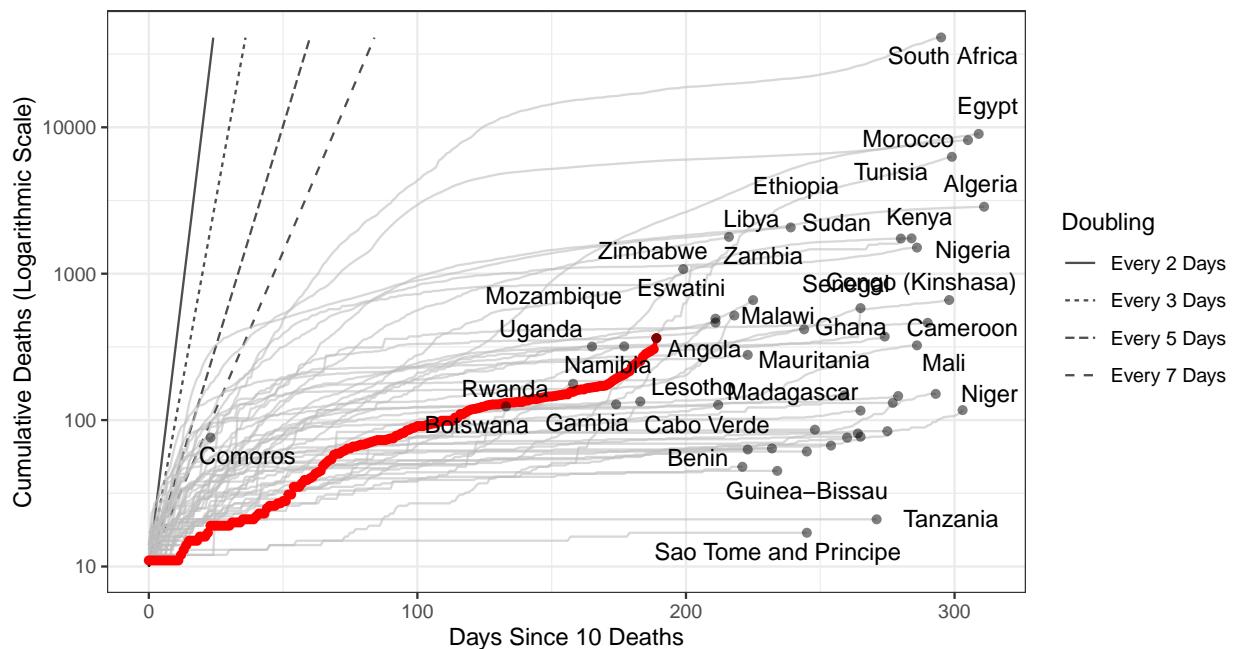


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 465,123 (95% CI: 426,161-504,086) 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).

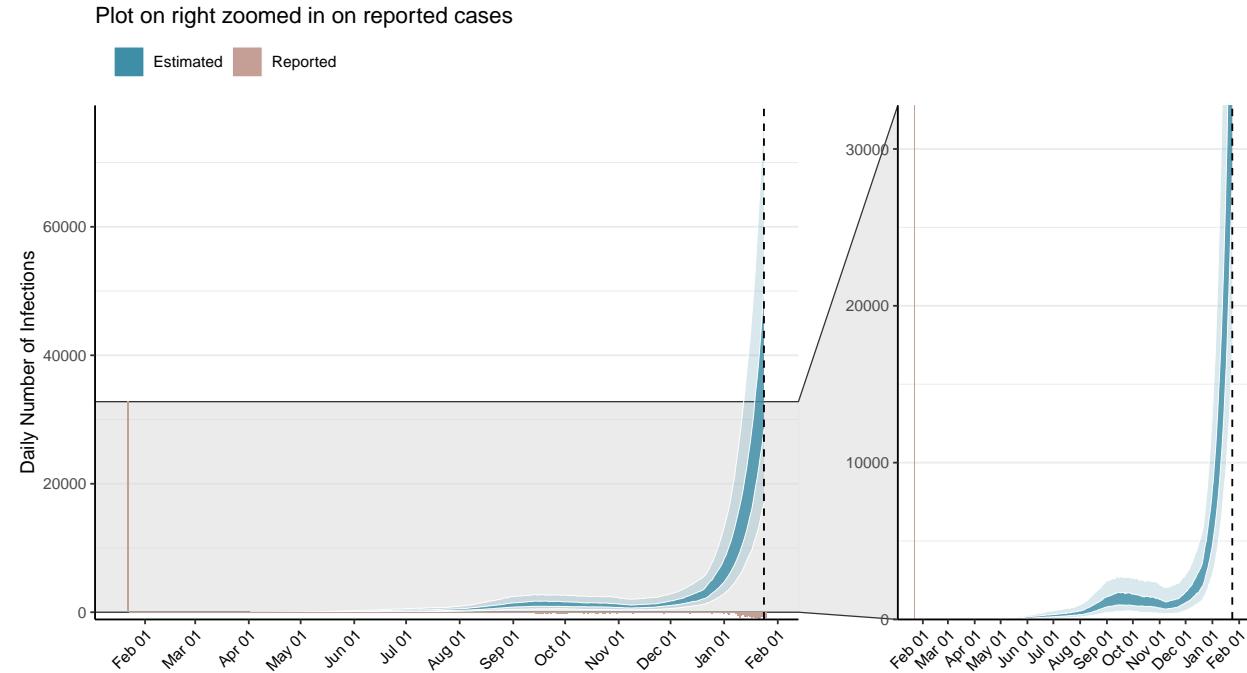


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

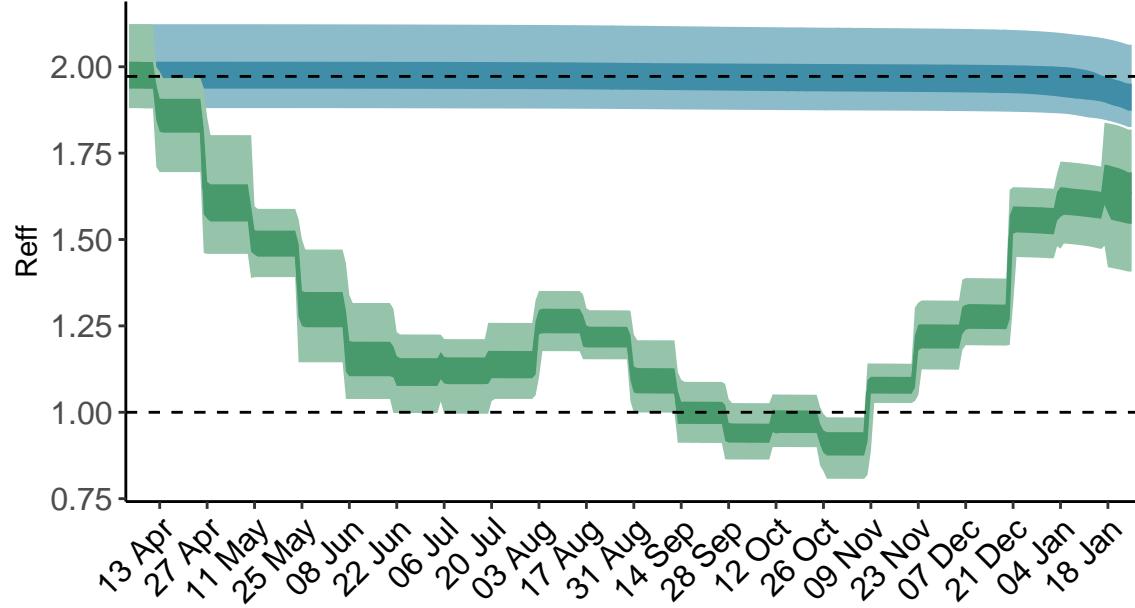


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

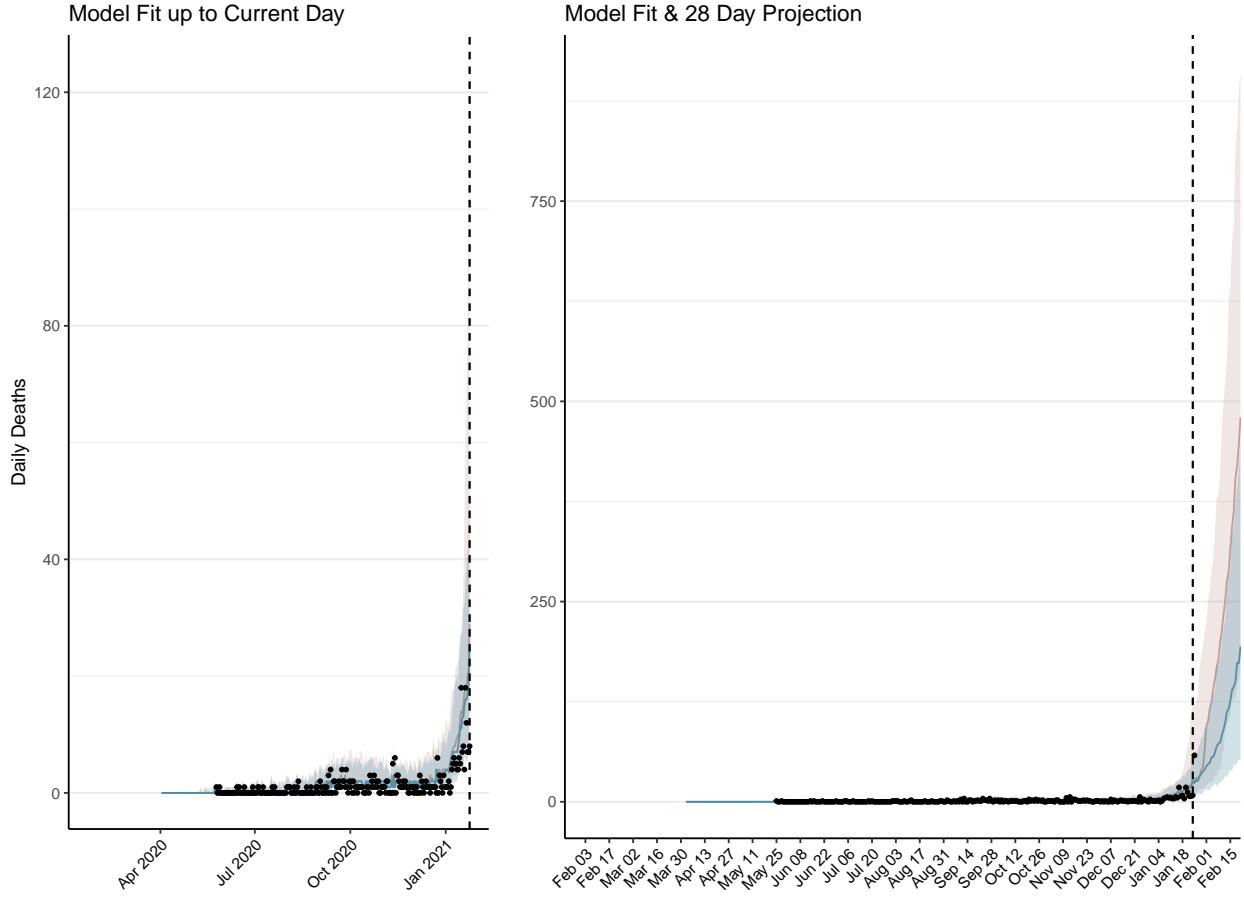


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 1,417 (95% CI: 1,298-1,536) patients requiring treatment with high-pressure oxygen at the current date to 11,001 (95% CI: 10,061-11,942) hospital beds being required on 2021-02-21 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 472 (95% CI: 437-506) patients requiring treatment with mechanical ventilation at the current date to 1,261 (95% CI: 1,201-1,320) by 2021-02-21. 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.**

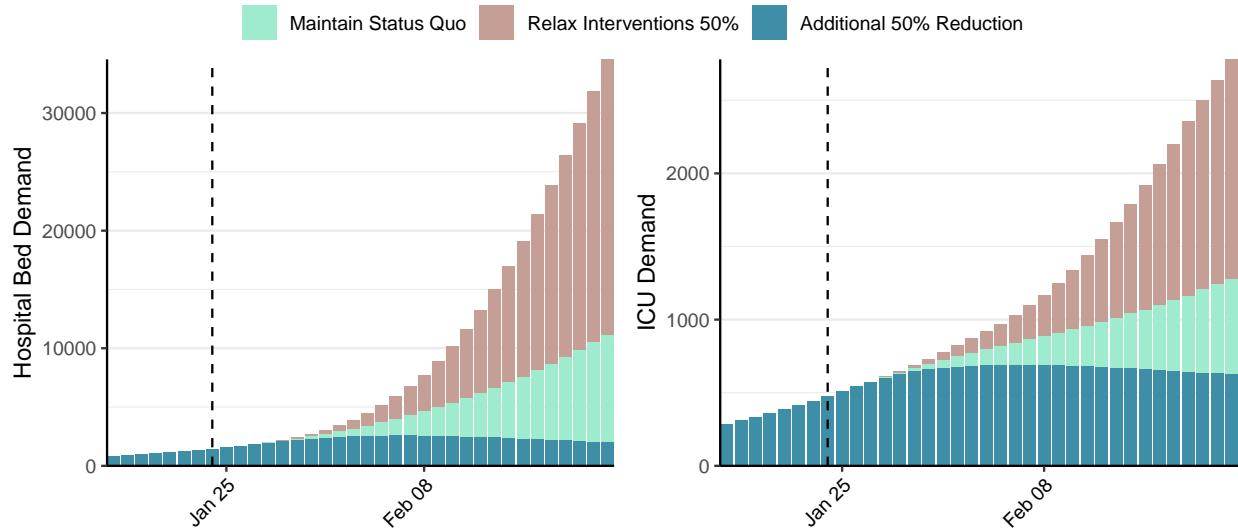


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 39,641 (95% CI: 36,197-43,085) at the current date to 18,675 (95% CI: 16,827-20,524) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 39,641 (95% CI: 36,197-43,085) at the current date to 921,447 (95% CI: 881,856-961,038) by 2021-02-21.

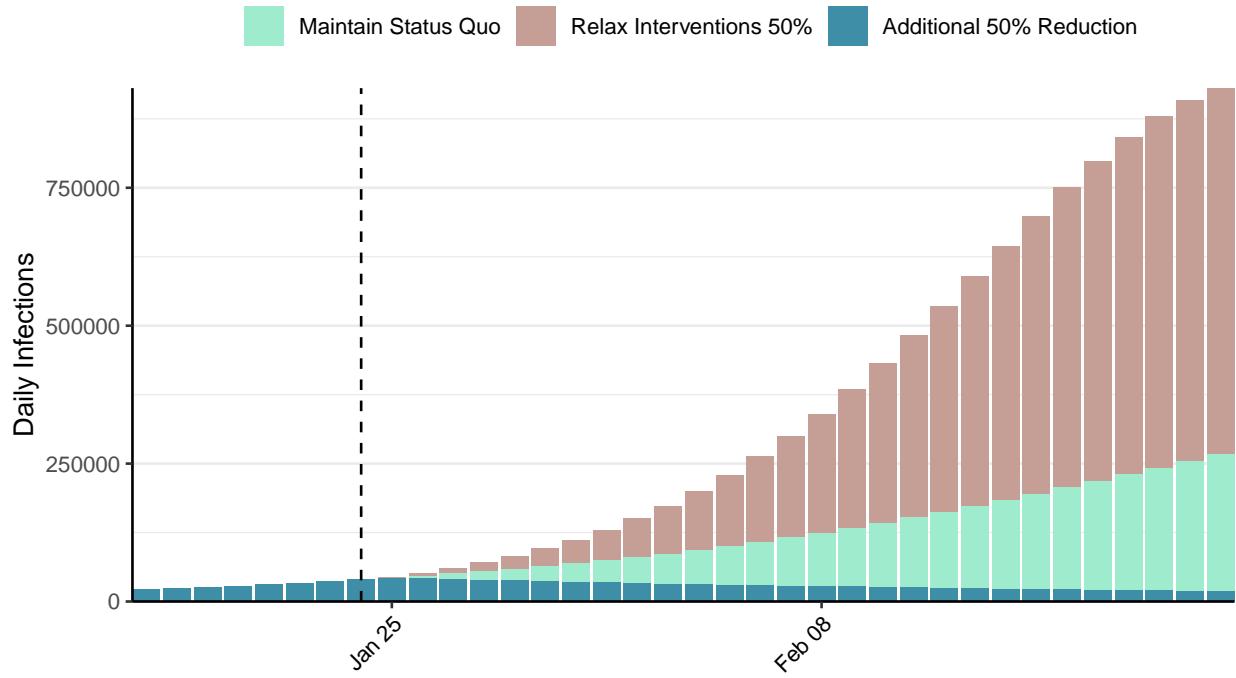


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Mauritania, 2021-01-24 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}
24	24	1	1	0.69 (95% CI: 0.55-0.83)

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. Mauritania is not shown in the following plot as only 1 deaths have been reported to date**

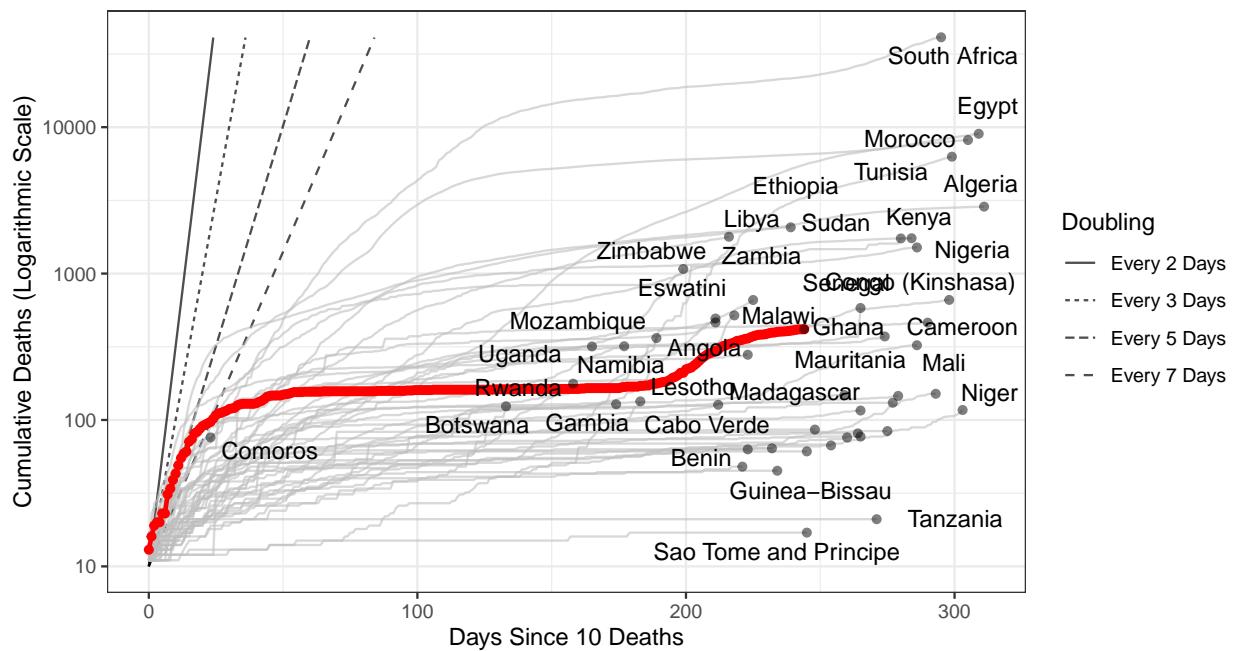


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 27,847 (95% CI: 26,164-29,530) 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

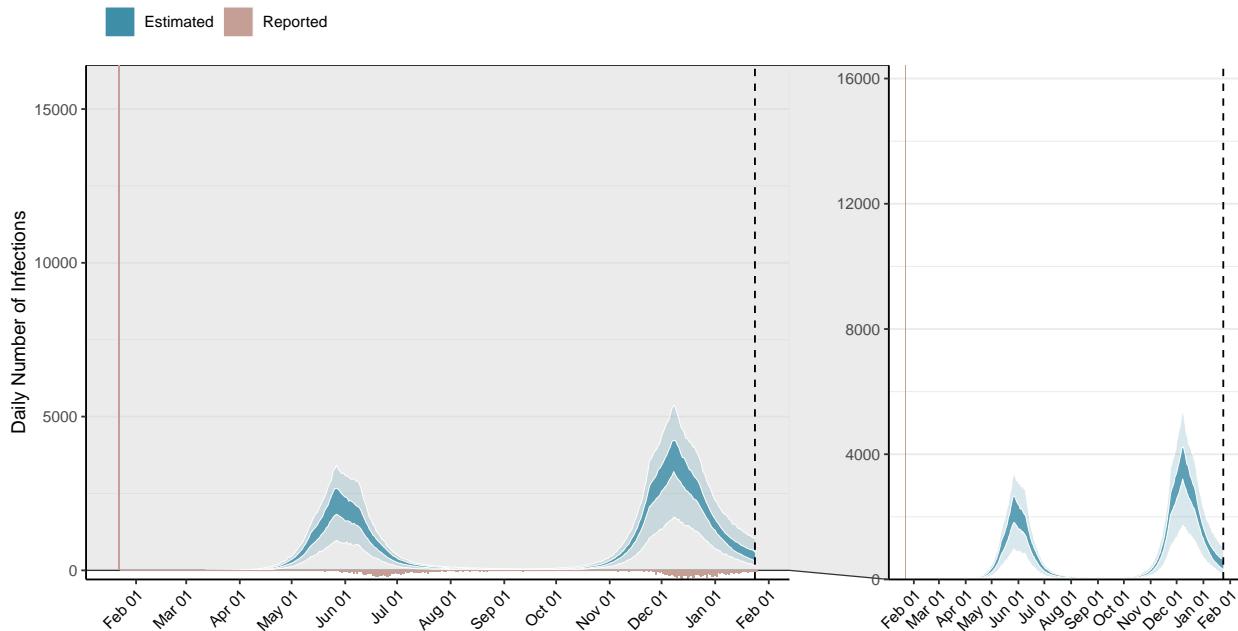


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

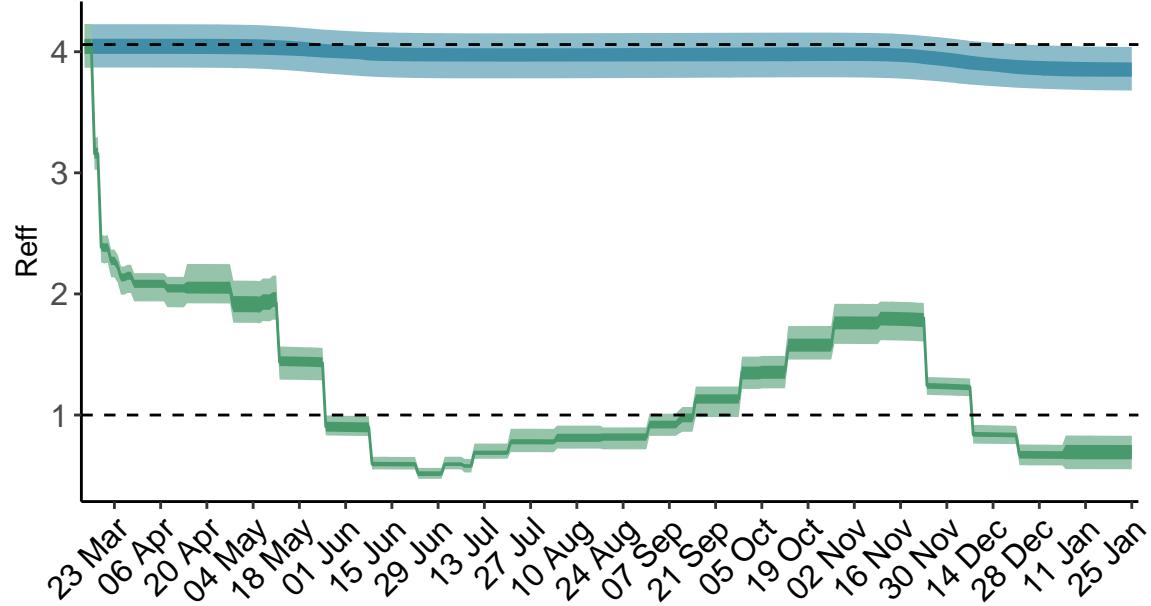


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

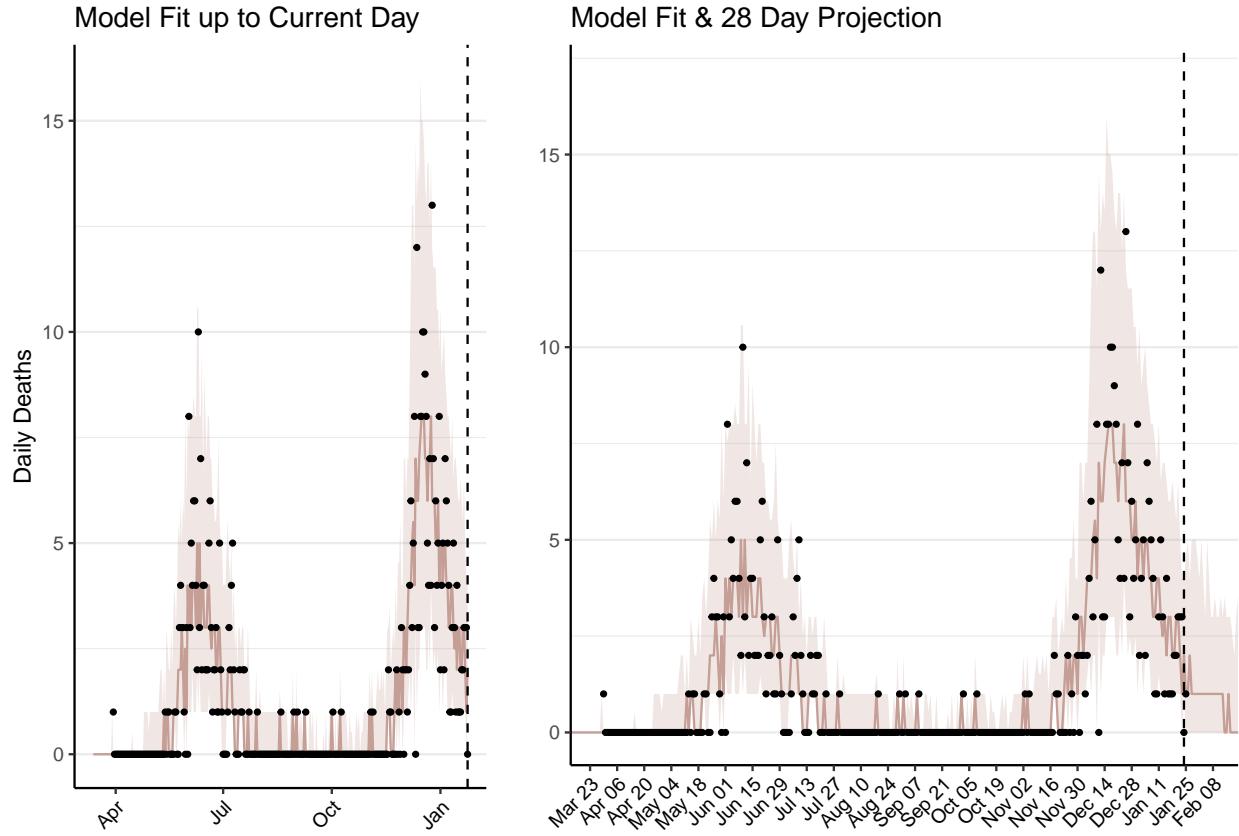


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 72 (95% CI: 67-77) patients requiring treatment with high-pressure oxygen at the current date to 21 (95% CI: 18-24) hospital beds being required on 2021-02-21 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 31 (95% CI: 29-33) patients requiring treatment with mechanical ventilation at the current date to 10 (95% CI: 8-11) by 2021-02-21. 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.**

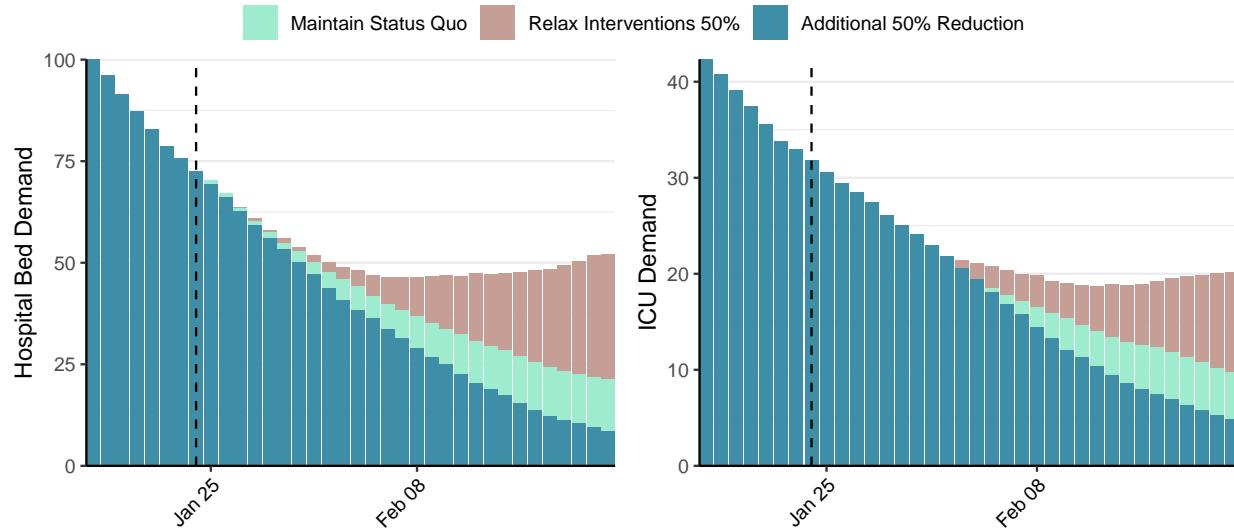


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 488 (95% CI: 438-537) at the current date to 16 (95% CI: 13-19) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 488 (95% CI: 438-537) at the current date to 748 (95% CI: 590-905) by 2021-02-21.

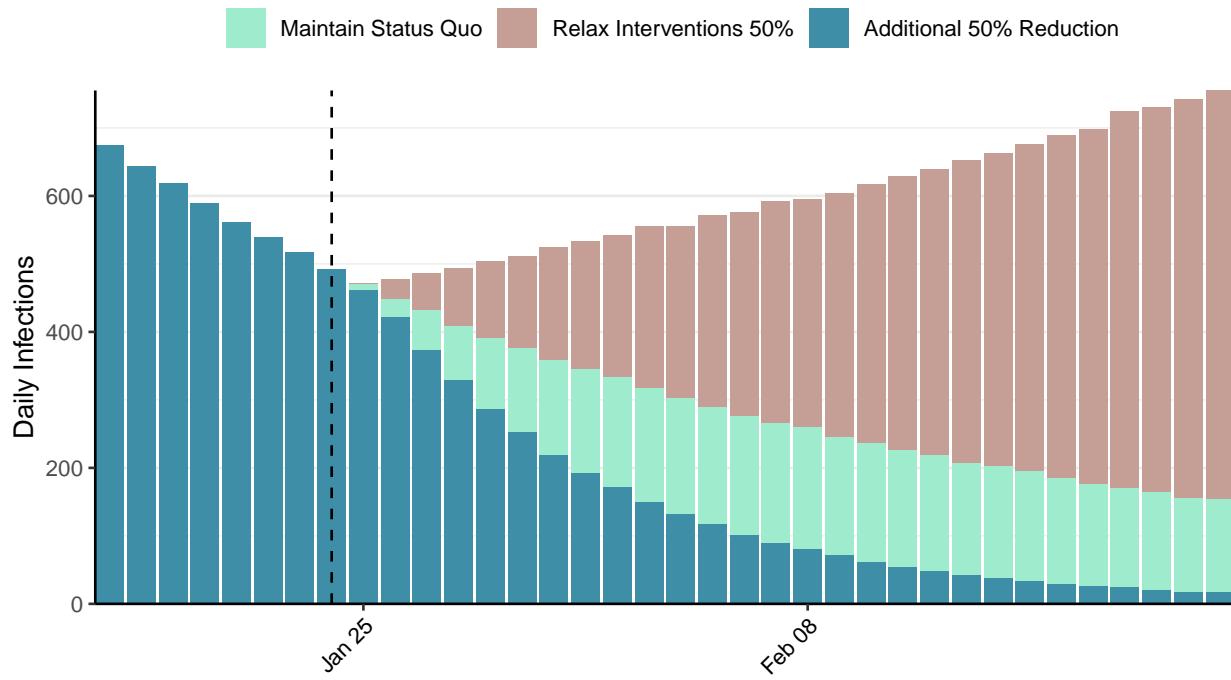


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Mauritius, 2021-01-24

[Download the report for Mauritius, 2021-01-24 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}
12	12	0	0	0.68 (95% CI: 0.24-1.21)

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. Mauritius is not shown in the following plot as only 0 deaths have been reported to date**

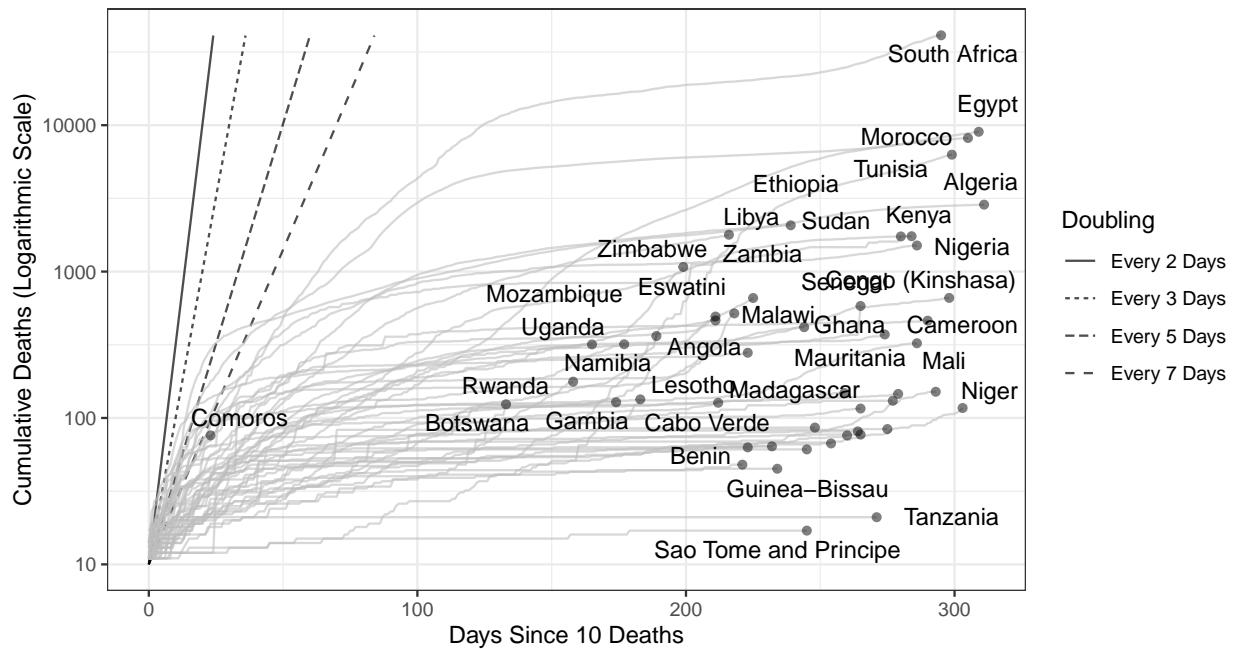


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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

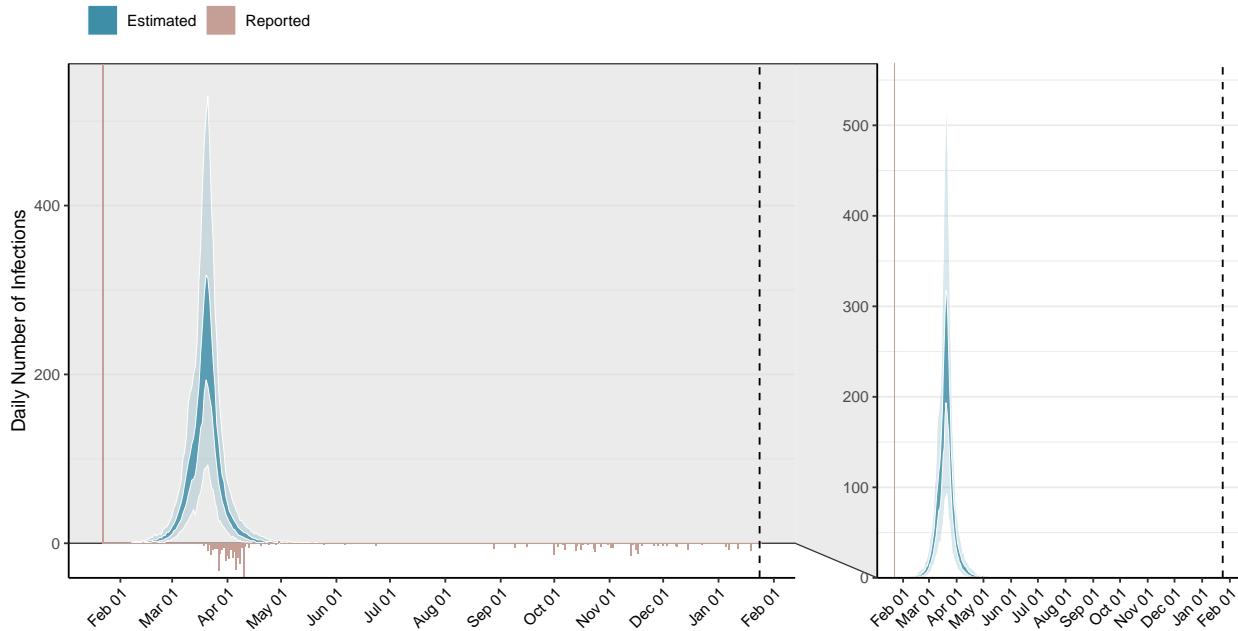


Figure 2: Daily number of infections estimated by fitting to the current total of deaths. Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

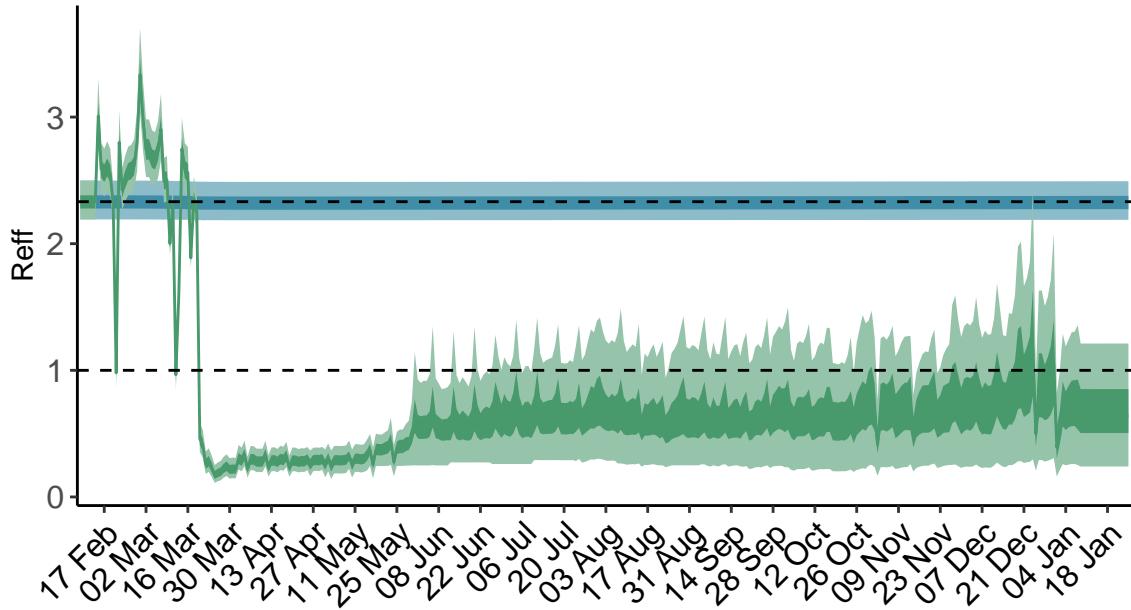


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

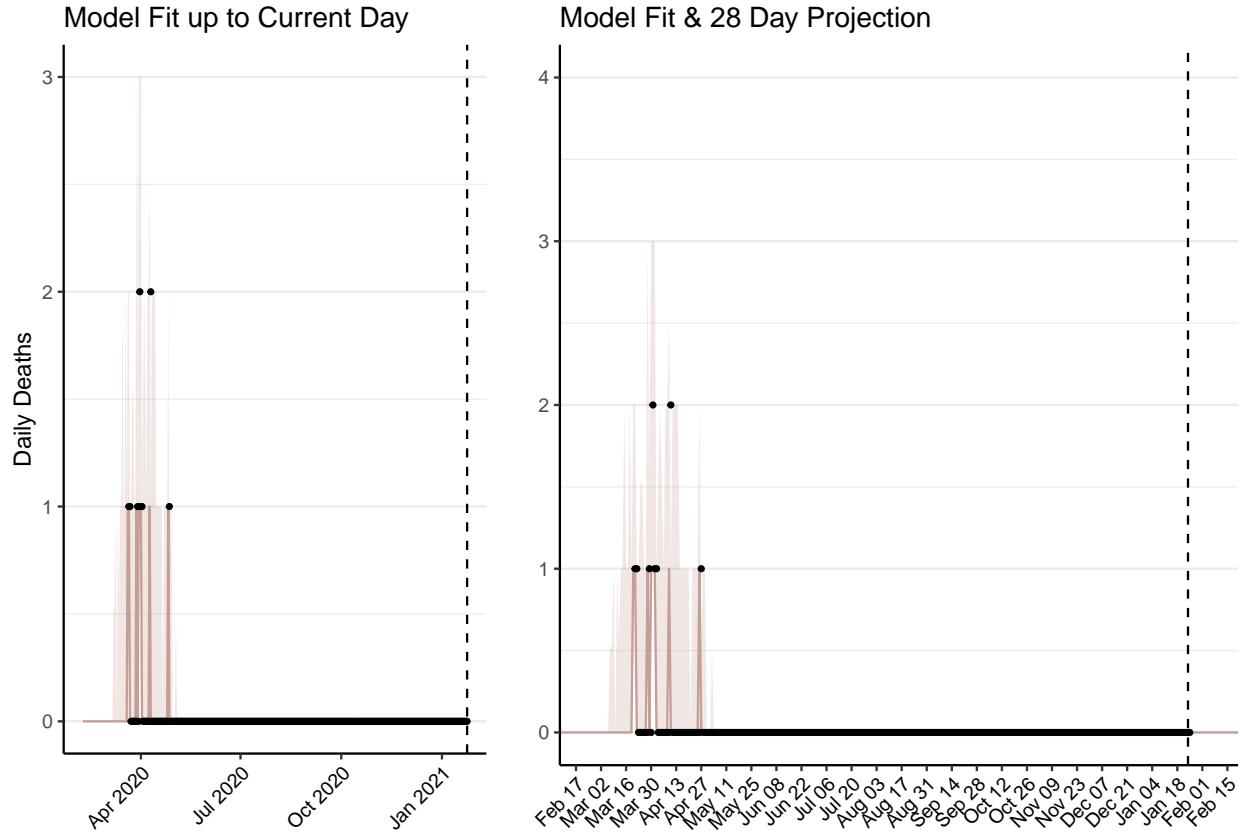


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 2021-02-21 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 2021-02-21. 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.**

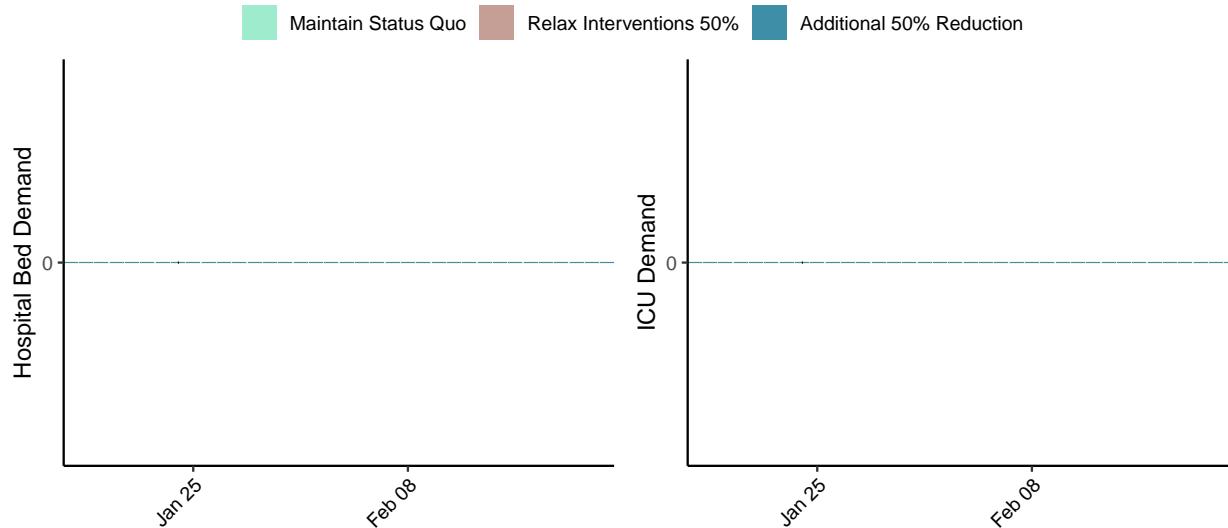


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 2021-02-21. 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 2021-02-21.

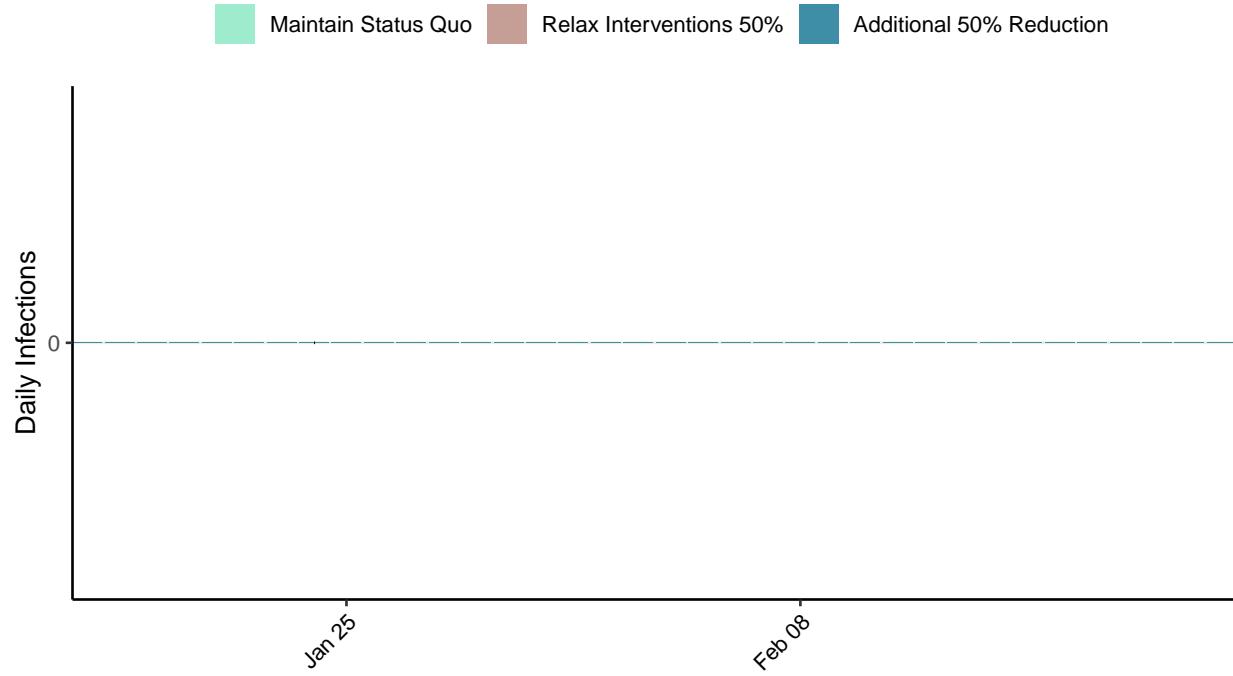


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Malawi, 2021-01-24 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}
592	592	10	10	2 (95% CI: 1.85-2.19)

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.

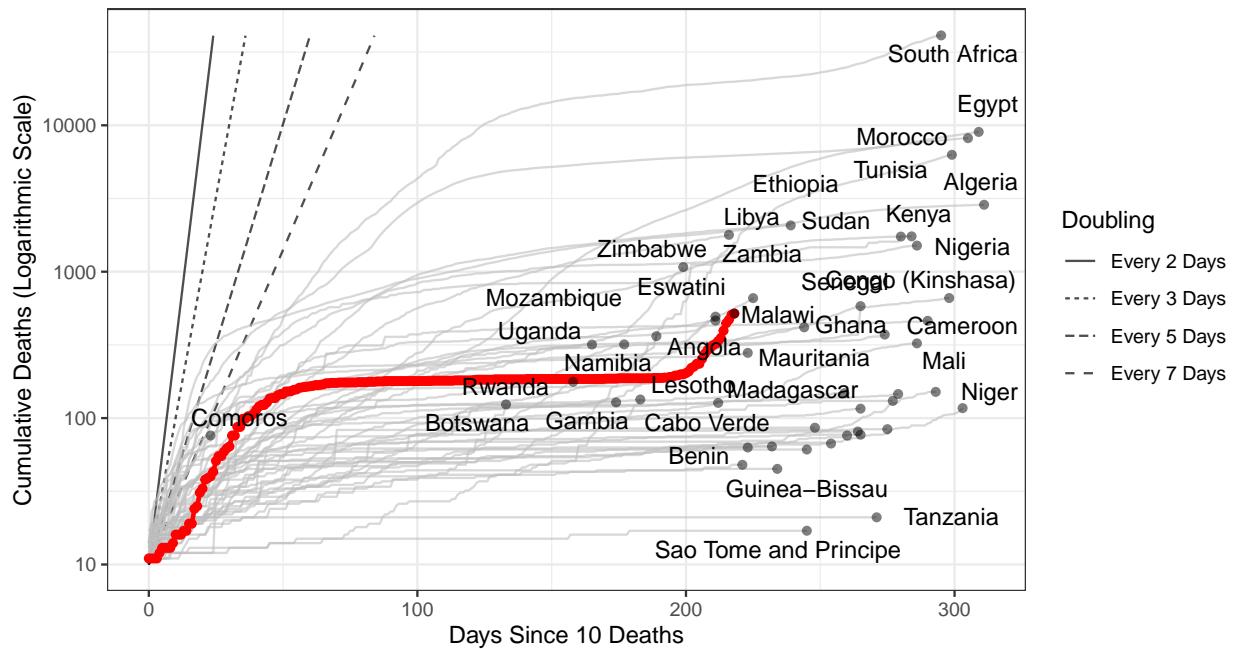


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 820,063 (95% CI: 766,210–873,916) 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).

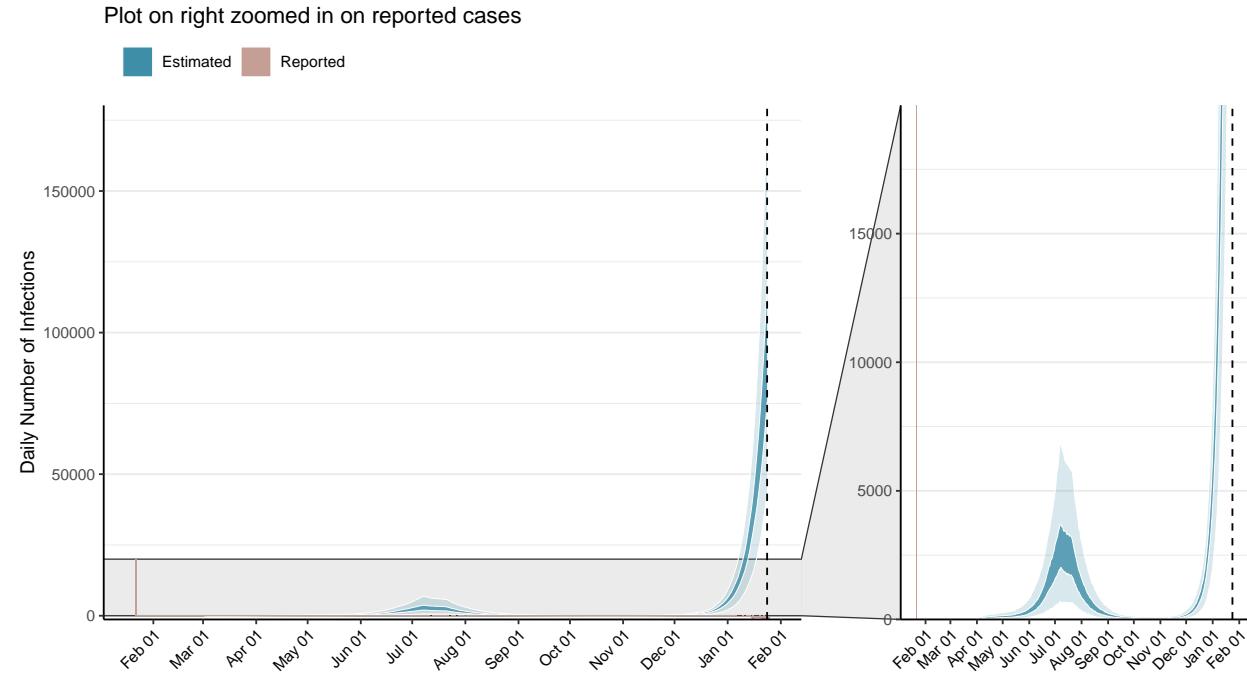


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

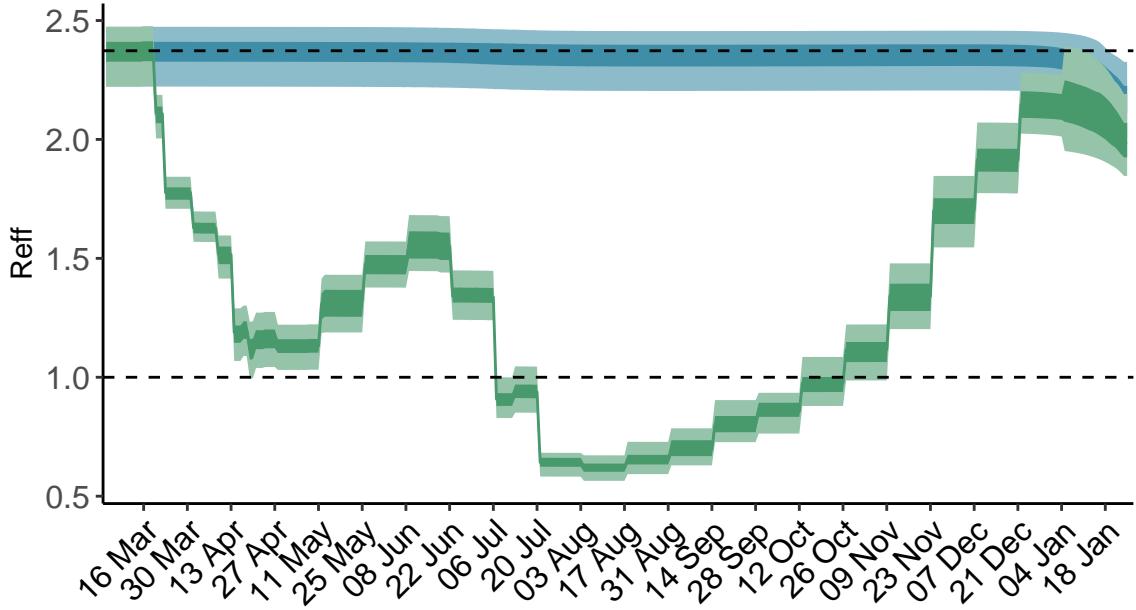


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

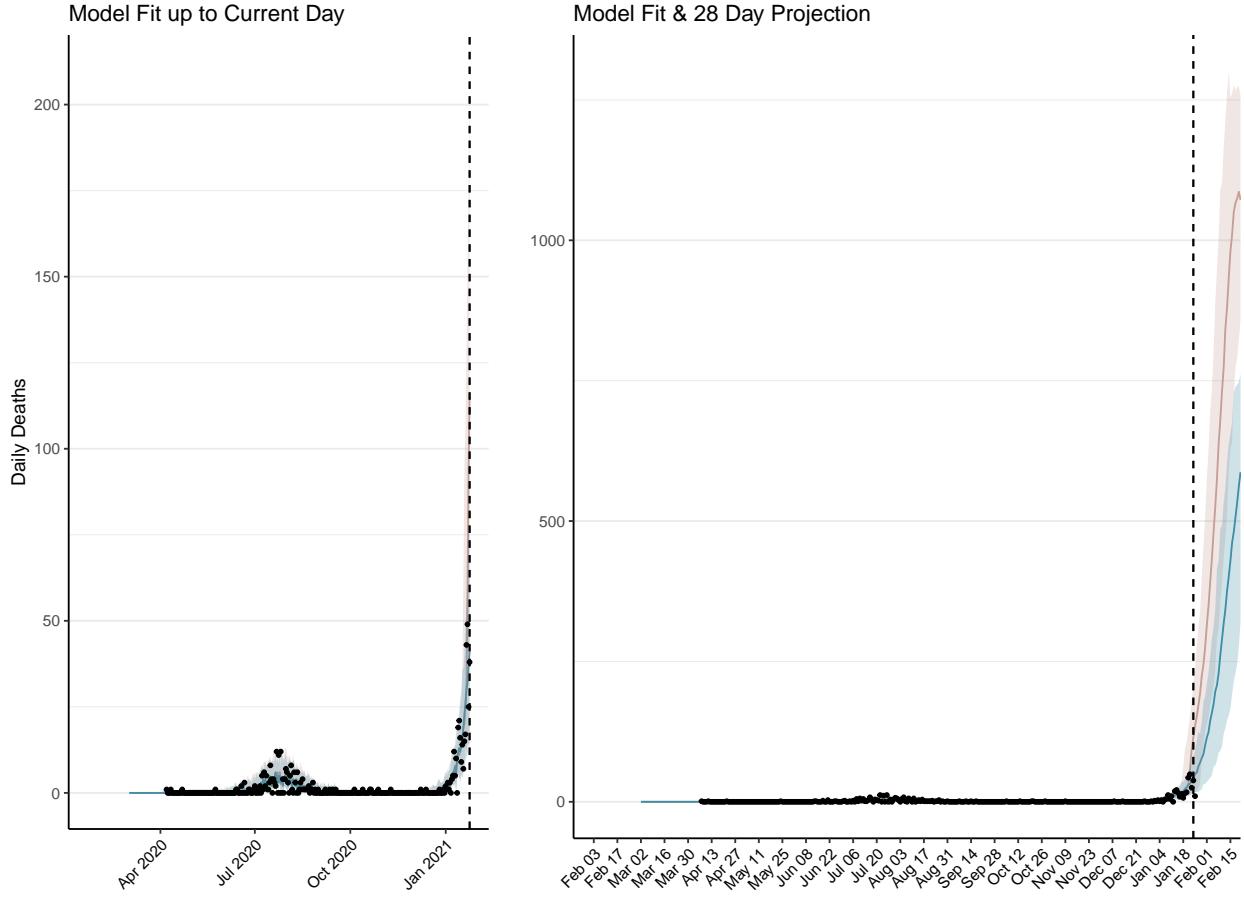


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 2,457 (95% CI: 2,296-2,619) patients requiring treatment with high-pressure oxygen at the current date to 26,143 (95% CI: 25,260-27,026) hospital beds being required on 2021-02-21 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 614 (95% CI: 590-637) patients requiring treatment with mechanical ventilation at the current date to 1,831 (95% CI: 1,785-1,876) by 2021-02-21. 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.**

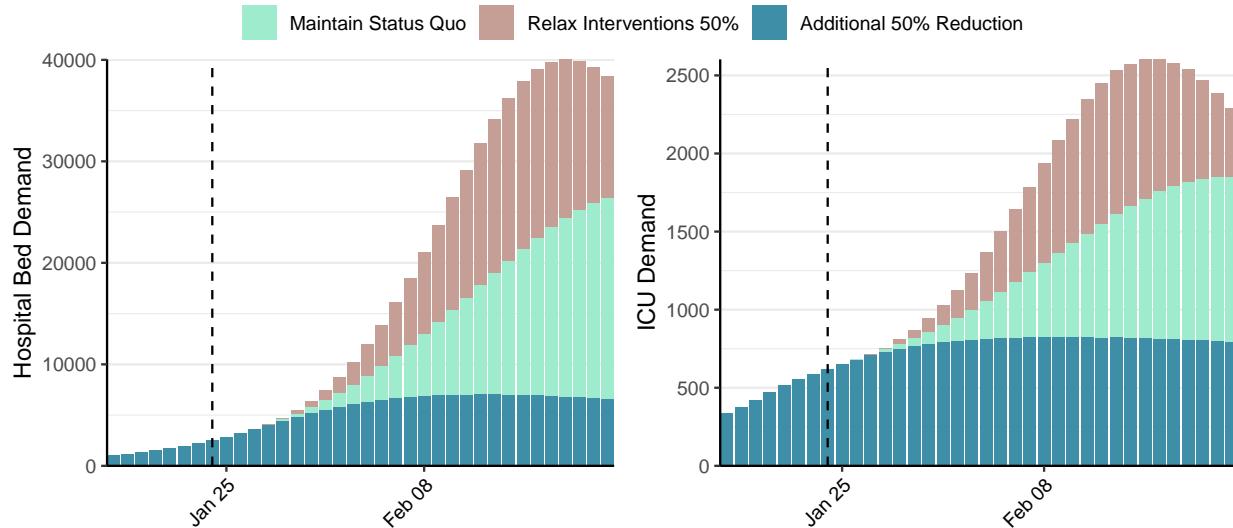


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 98,497 (95% CI: 91,802-105,193) at the current date to 75,797 (95% CI: 71,561-80,032) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 98,497 (95% CI: 91,802-105,193) at the current date to 352,698 (95% CI: 329,338-376,059) by 2021-02-21.

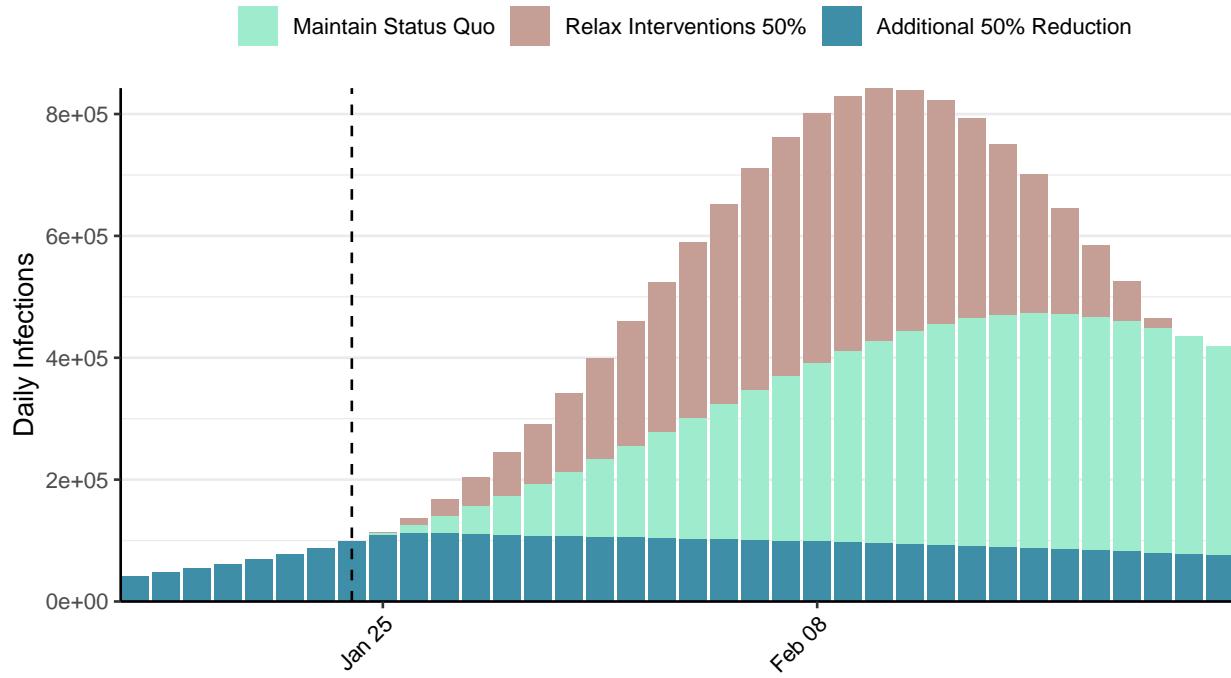


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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: Malaysia, 2021-01-24

[Download the report for Malaysia, 2021-01-24 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}
3,048	3,048	11	11	1.09 (95% CI: 0.95-1.28)

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.

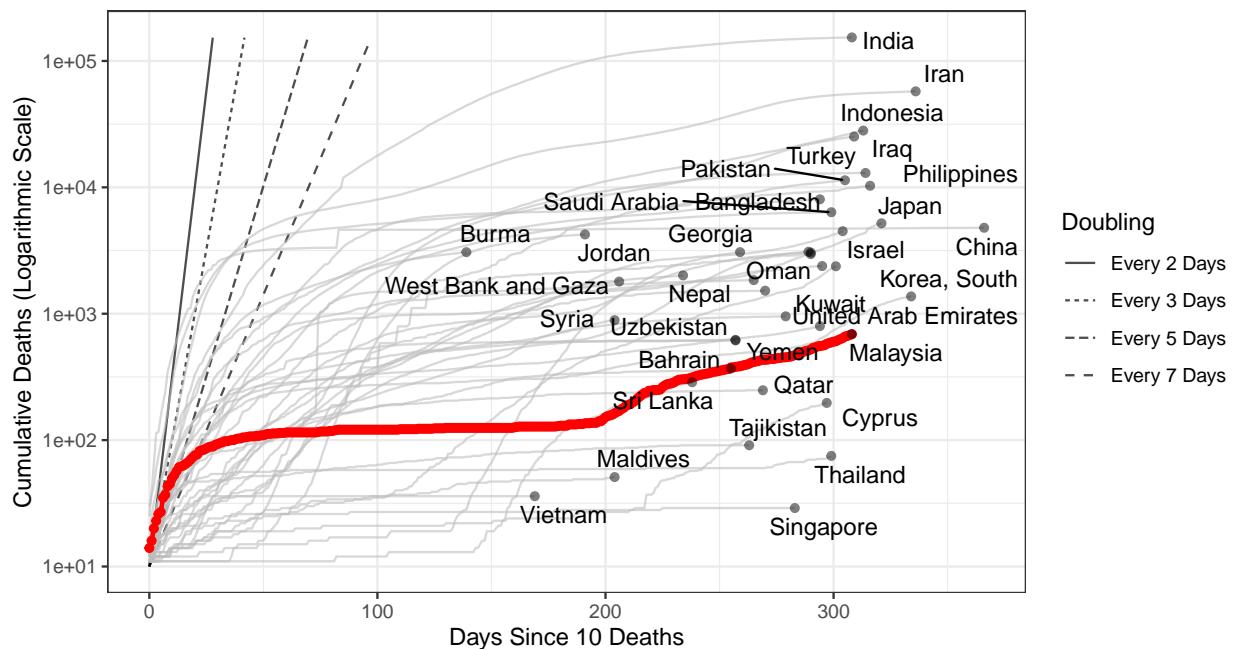


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 164,730 (95% CI: 154,446-175,015) 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).

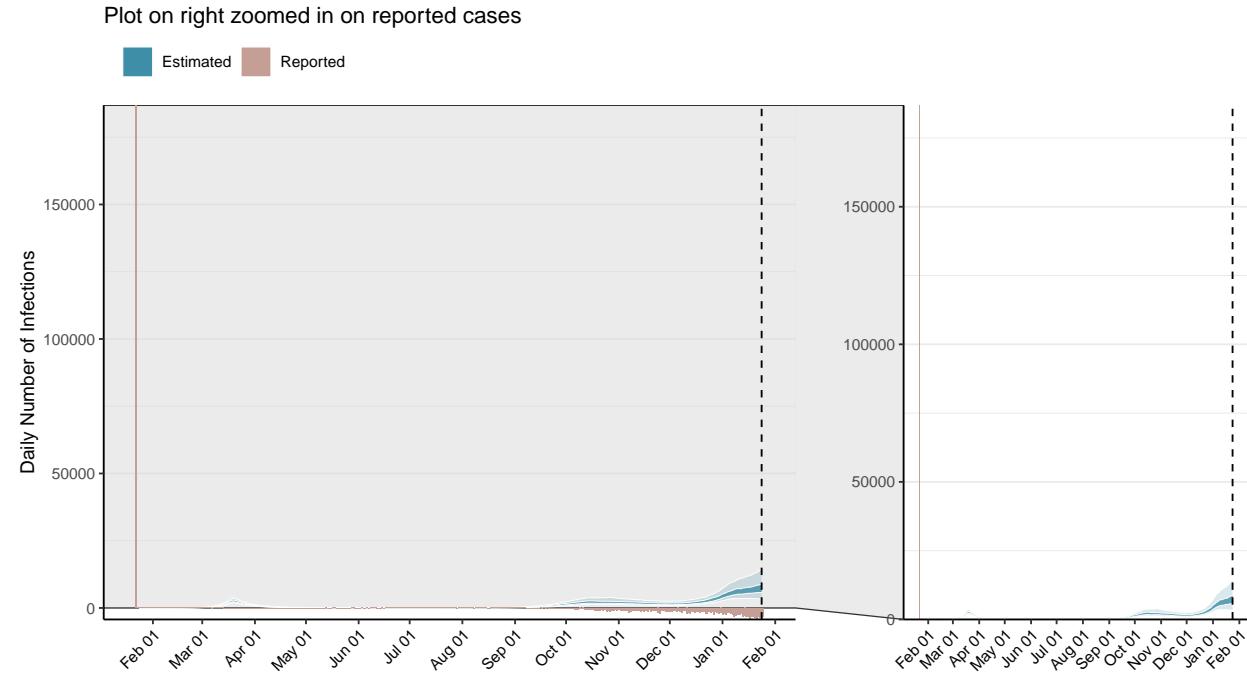


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

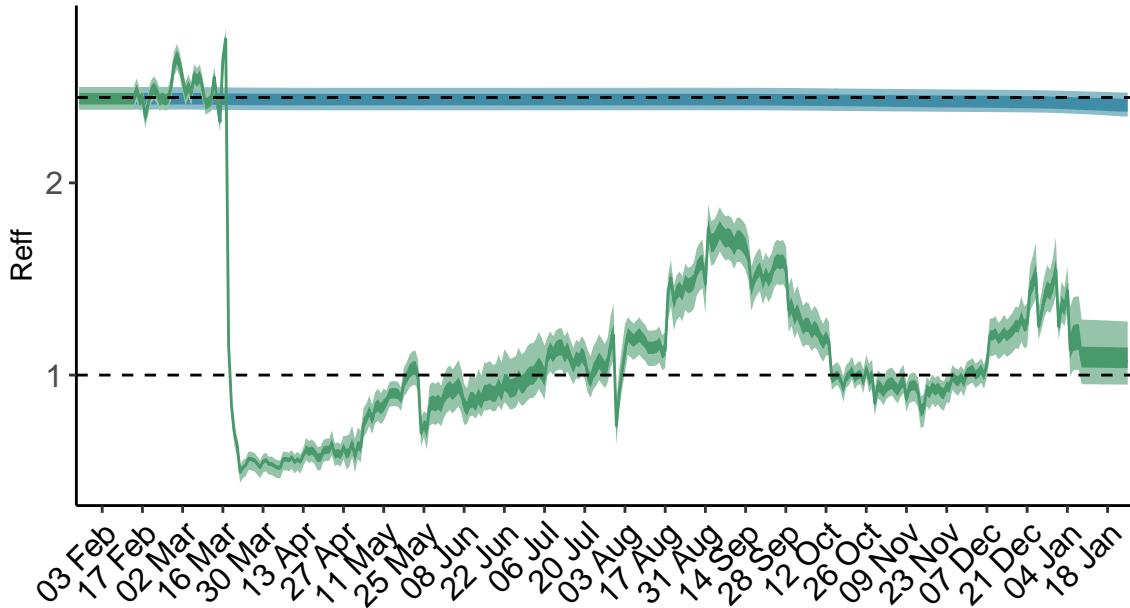


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

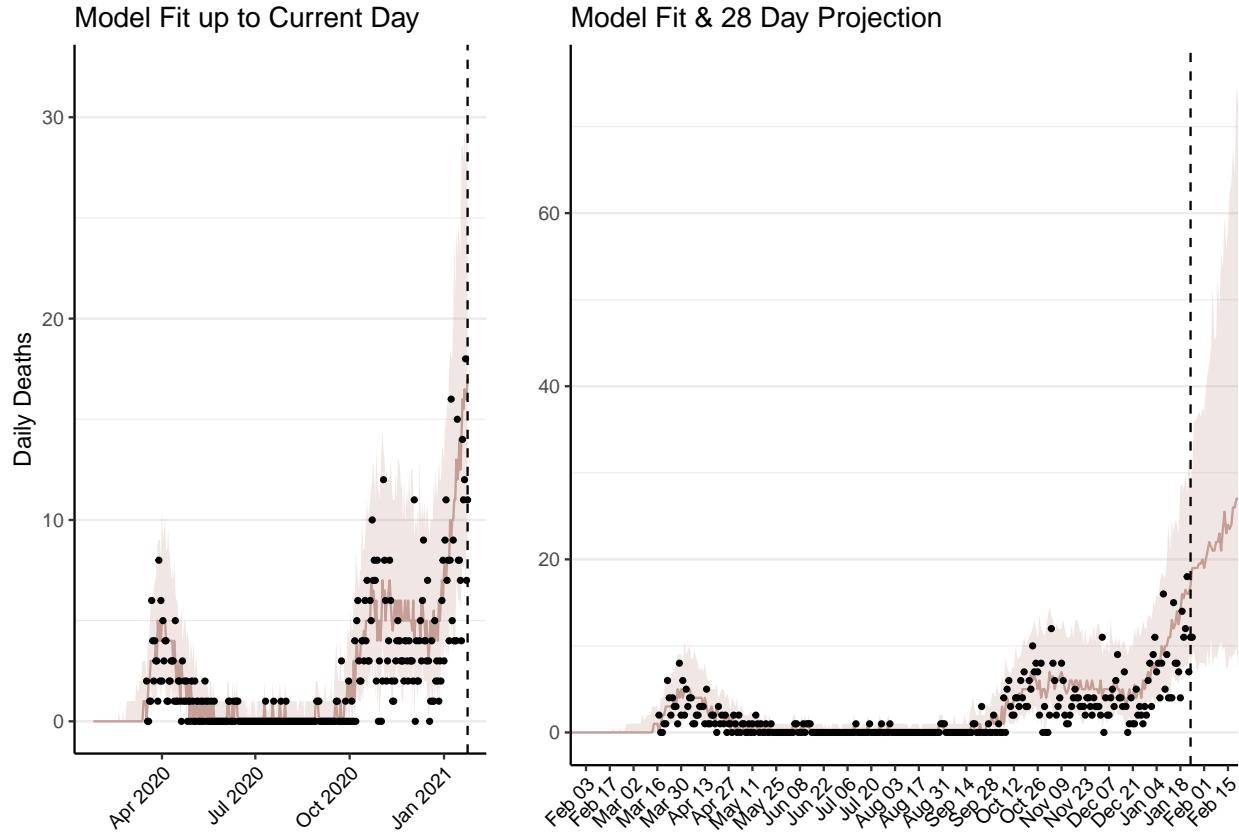


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 756 (95% CI: 707-805) patients requiring treatment with high-pressure oxygen at the current date to 1,227 (95% CI: 1,084-1,370) hospital beds being required on 2021-02-21 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 276 (95% CI: 259-294) patients requiring treatment with mechanical ventilation at the current date to 458 (95% CI: 407-509) by 2021-02-21. 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.**

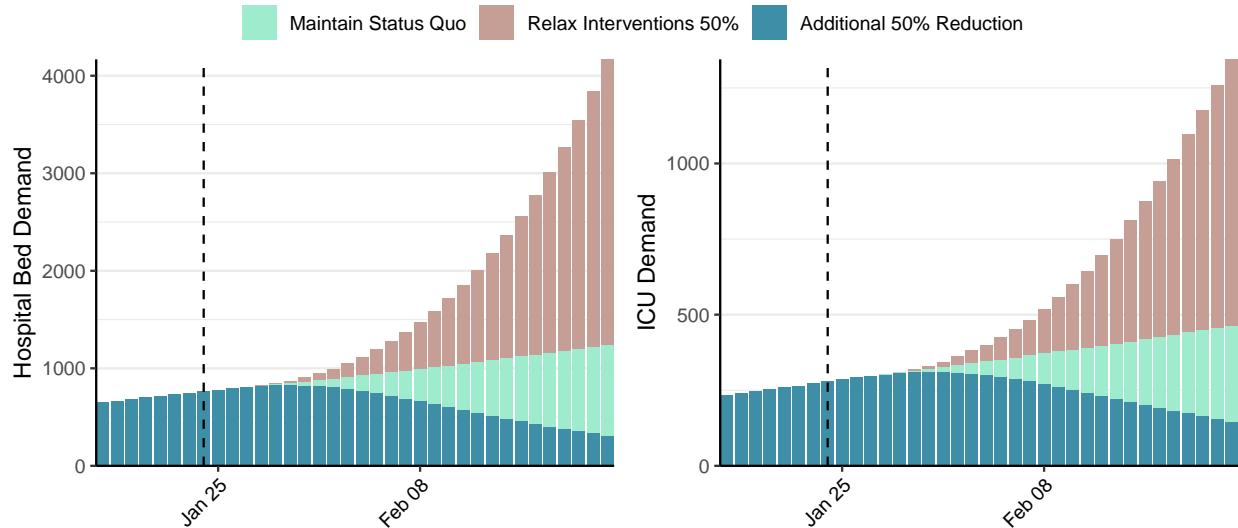


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 7,562 (95% CI: 6,974-8,151) at the current date to 944 (95% CI: 819-1,070) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 7,562 (95% CI: 6,974-8,151) at the current date to 73,478 (95% CI: 62,593-84,364) by 2021-02-21.

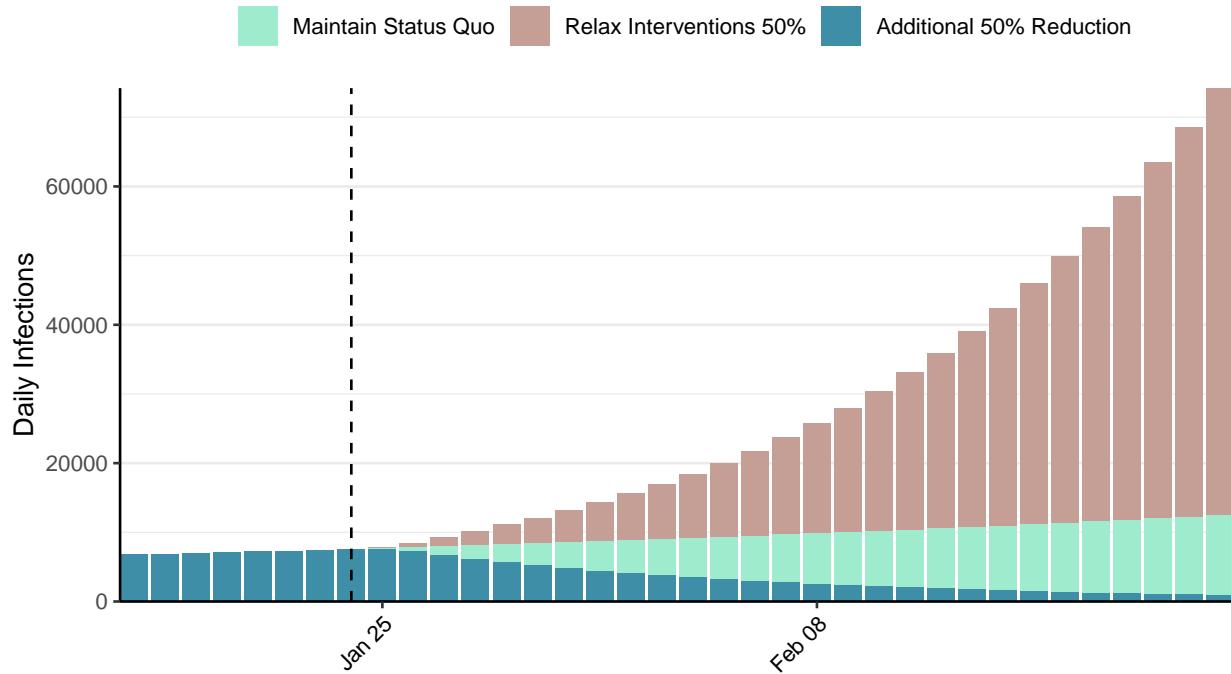


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Namibia, 2021-01-24 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}
225	225	0	0	0.9 (95% CI: 0.82-1)

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. Namibia is not shown in the following plot as only 0 deaths have been reported to date**

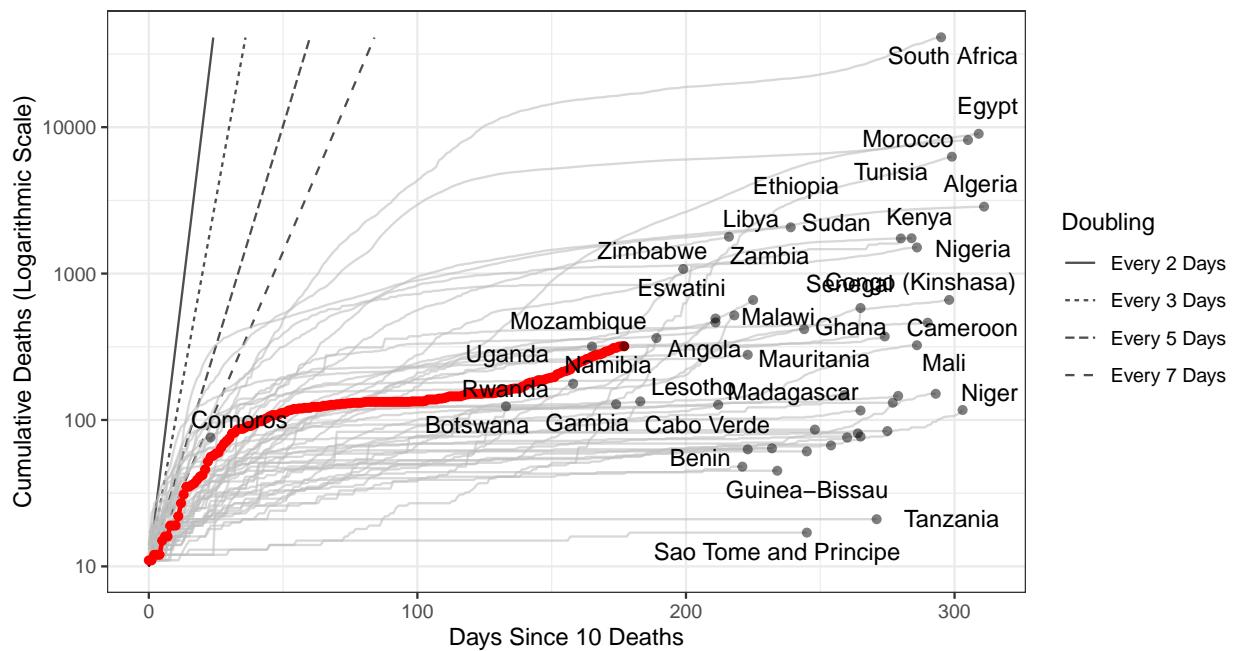


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 55,295 (95% CI: 52,440–58,151) 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

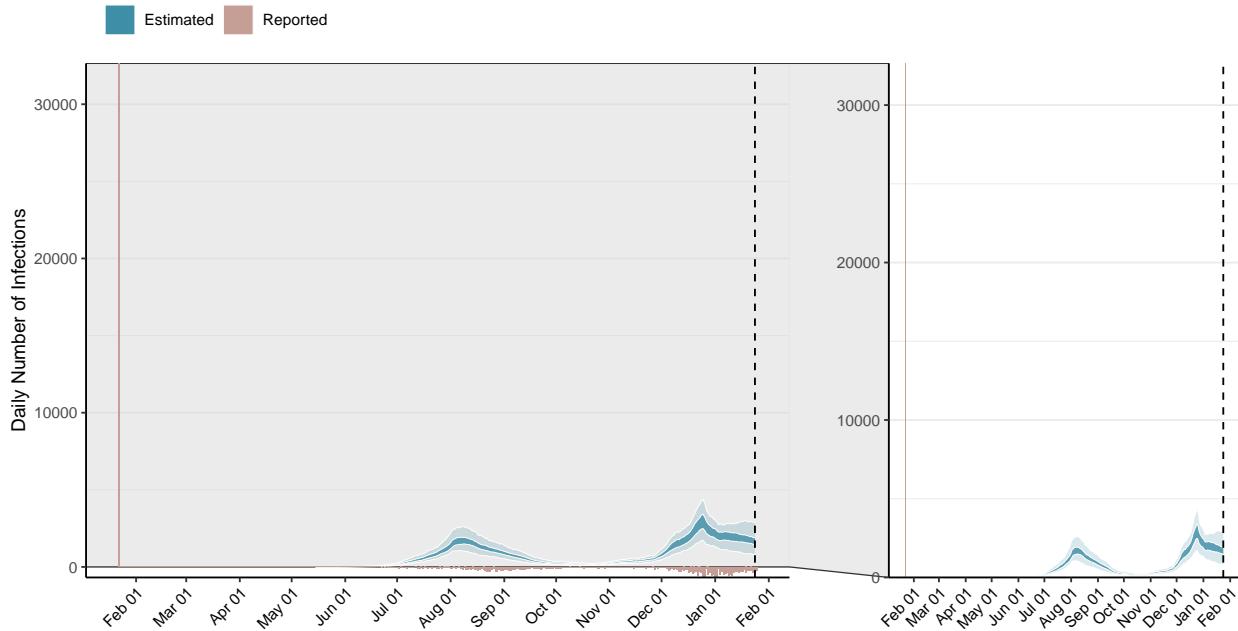


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

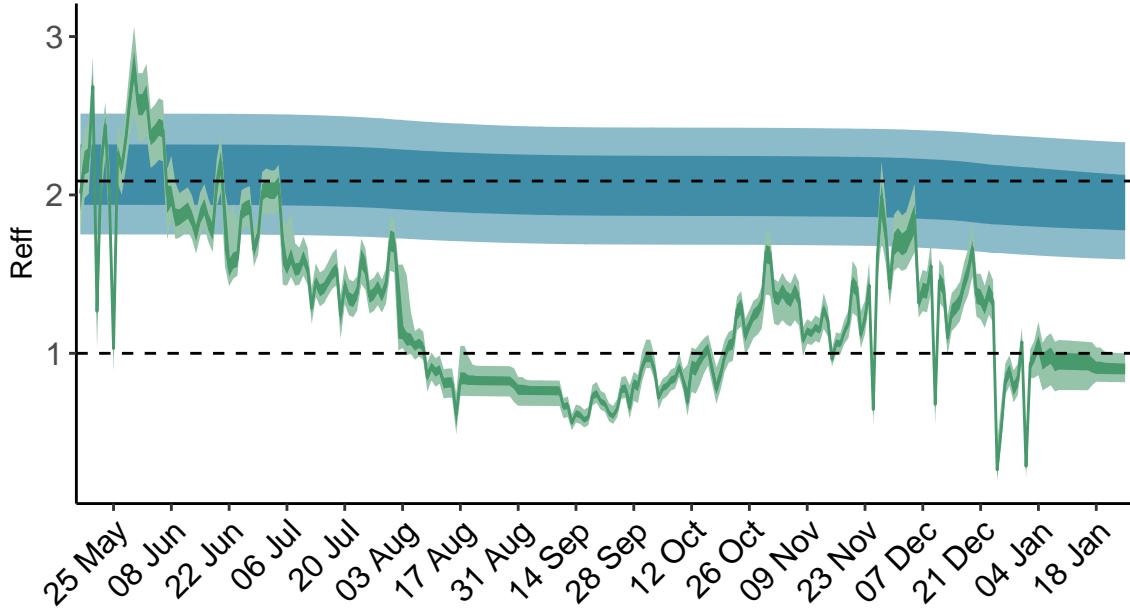


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

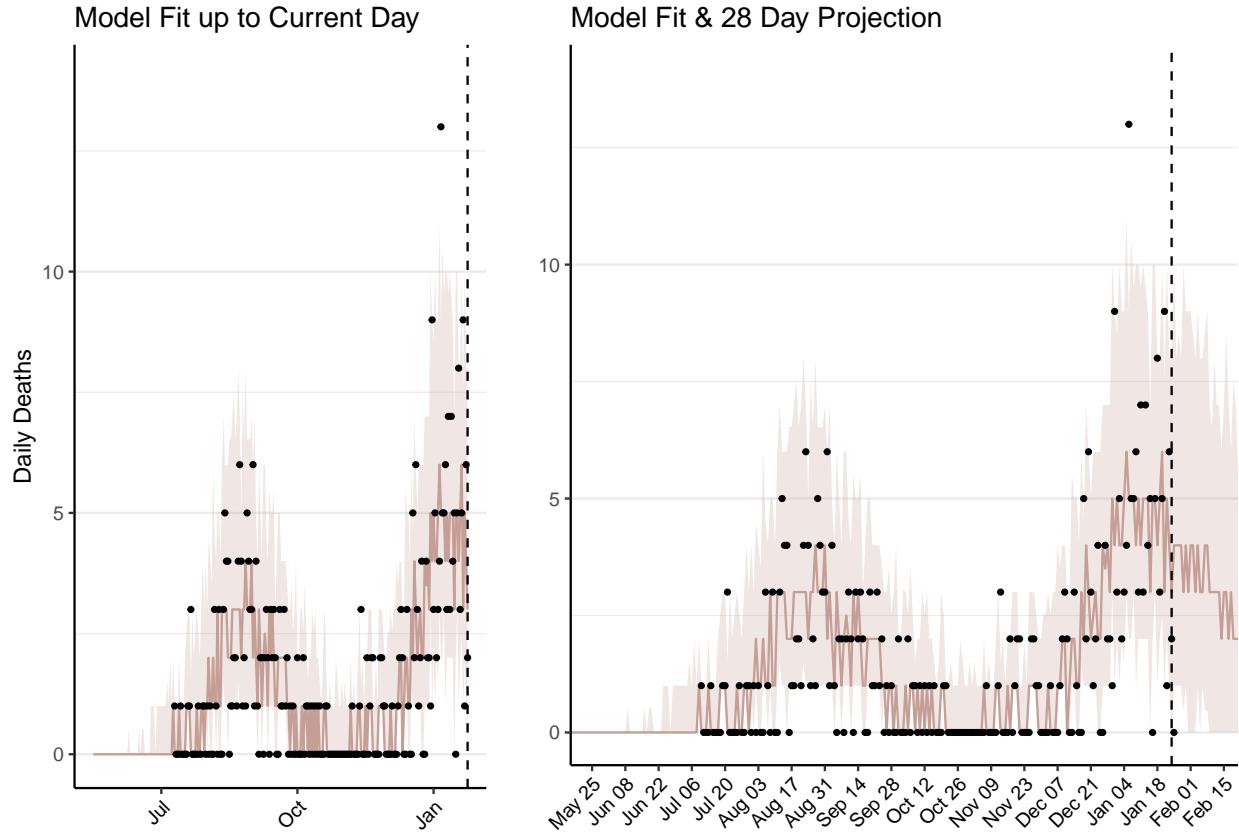


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 164 (95% CI: 155-174) patients requiring treatment with high-pressure oxygen at the current date to 79 (95% CI: 71-87) hospital beds being required on 2021-02-21 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 64 (95% CI: 61-68) patients requiring treatment with mechanical ventilation at the current date to 34 (95% CI: 31-38) by 2021-02-21. 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.**

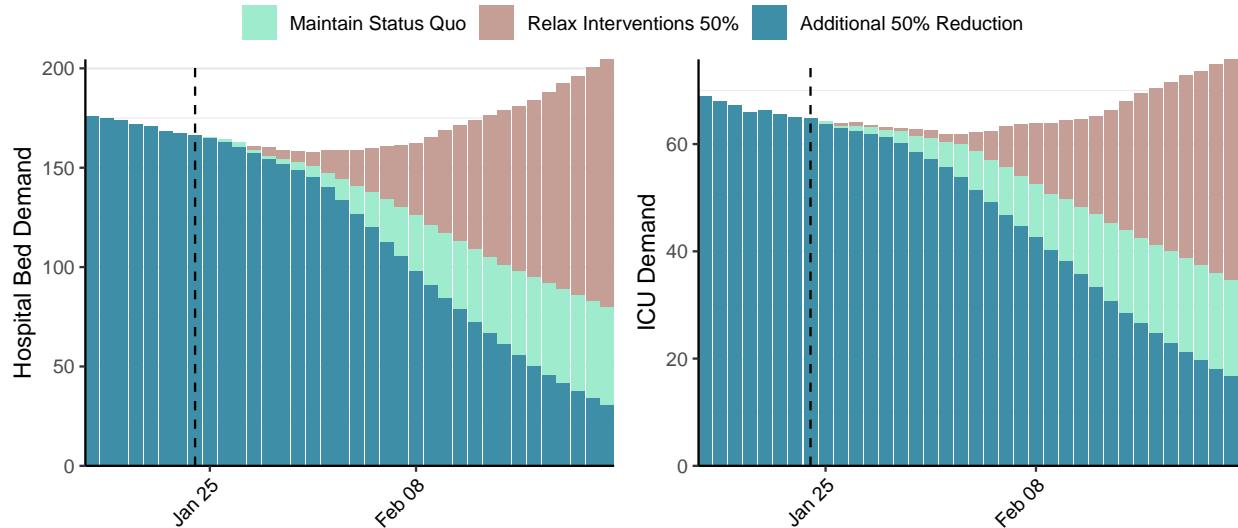


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 1,722 (95% CI: 1,607-1,837) at the current date to 63 (95% CI: 55-72) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,722 (95% CI: 1,607-1,837) at the current date to 3,054 (95% CI: 2,539-3,570) by 2021-02-21.

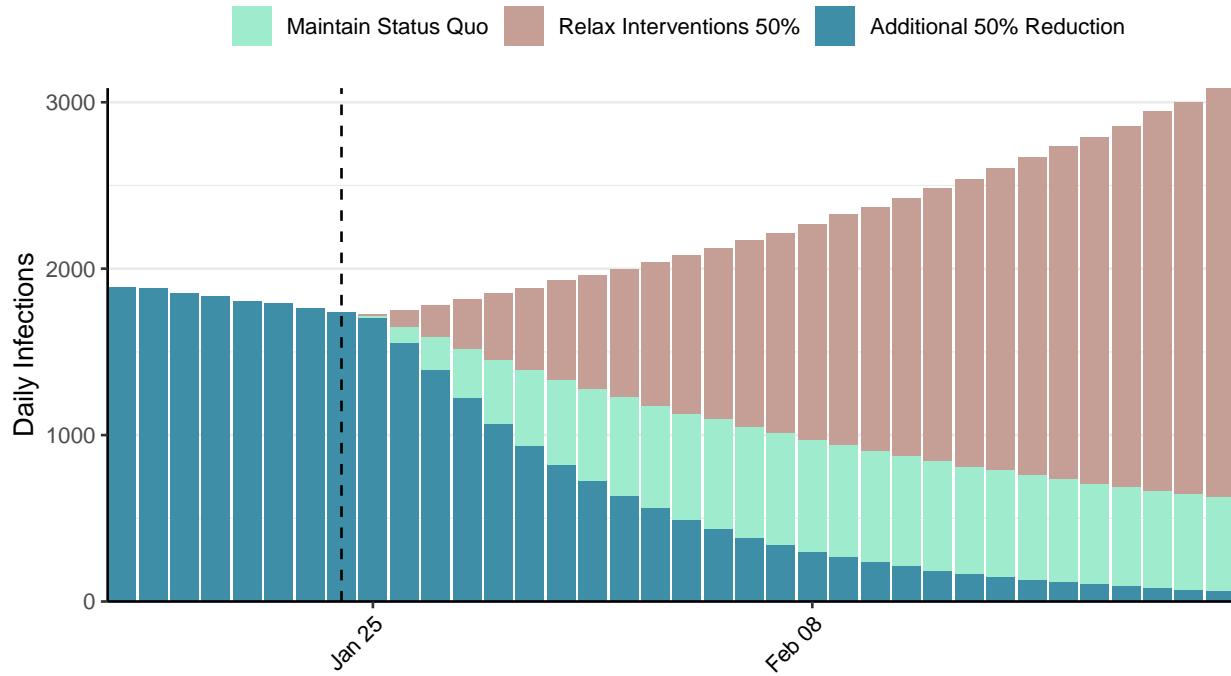


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Niger, 2021-01-24 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	0.94 (95% CI: 0.77-1.14)

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**

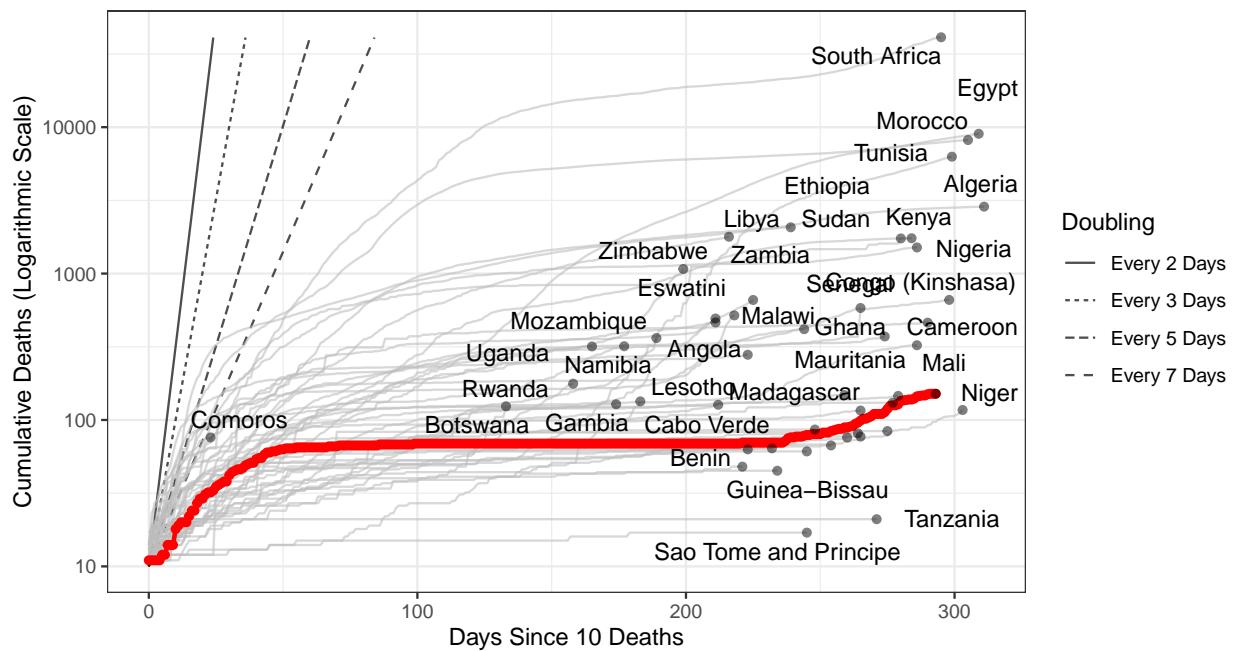


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 37,126 (95% CI: 33,492-40,760) 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.**

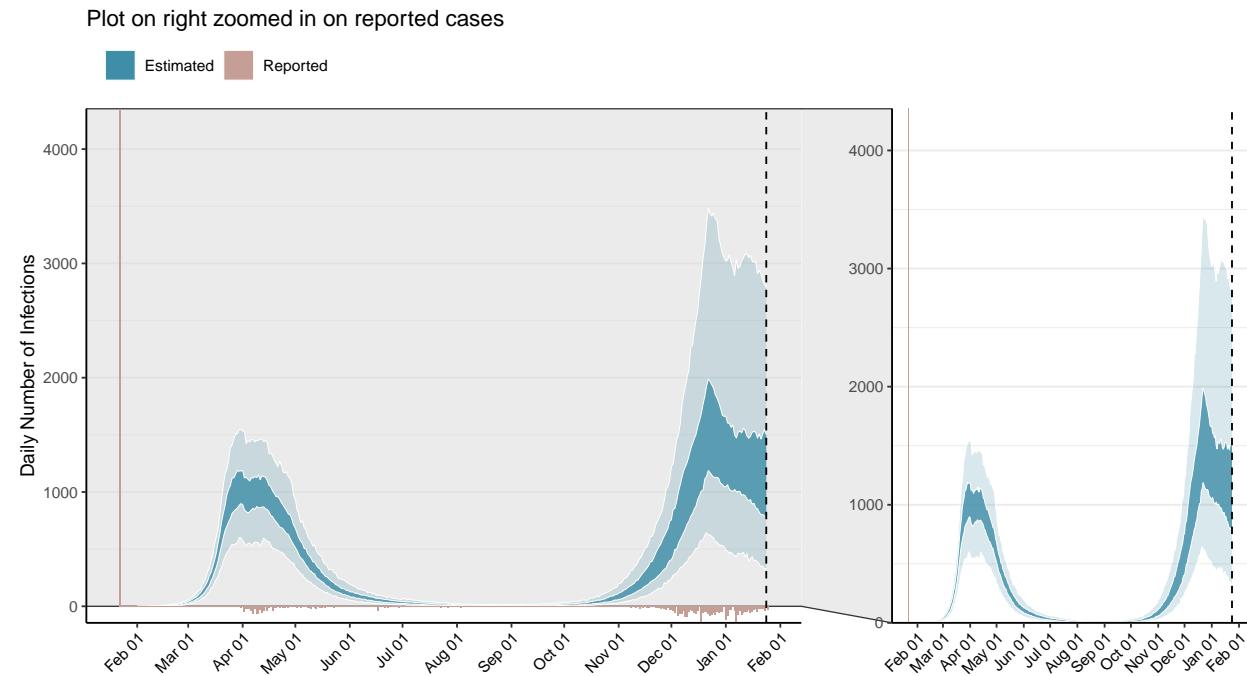


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

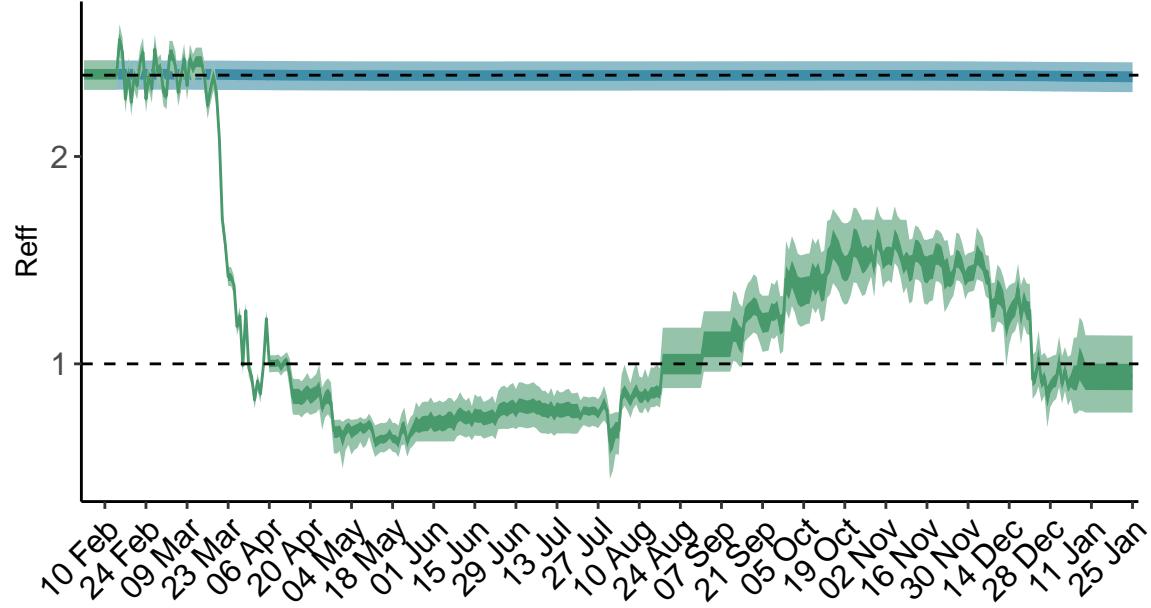


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

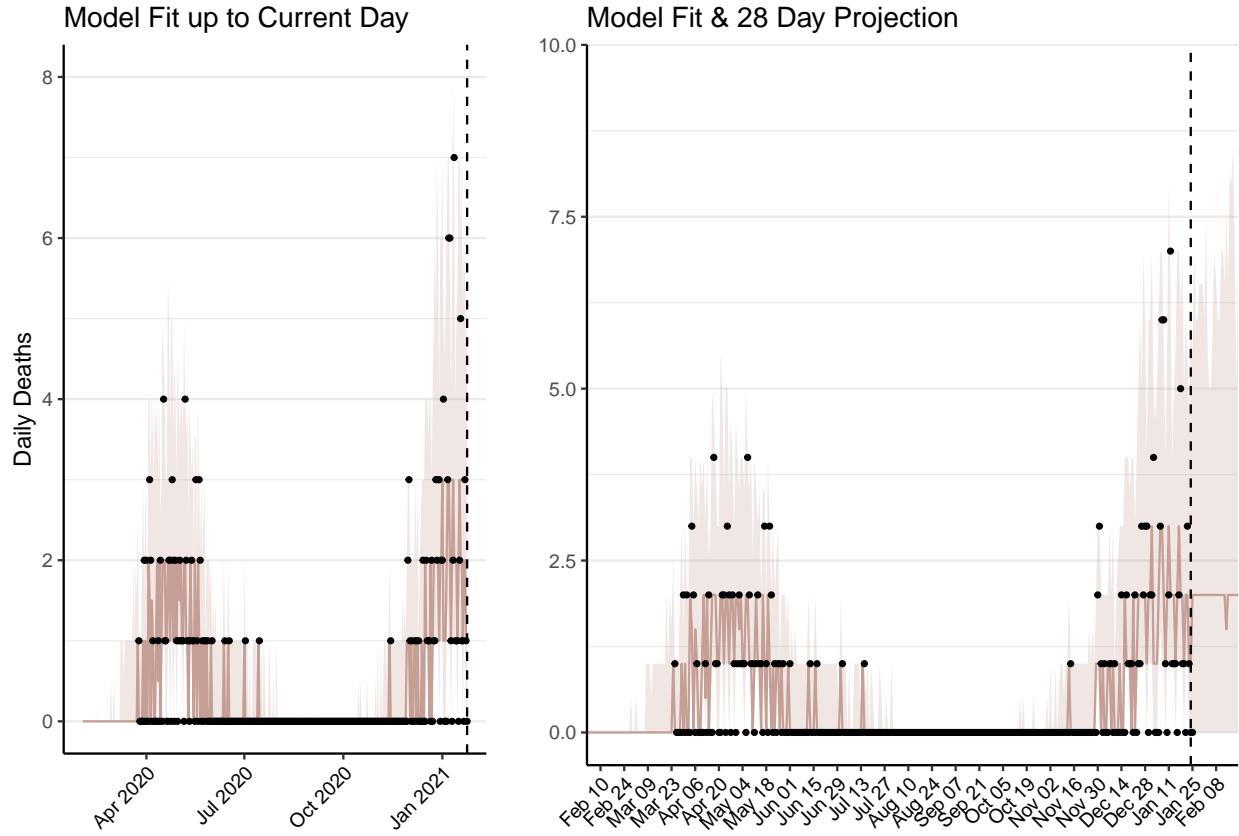


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 96 (95% CI: 86-105) patients requiring treatment with high-pressure oxygen at the current date to 84 (95% CI: 71-97) hospital beds being required on 2021-02-21 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 38 (95% CI: 34-42) patients requiring treatment with mechanical ventilation at the current date to 34 (95% CI: 29-39) by 2021-02-21. 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.**

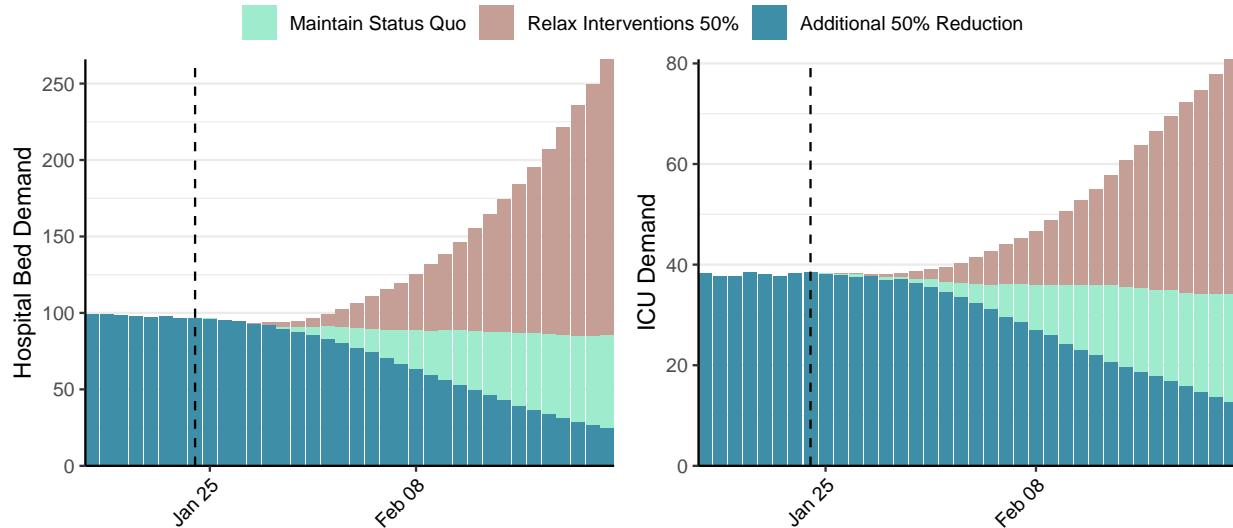


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 1,222 (95% CI: 1,076-1,369) at the current date to 97 (95% CI: 80-114) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,222 (95% CI: 1,076-1,369) at the current date to 6,789 (95% CI: 5,448-8,131) by 2021-02-21.

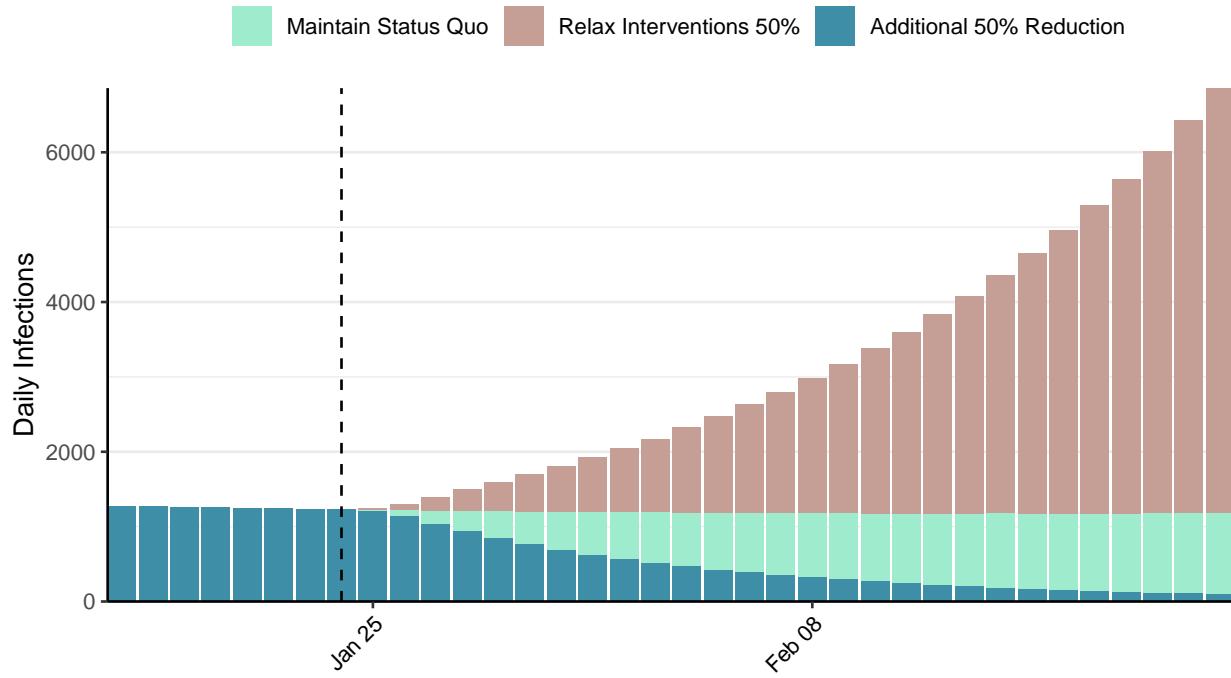


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Nigeria, 2021-01-24 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}
1,430	1,430	3	3	1.08 (95% CI: 0.93-1.26)

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. Nigeria is not shown in the following plot as only 3 deaths have been reported to date**

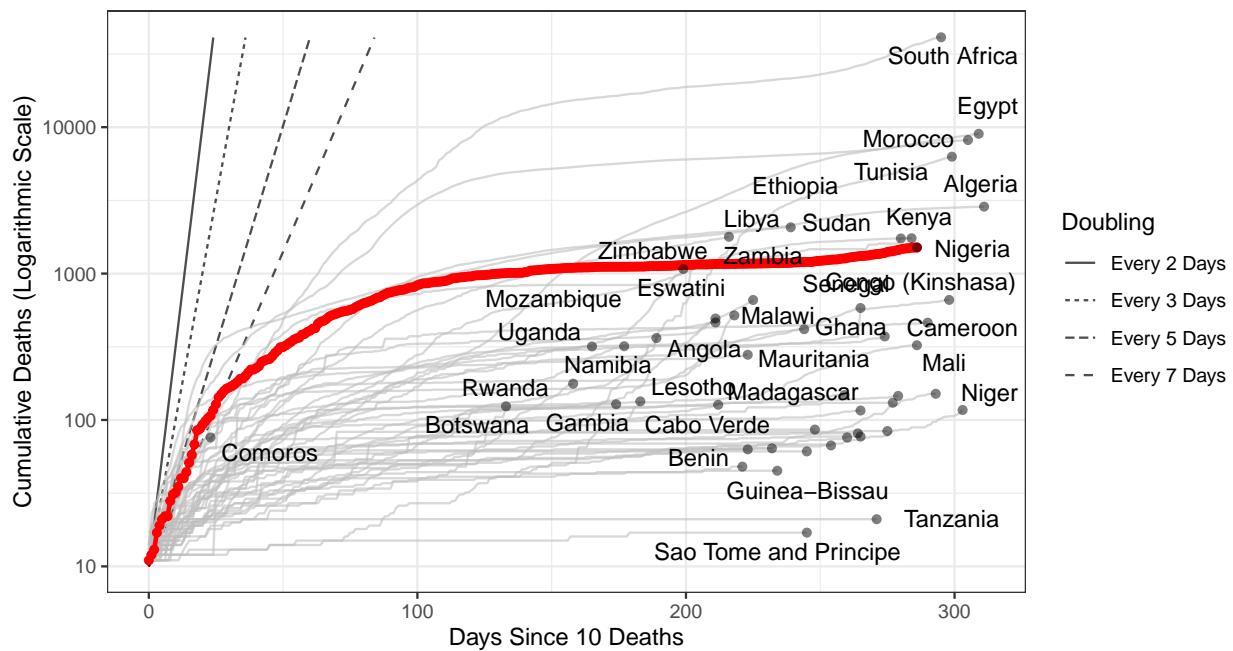


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 287,248 (95% CI: 267,733-306,763) 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).

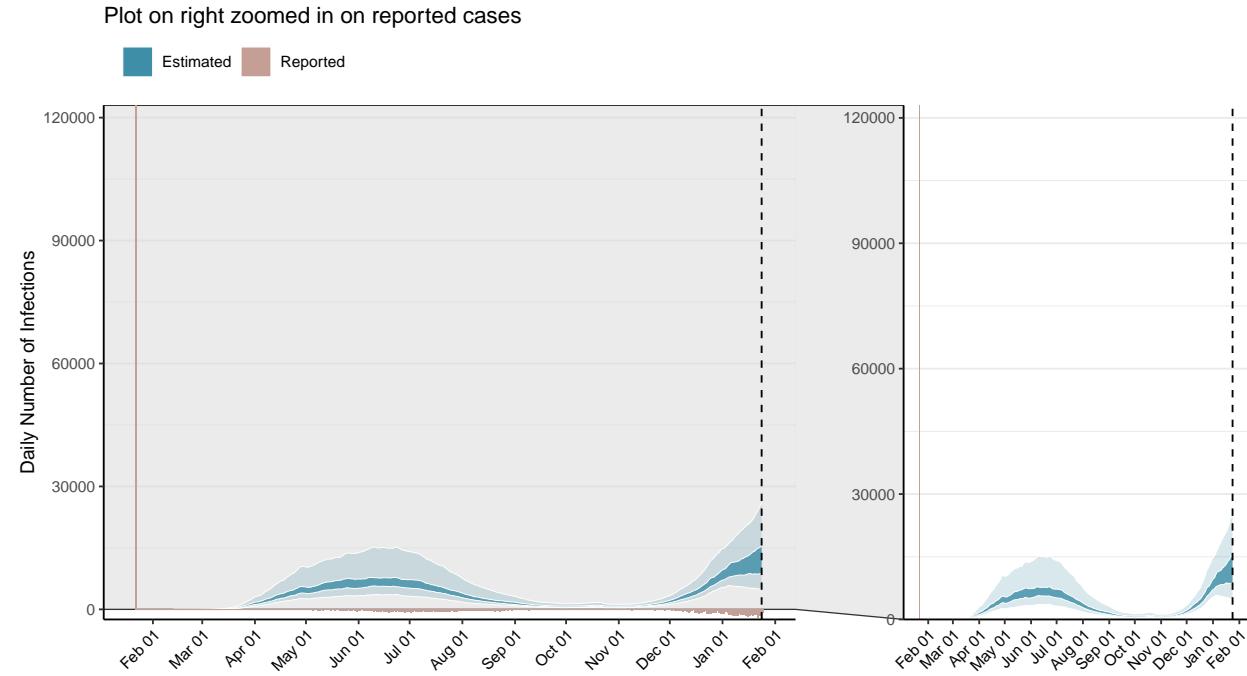


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

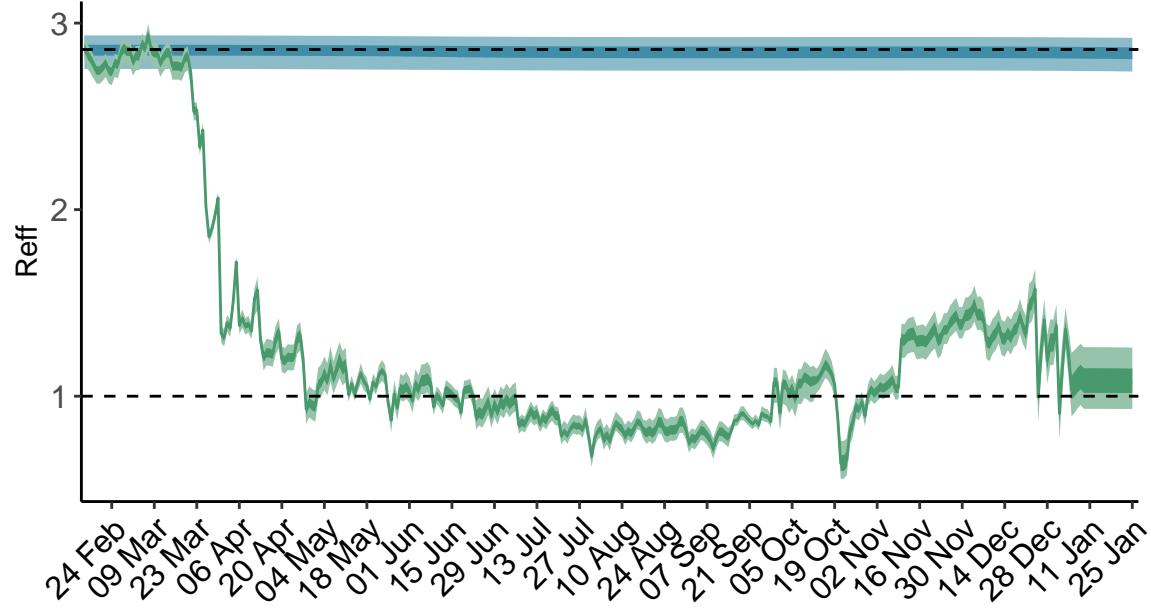


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

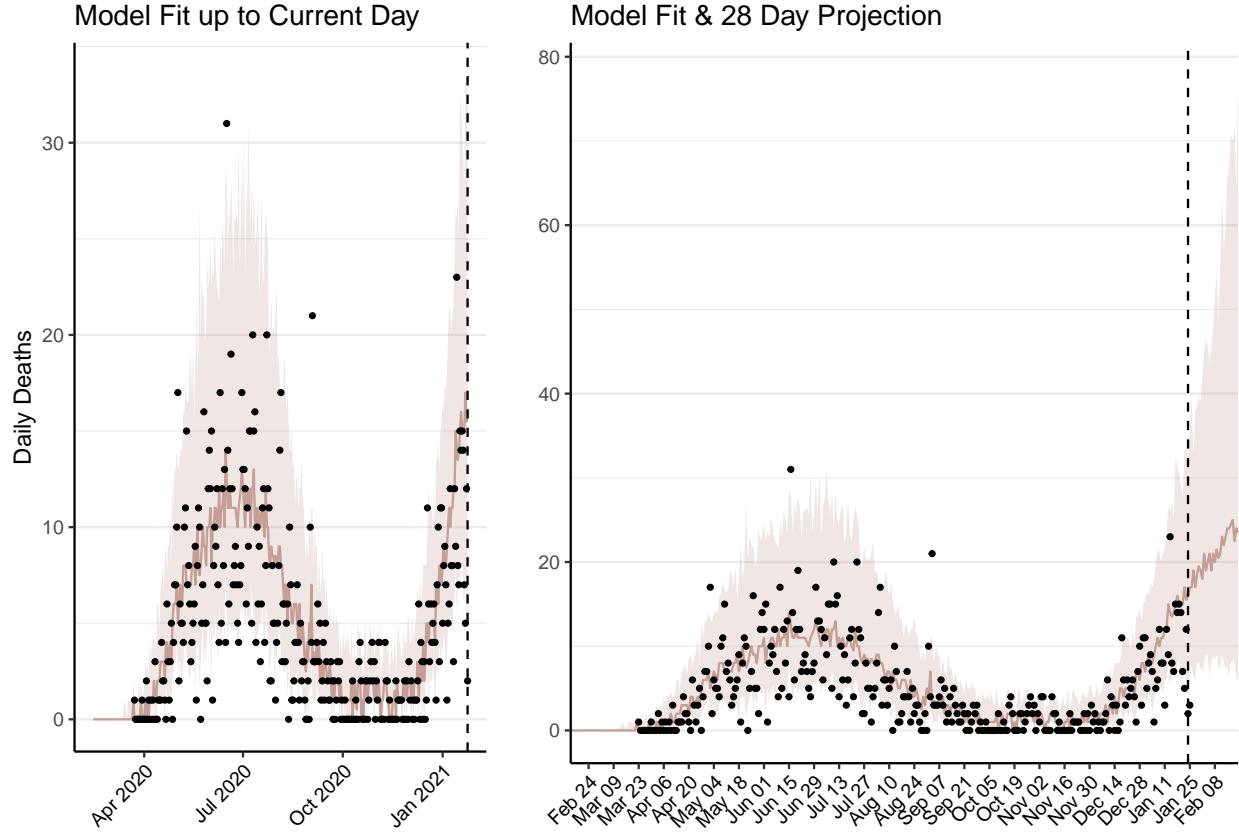


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 808 (95% CI: 751-865) patients requiring treatment with high-pressure oxygen at the current date to 1,298 (95% CI: 1,132-1,465) hospital beds being required on 2021-02-21 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 320 (95% CI: 297-343) patients requiring treatment with mechanical ventilation at the current date to 508 (95% CI: 446-570) by 2021-02-21. 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.**

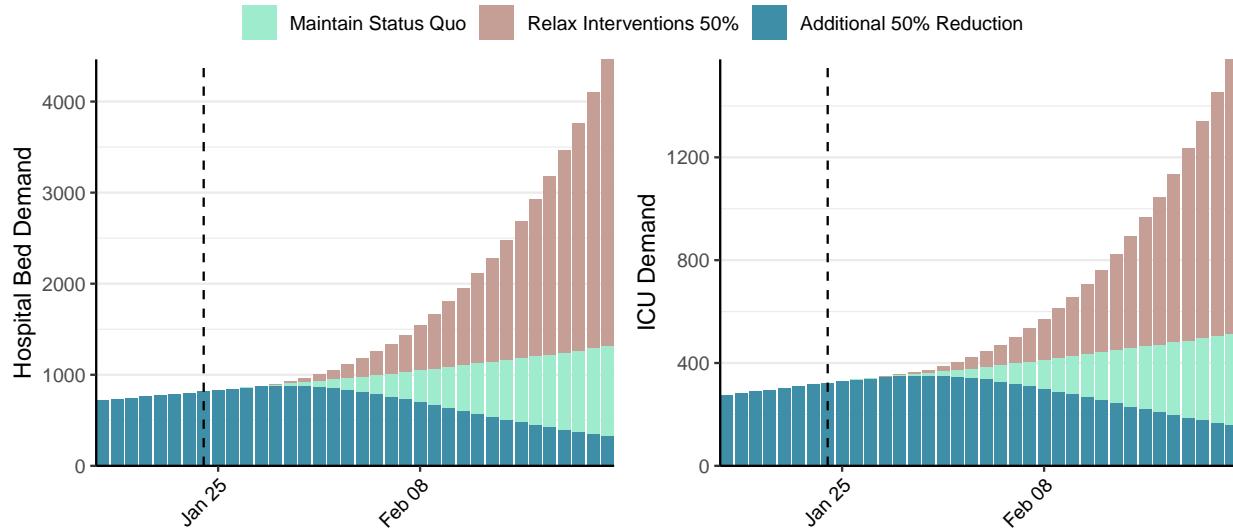


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 12,644 (95% CI: 11,528-13,760) at the current date to 1,566 (95% CI: 1,348-1,783) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 12,644 (95% CI: 11,528-13,760) at the current date to 129,945 (95% CI: 108,721-151,169) by 2021-02-21.

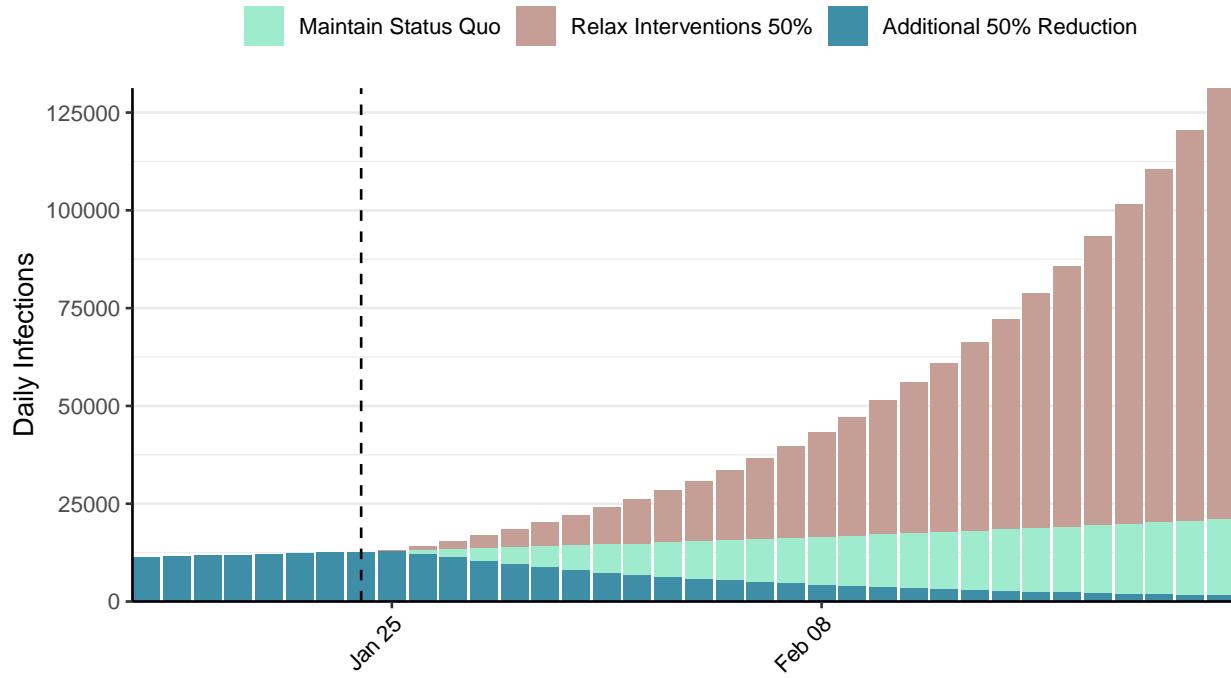


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Nicaragua, 2021-01-24

[Download the report for Nicaragua, 2021-01-24 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: 0.6-1.07)

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. Nicaragua is not shown in the following plot as only 0 deaths have been reported to date**

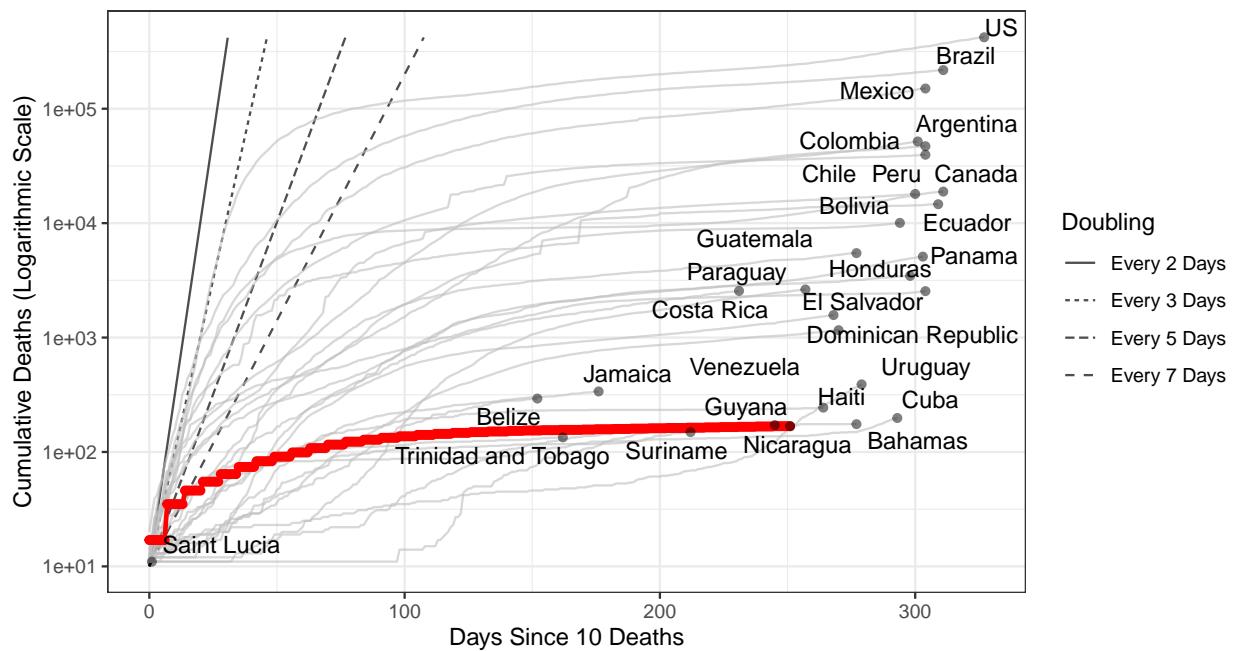


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 1,906 (95% CI: 1,697-2,115) 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).

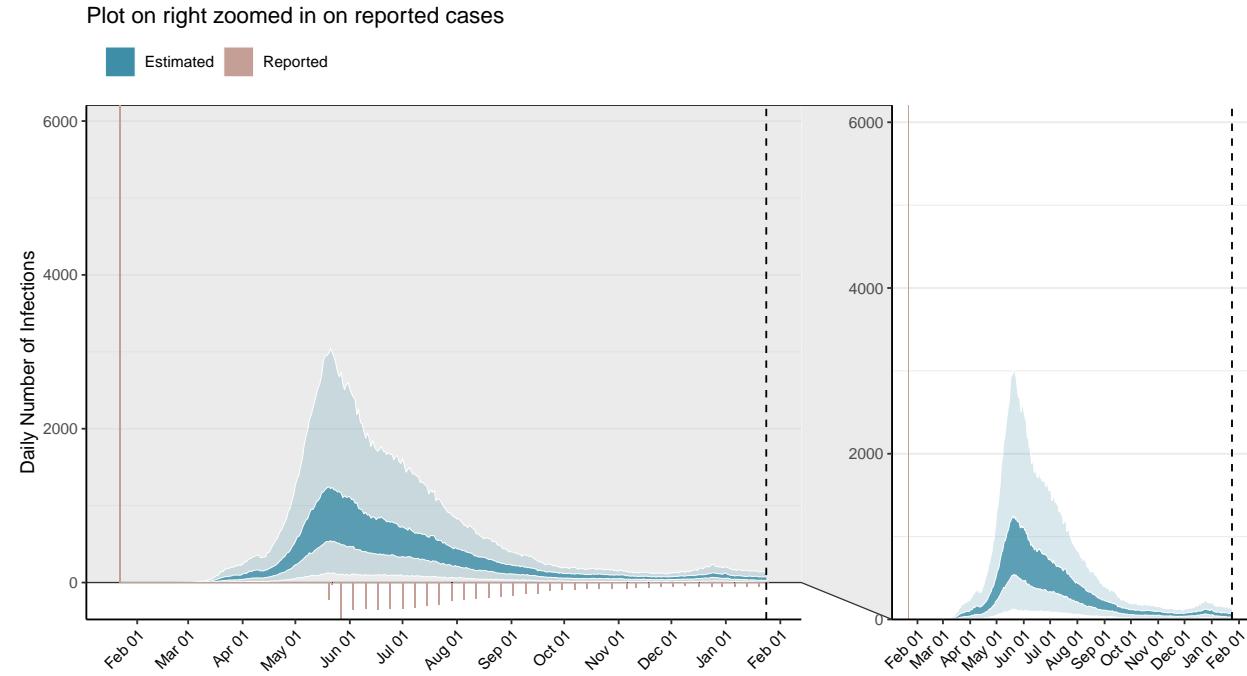


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

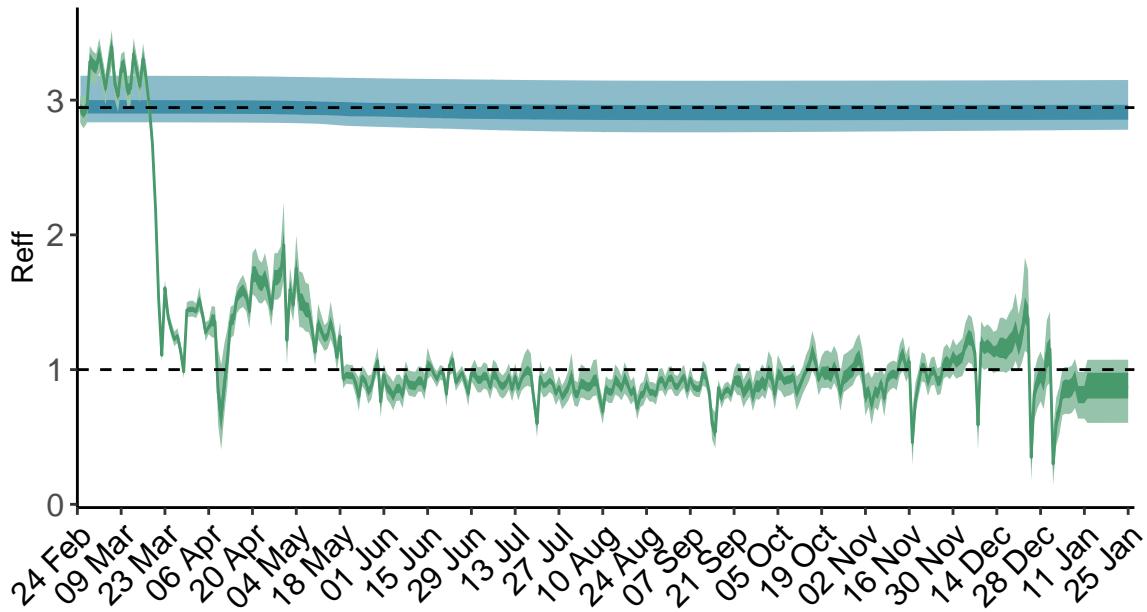


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

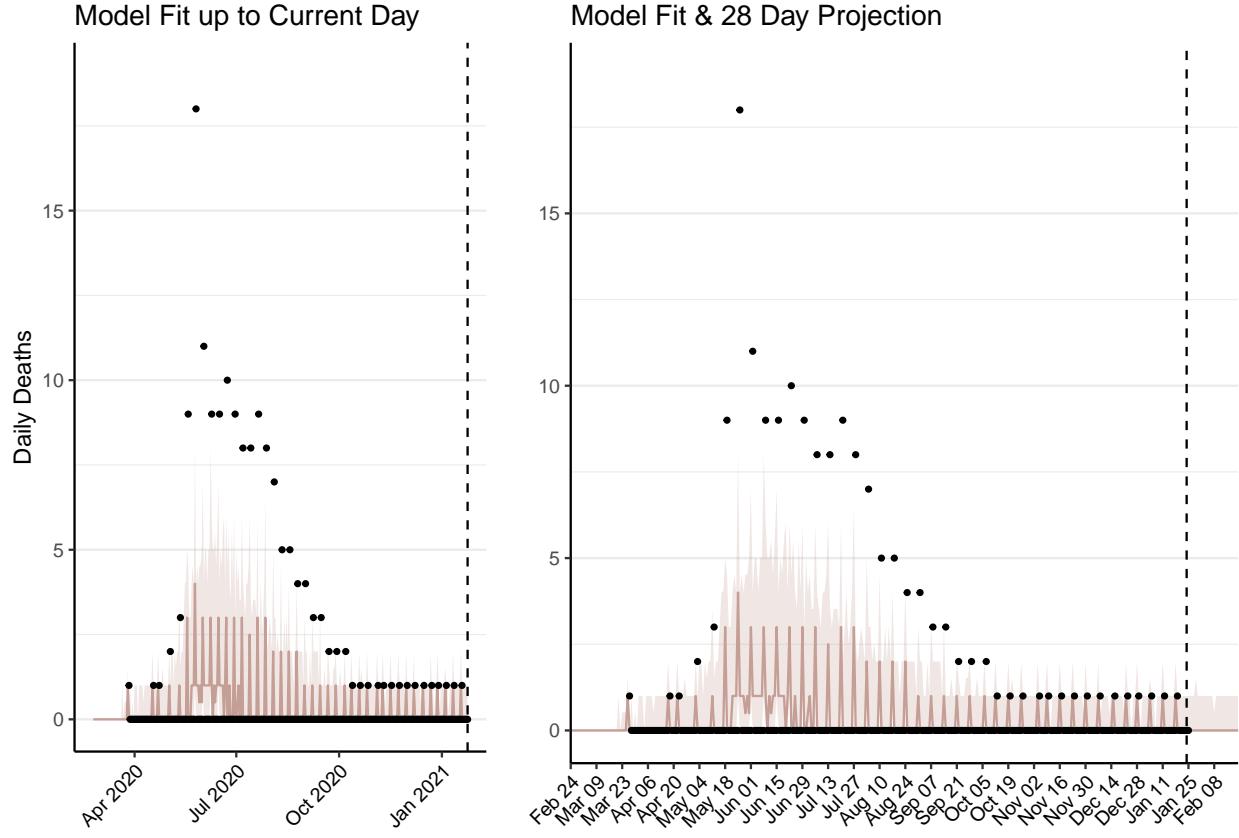


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 5 (95% CI: 4-6) patients requiring treatment with high-pressure oxygen at the current date to 3 (95% CI: 3-4) hospital beds being required on 2021-02-21 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 1 (95% CI: 1-2) by 2021-02-21. 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.**

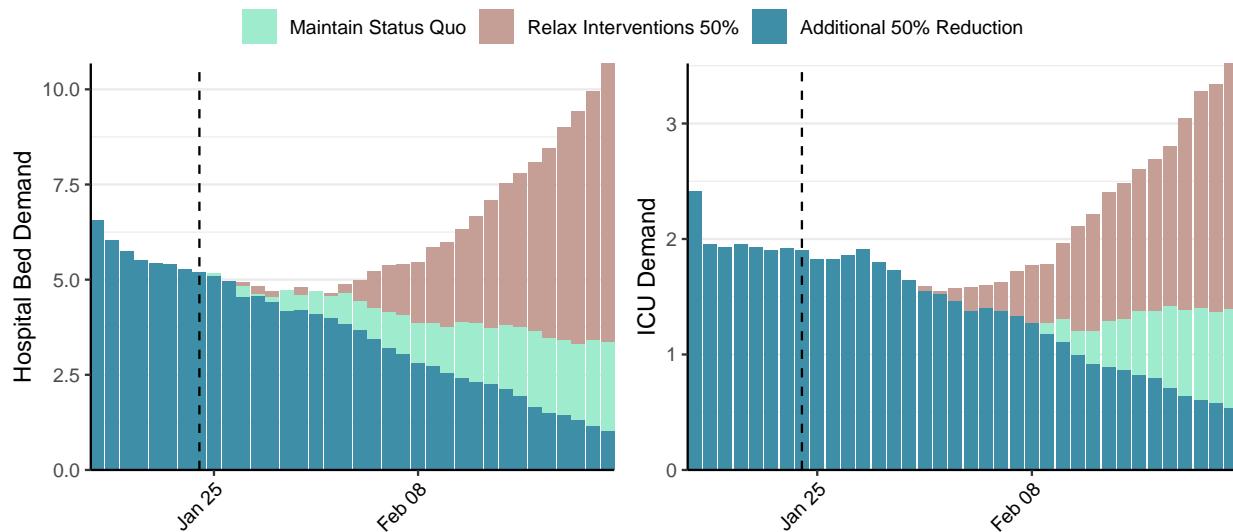


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 52 (95% CI: 45-58) at the current date to 4 (95% CI: 3-4) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 52 (95% CI: 45-58) at the current date to 241 (95% CI: 188-295) by 2021-02-21.

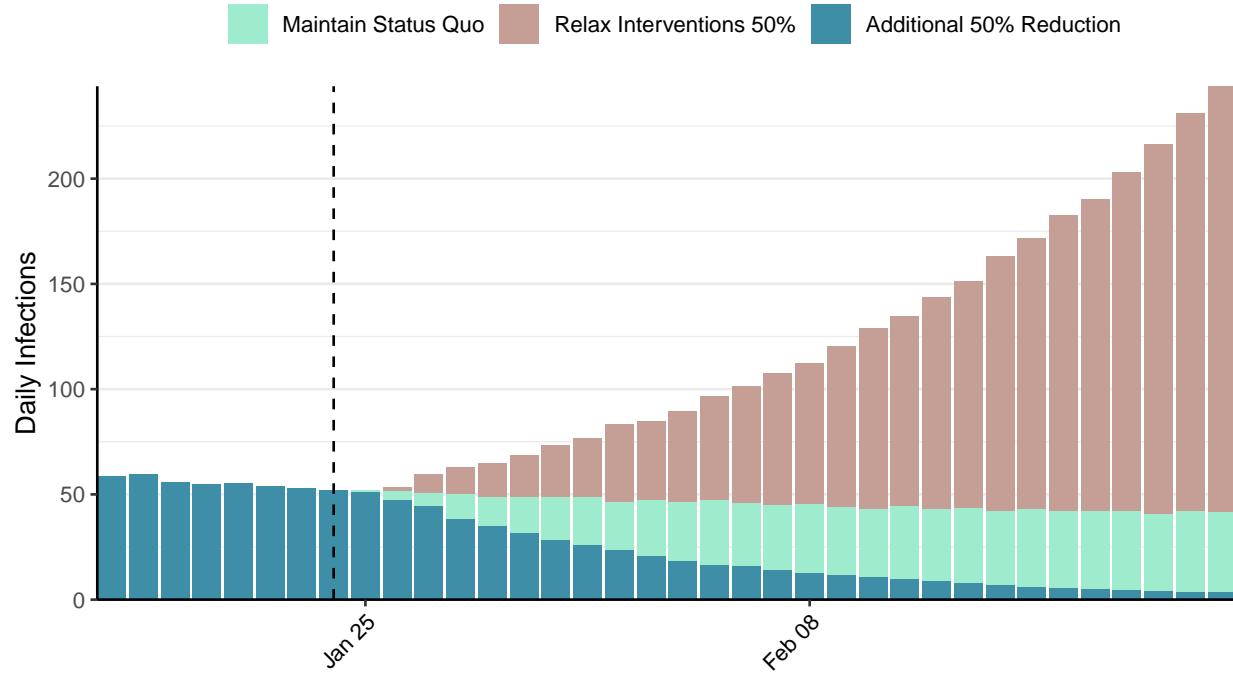


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Nepal, 2021-01-24 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}
339	339	10	10	0.73 (95% CI: 0.58-0.88)

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.

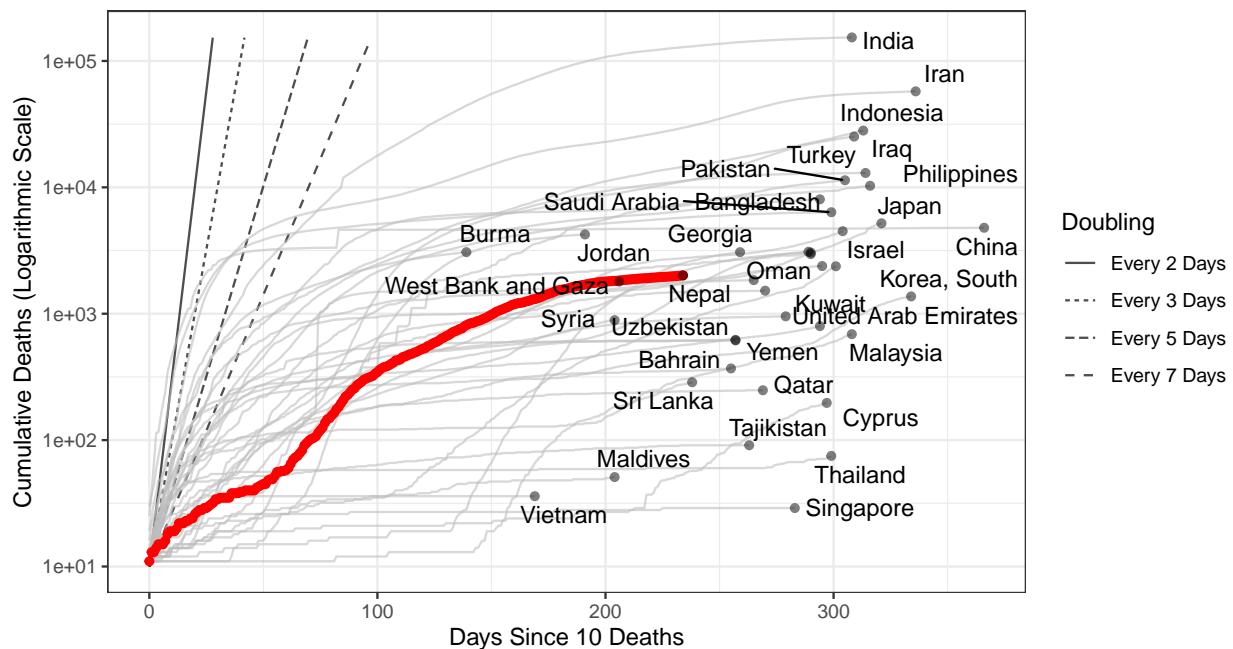


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 70,586 (95% CI: 67,262-73,911) 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.**

Plot on right zoomed in on reported cases

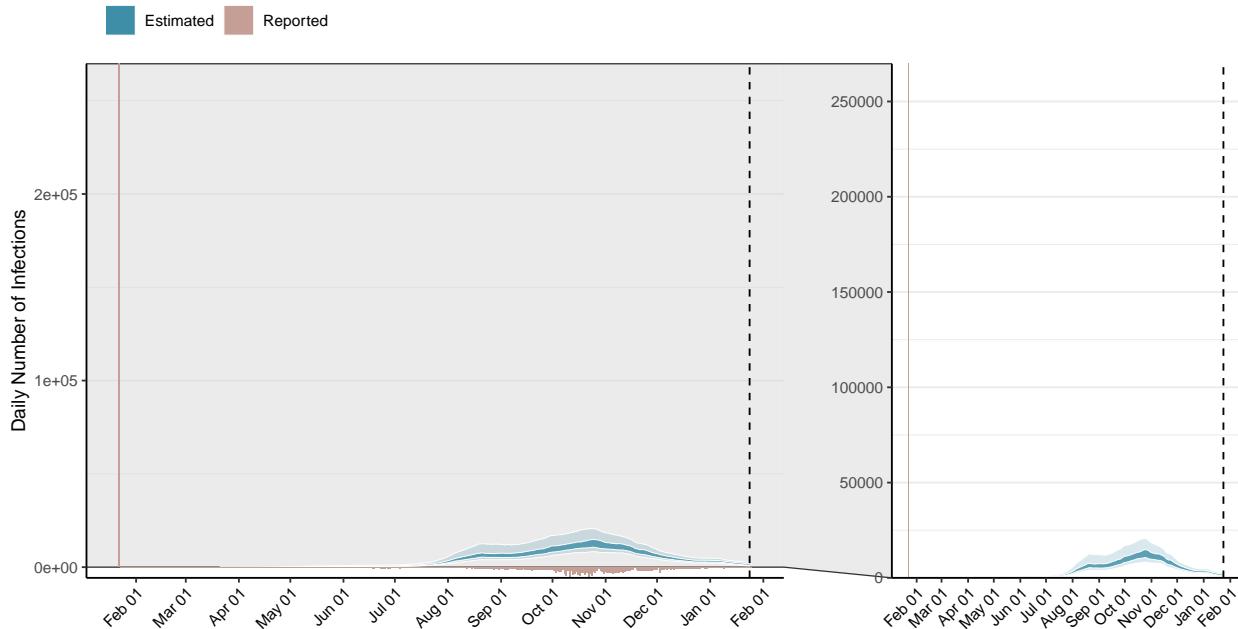


Figure 2: Daily number of infections estimated by fitting to the current total of deaths. Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

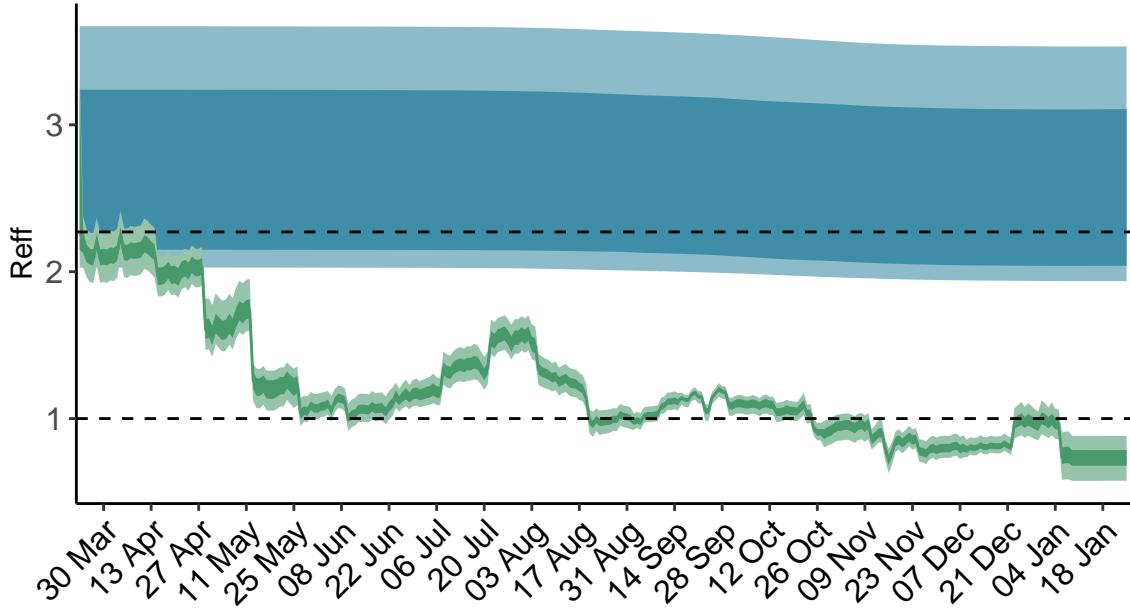


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

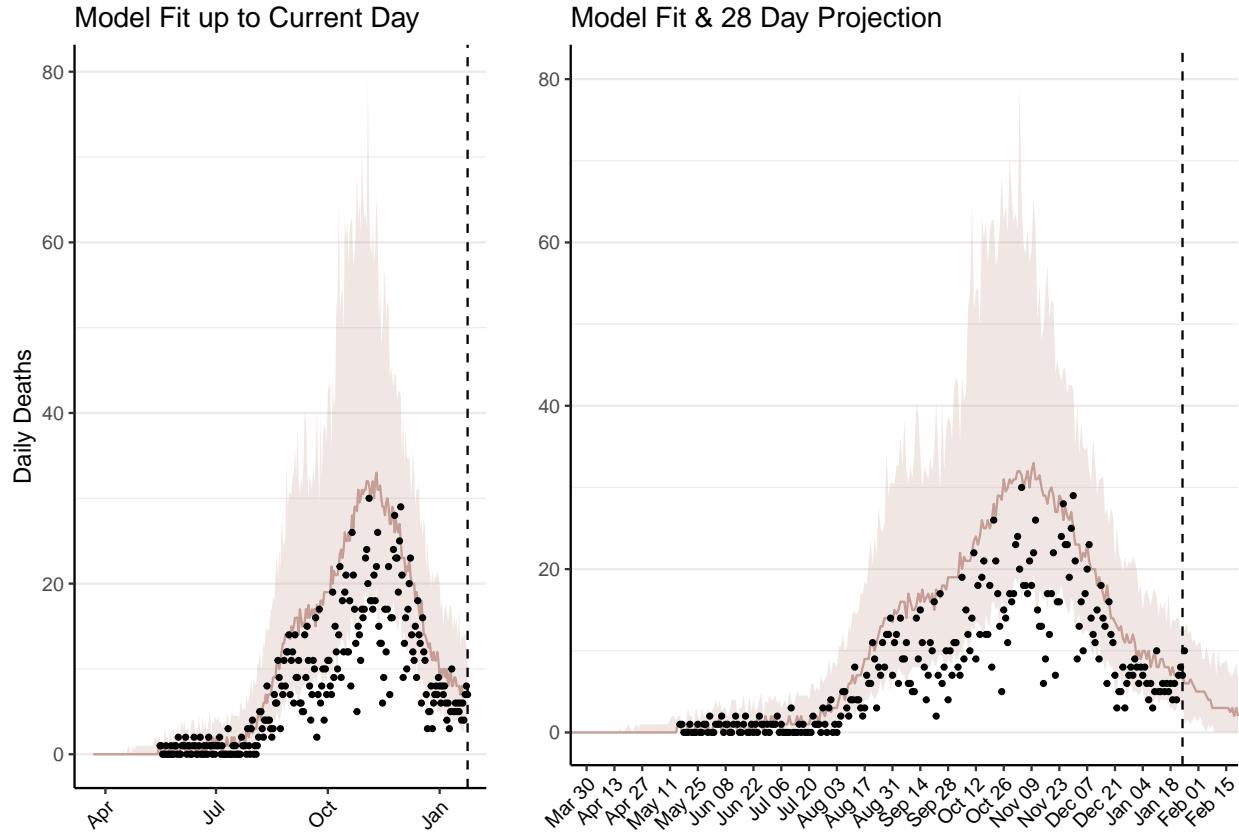


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 244 (95% CI: 231-256) patients requiring treatment with high-pressure oxygen at the current date to 84 (95% CI: 74-93) hospital beds being required on 2021-02-21 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 104 (95% CI: 99-109) patients requiring treatment with mechanical ventilation at the current date to 38 (95% CI: 34-42) by 2021-02-21. 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.**

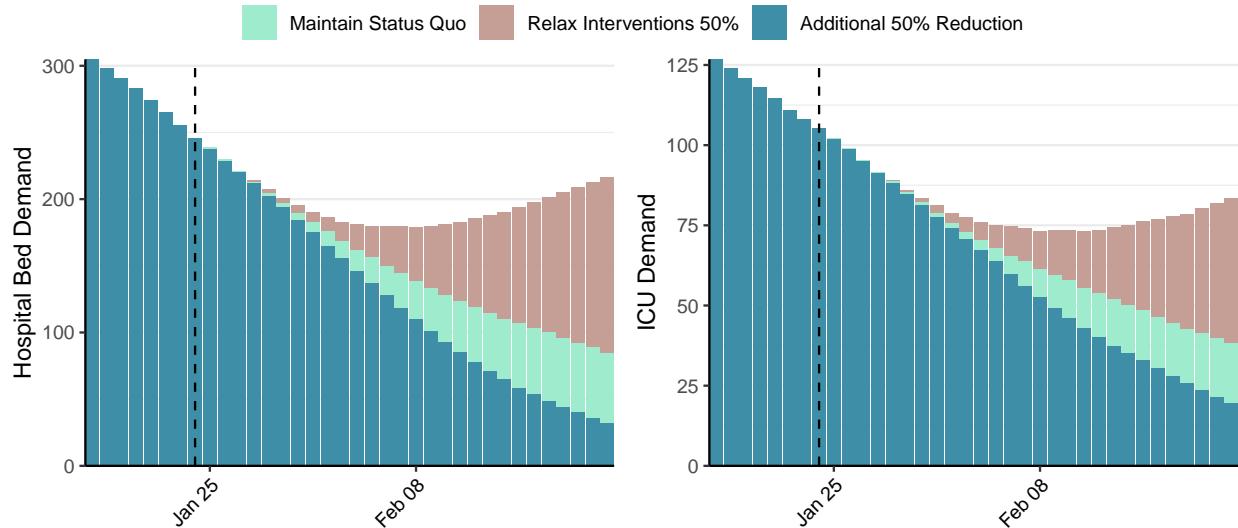


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 1,461 (95% CI: 1,353-1,569) at the current date to 52 (95% CI: 45-60) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,461 (95% CI: 1,353-1,569) at the current date to 2,602 (95% CI: 2,158-3,046) by 2021-02-21.

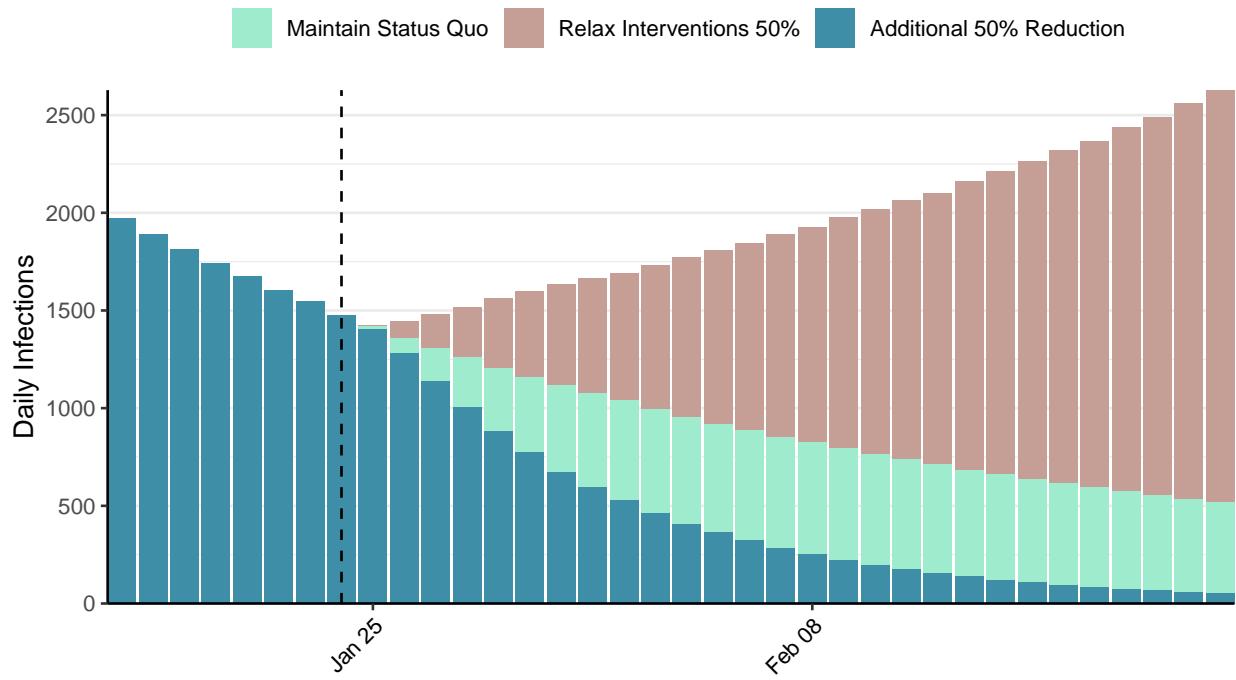


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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: Pakistan, 2021-01-24

[Download the report for Pakistan, 2021-01-24 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}
1,873	1,873	58	58	1.03 (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.

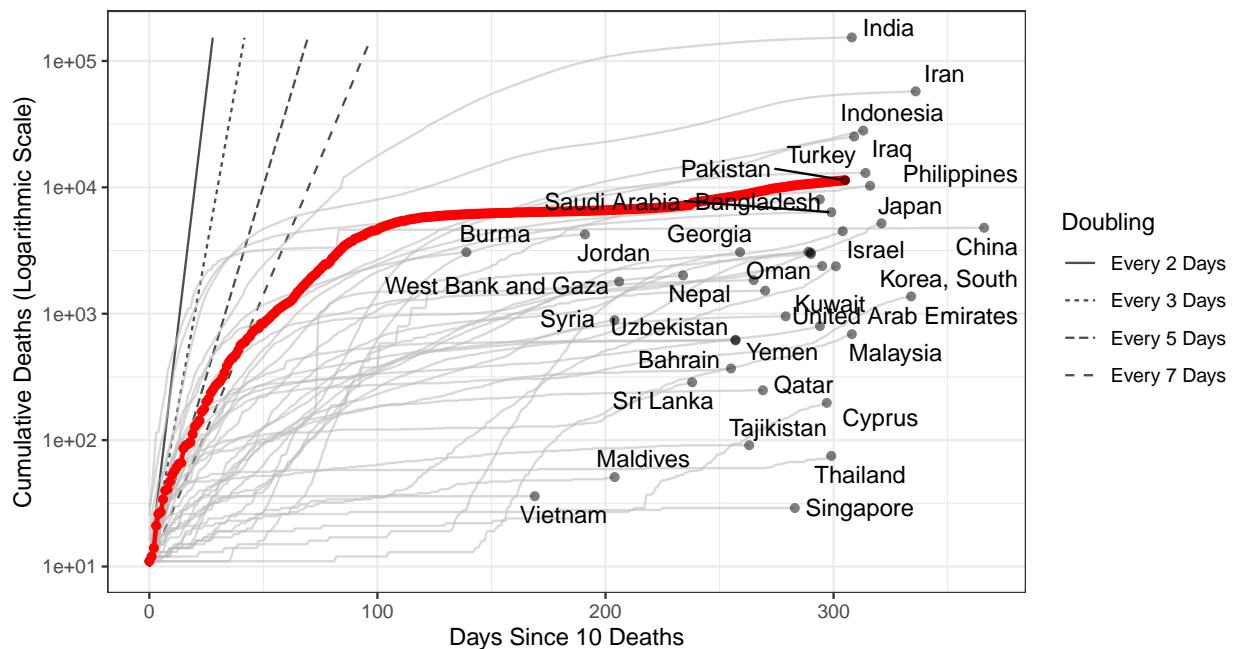


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 633,825 (95% CI: 600,495–667,155) 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

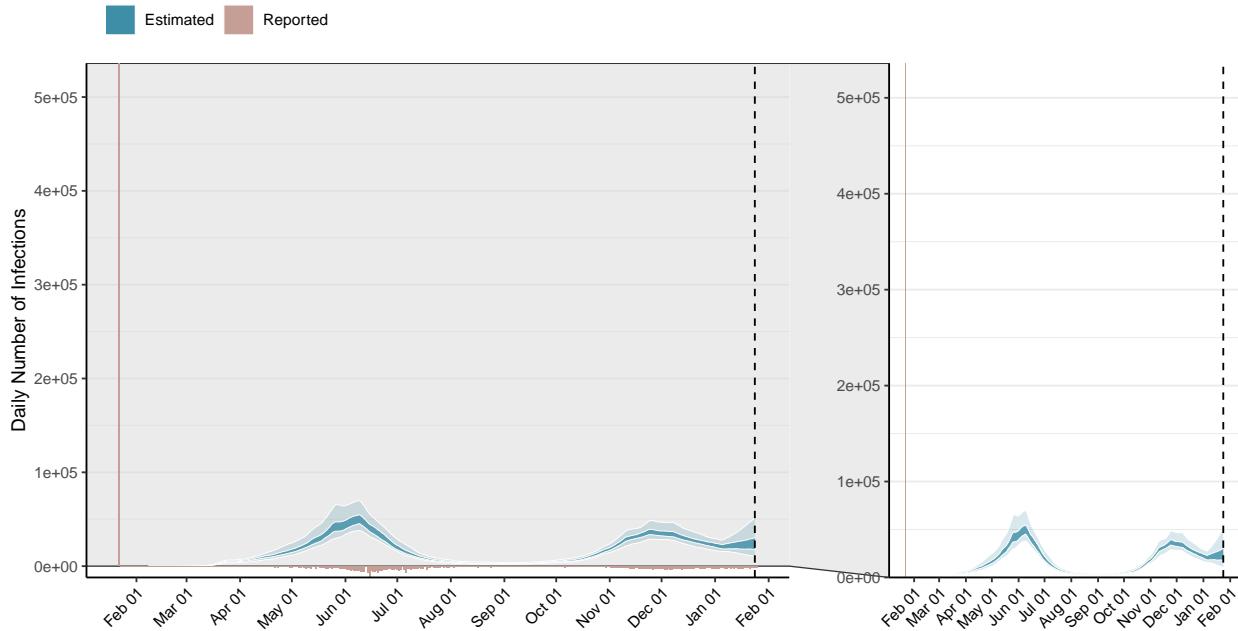


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

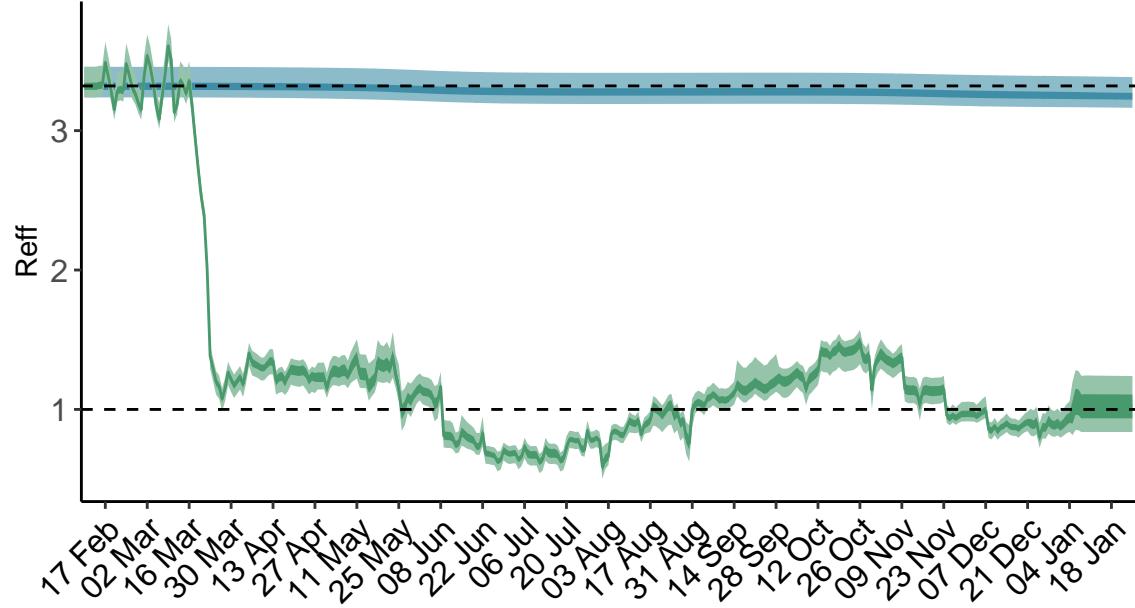


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

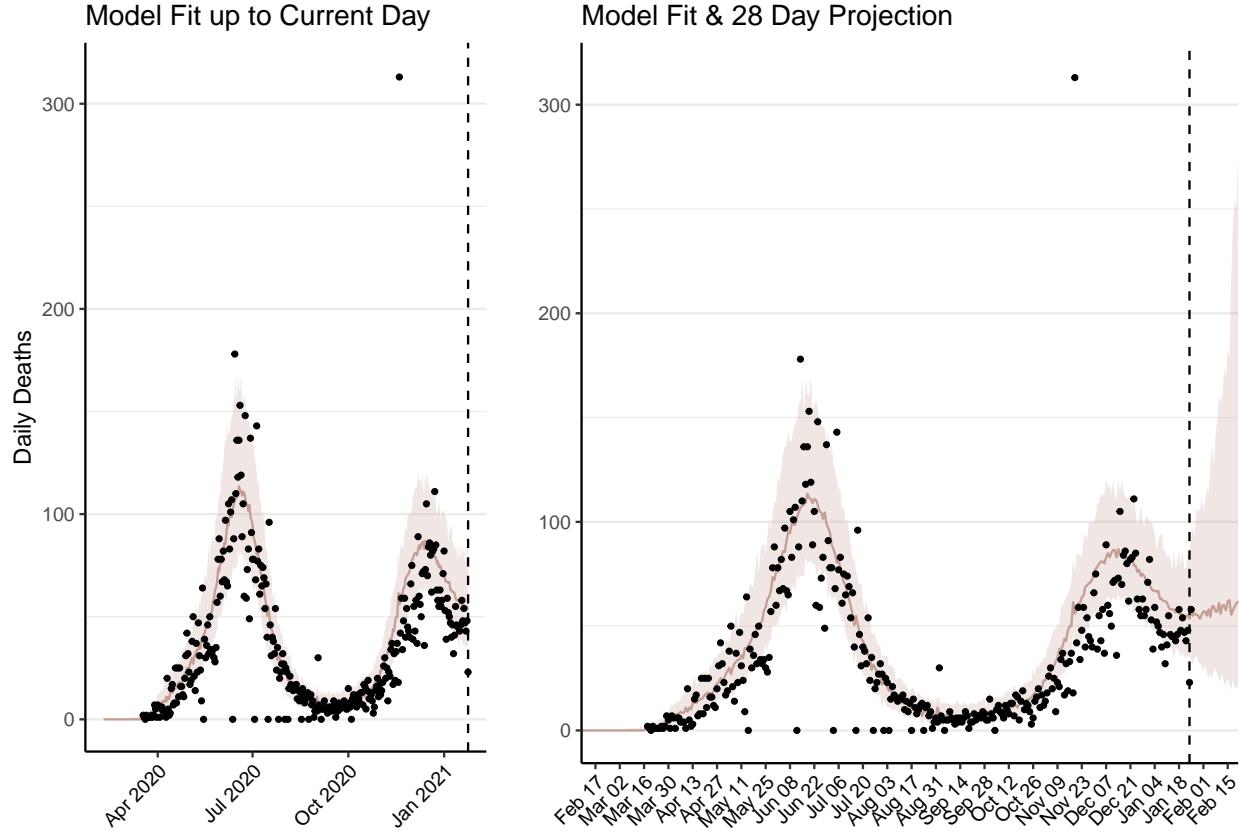


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 2,230 (95% CI: 2,098-2,363) patients requiring treatment with high-pressure oxygen at the current date to 3,178 (95% CI: 2,499-3,857) hospital beds being required on 2021-02-21 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 876 (95% CI: 830-921) patients requiring treatment with mechanical ventilation at the current date to 1,101 (95% CI: 957-1,244) by 2021-02-21. 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.**

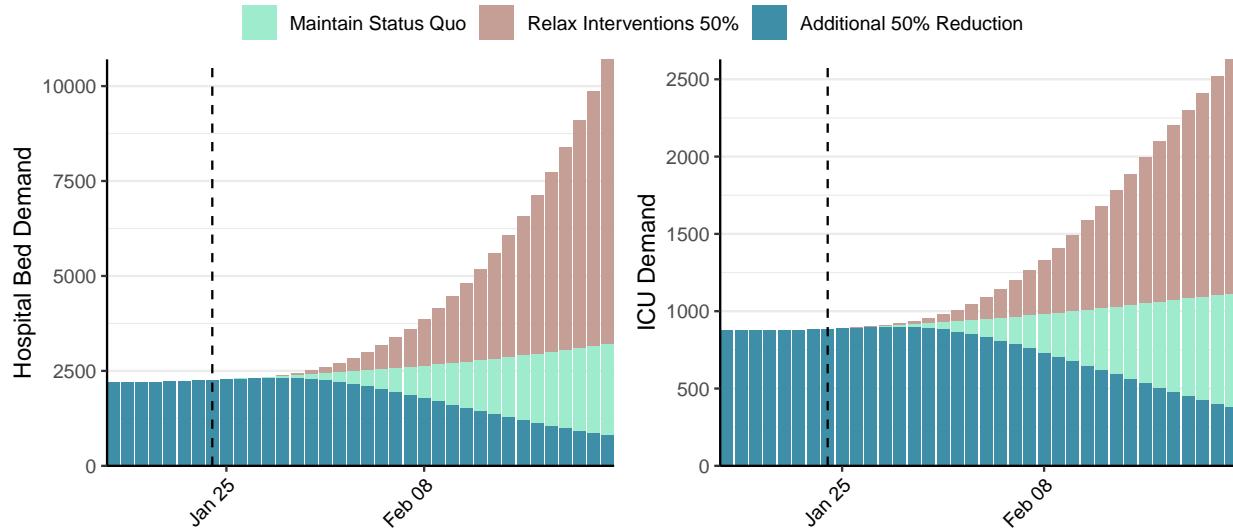


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 25,036 (95% CI: 22,517-27,554) at the current date to 2,970 (95% CI: 2,203-3,738) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 25,036 (95% CI: 22,517-27,554) at the current date to 238,873 (95% CI: 165,330-312,415) by 2021-02-21.

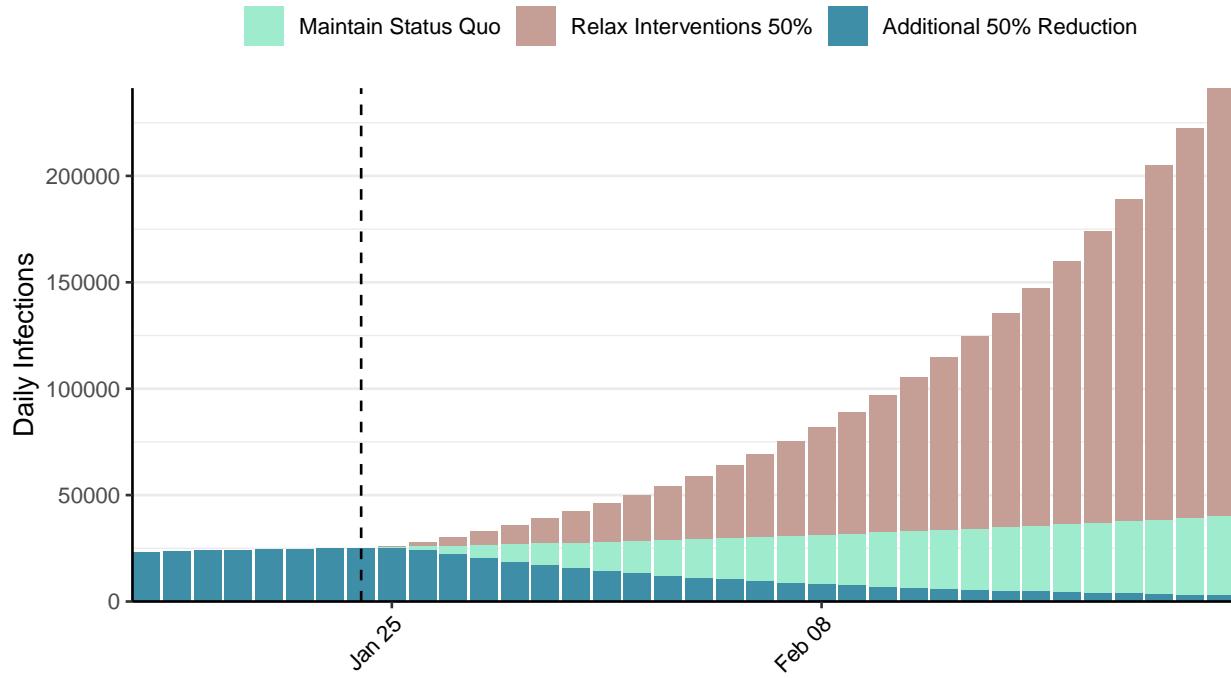


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Panama, 2021-01-24 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}
914	914	35	35	0.72 (95% CI: 0.61-0.87)

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.

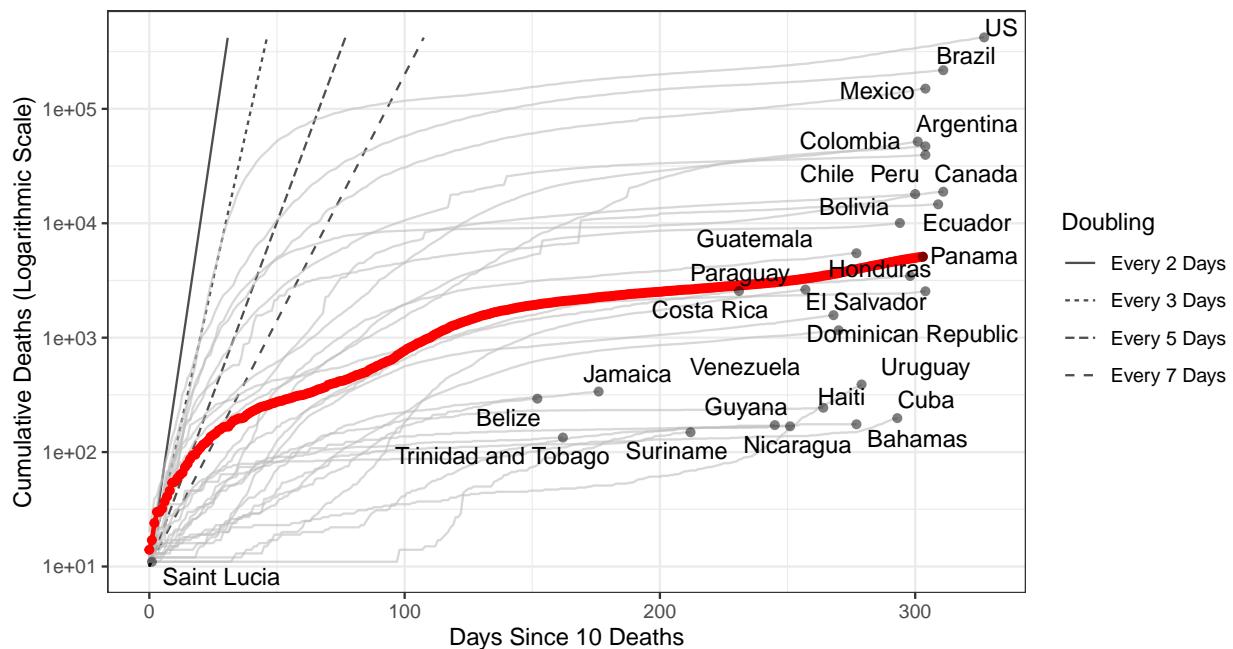


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 297,224 (95% CI: 289,064–305,384) 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

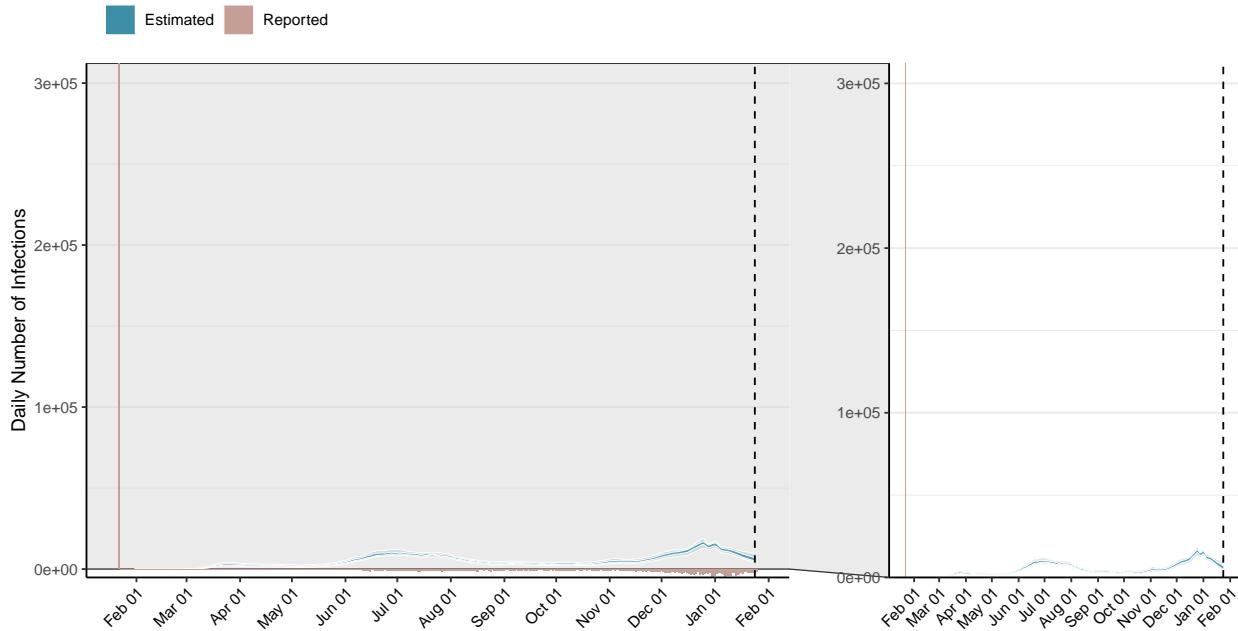


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

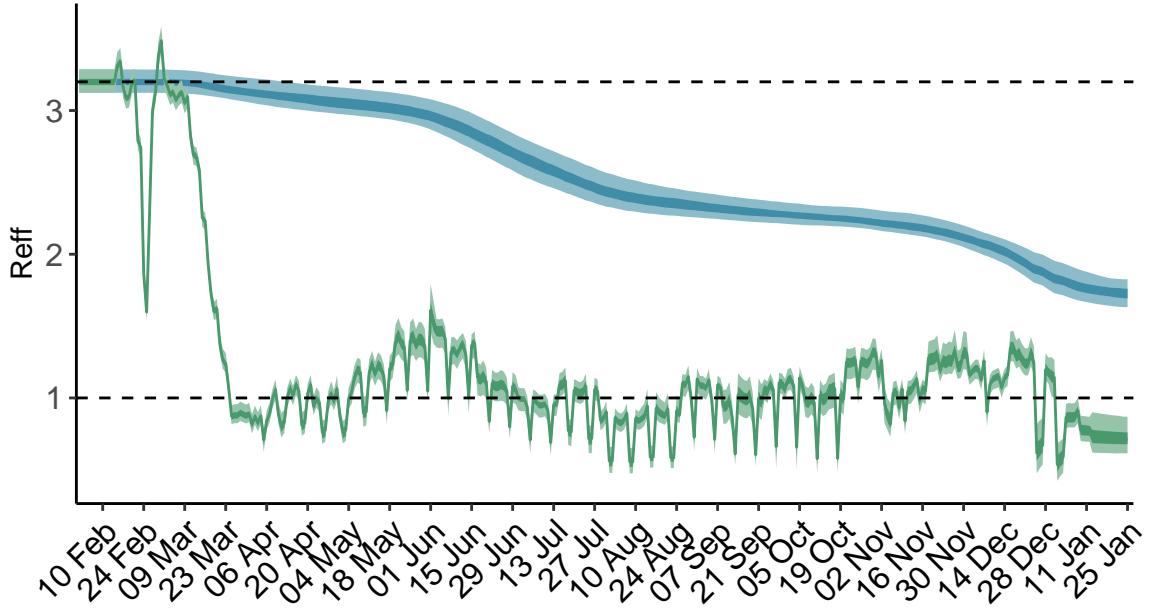


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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. 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.](#)

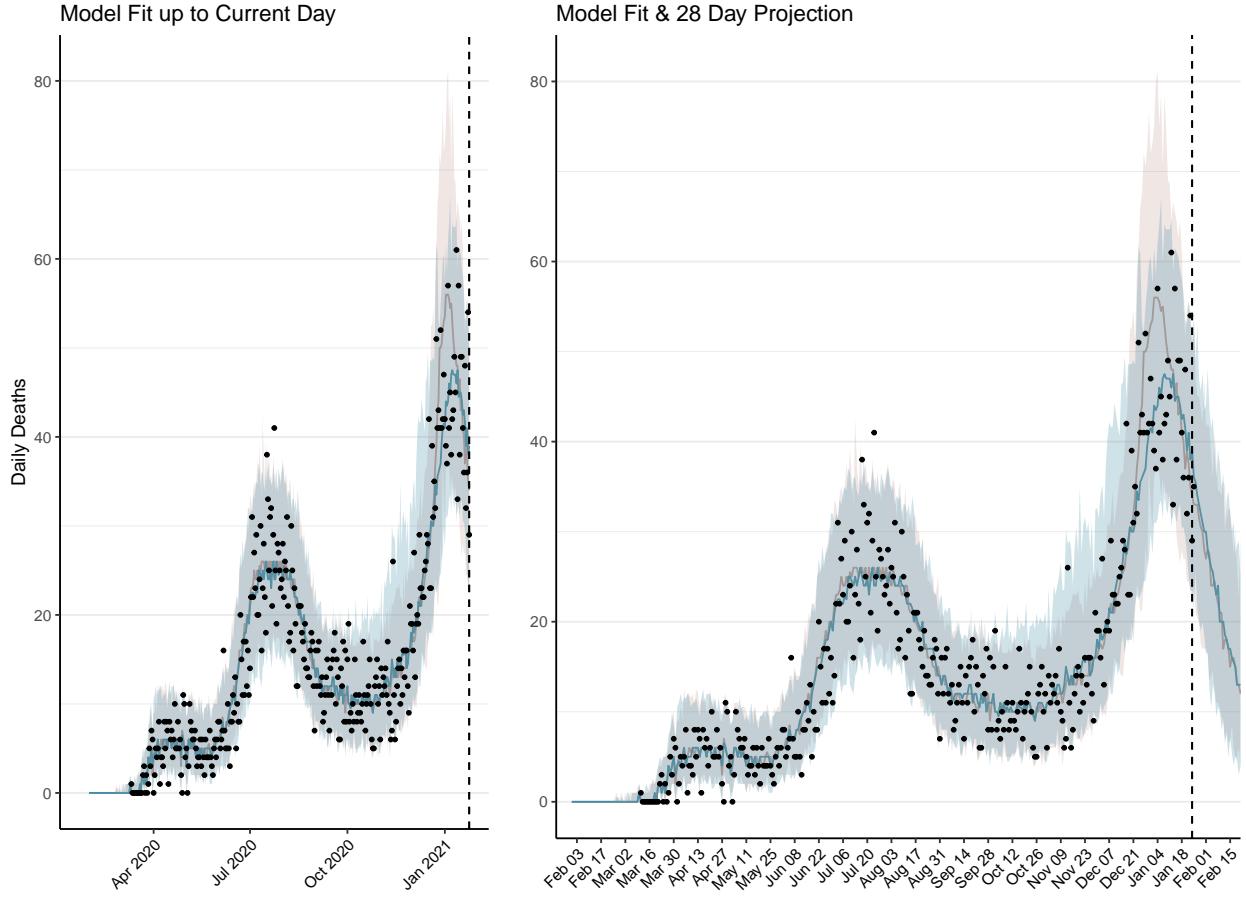


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 1,162 (95% CI: 1,126-1,198) patients requiring treatment with high-pressure oxygen at the current date to 397 (95% CI: 358-437) hospital beds being required on 2021-02-21 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 369 (95% CI: 360-378) patients requiring treatment with mechanical ventilation at the current date to 162 (95% CI: 149-174) by 2021-02-21. 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.**

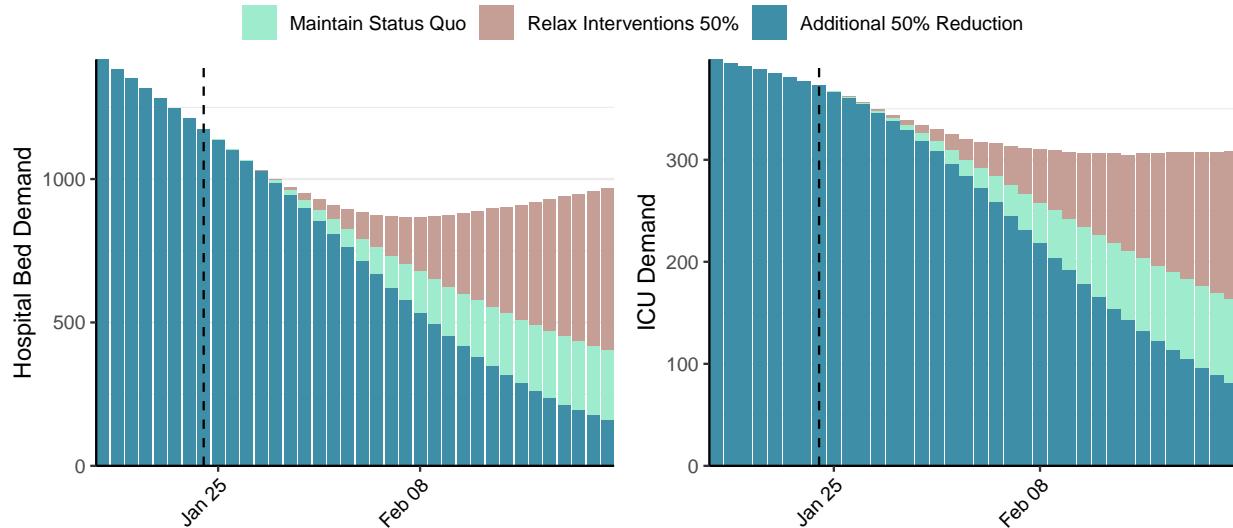


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 6,221 (95% CI: 5,885-6,556) at the current date to 213 (95% CI: 184-242) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 6,221 (95% CI: 5,885-6,556) at the current date to 8,514 (95% CI: 7,409-9,620) by 2021-02-21.

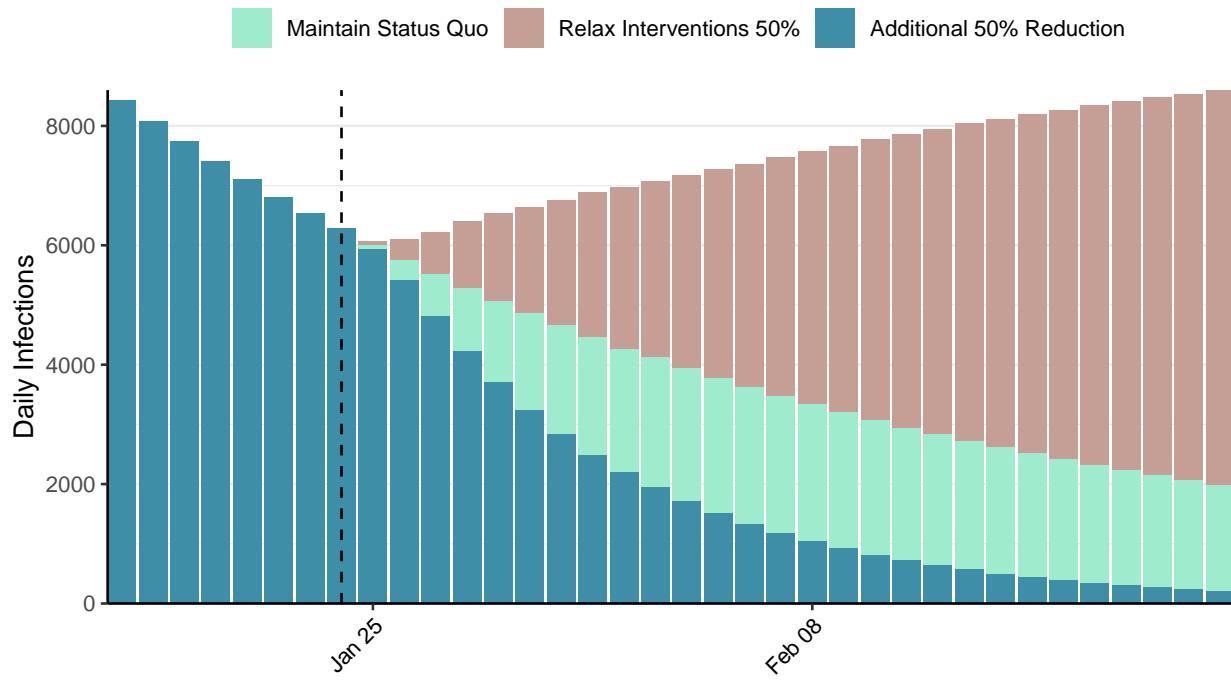


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Peru, 2021-01-24 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}
3,782	3,782	110	110	1.23 (95% CI: 1.08-1.36)

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.

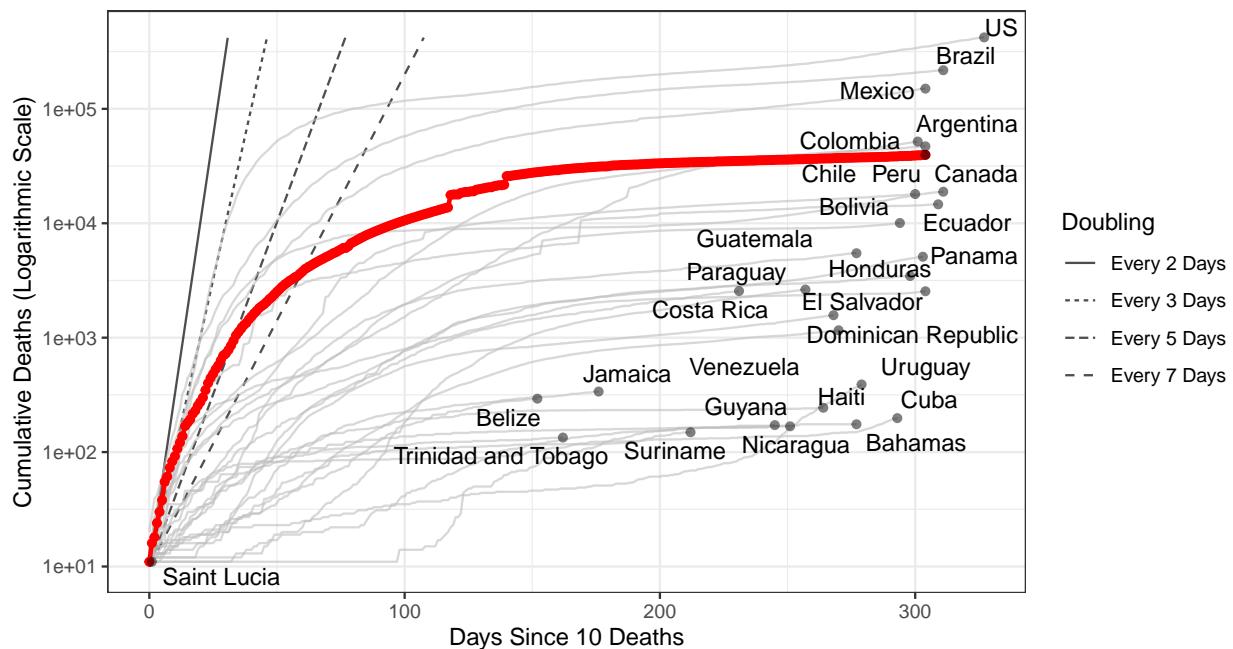


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 1,378,111 (95% CI: 1,329,452-1,426,769) 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

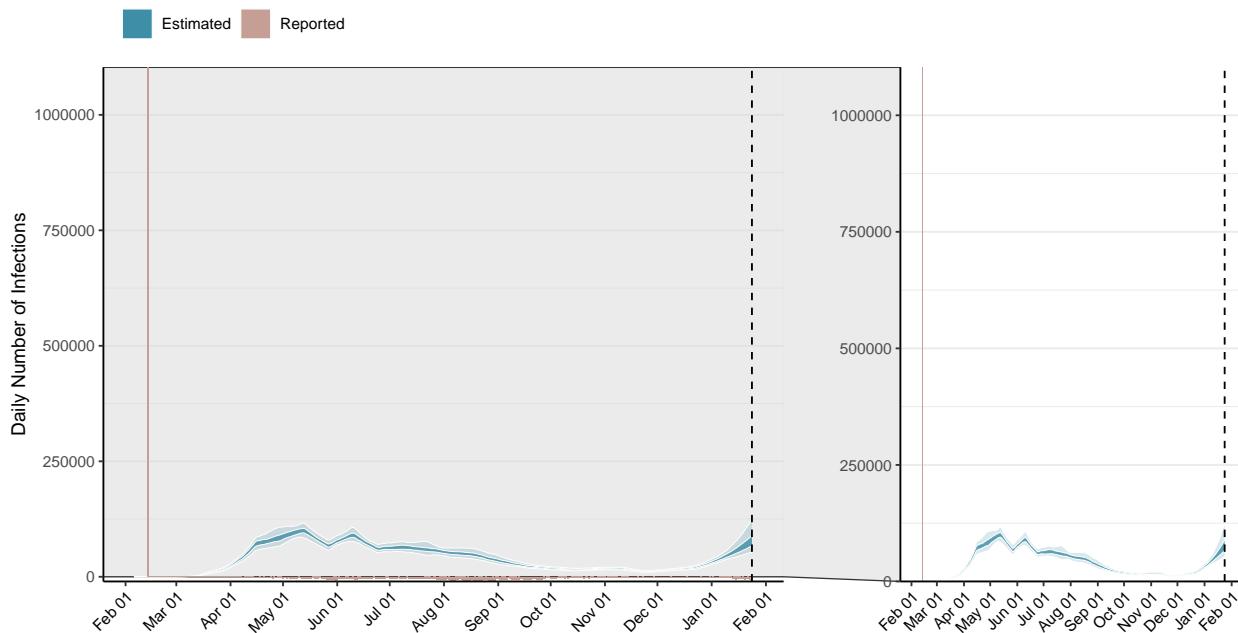


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

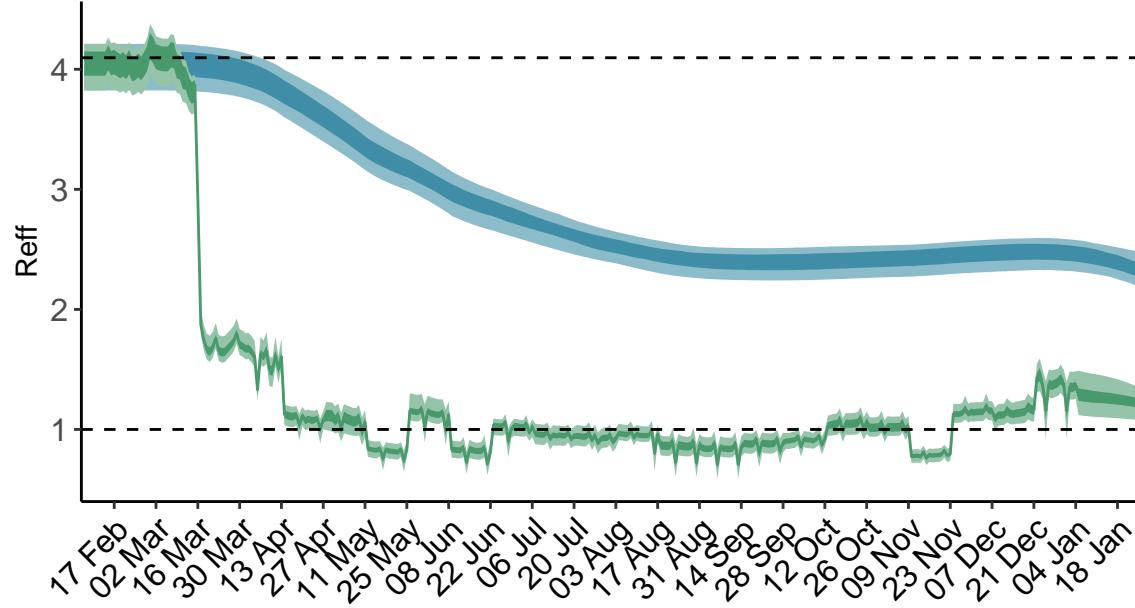


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

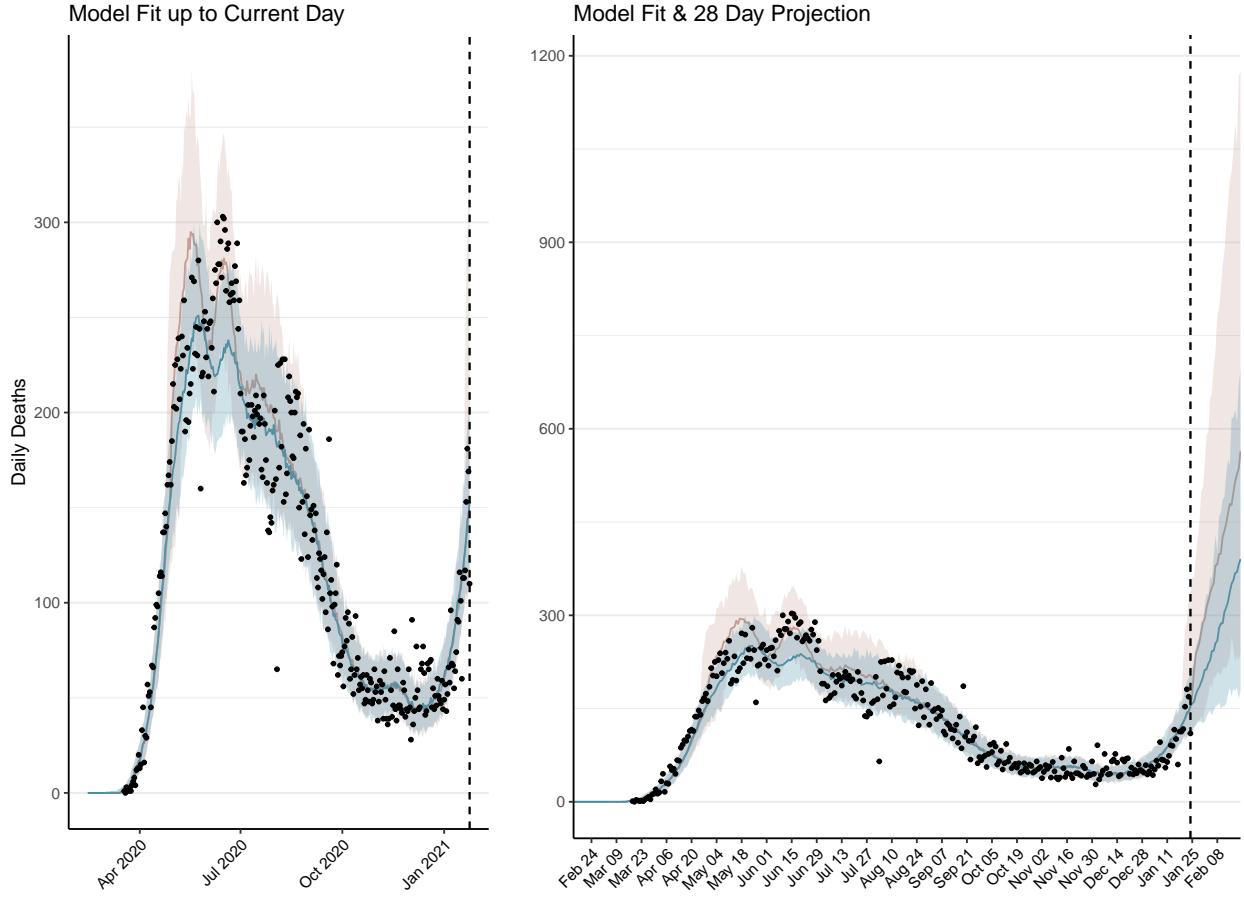


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 6,276 (95% CI: 6,040-6,511) patients requiring treatment with high-pressure oxygen at the current date to 15,077 (95% CI: 13,963-16,191) hospital beds being required on 2021-02-21 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 2,002 (95% CI: 1,948-2,056) patients requiring treatment with mechanical ventilation at the current date to 2,554 (95% CI: 2,478-2,630) by 2021-02-21. 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.**

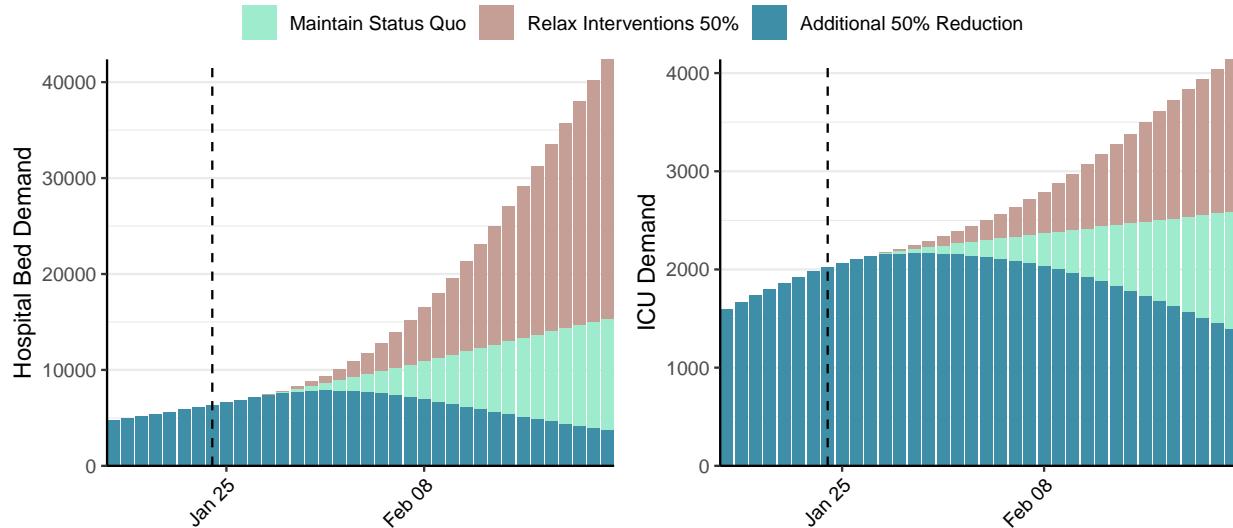


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 79,004 (95% CI: 74,803-83,204) at the current date to 13,777 (95% CI: 12,583-14,971) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 79,004 (95% CI: 74,803-83,204) at the current date to 456,914 (95% CI: 440,727-473,102) by 2021-02-21.

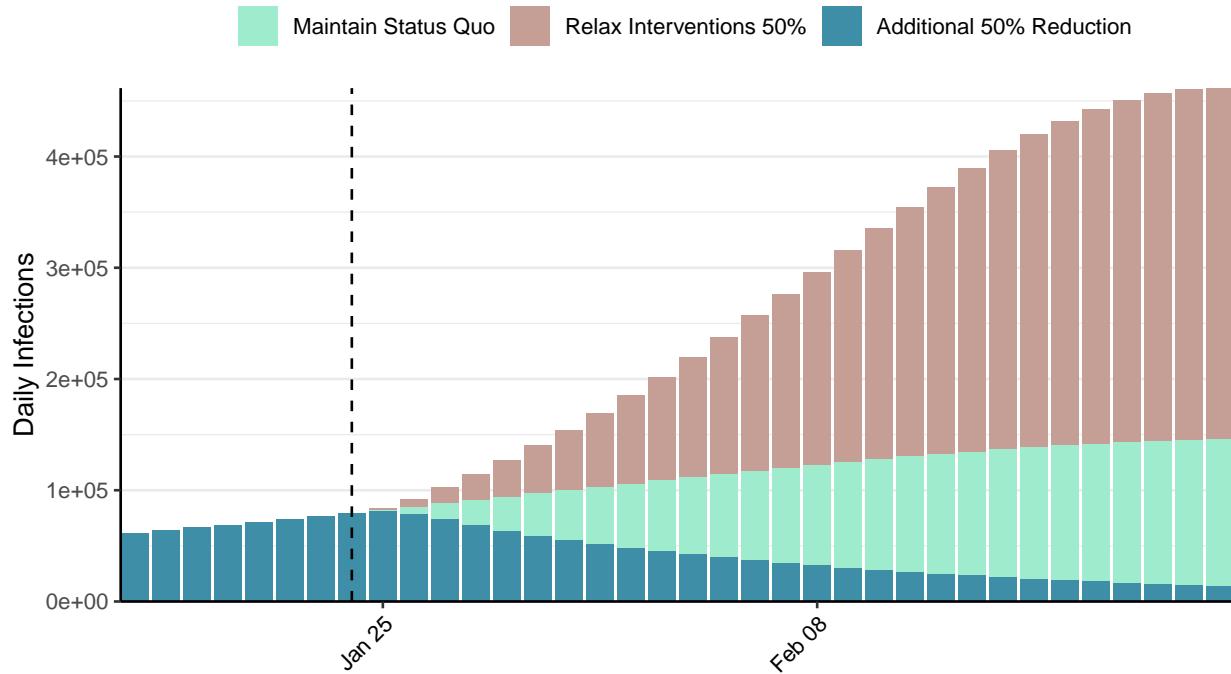


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Philippines, 2021-01-24 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}
1,377	1,377	50	50	1.17 (95% CI: 0.96-1.35)

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.

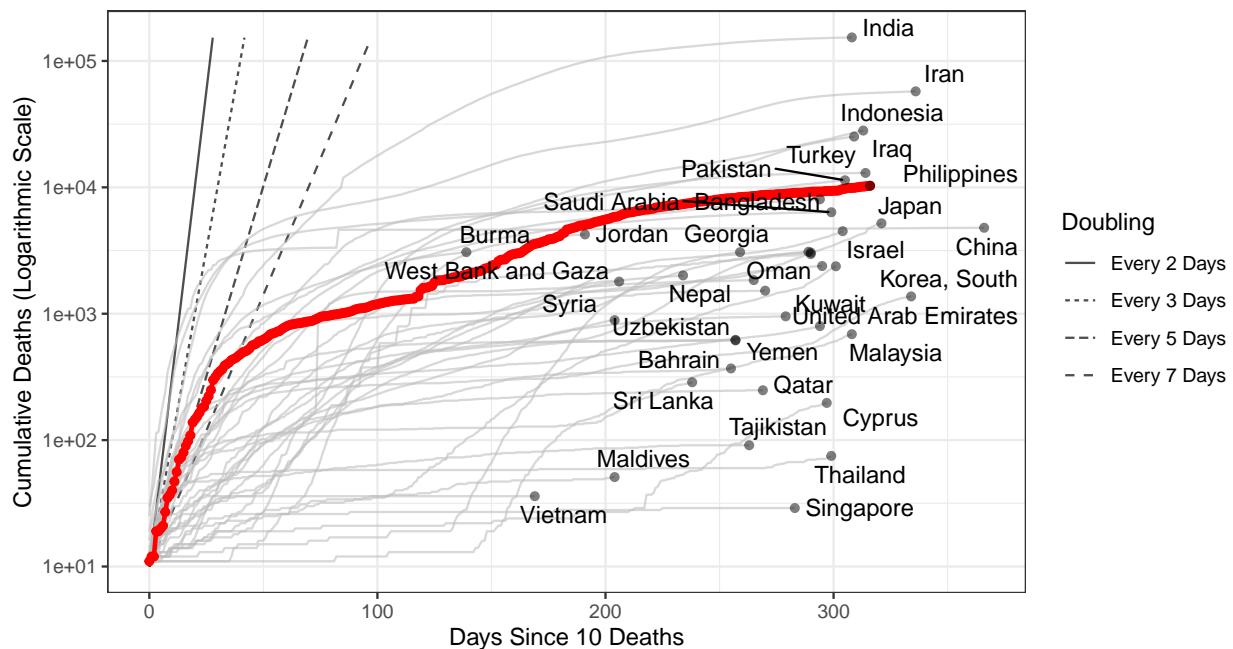


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 643,229 (95% CI: 614,769–671,690) 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

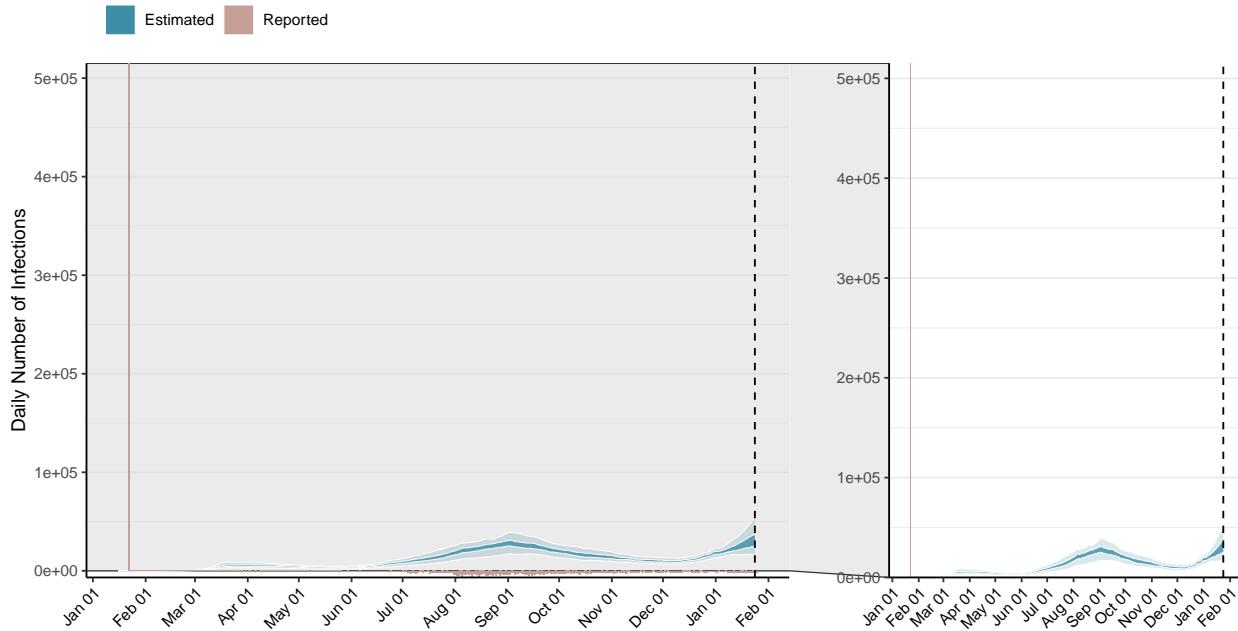


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

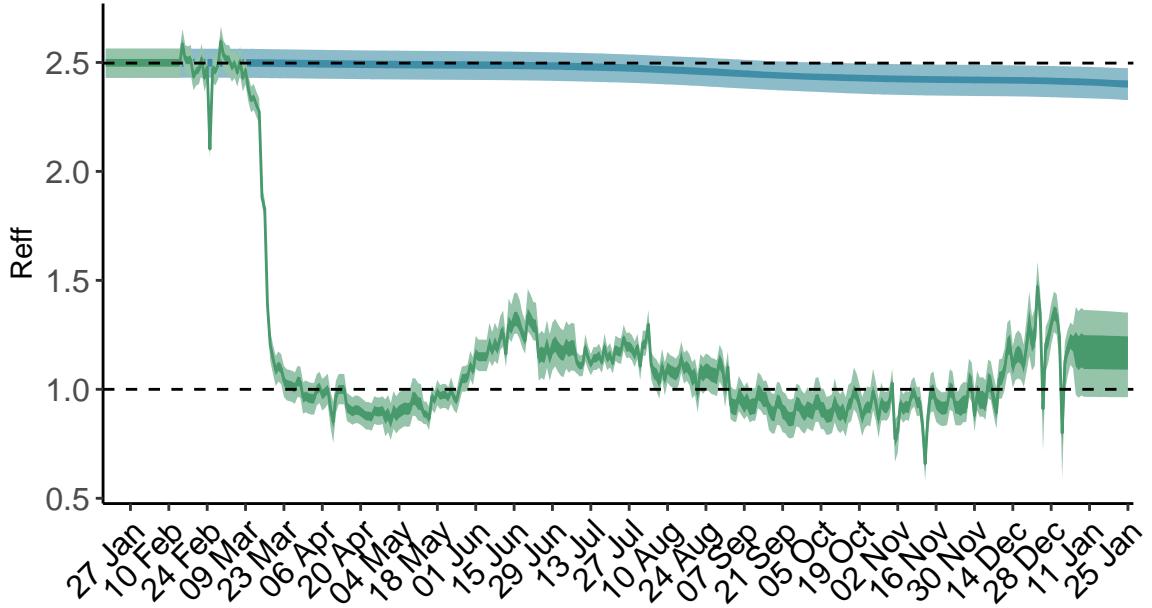


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

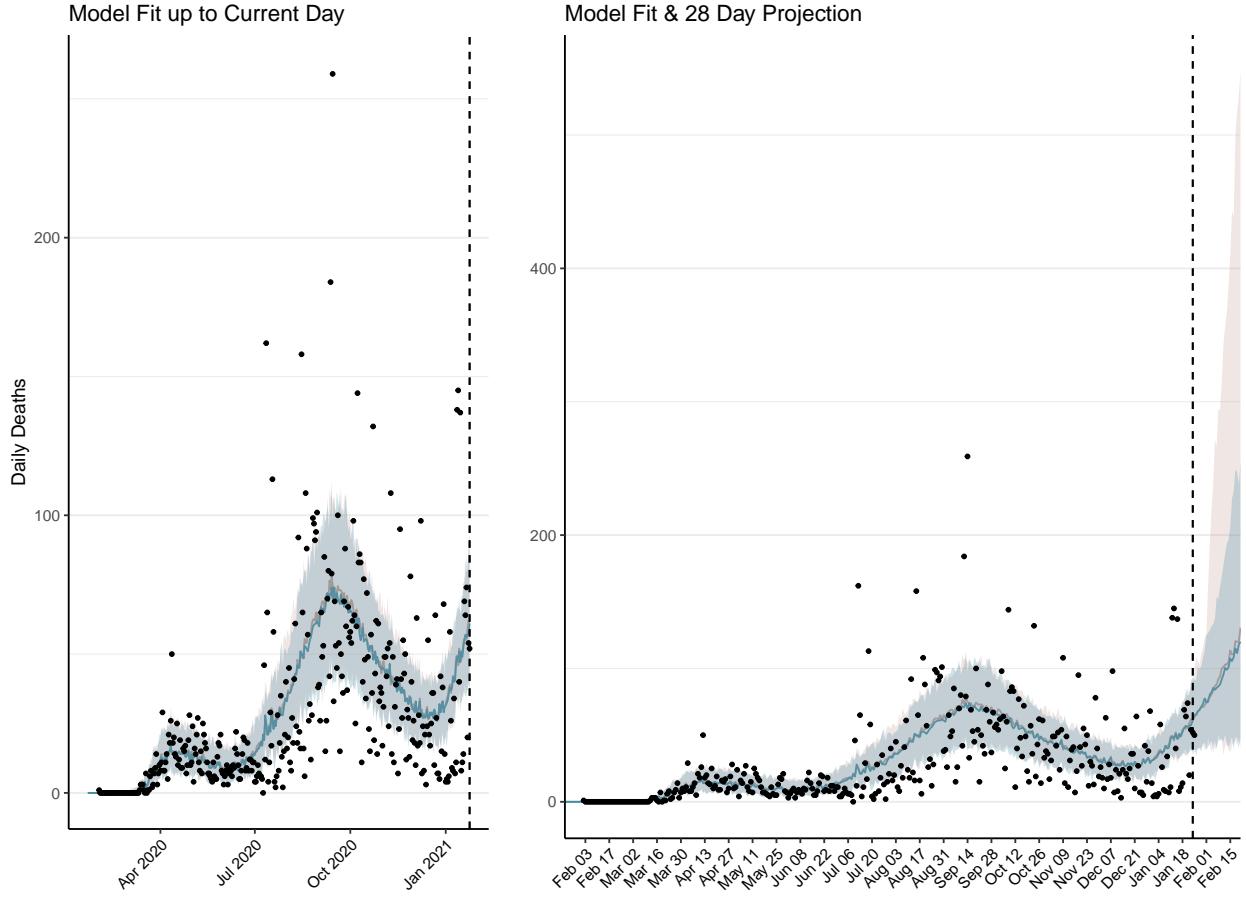


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 2,701 (95% CI: 2,572-2,830) patients requiring treatment with high-pressure oxygen at the current date to 6,024 (95% CI: 5,300-6,749) hospital beds being required on 2021-02-21 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 1,005 (95% CI: 960-1,050) patients requiring treatment with mechanical ventilation at the current date to 1,783 (95% CI: 1,666-1,899) by 2021-02-21. 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.**

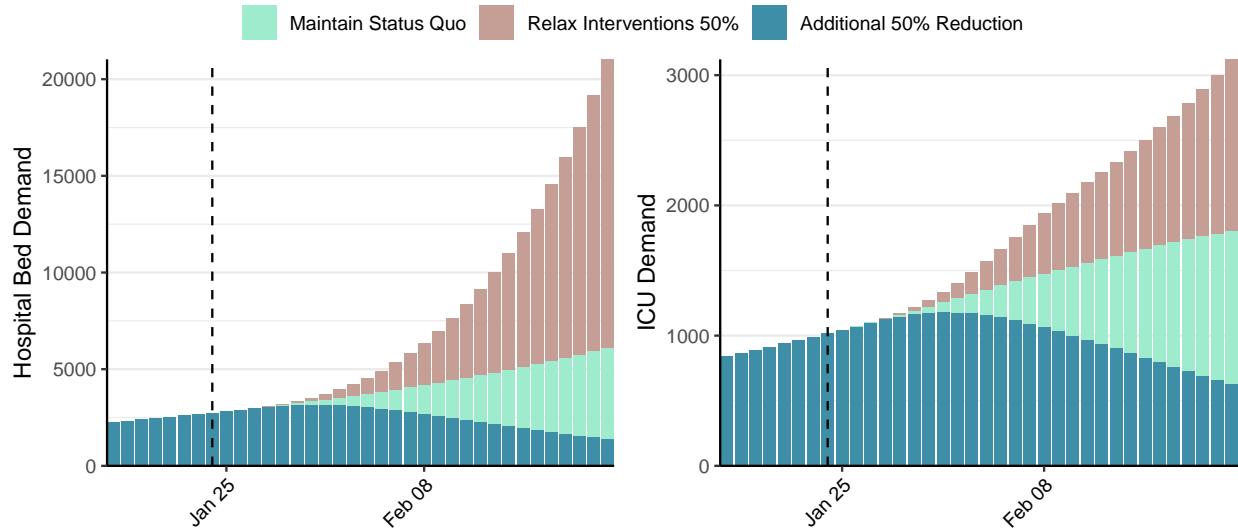


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 32,330 (95% CI: 30,041-34,618) at the current date to 5,297 (95% CI: 4,569-6,025) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 32,330 (95% CI: 30,041-34,618) at the current date to 438,380 (95% CI: 376,068-500,693) by 2021-02-21.

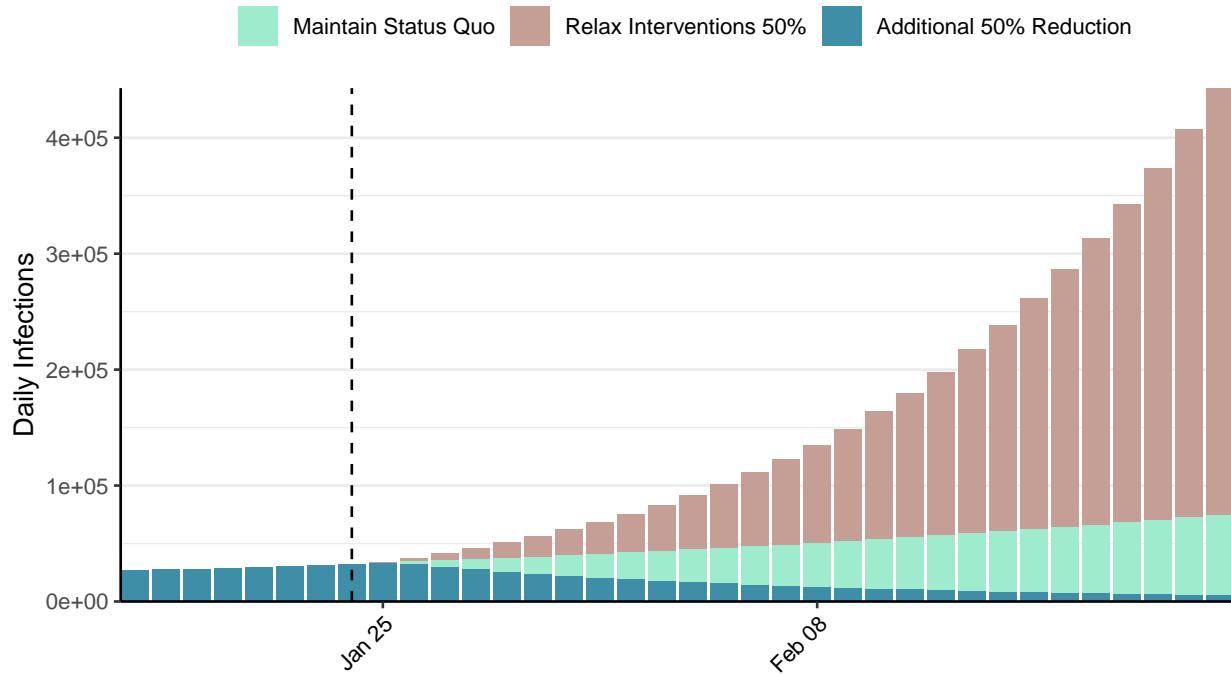


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Papua New Guinea, 2021-01-24 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: 0.71-1.21)

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.** Papua New Guinea is not shown in the following plot as only 0 deaths have been reported to date

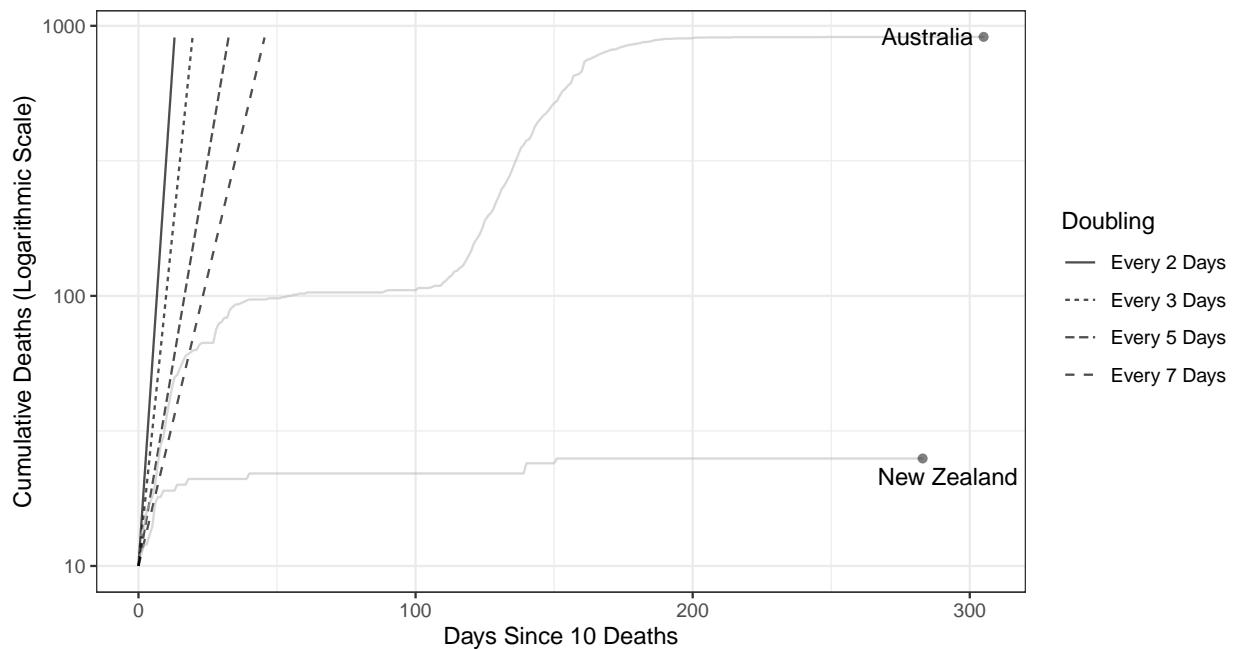


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 416 (95% CI: 306-526) 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

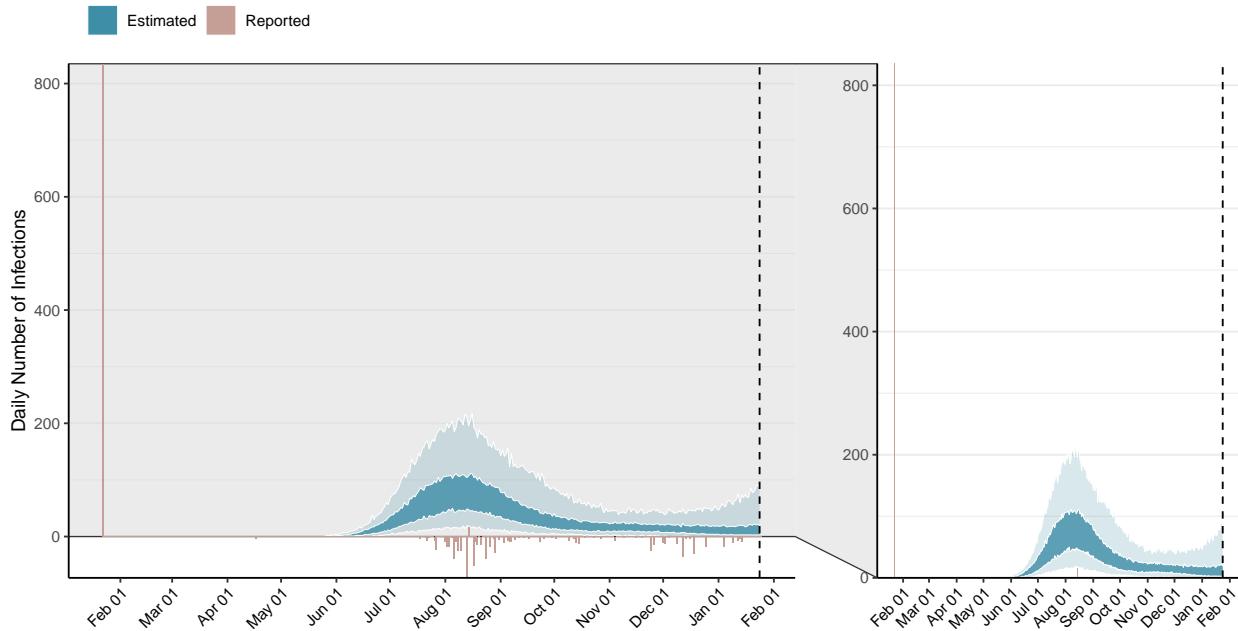


Figure 2: Daily number of infections estimated by fitting to the current total of deaths. Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

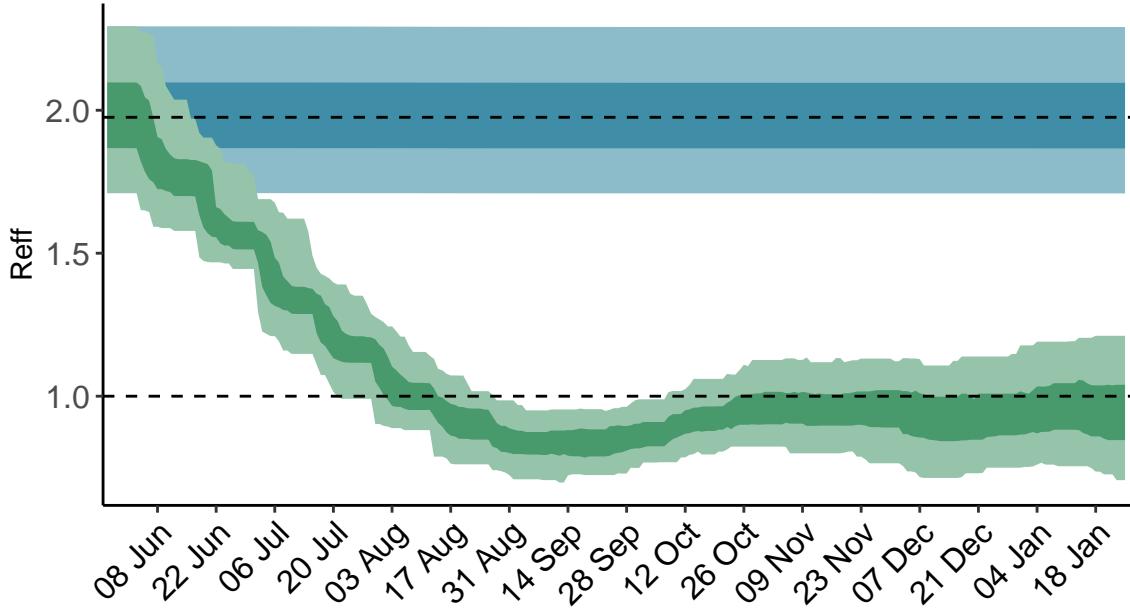


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

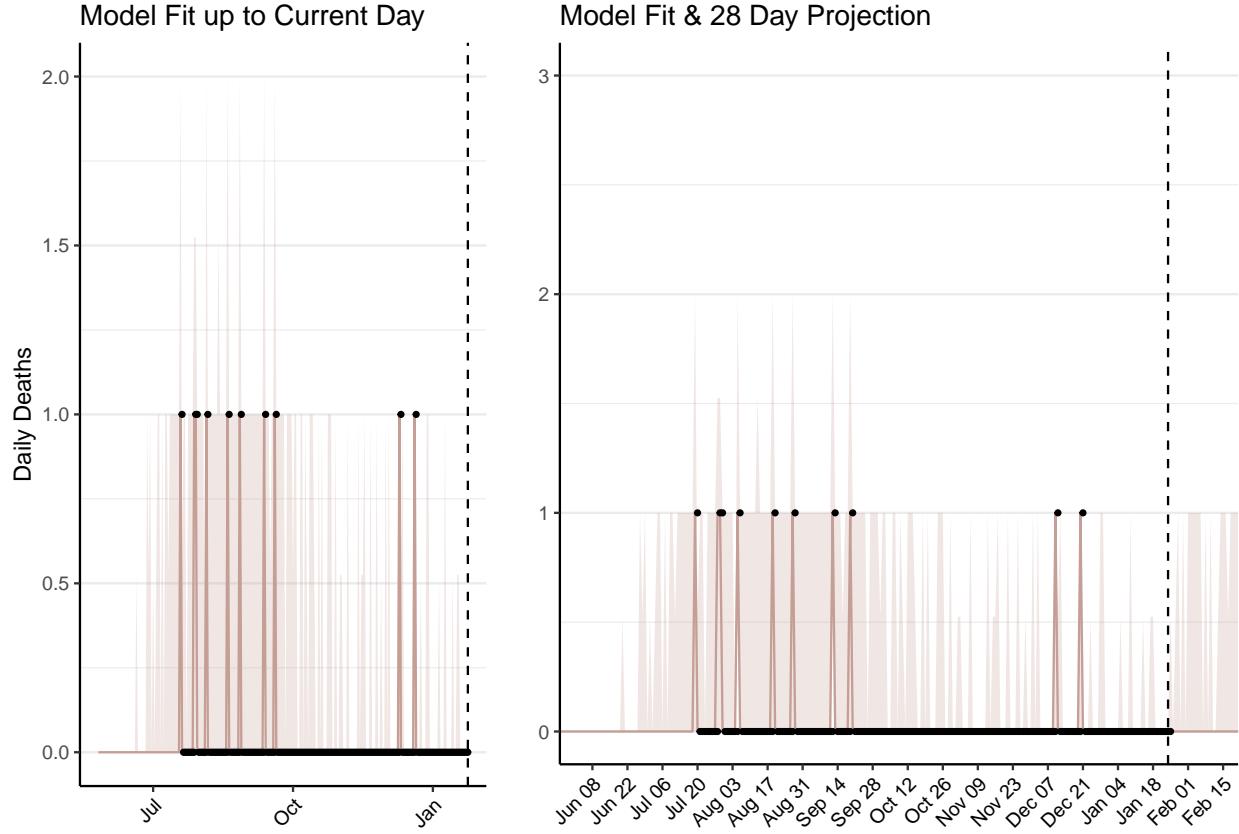


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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: 1-2) patients requiring treatment with high-pressure oxygen at the current date to 3 (95% CI: 1-4) hospital beds being required on 2021-02-21 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: 0-1) patients requiring treatment with mechanical ventilation at the current date to 1 (95% CI: 0-1) by 2021-02-21. 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.**

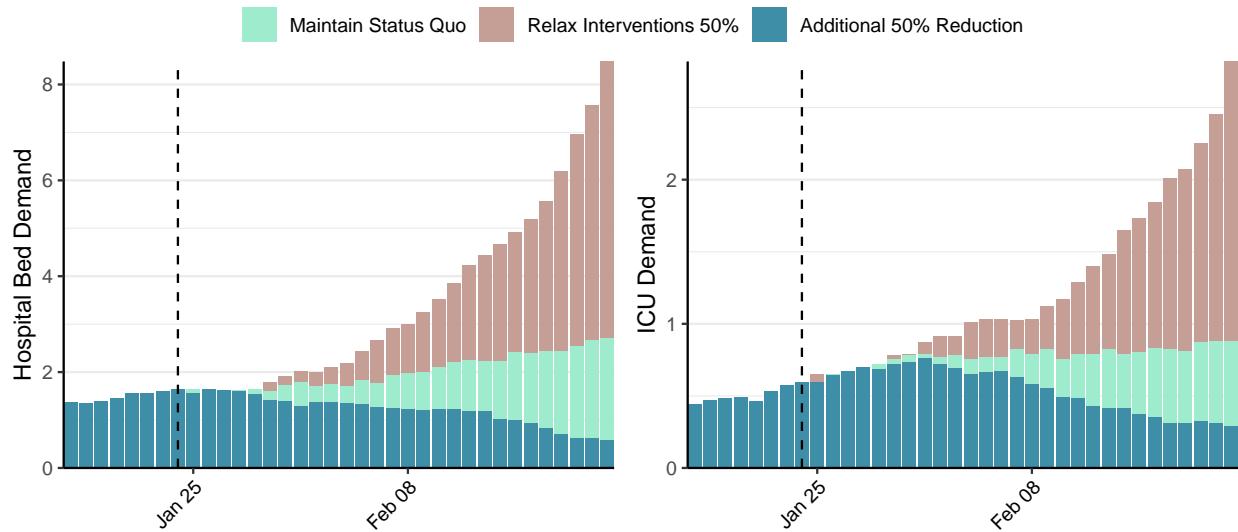
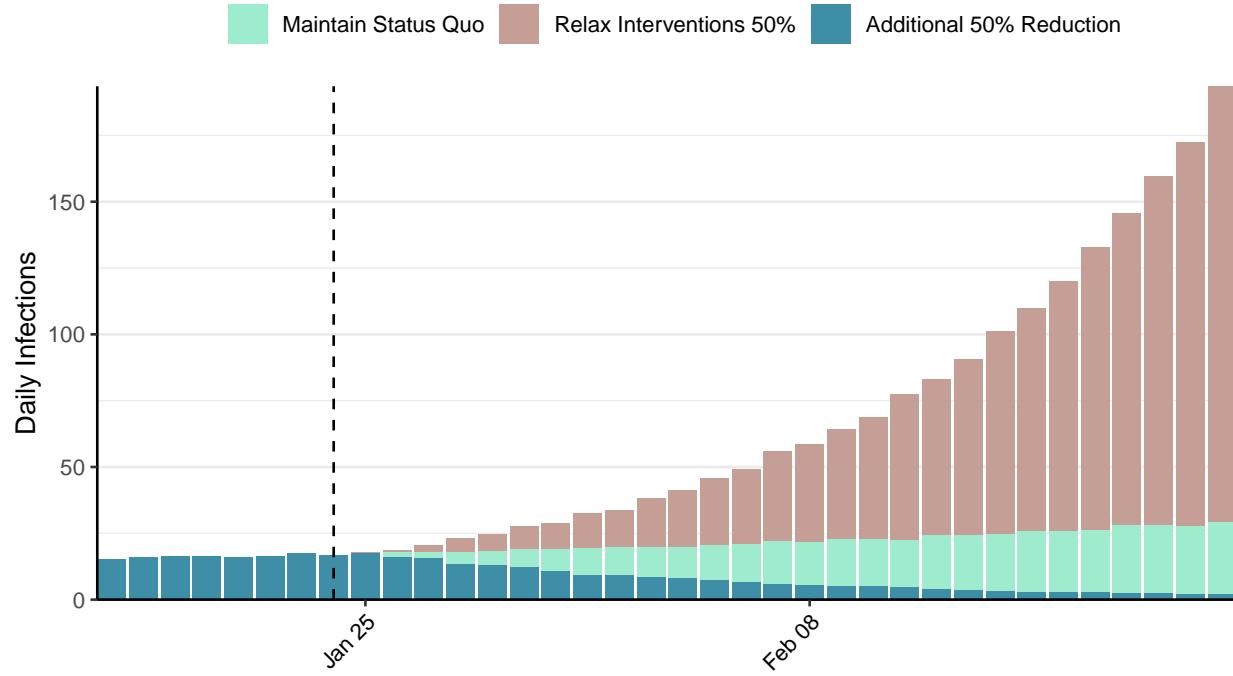


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 16 (95% CI: 11-22) at the current date to 2 (95% CI: 1-4) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 16 (95% CI: 11-22) at the current date to 192 (95% CI: 64-319) by 2021-02-21.



Situation Report for COVID-19: Paraguay, 2021-01-24

[Download the report for Paraguay, 2021-01-24 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}
714	714	15	15	0.98 (95% CI: 0.88-1.1)

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.

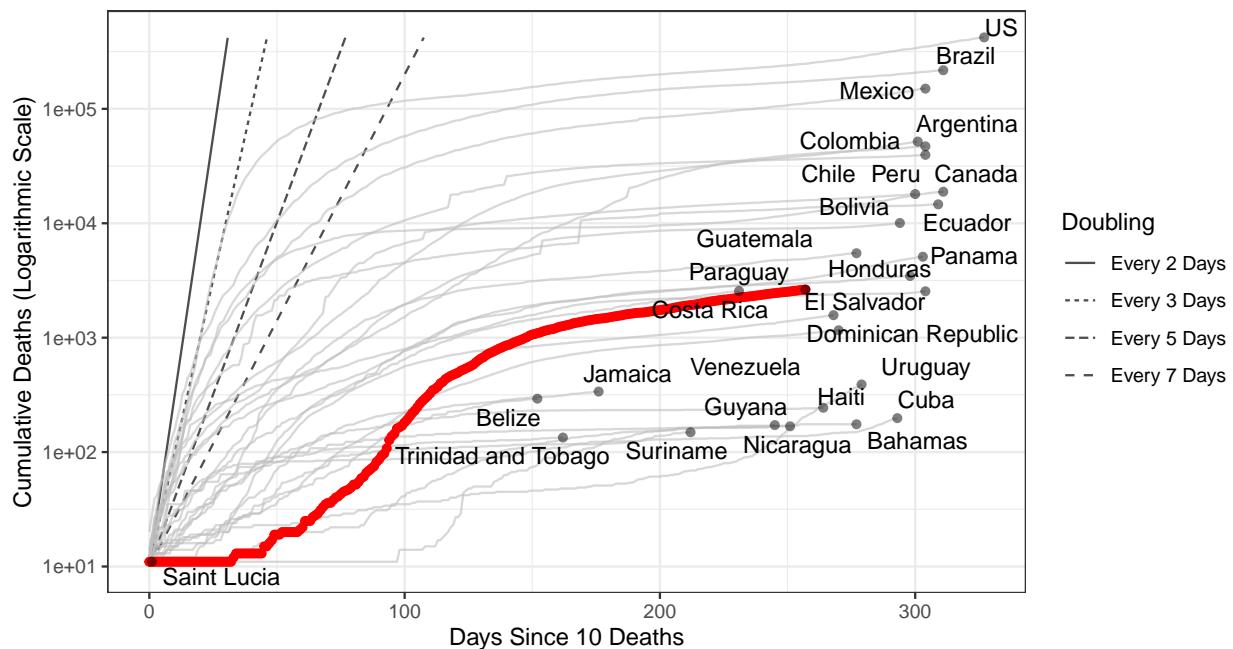


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 159,720 (95% CI: 147,424-172,015) 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

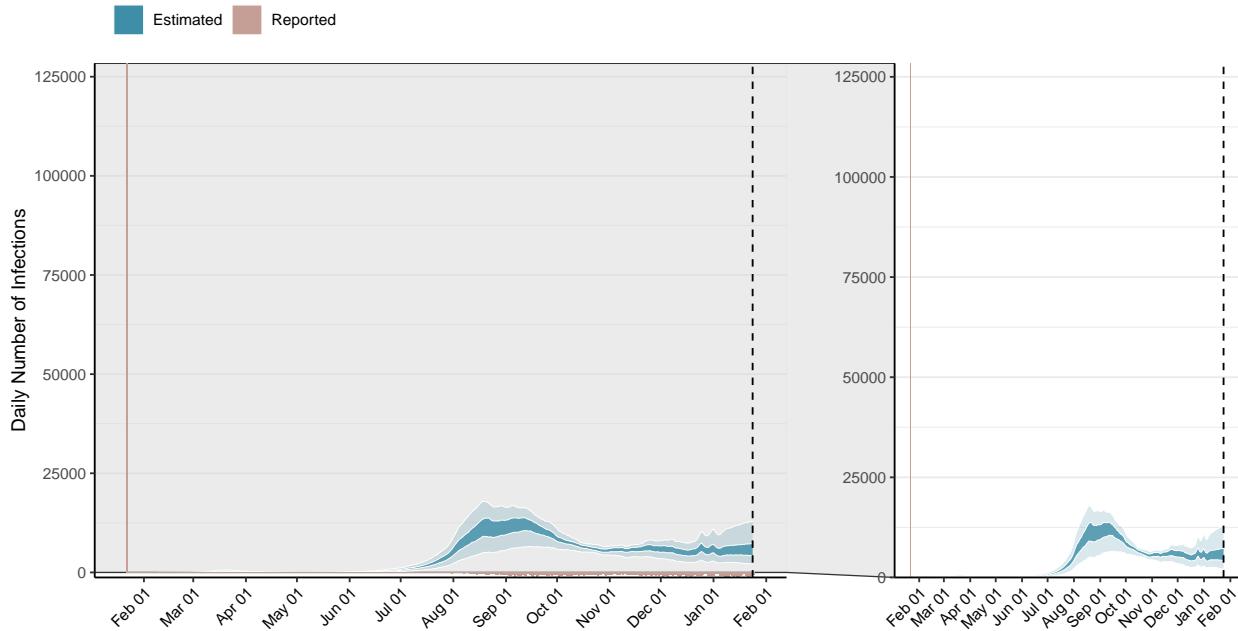


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

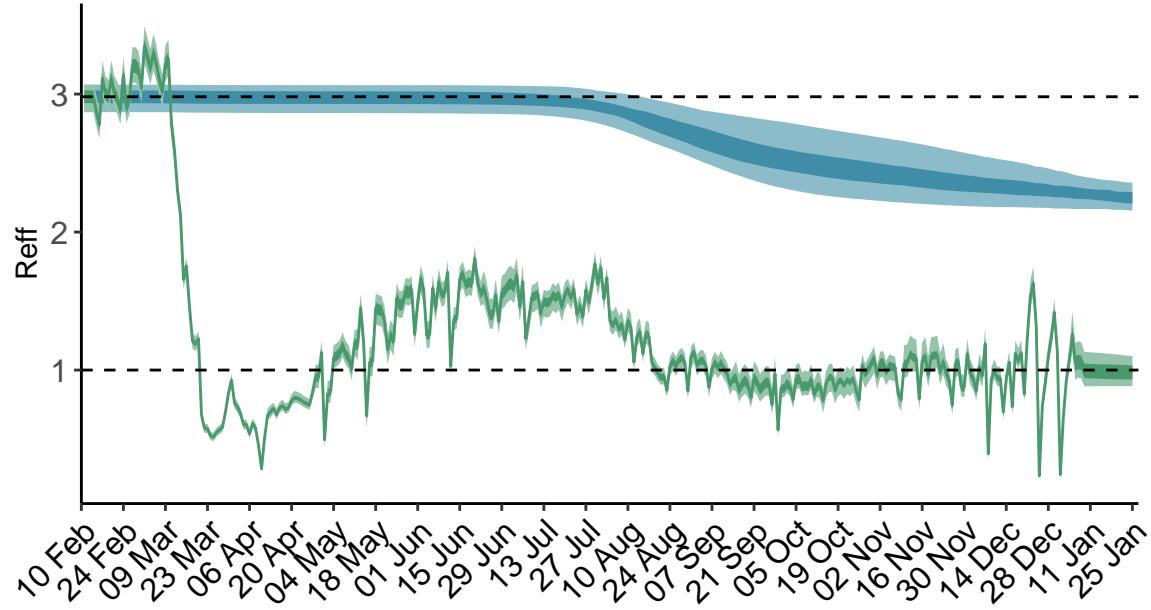


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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. Paraguay 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.](#)

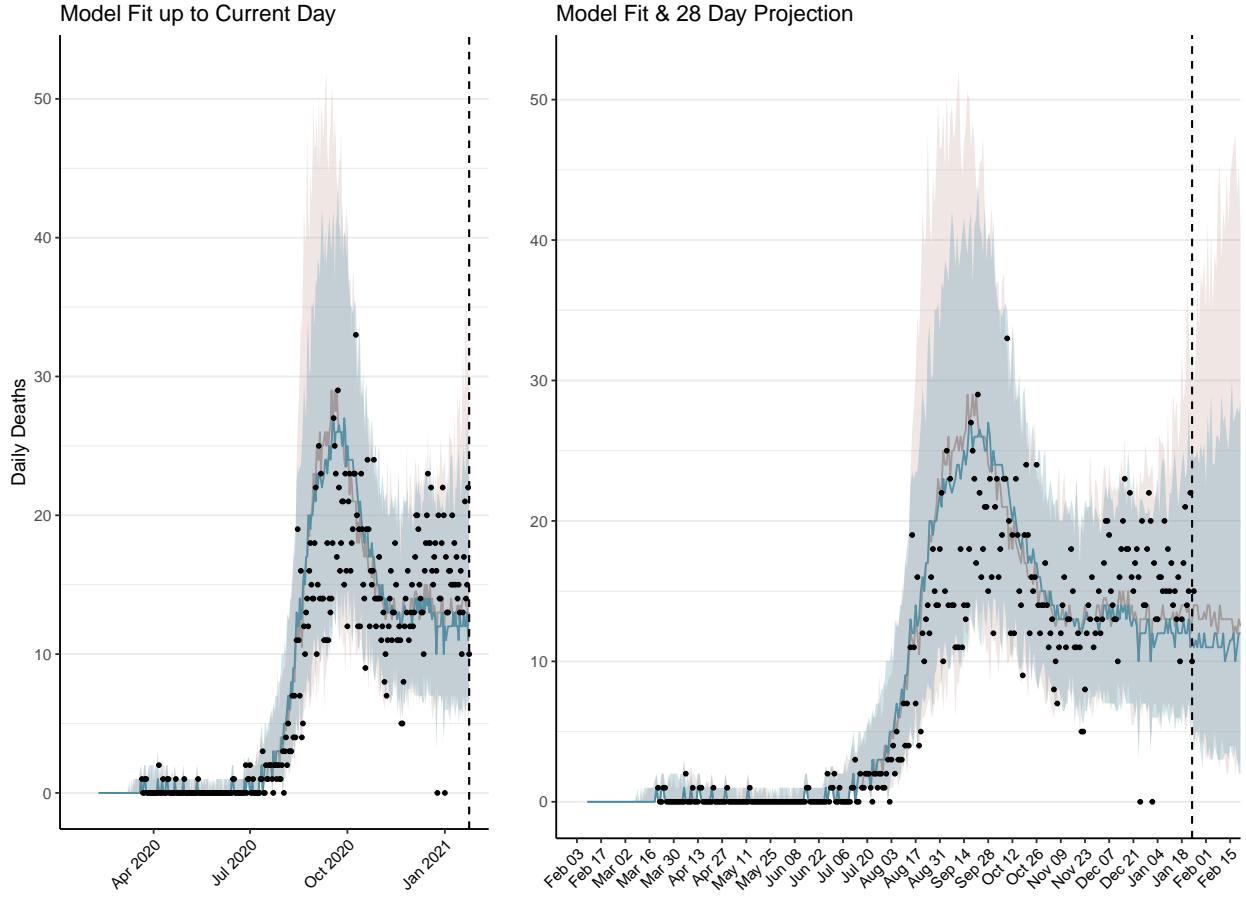


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 520 (95% CI: 479-561) patients requiring treatment with high-pressure oxygen at the current date to 538 (95% CI: 477-599) hospital beds being required on 2021-02-21 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 182 (95% CI: 171-194) patients requiring treatment with mechanical ventilation at the current date to 178 (95% CI: 164-193) by 2021-02-21. 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.**

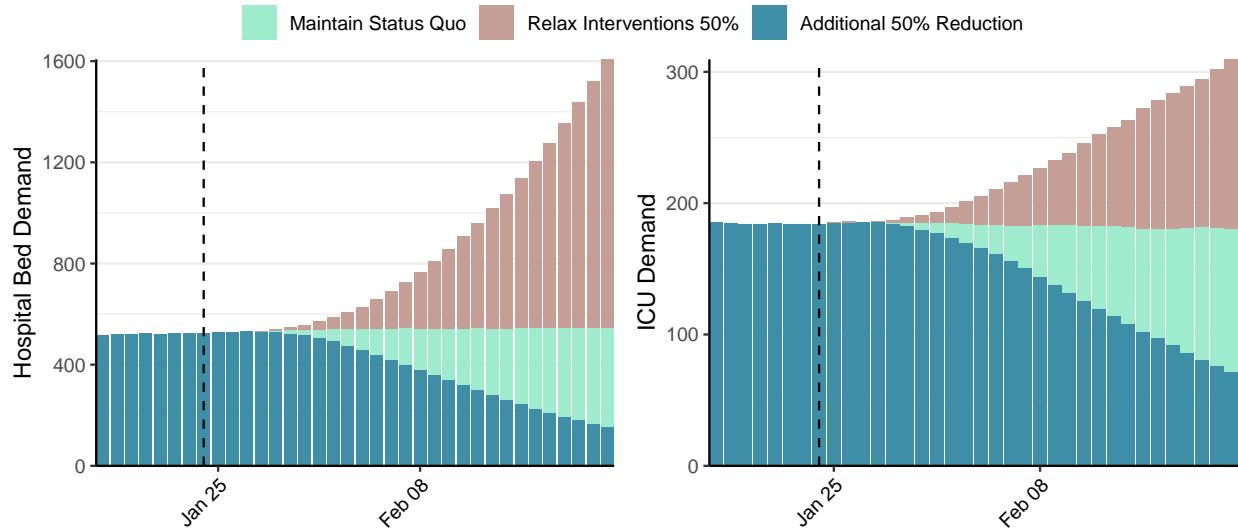


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 5,869 (95% CI: 5,310-6,429) at the current date to 514 (95% CI: 448-579) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 5,869 (95% CI: 5,310-6,429) at the current date to 28,850 (95% CI: 25,651-32,048) by 2021-02-21.

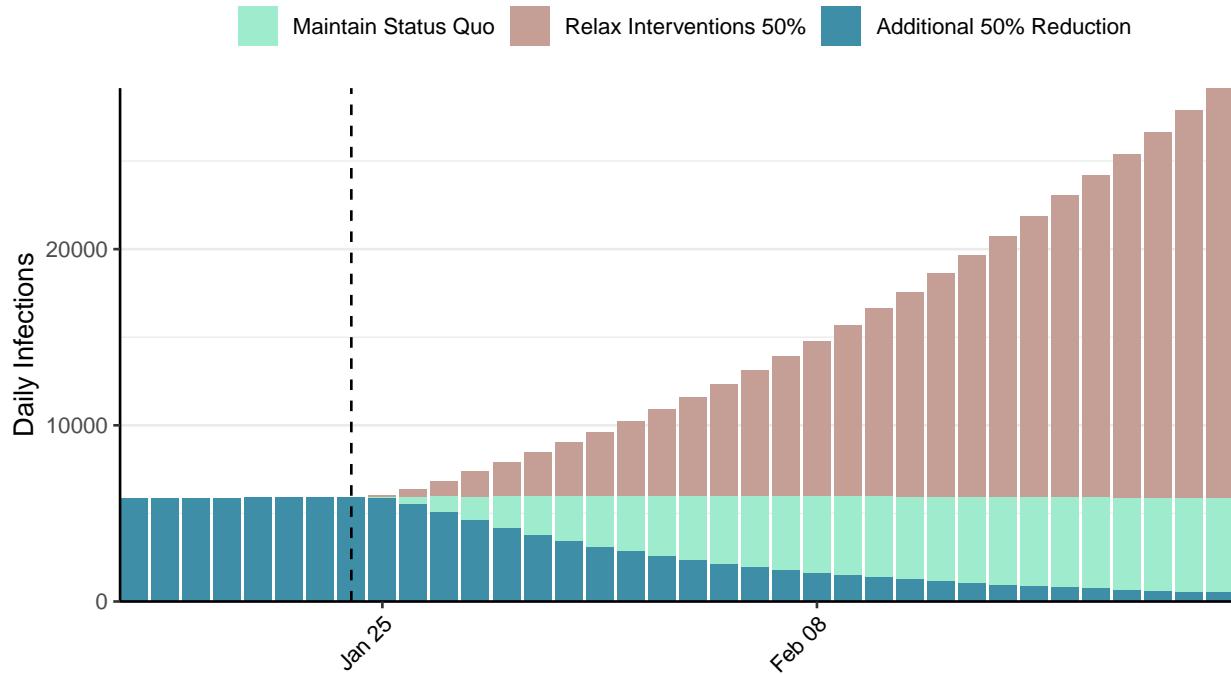


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for State of Palestine, 2021-01-24 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}
470	470	5	5	0.66 (95% CI: 0.56-0.78)

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 5 deaths have been reported to date**

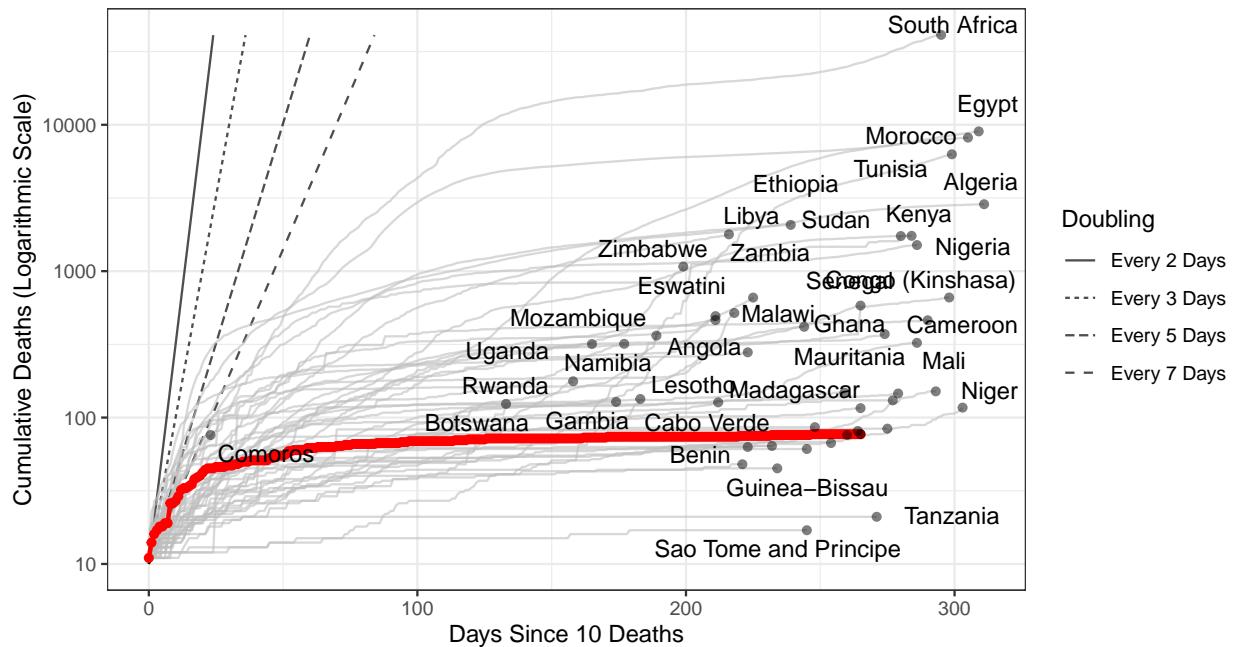


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 122,882 (95% CI: 118,216-127,547) 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).

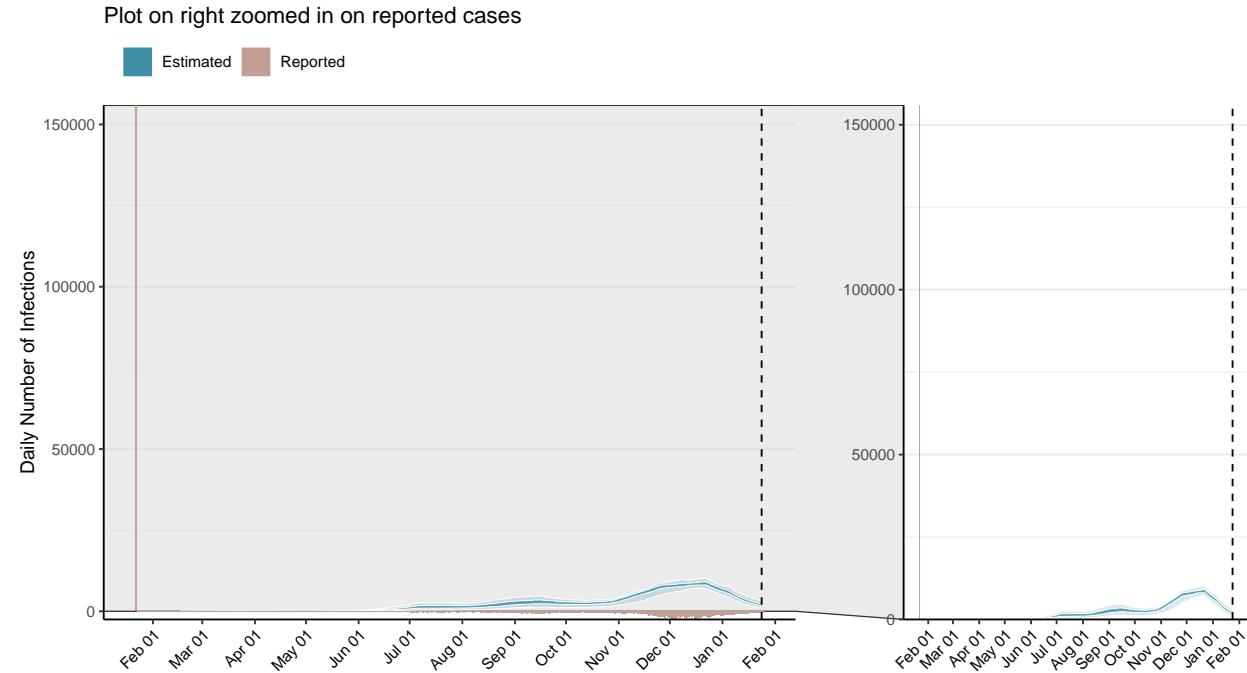


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

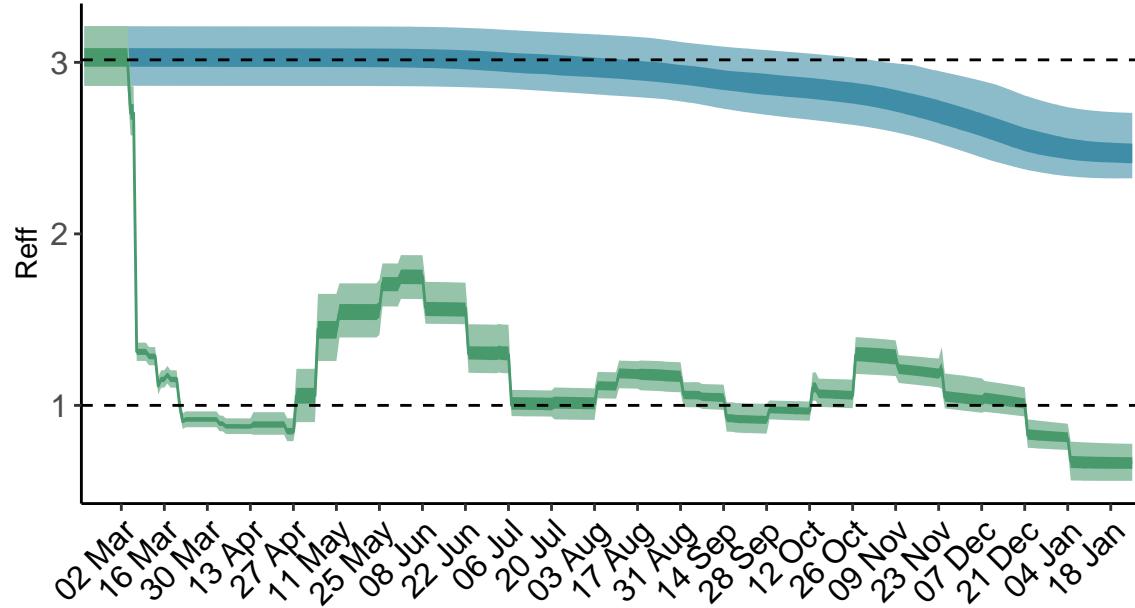


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

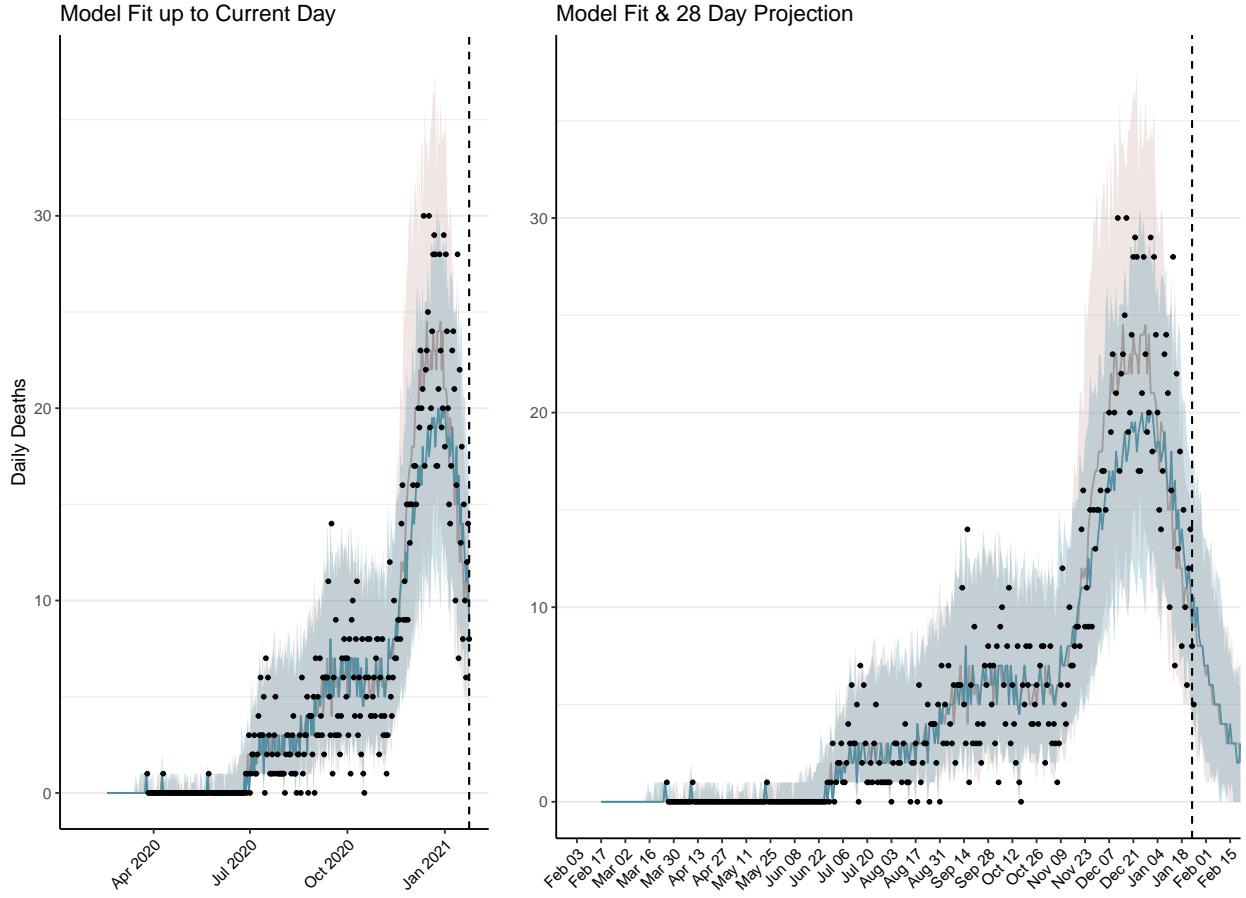


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 356 (95% CI: 342-371) patients requiring treatment with high-pressure oxygen at the current date to 84 (95% CI: 77-91) hospital beds being required on 2021-02-21 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 138 (95% CI: 133-143) patients requiring treatment with mechanical ventilation at the current date to 39 (95% CI: 36-42) by 2021-02-21. 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.**

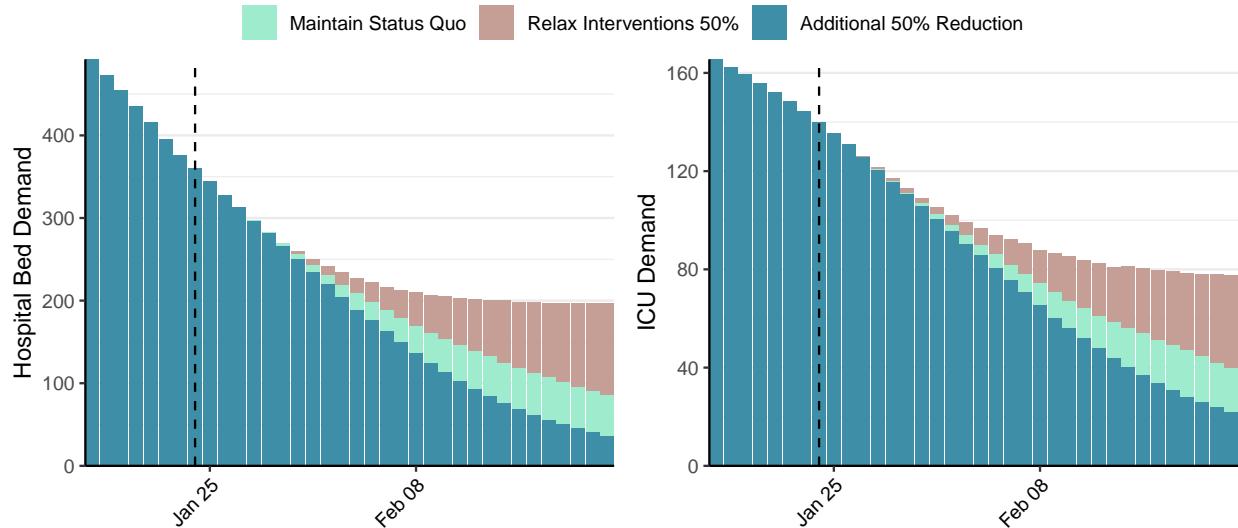


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 1,993 (95% CI: 1,876-2,111) at the current date to 51 (95% CI: 46-56) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,993 (95% CI: 1,876-2,111) at the current date to 2,073 (95% CI: 1,829-2,317) by 2021-02-21.

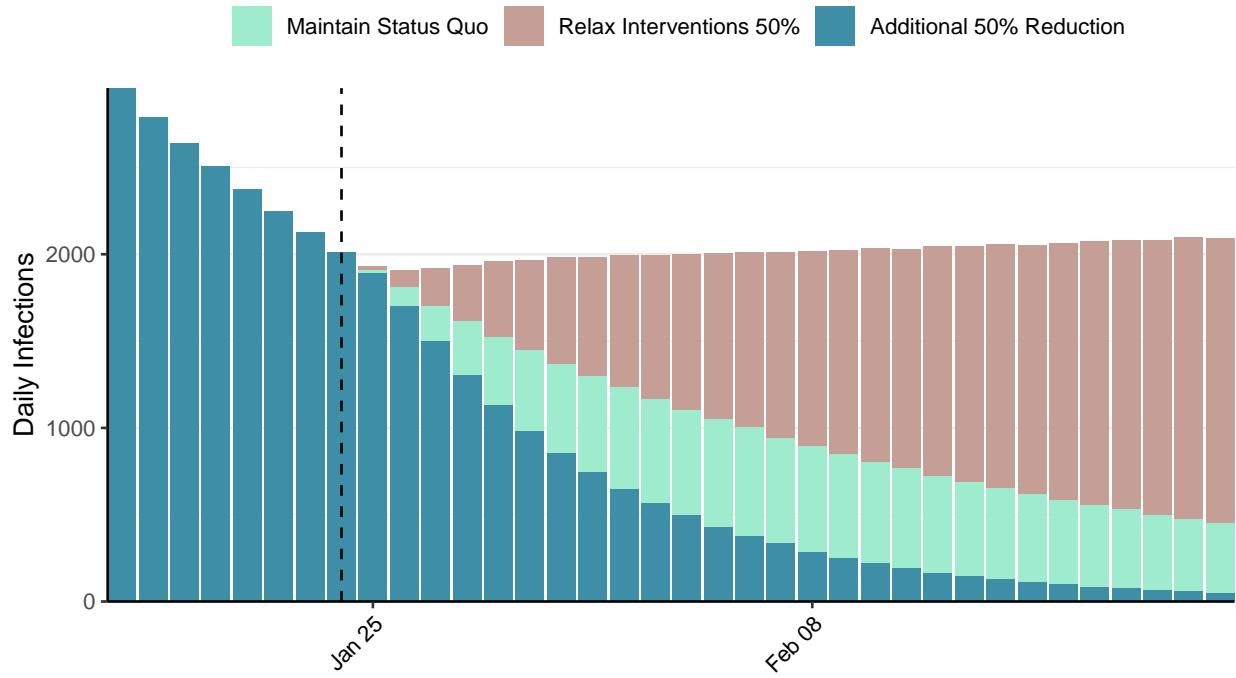


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Romania, 2021-01-24 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}
1,551	1,551	65	65	1 (95% CI: 0.81-1.16)

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.

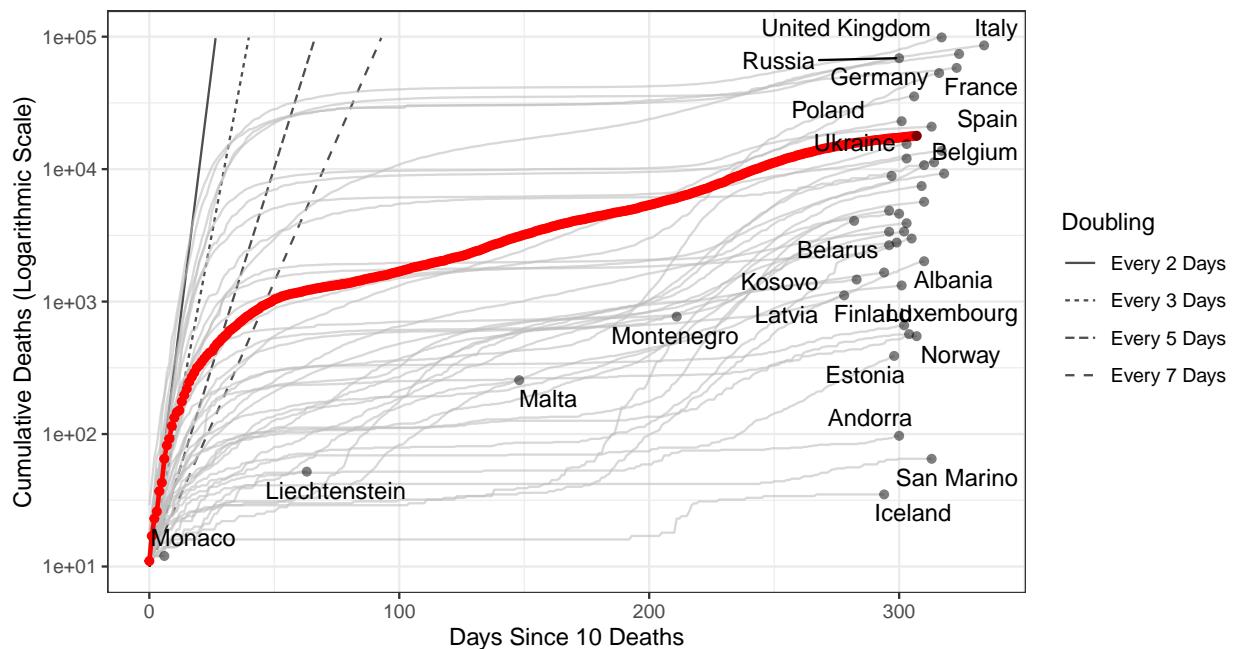


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 393,251 (95% CI: 378,290-408,213) 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

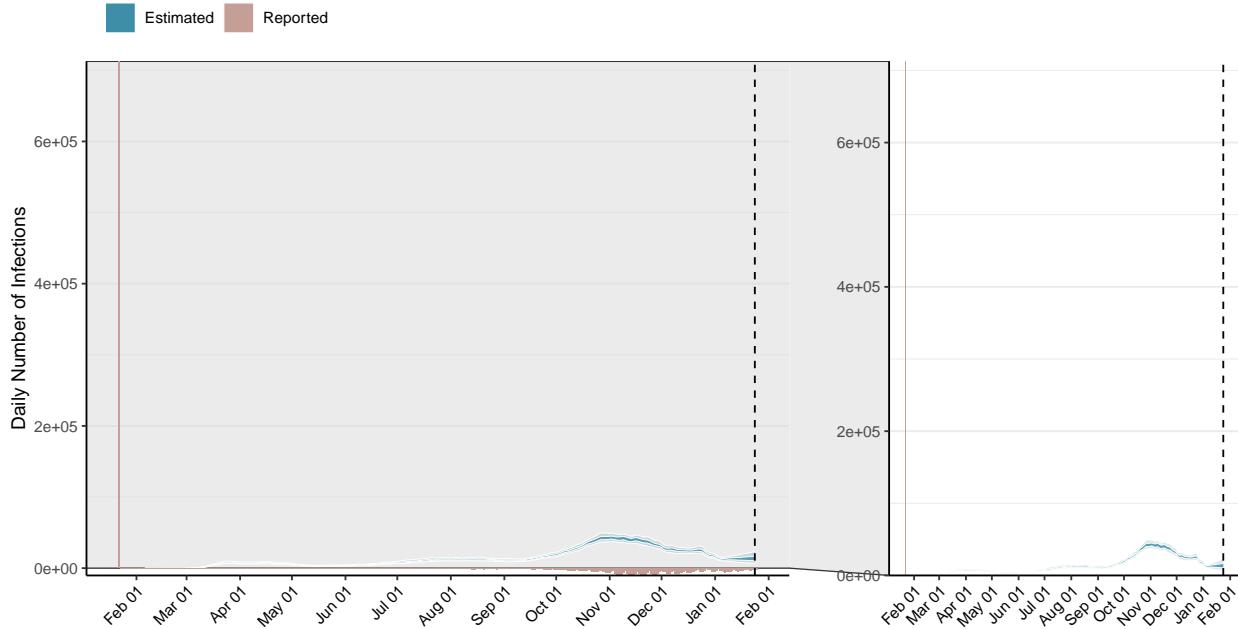


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

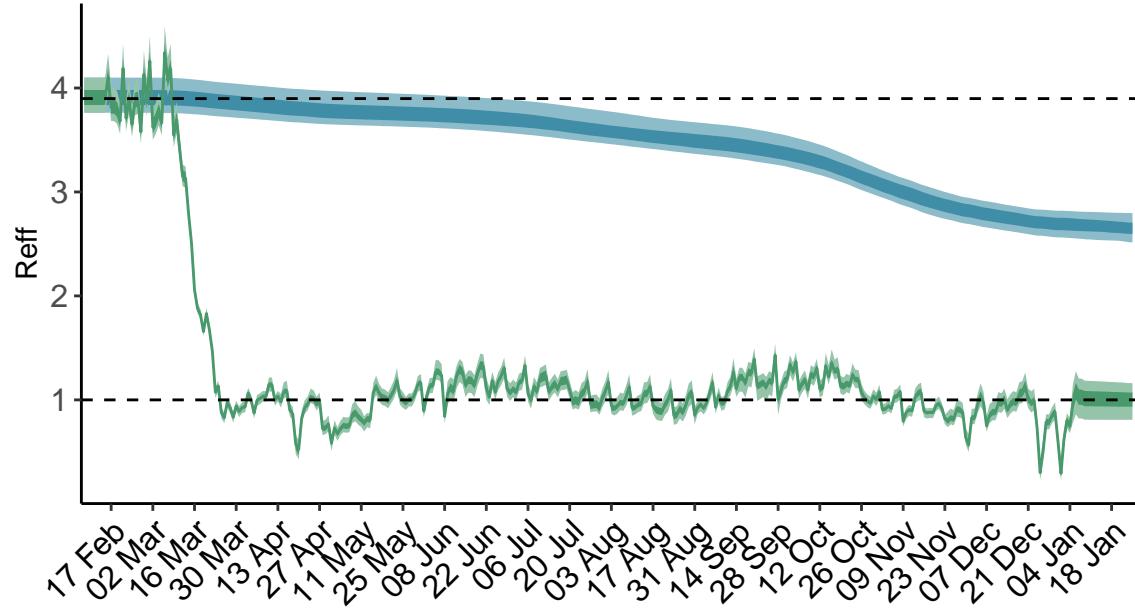


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

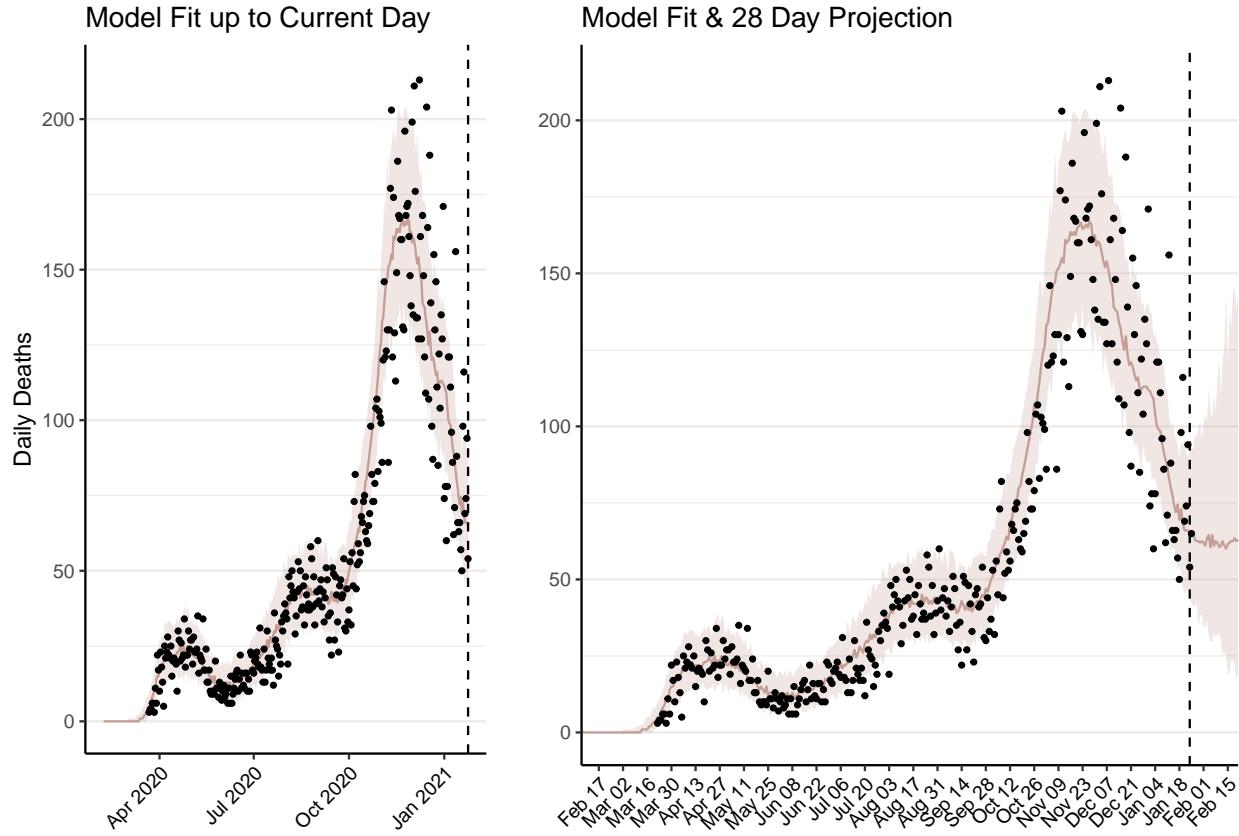


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 2,231 (95% CI: 2,137-2,326) patients requiring treatment with high-pressure oxygen at the current date to 2,450 (95% CI: 2,181-2,720) hospital beds being required on 2021-02-21 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 850 (95% CI: 818-882) patients requiring treatment with mechanical ventilation at the current date to 887 (95% CI: 795-979) by 2021-02-21. 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.**

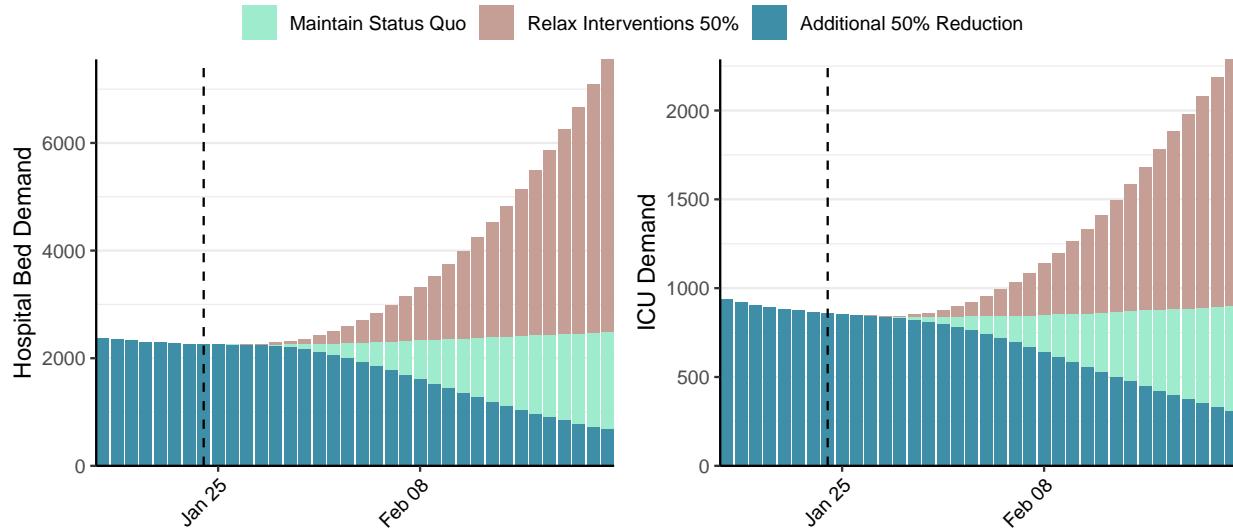


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 13,853 (95% CI: 12,891-14,816) at the current date to 1,345 (95% CI: 1,179-1,511) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 13,853 (95% CI: 12,891-14,816) at the current date to 78,910 (95% CI: 69,434-88,385) by 2021-02-21.

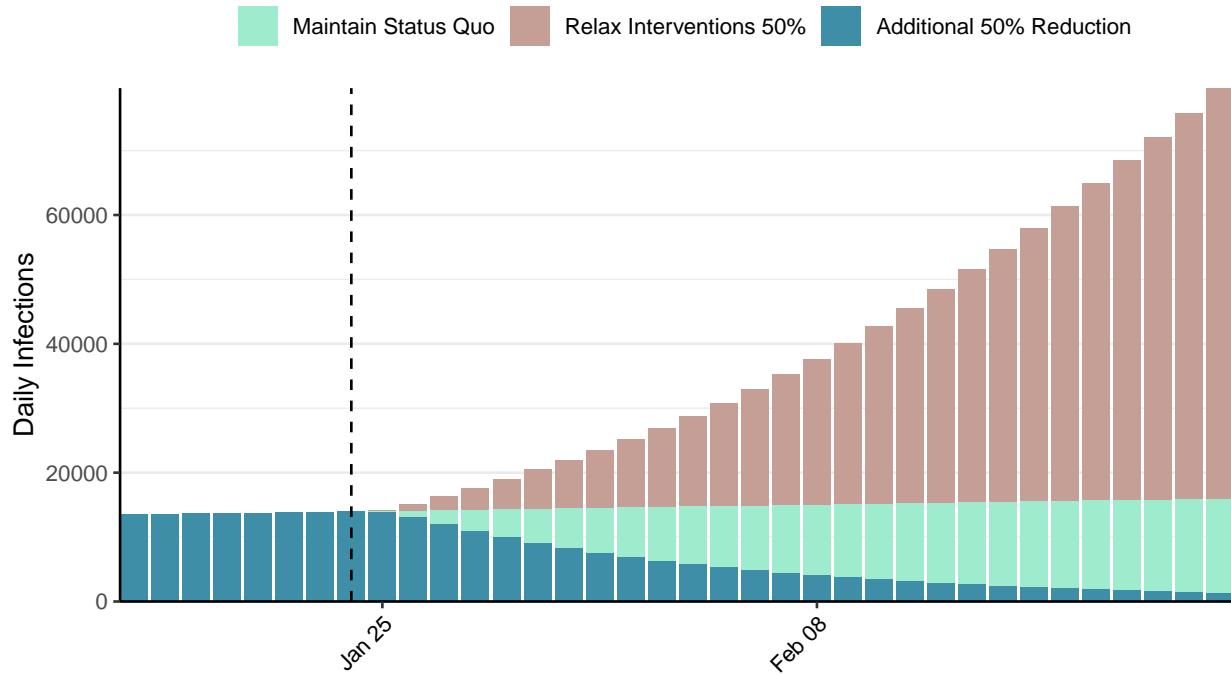


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Russia, 2021-01-24 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}
18,999	18,999	444	444	0.97 (95% CI: 0.76-1.24)

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.

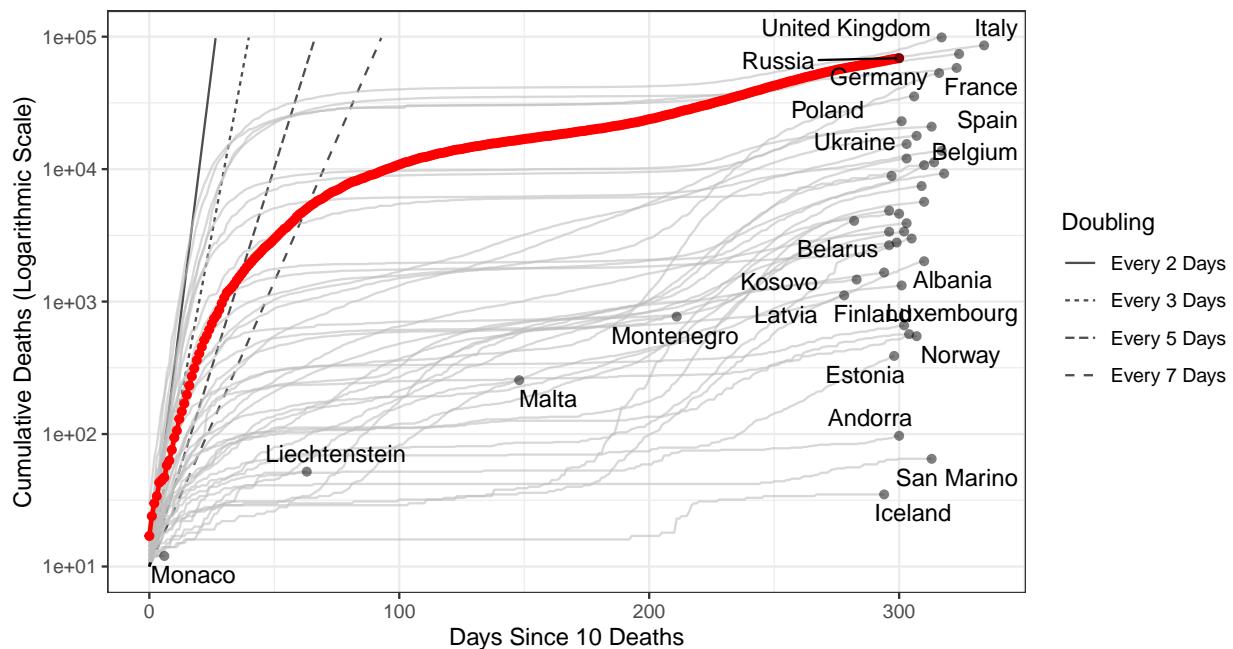


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 3,905,512 (95% CI: 3,721,652-4,089,373) 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

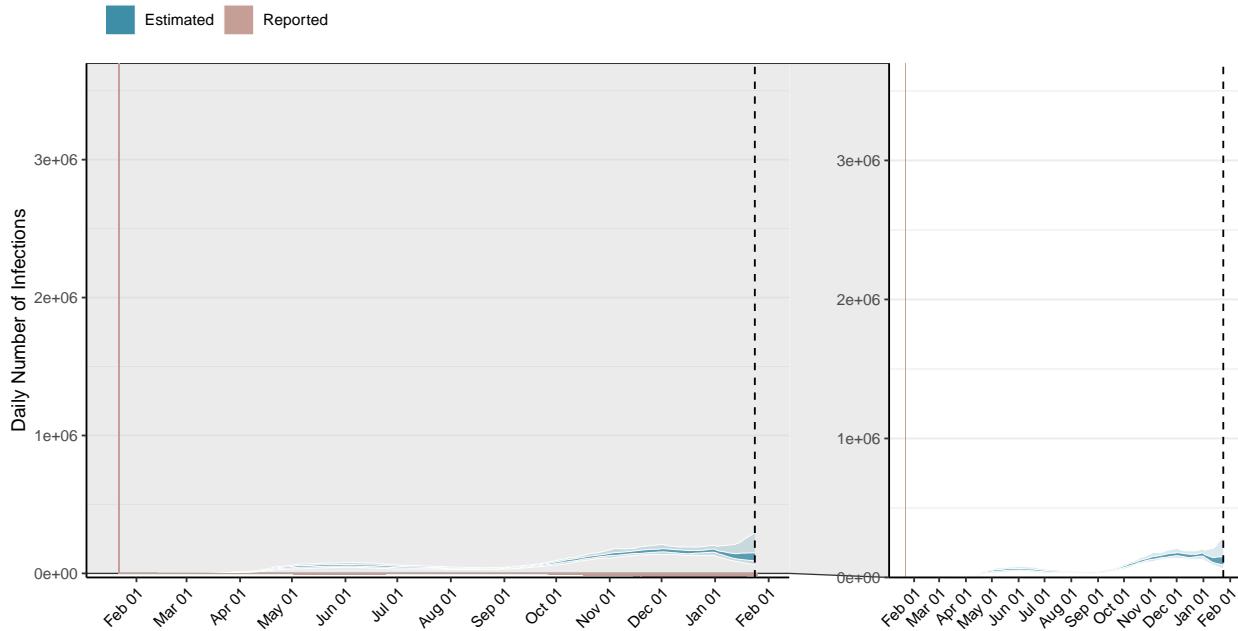


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

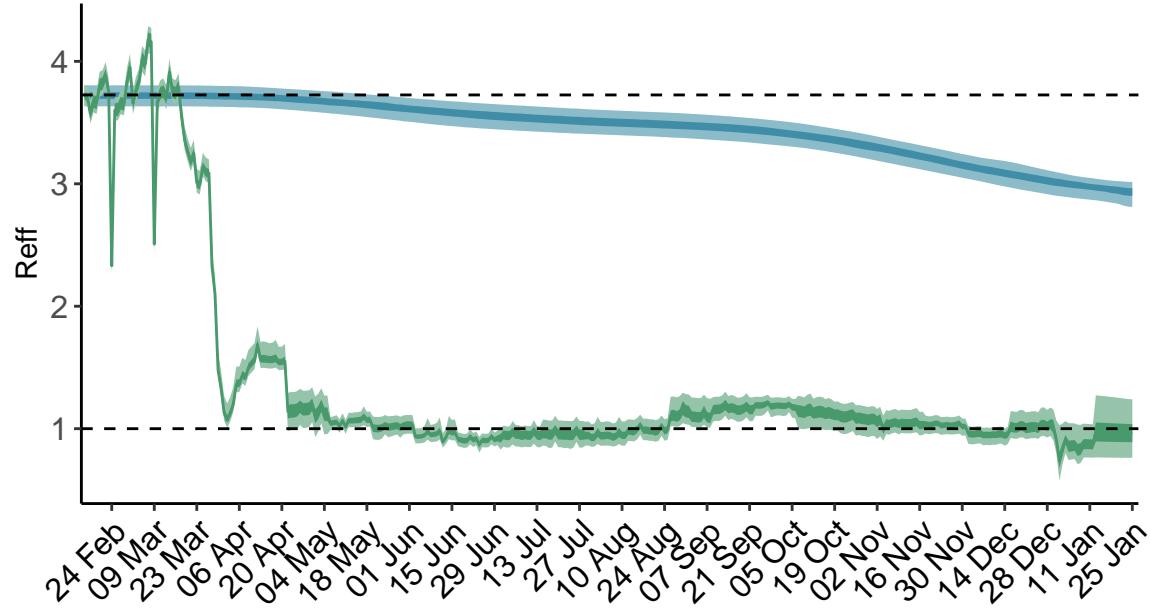


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

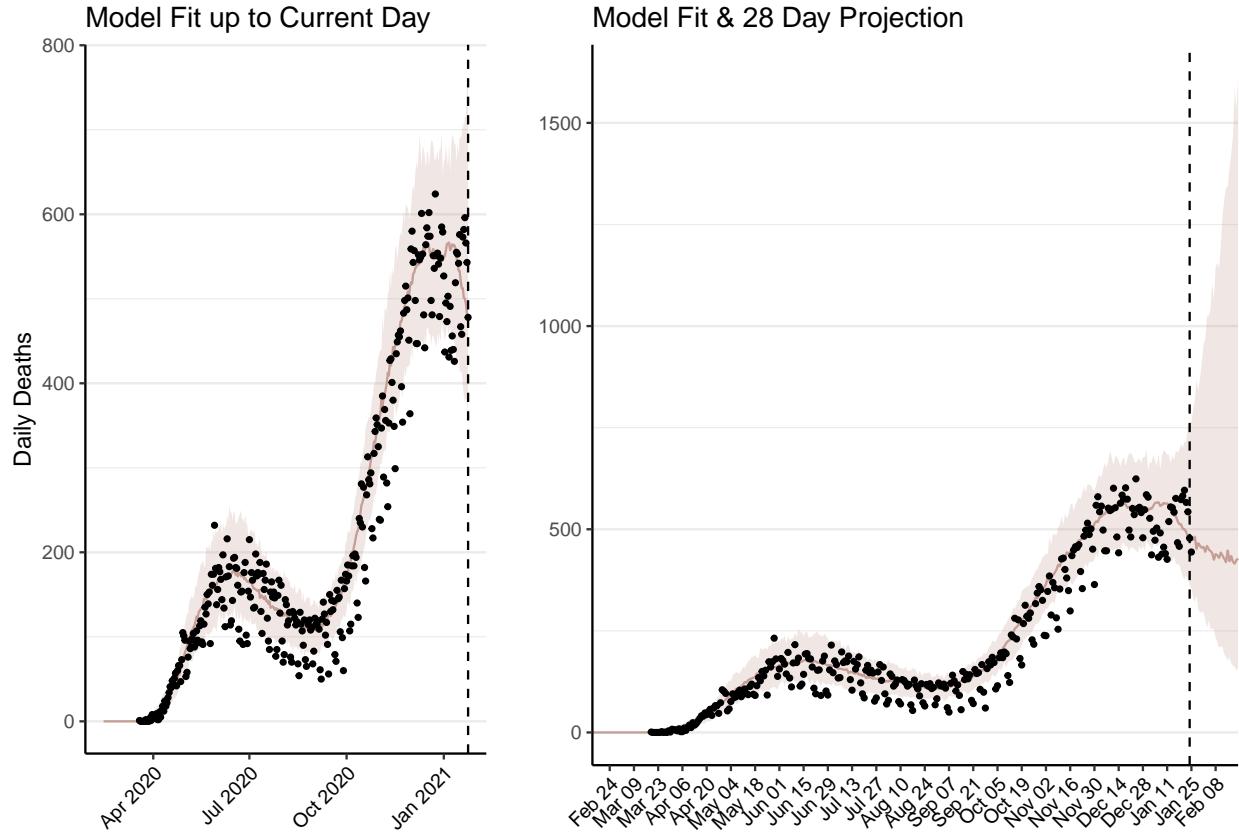


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 17,662 (95% CI: 16,708-18,617) patients requiring treatment with high-pressure oxygen at the current date to 19,524 (95% CI: 15,845-23,203) hospital beds being required on 2021-02-21 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 6,793 (95% CI: 6,468-7,118) patients requiring treatment with mechanical ventilation at the current date to 7,176 (95% CI: 5,978-8,374) by 2021-02-21. 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.

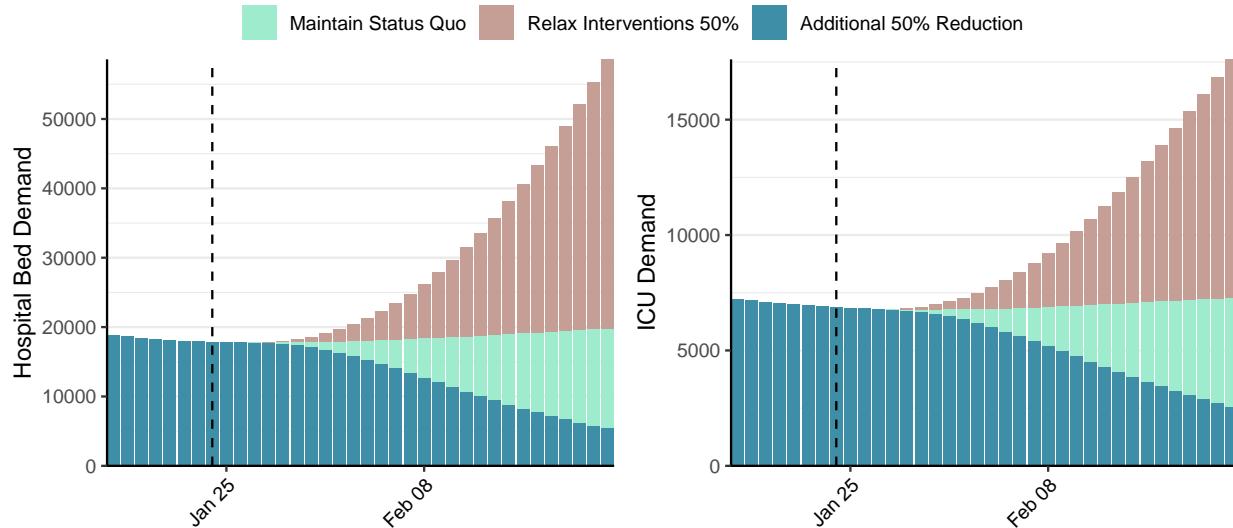


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 131,489 (95% CI: 118,585-144,393) at the current date to 12,947 (95% CI: 10,028-15,867) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 131,489 (95% CI: 118,585-144,393) at the current date to 669,243 (95% CI: 556,926-781,561) by 2021-02-21.

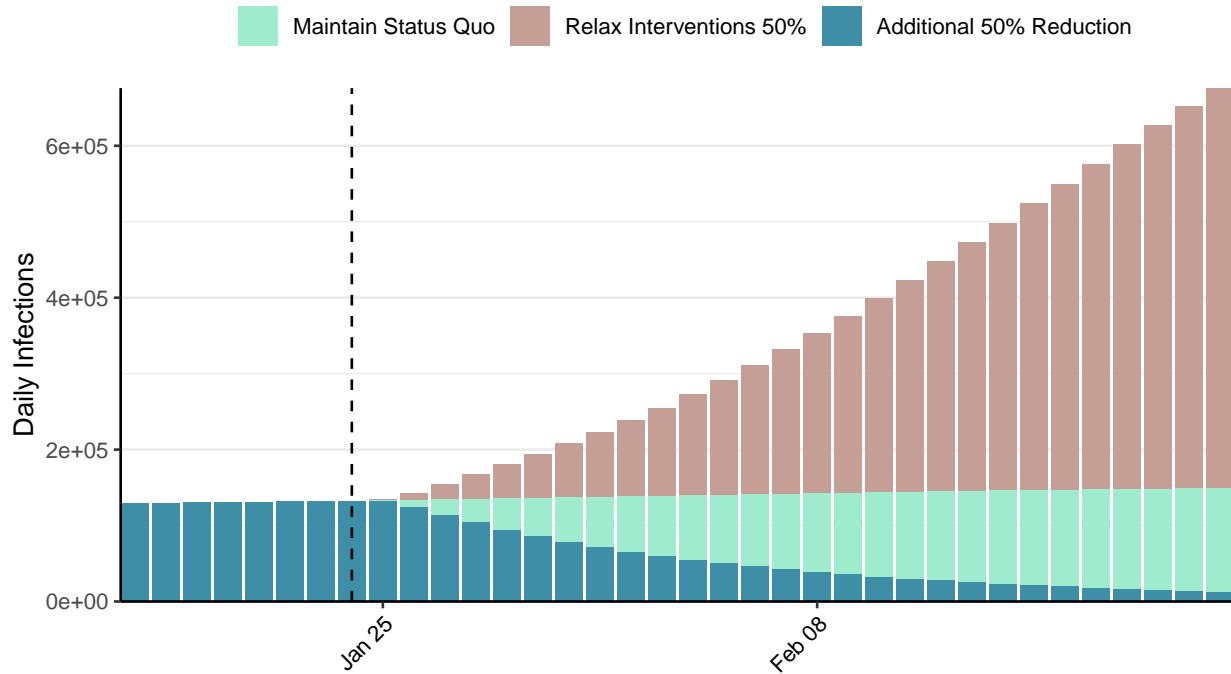


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Rwanda, 2021-01-24 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}
336	336	3	3	1.27 (95% CI: 1.12-1.42)

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 3 deaths have been reported to date**

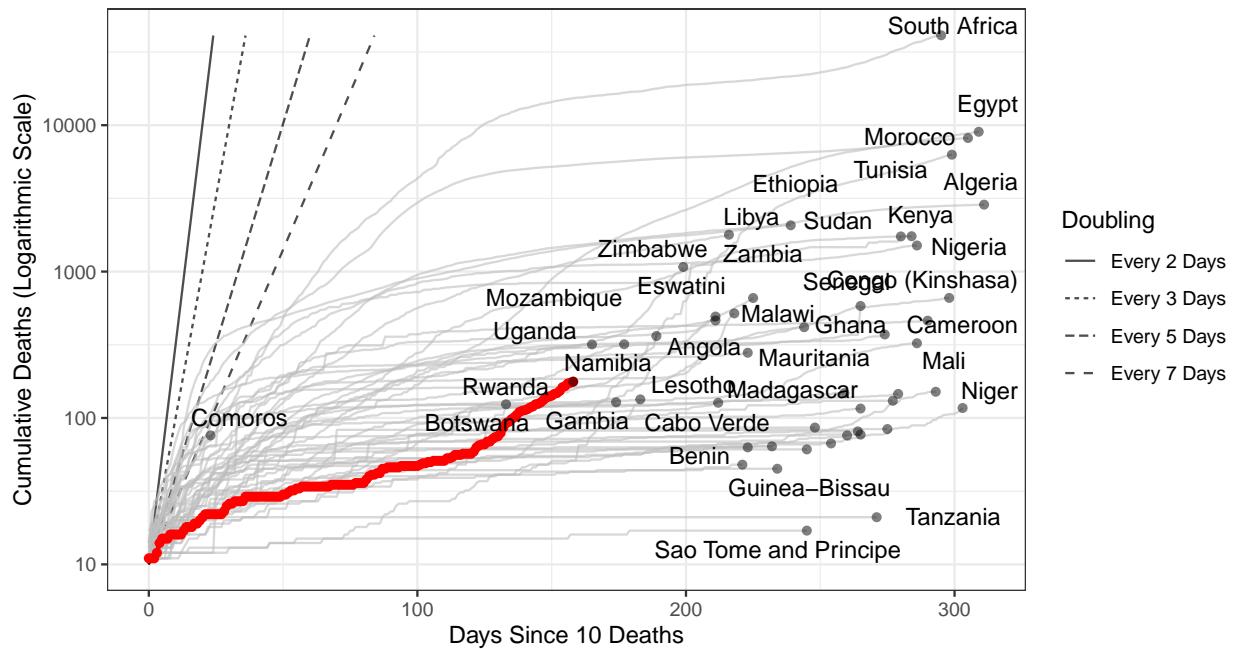


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 133,145 (95% CI: 120,344-145,945) 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

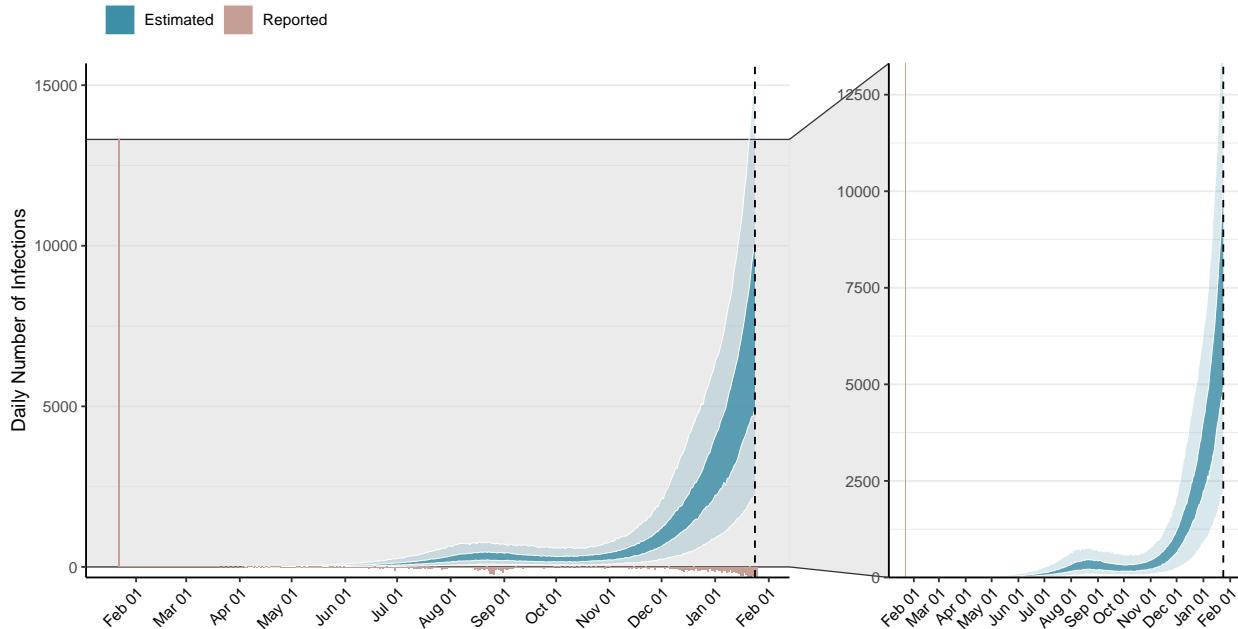


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

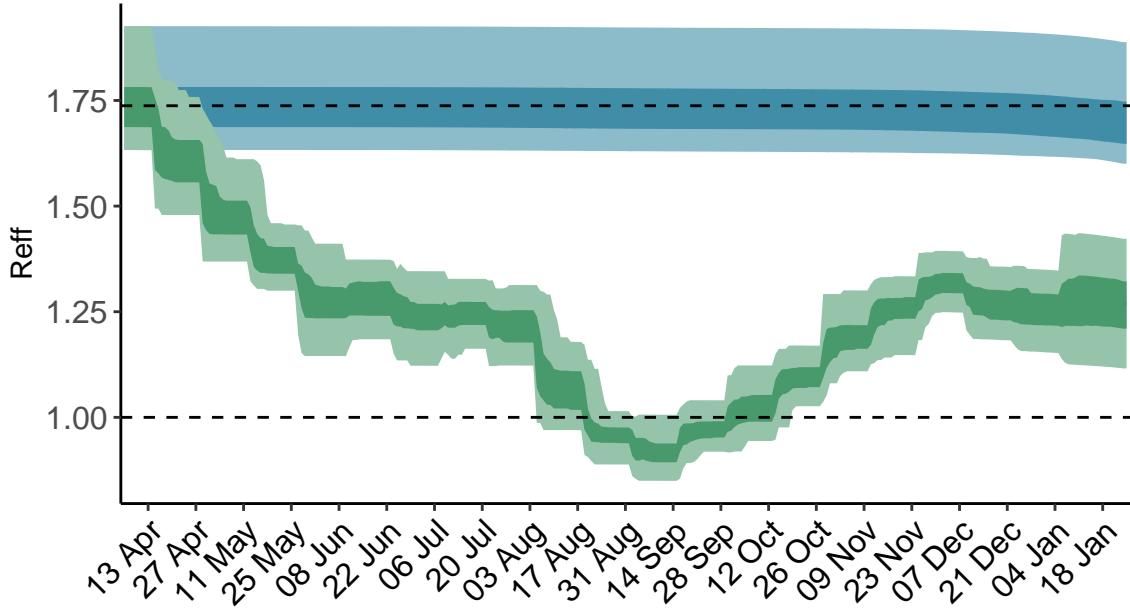


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

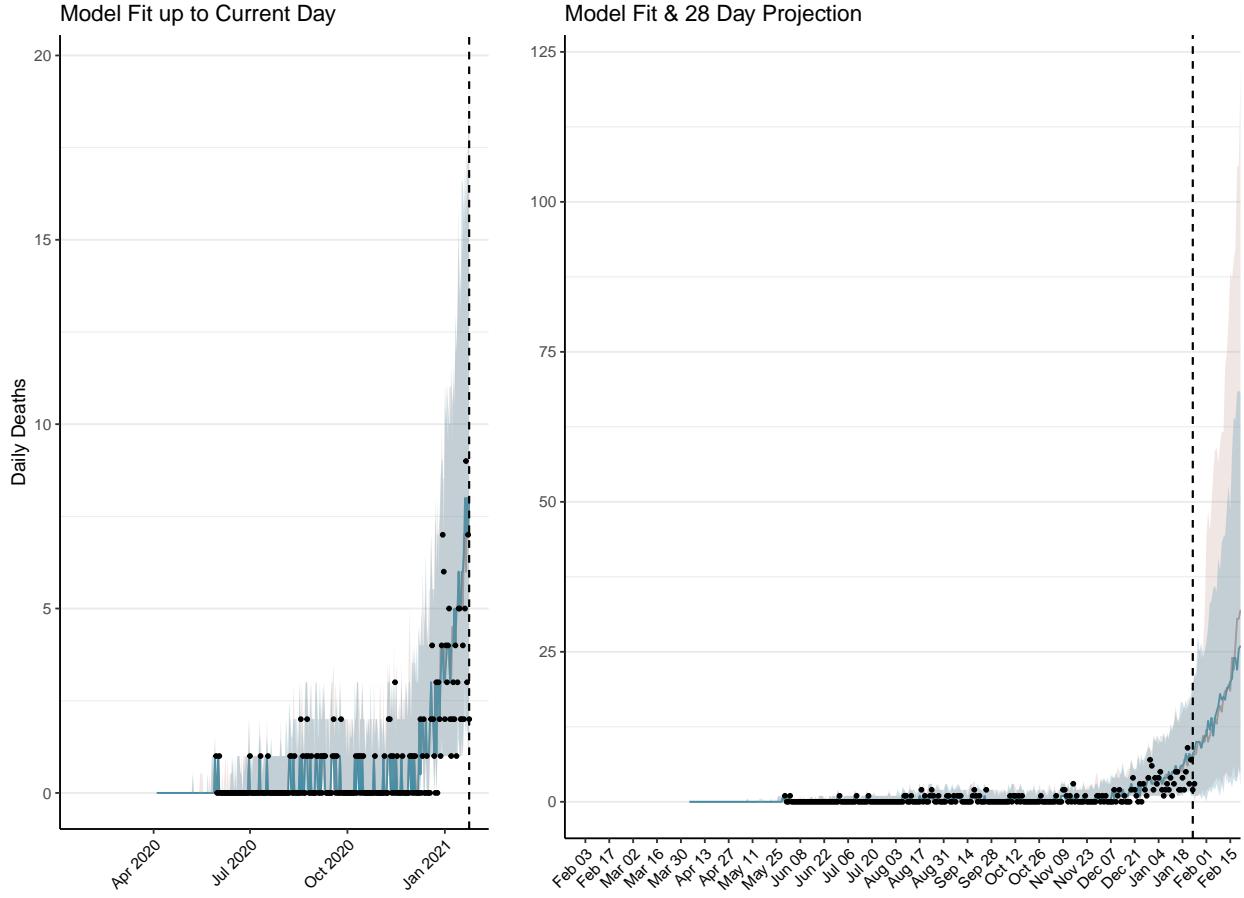


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 409 (95% CI: 369-448) patients requiring treatment with high-pressure oxygen at the current date to 1,176 (95% CI: 1,042-1,309) hospital beds being required on 2021-02-21 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: 137-165) patients requiring treatment with mechanical ventilation at the current date to 321 (95% CI: 301-340) by 2021-02-21. 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.**

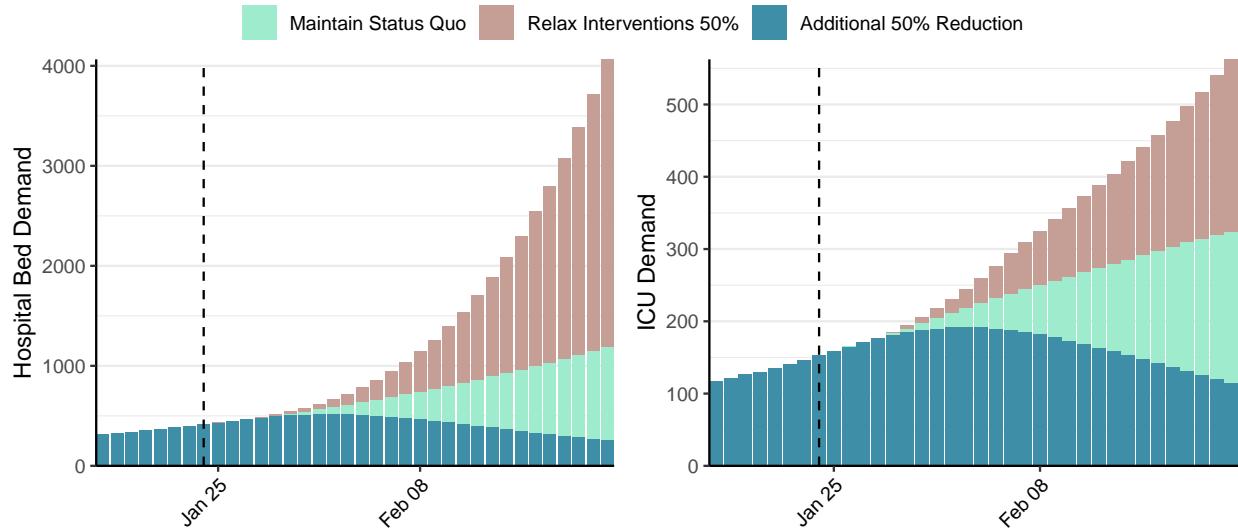


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 7,626 (95% CI: 6,848-8,404) at the current date to 1,512 (95% CI: 1,326-1,698) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 7,626 (95% CI: 6,848-8,404) at the current date to 117,115 (95% CI: 104,959-129,270) by 2021-02-21.

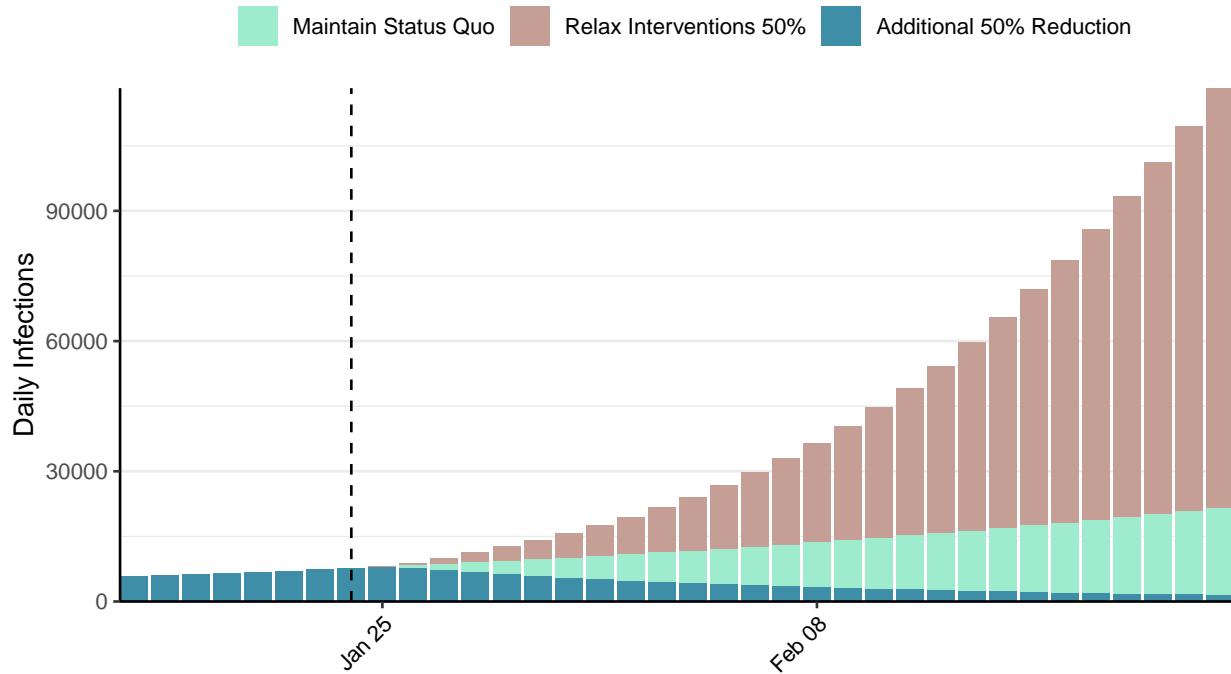


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Sudan, 2021-01-24 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}
95	95	0	0	1.23 (95% CI: 1.03-1.47)

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. Sudan is not shown in the following plot as only 0 deaths have been reported to date**

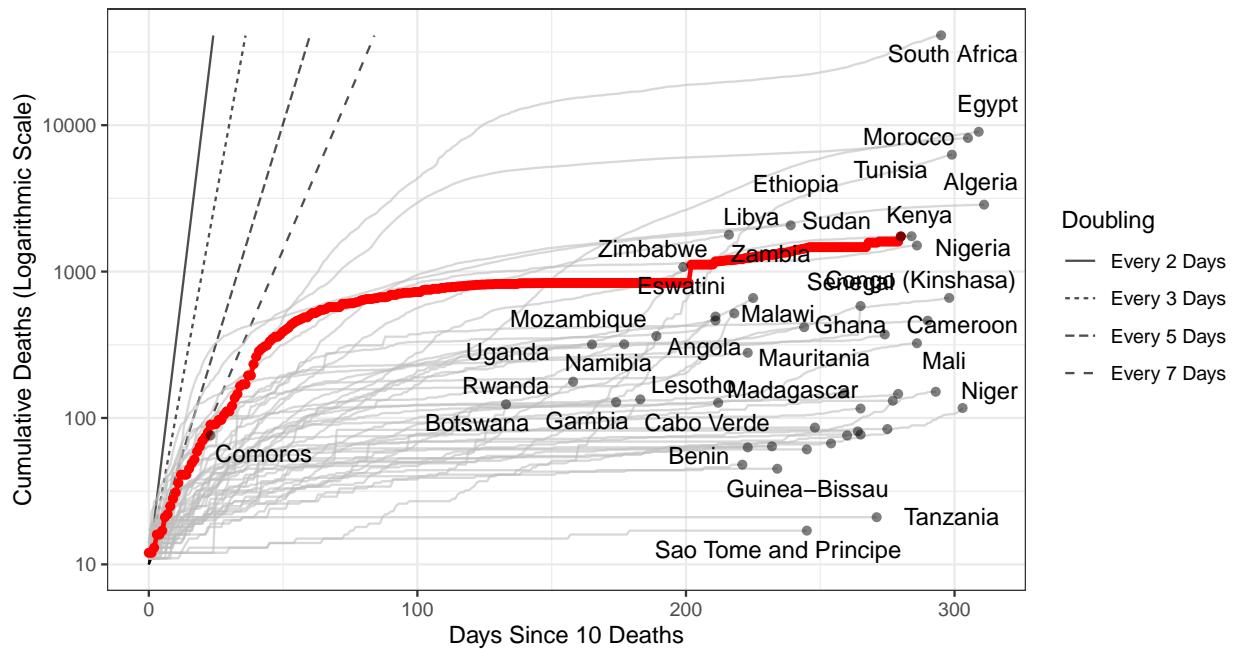


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 226,301 (95% CI: 213,360-239,241) 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

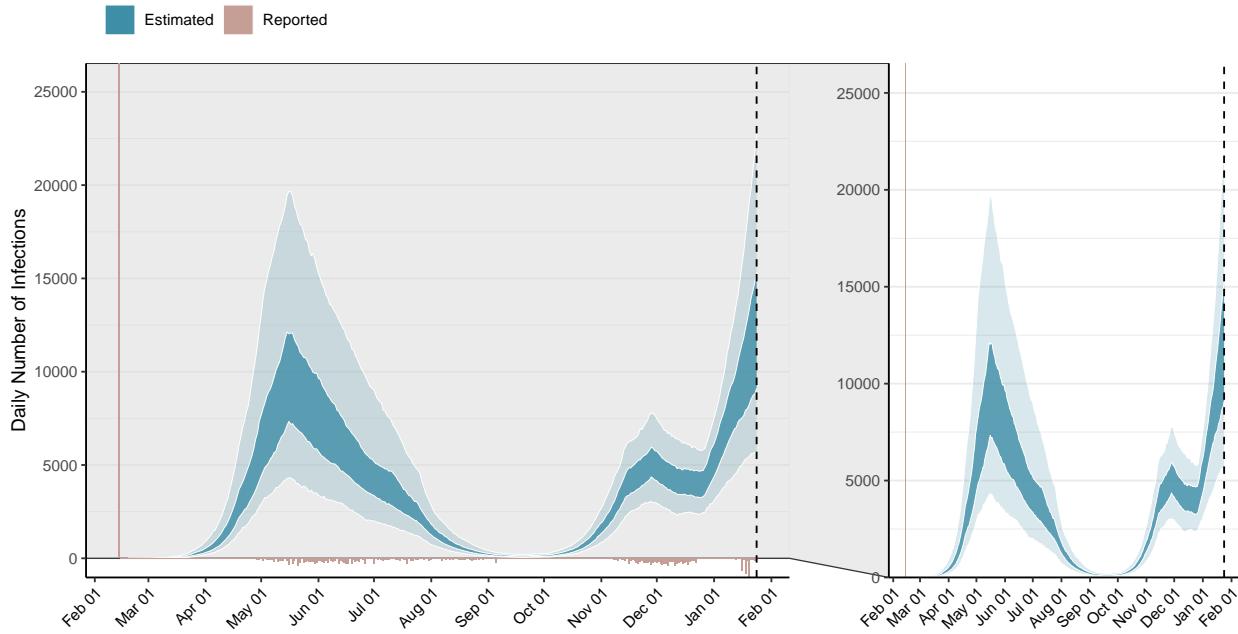


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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](#)

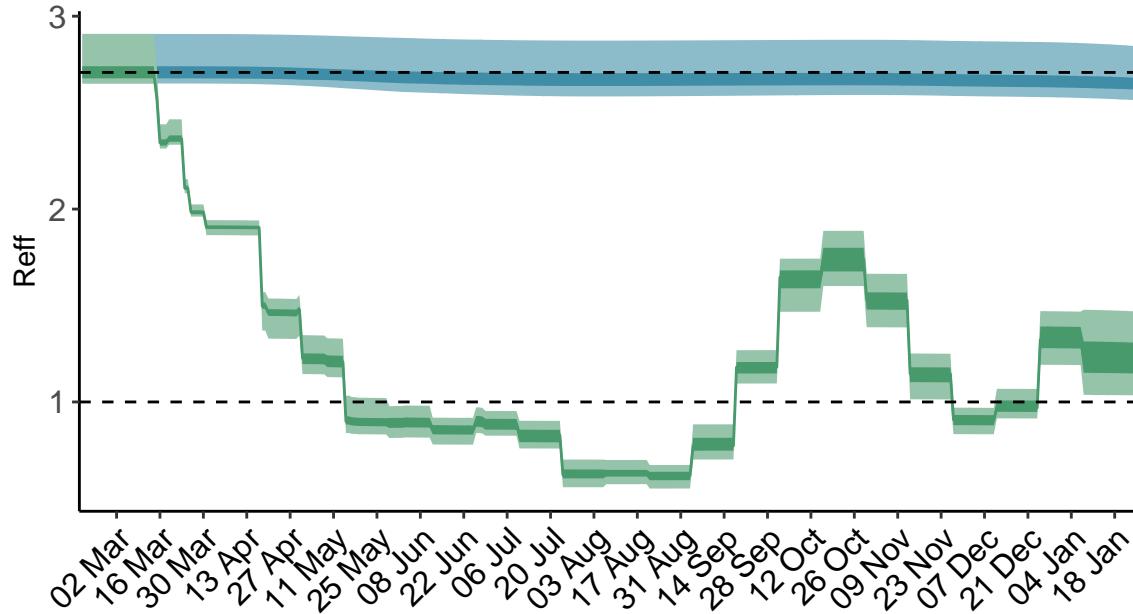


Figure 3: **Time-varying effective reproduction number, R_{eff} .** R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

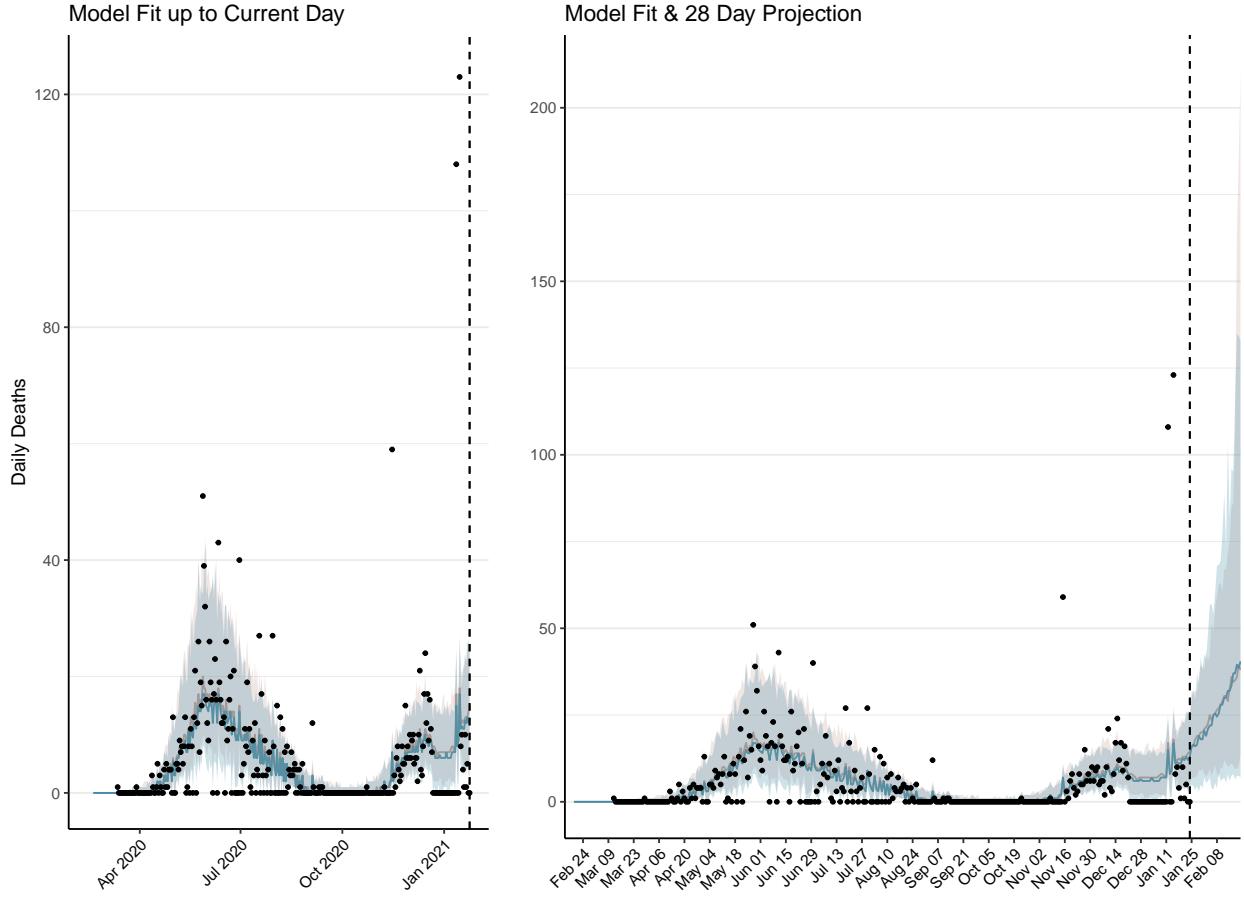


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 735 (95% CI: 691-779) patients requiring treatment with high-pressure oxygen at the current date to 2,058 (95% CI: 1,796-2,320) hospital beds being required on 2021-02-21 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 268 (95% CI: 252-283) patients requiring treatment with mechanical ventilation at the current date to 727 (95% CI: 643-811) by 2021-02-21. 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.**

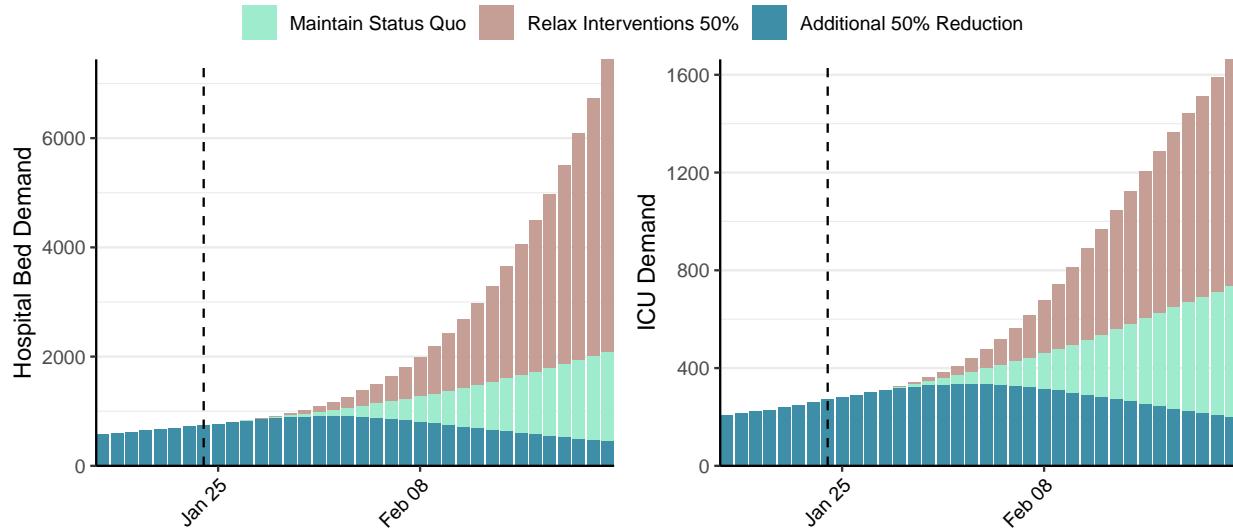


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 12,677 (95% CI: 11,686-13,669) at the current date to 2,481 (95% CI: 2,133-2,828) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 12,677 (95% CI: 11,686-13,669) at the current date to 219,824 (95% CI: 186,859-252,790) by 2021-02-21.

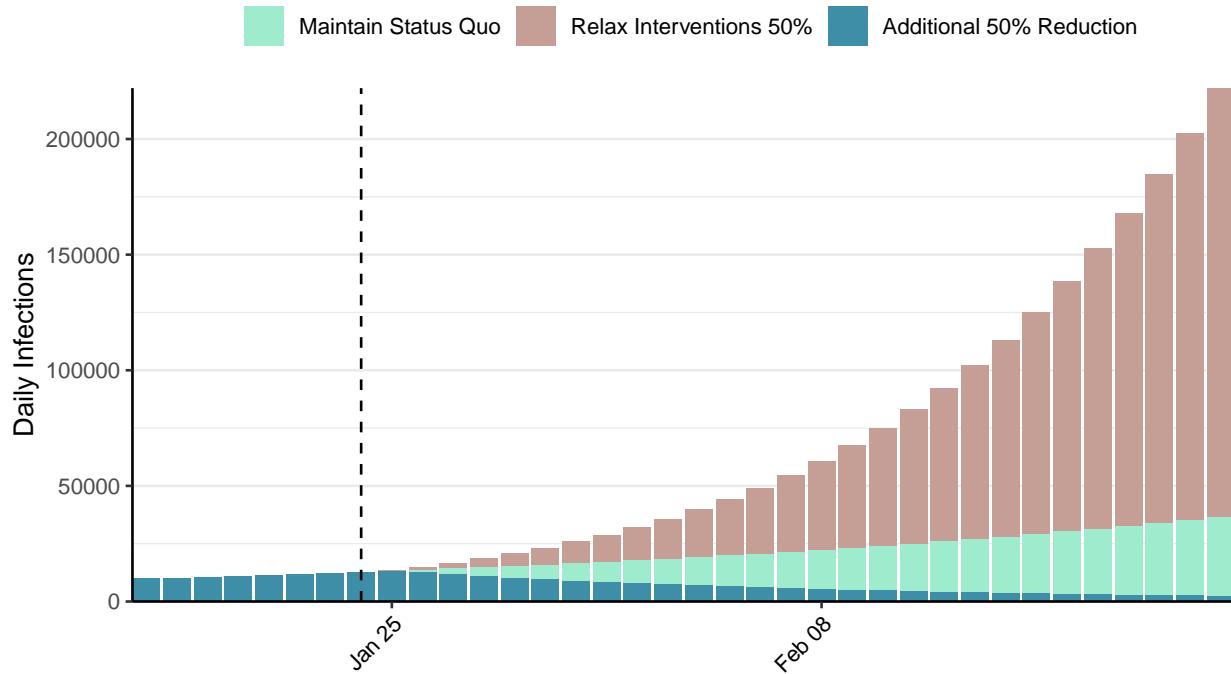


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Senegal, 2021-01-24 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}
266	266	7	7	0.99 (95% CI: 0.81-1.23)

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. Senegal is not shown in the following plot as only 7 deaths have been reported to date**

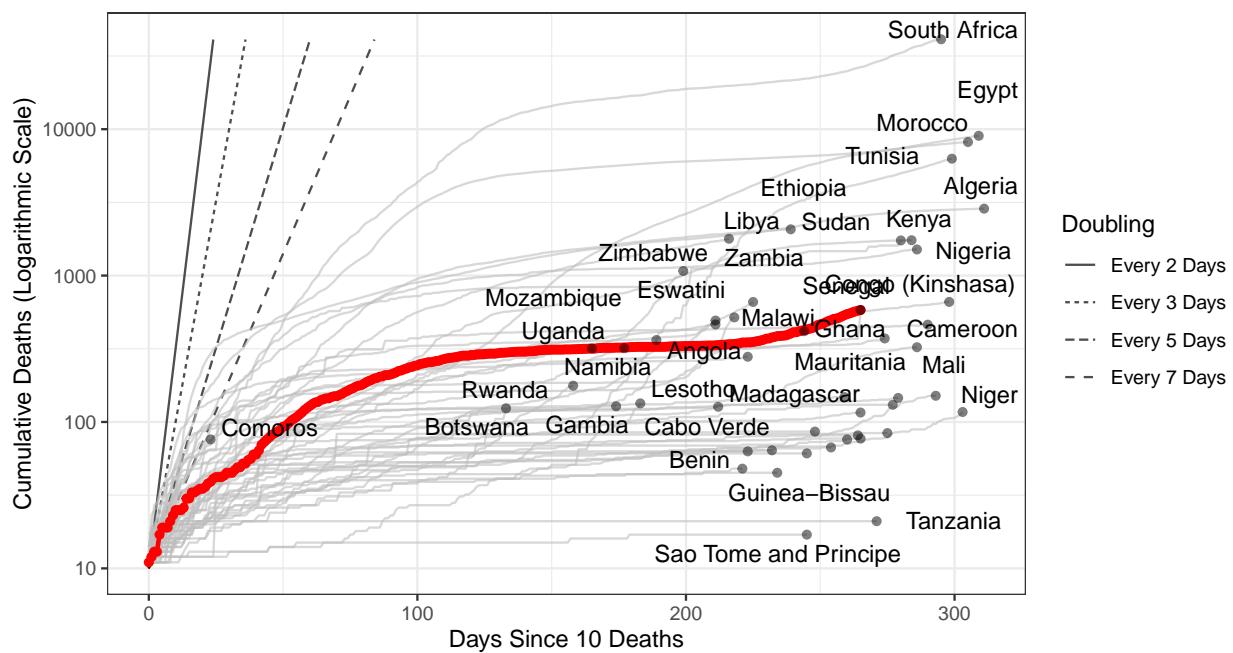


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 207,893 (95% CI: 197,049–218,737) 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

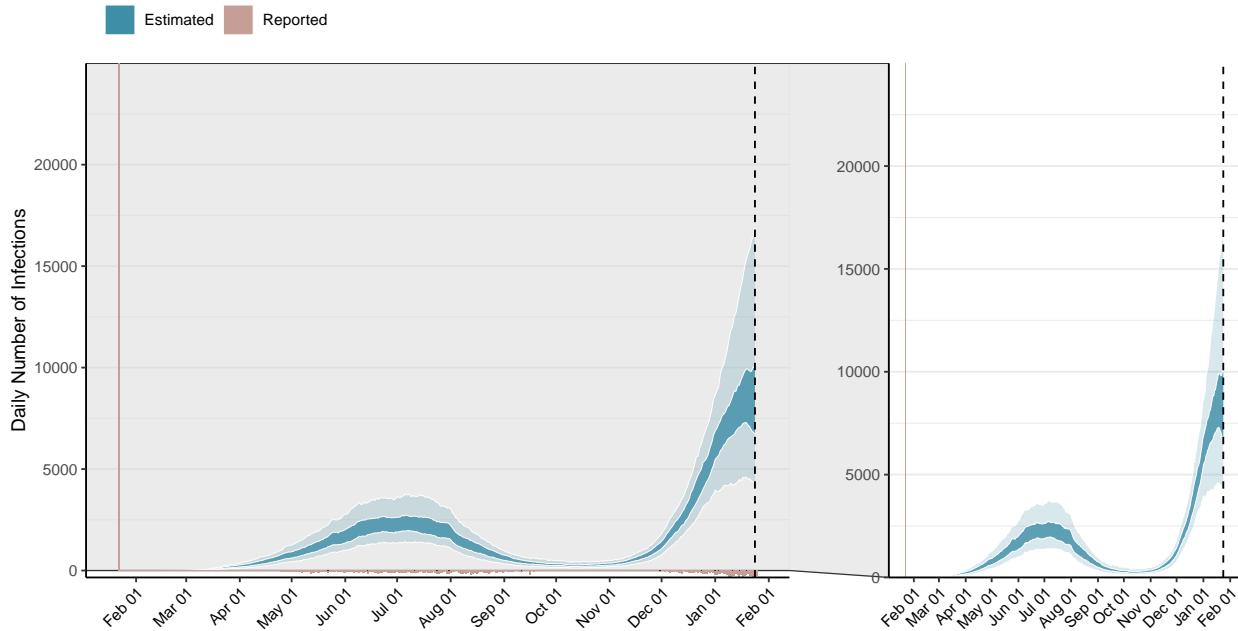


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

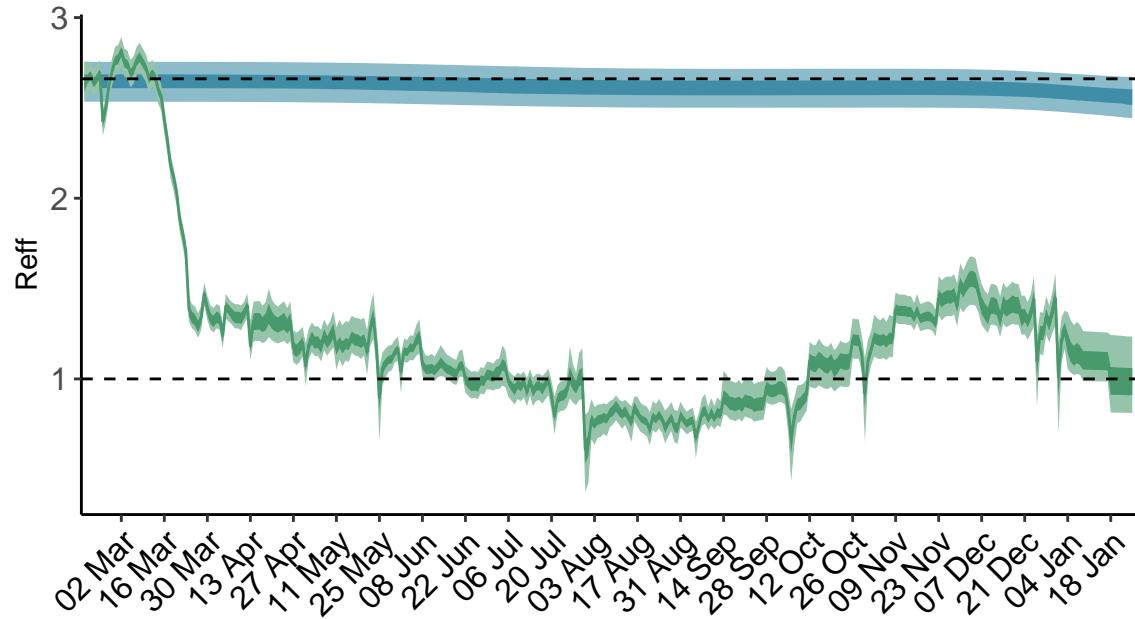


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

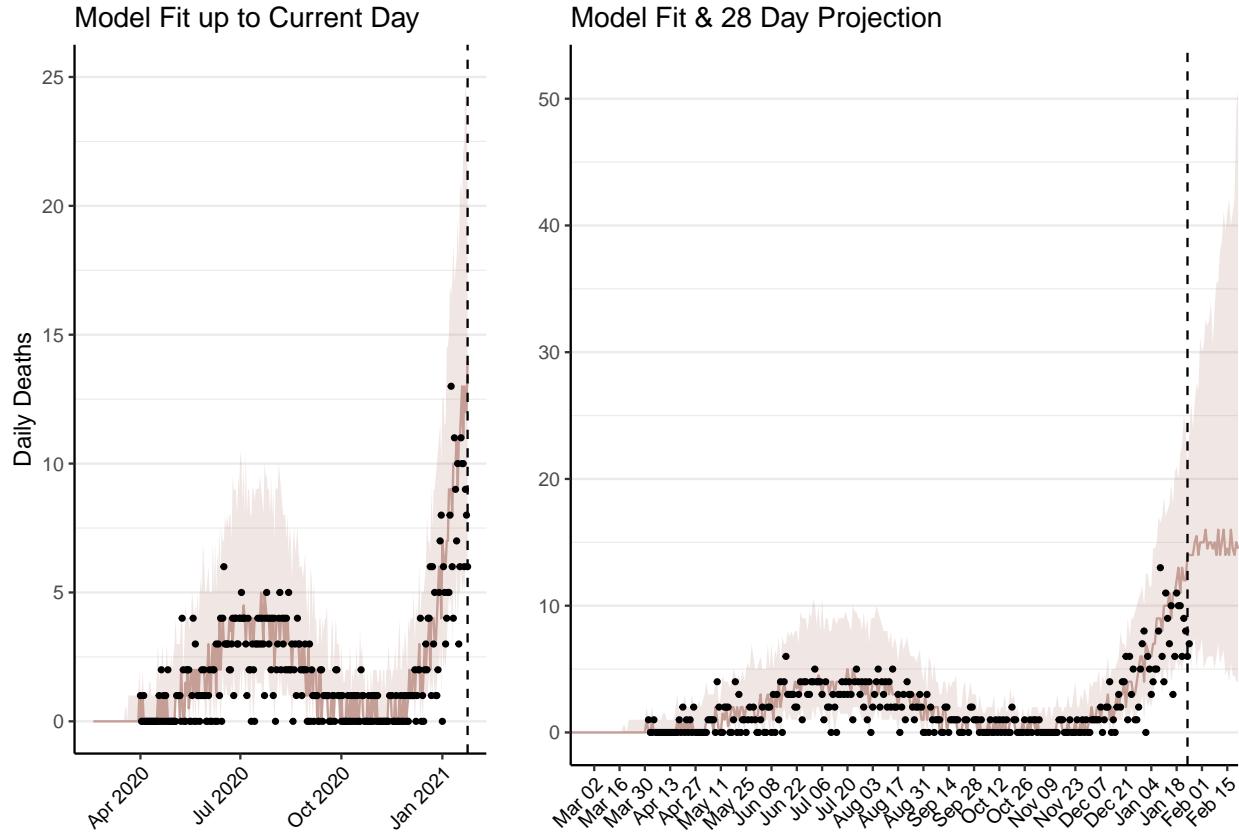


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 614 (95% CI: 581-647) patients requiring treatment with high-pressure oxygen at the current date to 744 (95% CI: 647-842) hospital beds being required on 2021-02-21 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 232 (95% CI: 219-244) patients requiring treatment with mechanical ventilation at the current date to 286 (95% CI: 251-321) by 2021-02-21. 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.**

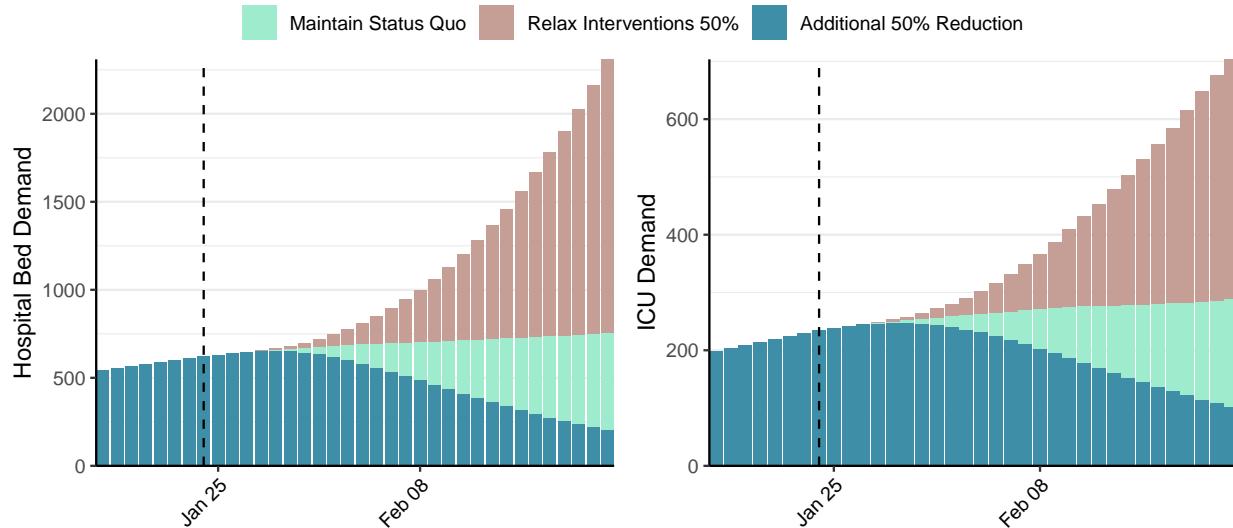


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 8,729 (95% CI: 8,076-9,382) at the current date to 825 (95% CI: 699-950) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 8,729 (95% CI: 8,076-9,382) at the current date to 54,647 (95% CI: 45,555-63,738) by 2021-02-21.

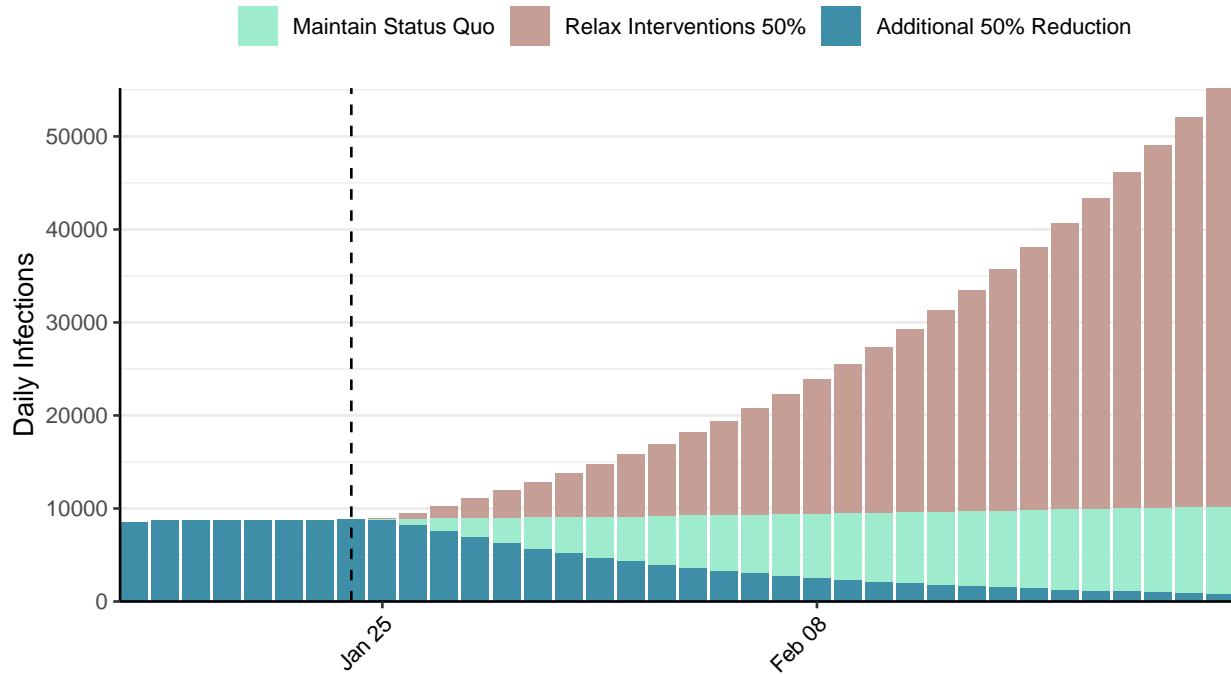


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Sierra Leone, 2021-01-24 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}
34	34	0	0	1.09 (95% CI: 0.84-1.38)

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. Sierra Leone is not shown in the following plot as only 0 deaths have been reported to date**

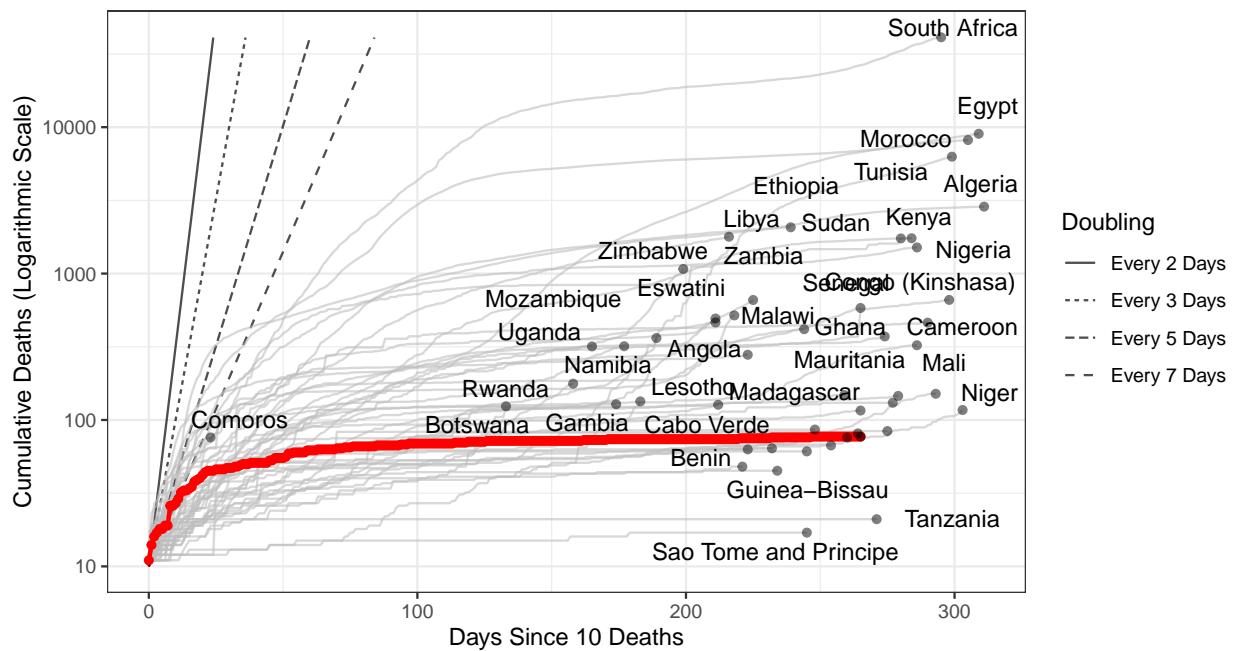


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 1,621 (95% CI: 1,347-1,895) 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).

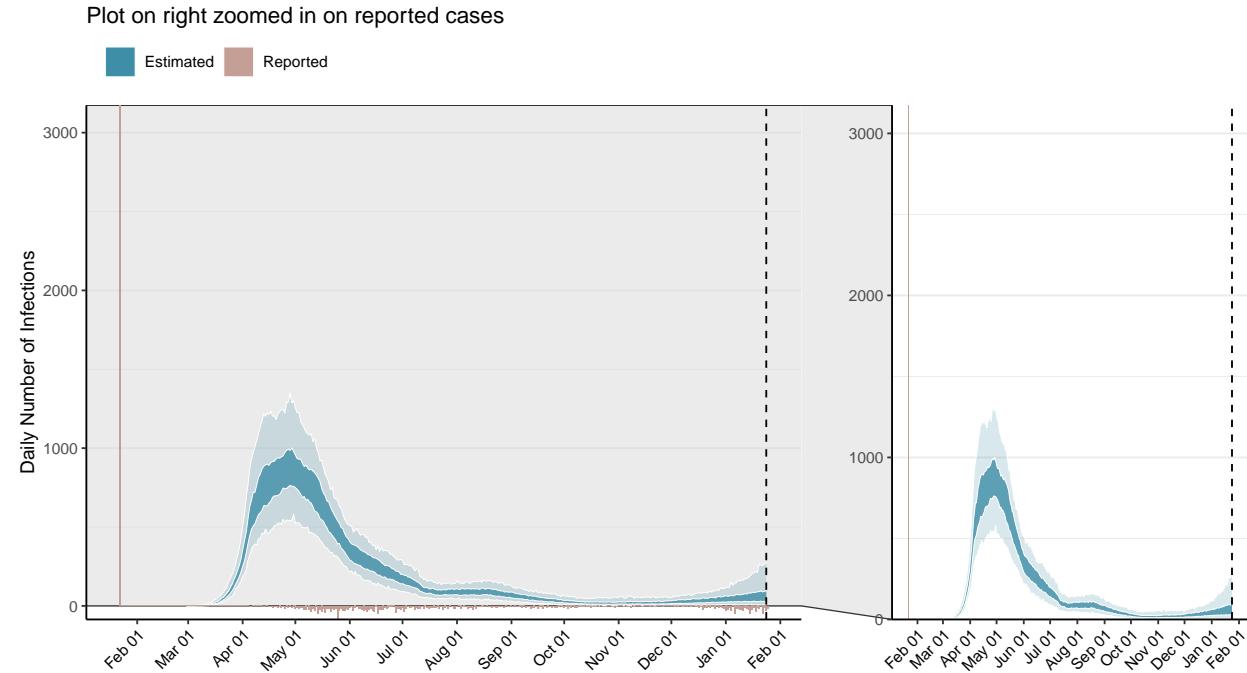


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

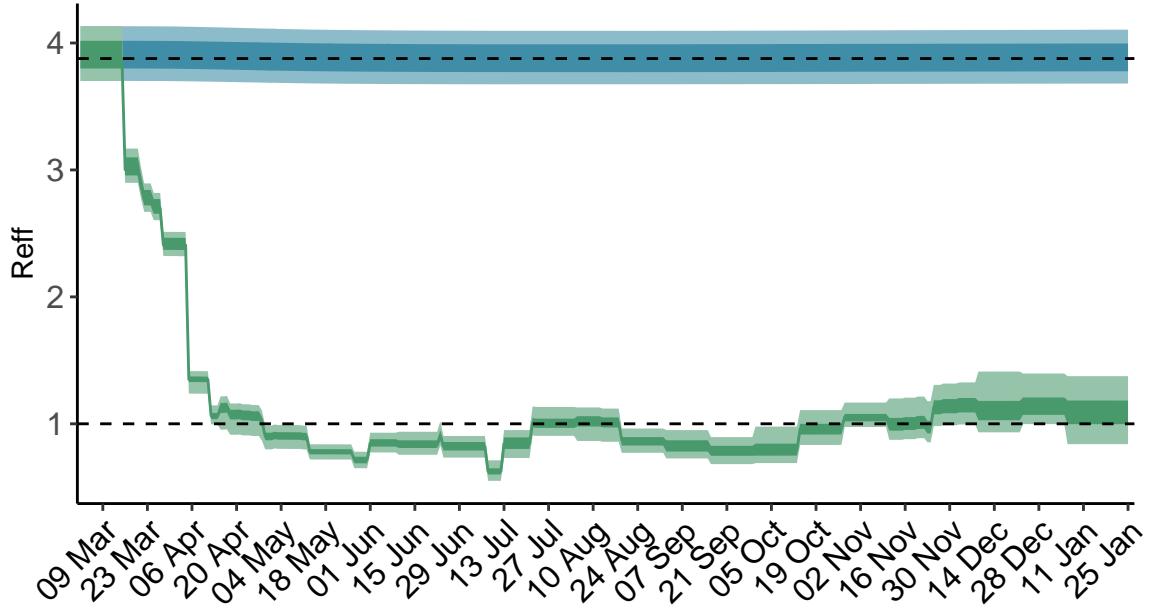


Figure 3: **Time-varying effective reproduction number, R_{eff} .** R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

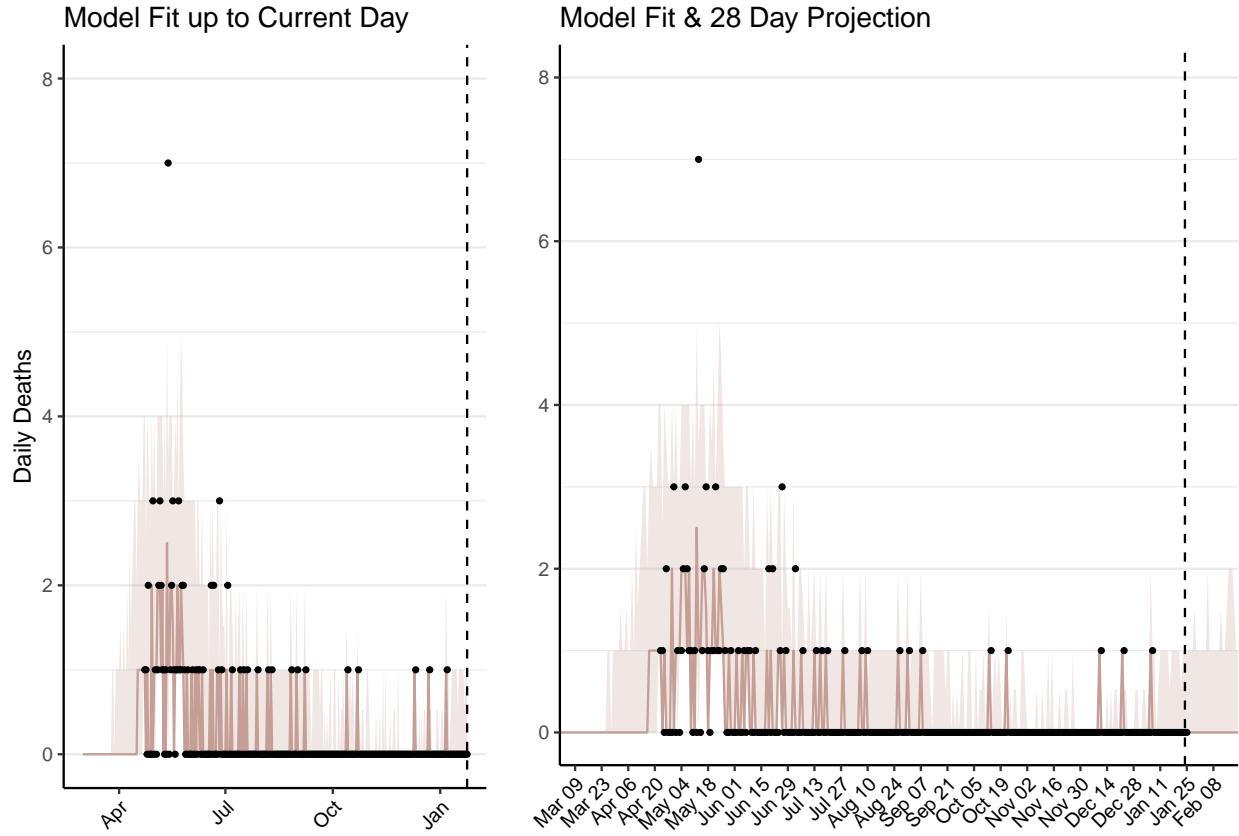


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 5 (95% CI: 4-5) patients requiring treatment with high-pressure oxygen at the current date to 10 (95% CI: 7-12) hospital beds being required on 2021-02-21 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: 1-2) patients requiring treatment with mechanical ventilation at the current date to 3 (95% CI: 3-4) by 2021-02-21. 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.**

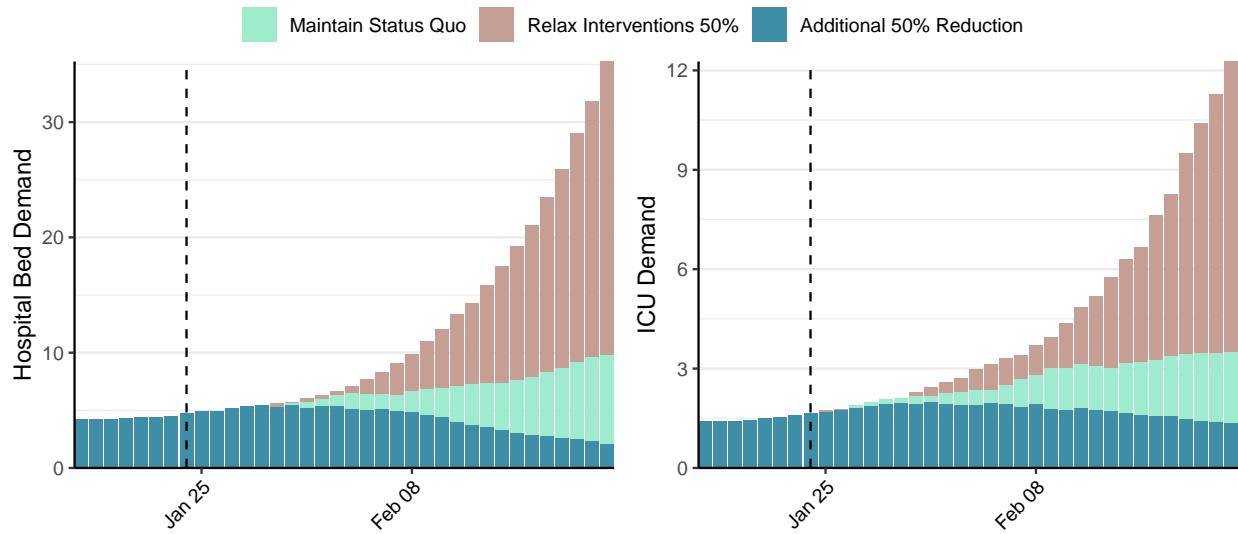


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 75 (95% CI: 60-90) at the current date to 11 (95% CI: 8-14) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 75 (95% CI: 60-90) at the current date to 1,082 (95% CI: 739-1,425) by 2021-02-21.

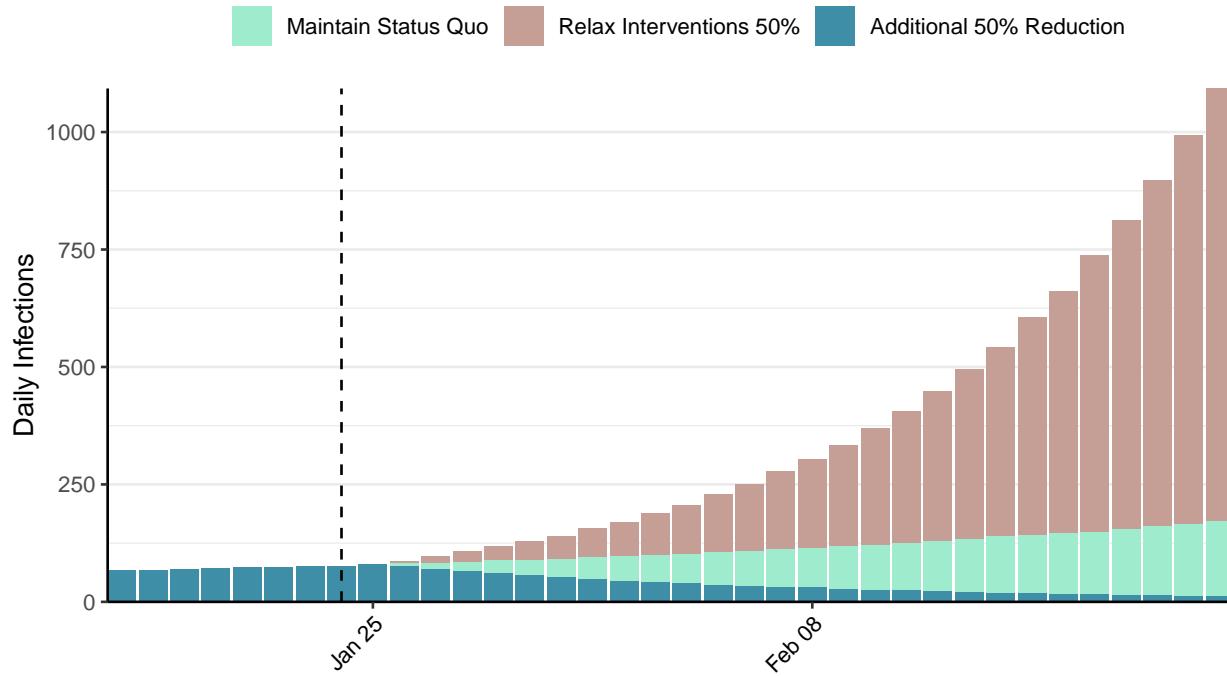


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for El Salvador, 2021-01-24 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}
261	261	11	11	1.11 (95% CI: 0.97-1.31)

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.

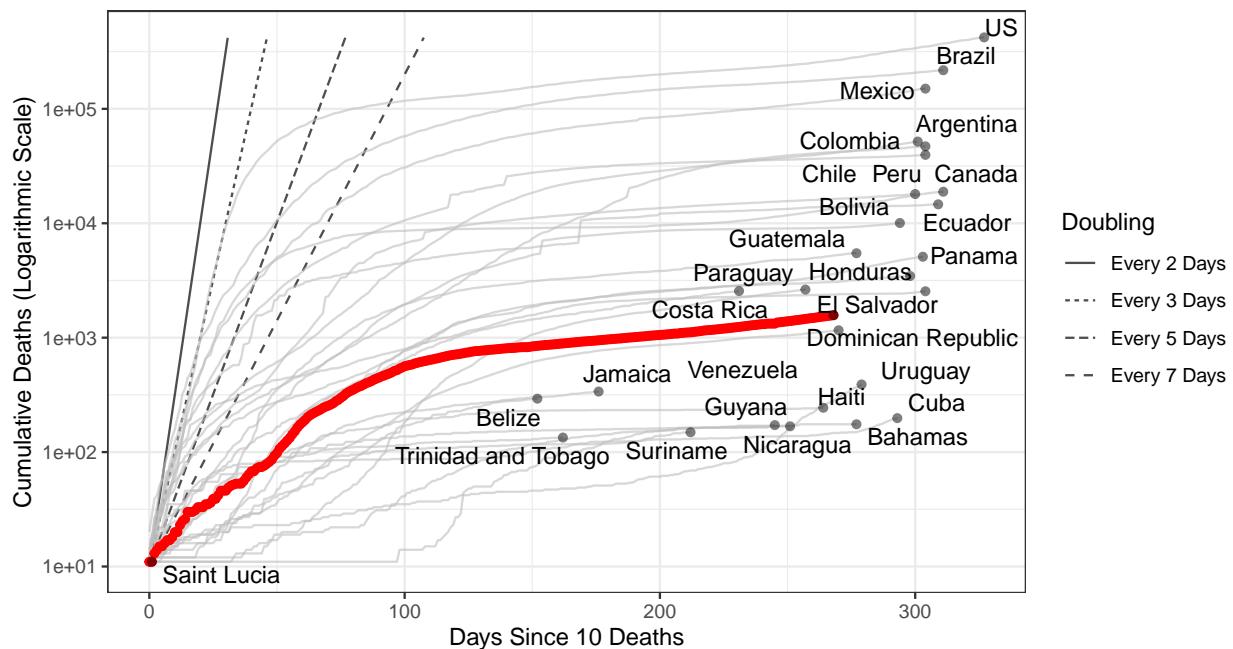


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 94,568 (95% CI: 88,123-101,013) 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

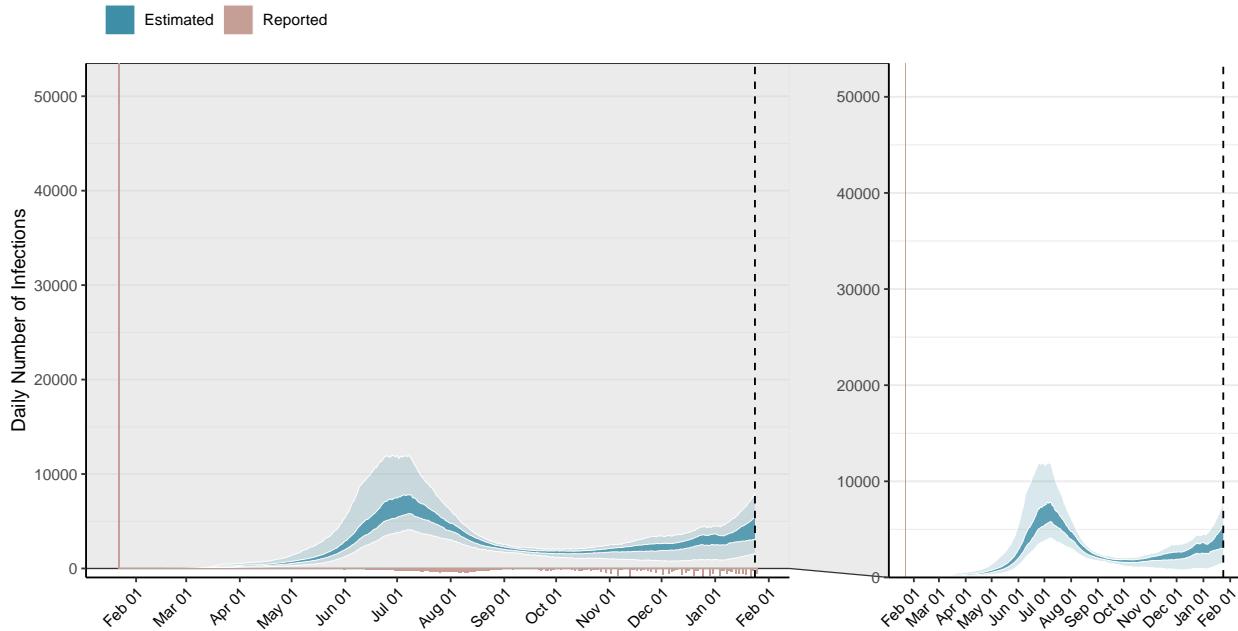


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

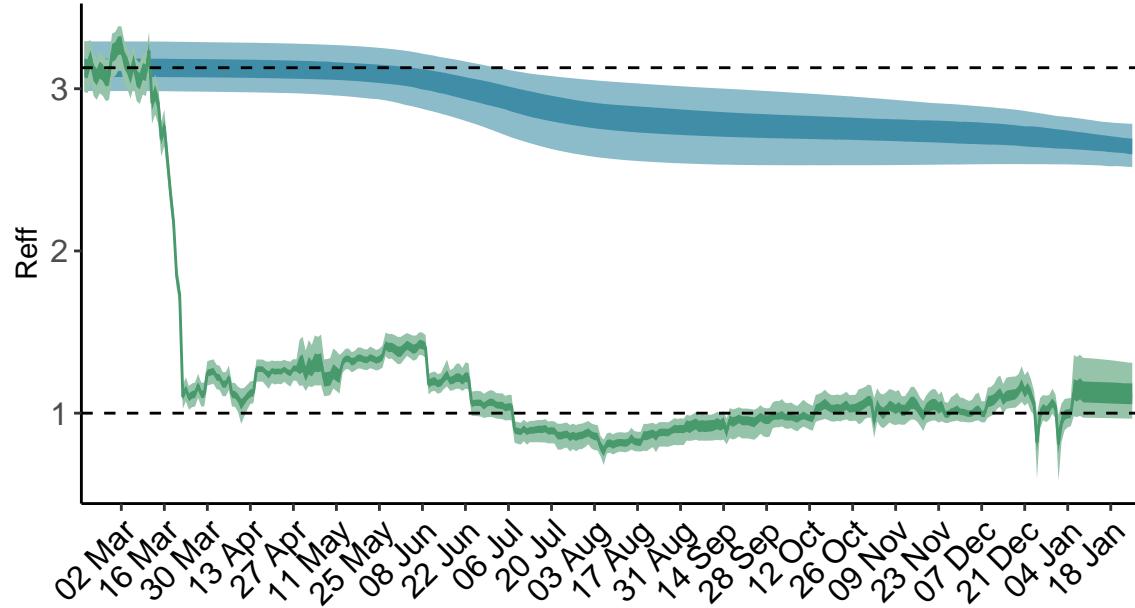


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

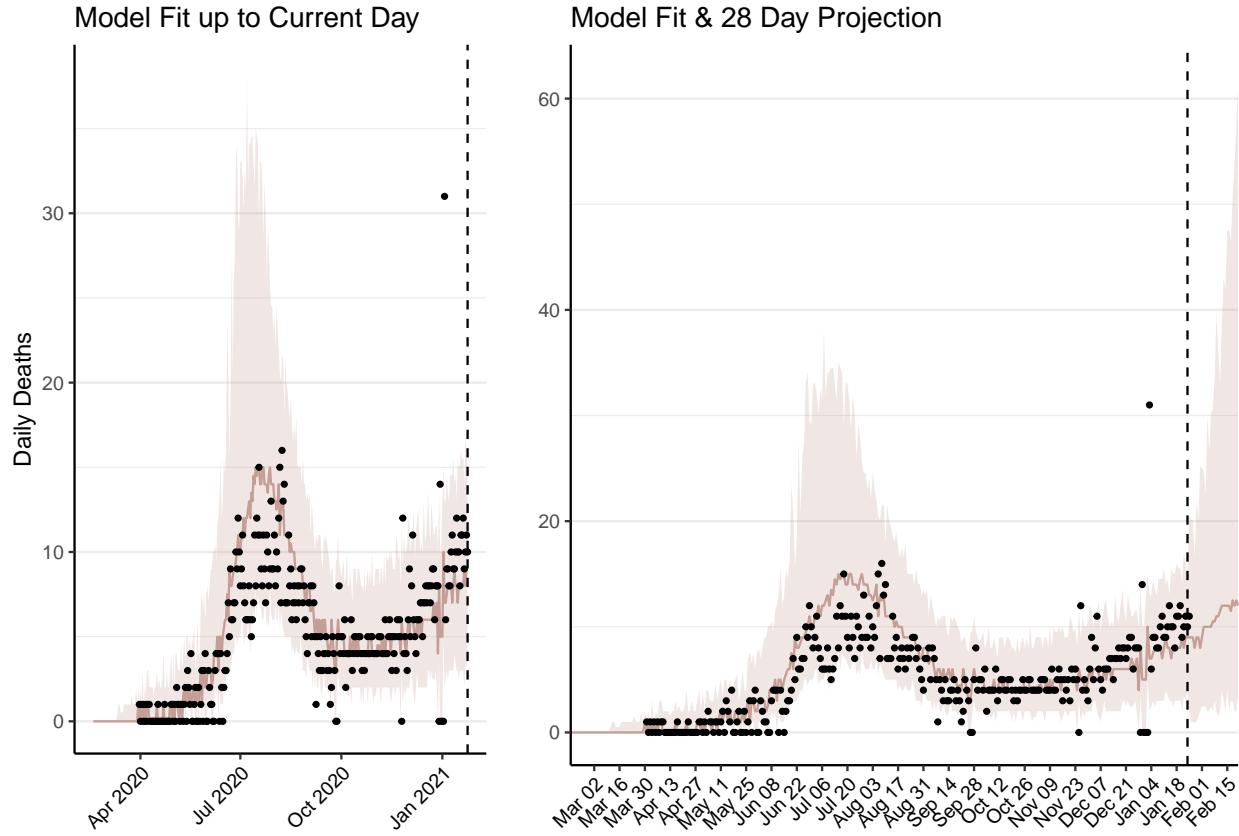


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 332 (95% CI: 309-356) patients requiring treatment with high-pressure oxygen at the current date to 577 (95% CI: 508-646) hospital beds being required on 2021-02-21 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 115 (95% CI: 107-123) patients requiring treatment with mechanical ventilation at the current date to 168 (95% CI: 154-182) by 2021-02-21. 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.**

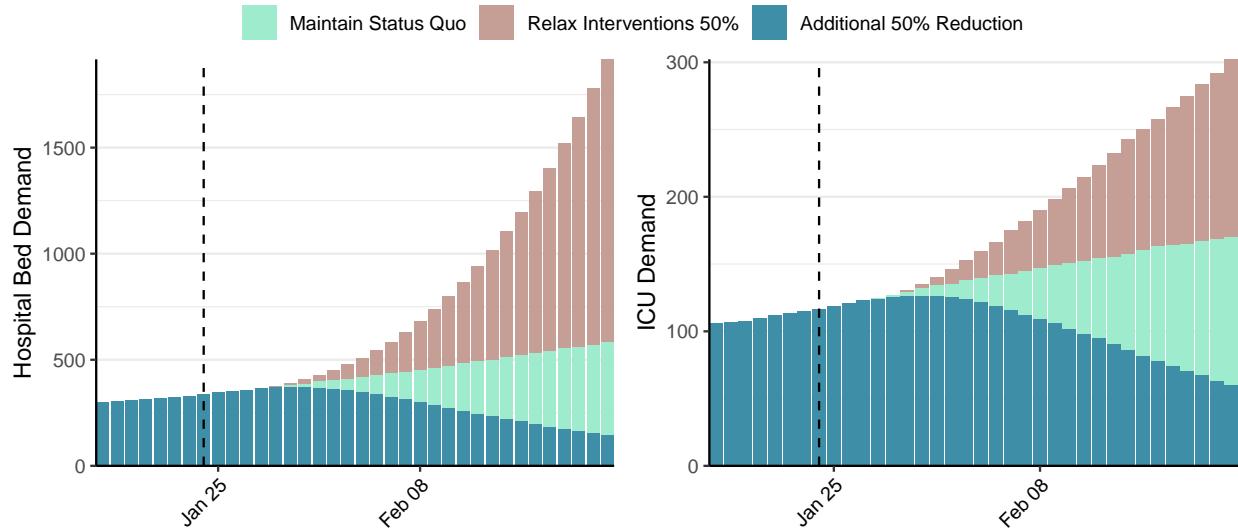


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 4,269 (95% CI: 3,899-4,638) at the current date to 571 (95% CI: 494-648) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 4,269 (95% CI: 3,899-4,638) at the current date to 37,443 (95% CI: 32,928-41,958) by 2021-02-21.

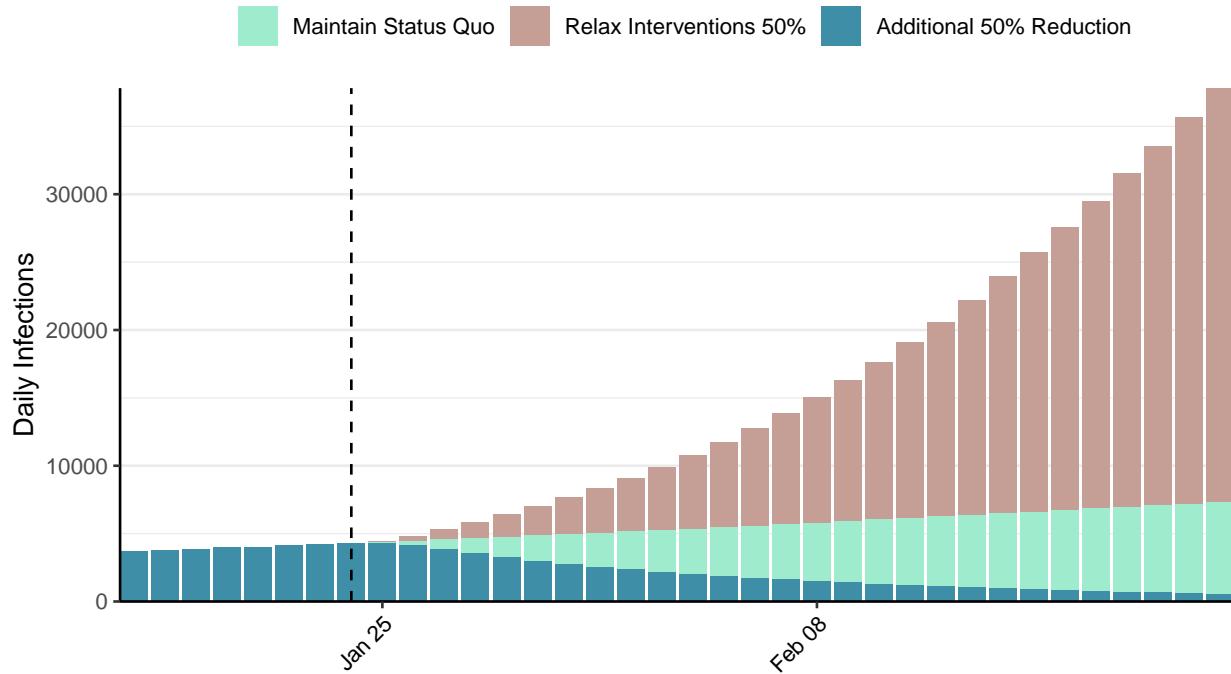


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Somalia, 2021-01-24 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	0.66 (95% CI: 0.54-0.8)

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. Somalia is not shown in the following plot as only 0 deaths have been reported to date**

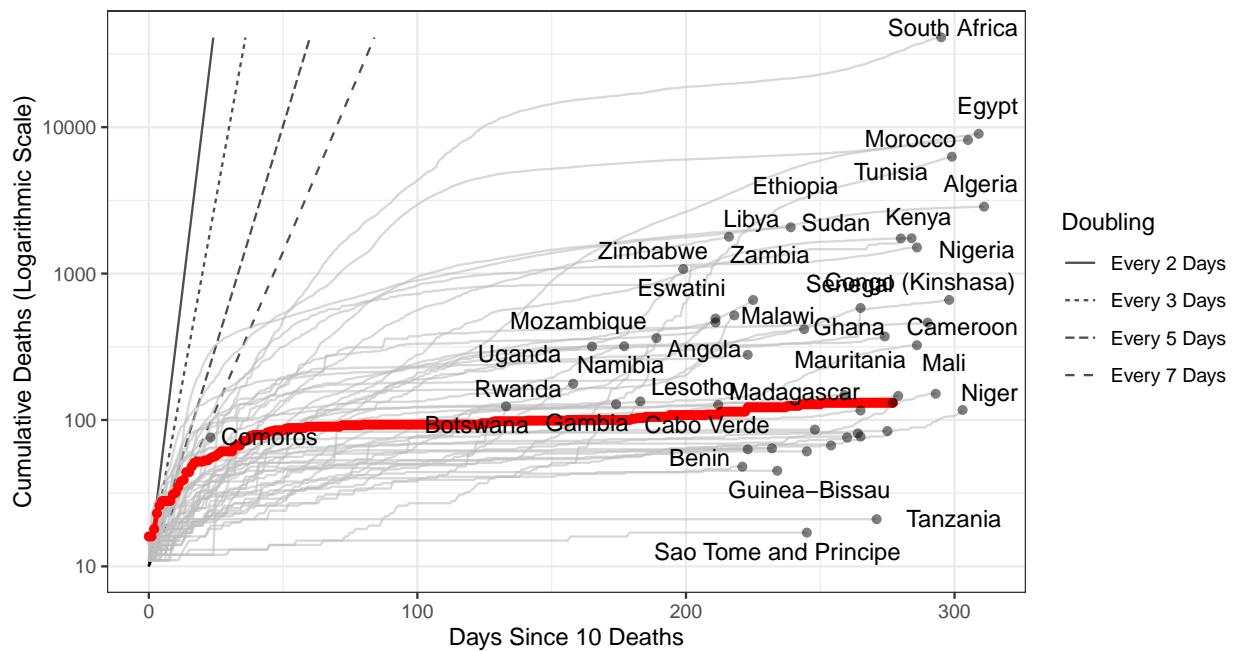


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 1,341 (95% CI: 1,207-1,475) 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

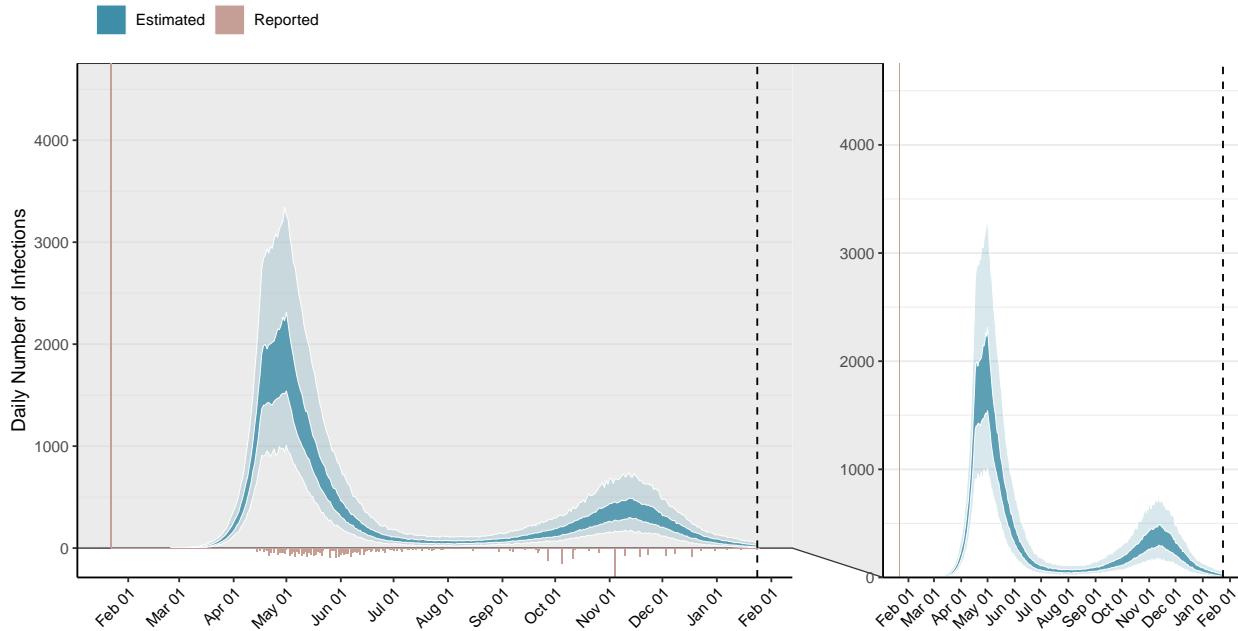


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

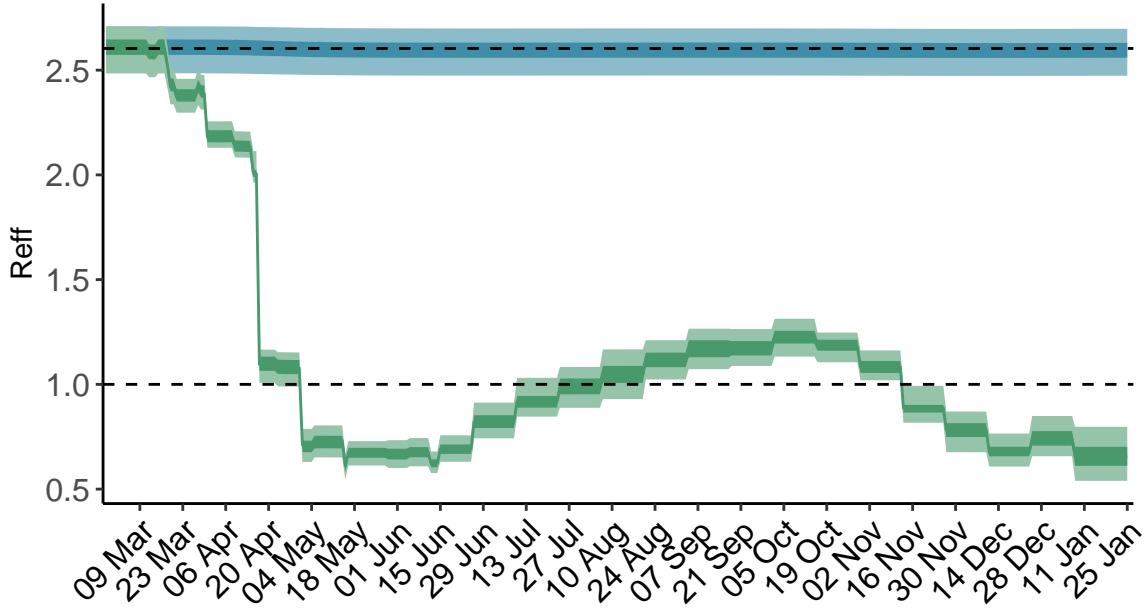


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

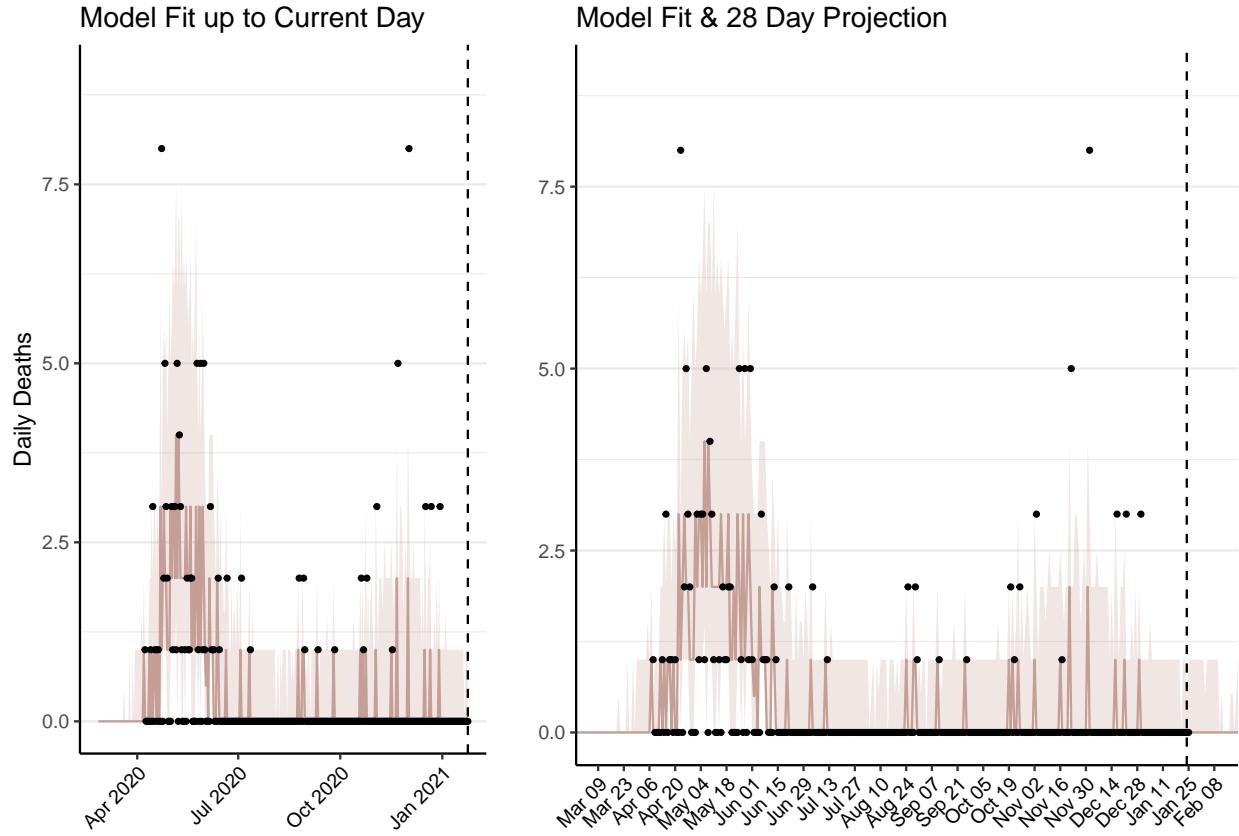


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 3 (95% CI: 3-4) patients requiring treatment with high-pressure oxygen at the current date to 1 (95% CI: 1-1) hospital beds being required on 2021-02-21 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: 1-2) patients requiring treatment with mechanical ventilation at the current date to 0 (95% CI: 0-1) by 2021-02-21. 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.**

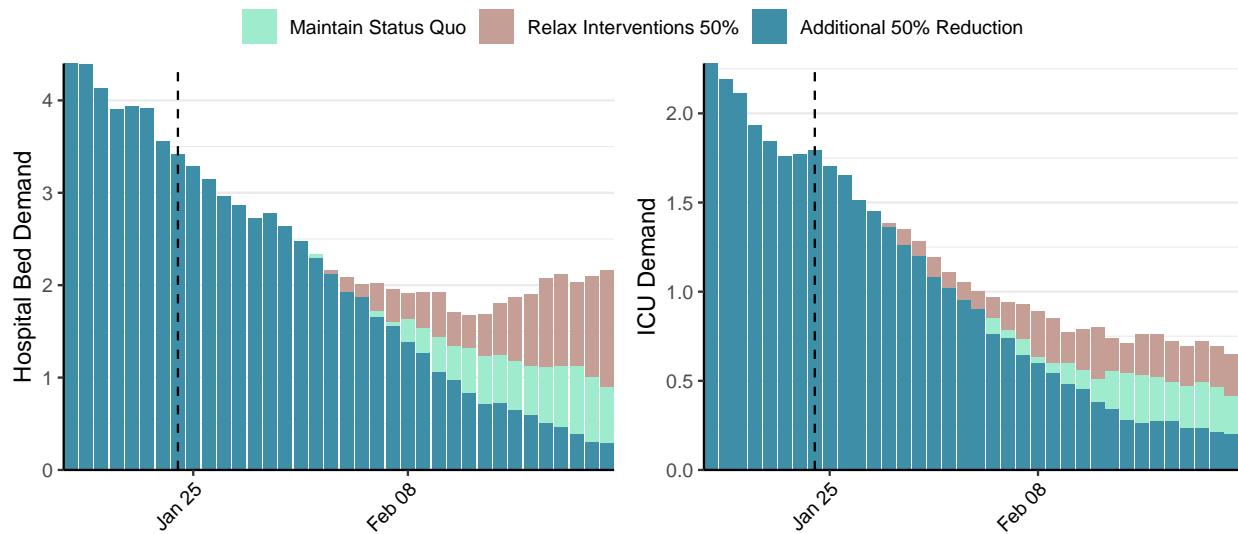


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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: 19-25) at the current date to 1 (95% CI: 0-1) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 22 (95% CI: 19-25) at the current date to 26 (95% CI: 20-32) by 2021-02-21.

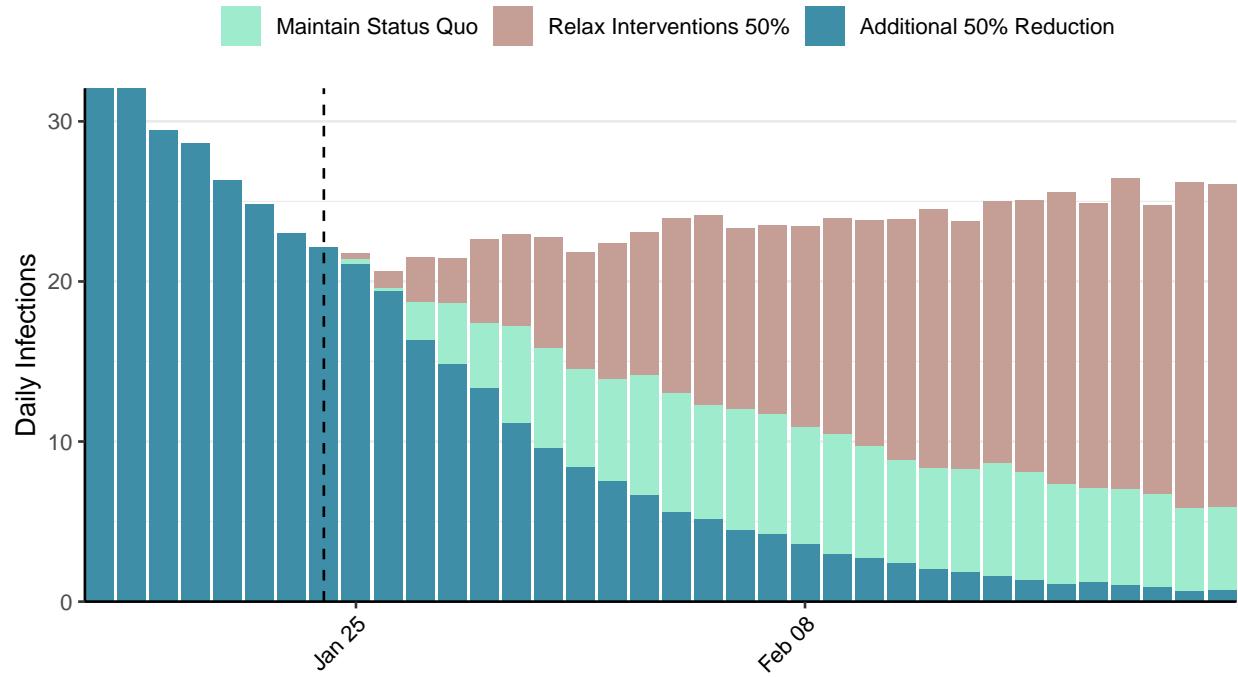


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Serbia, 2021-01-24

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Epidemiological Situation

Total Reported Cases	New Reported Cases	Total Reported Deaths	New Reported Deaths	Estimated R_{eff}
1,523	1,523	19	19	0.8 (95% CI: 0.68-0.94)

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.

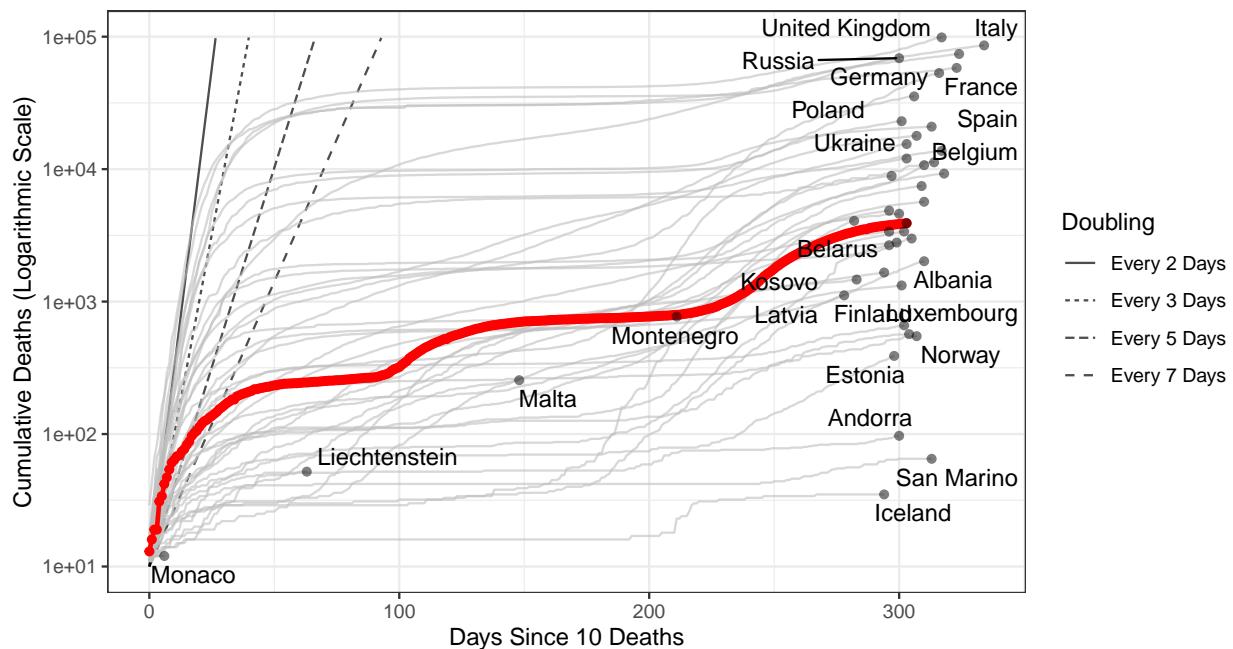


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 149,769 (95% CI: 144,475-155,063) 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

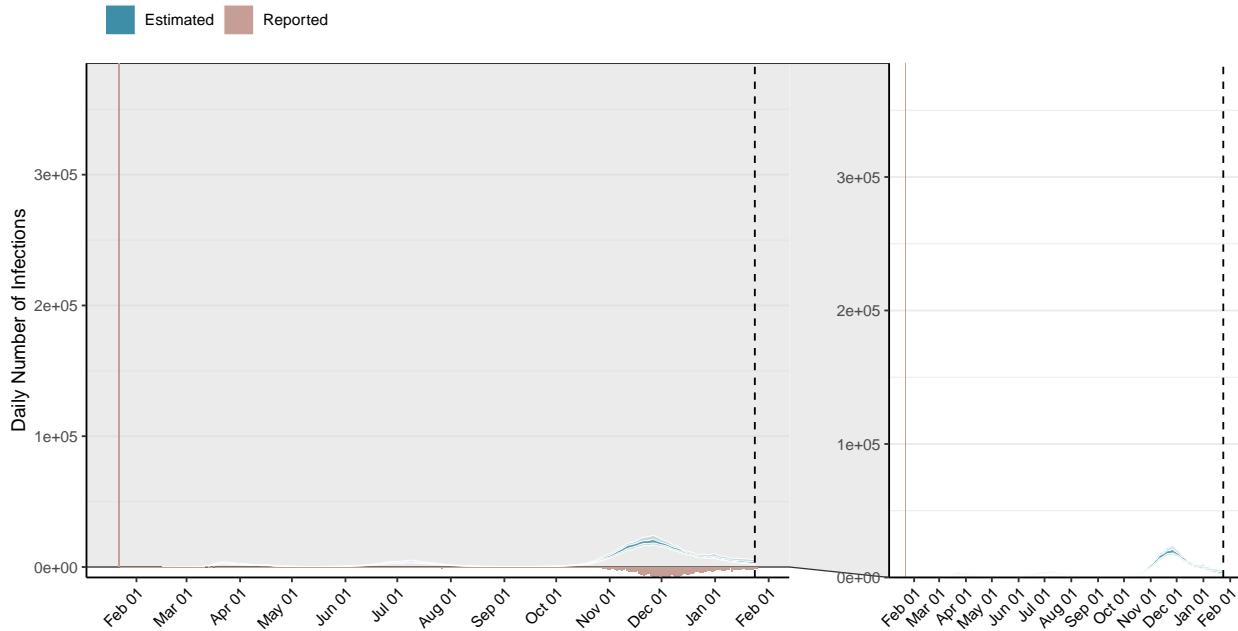


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

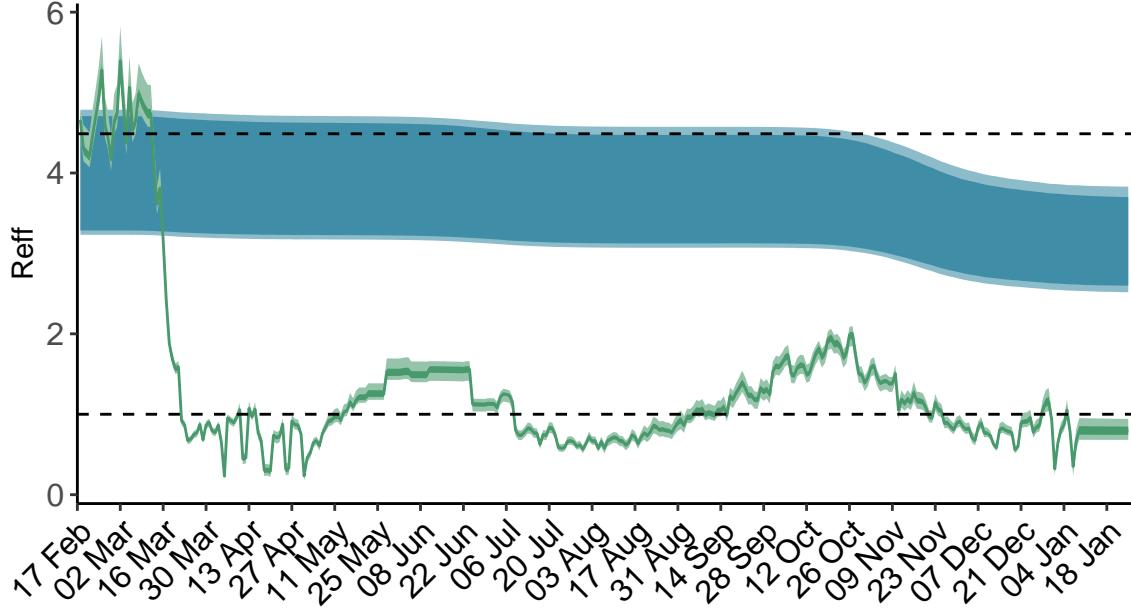


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

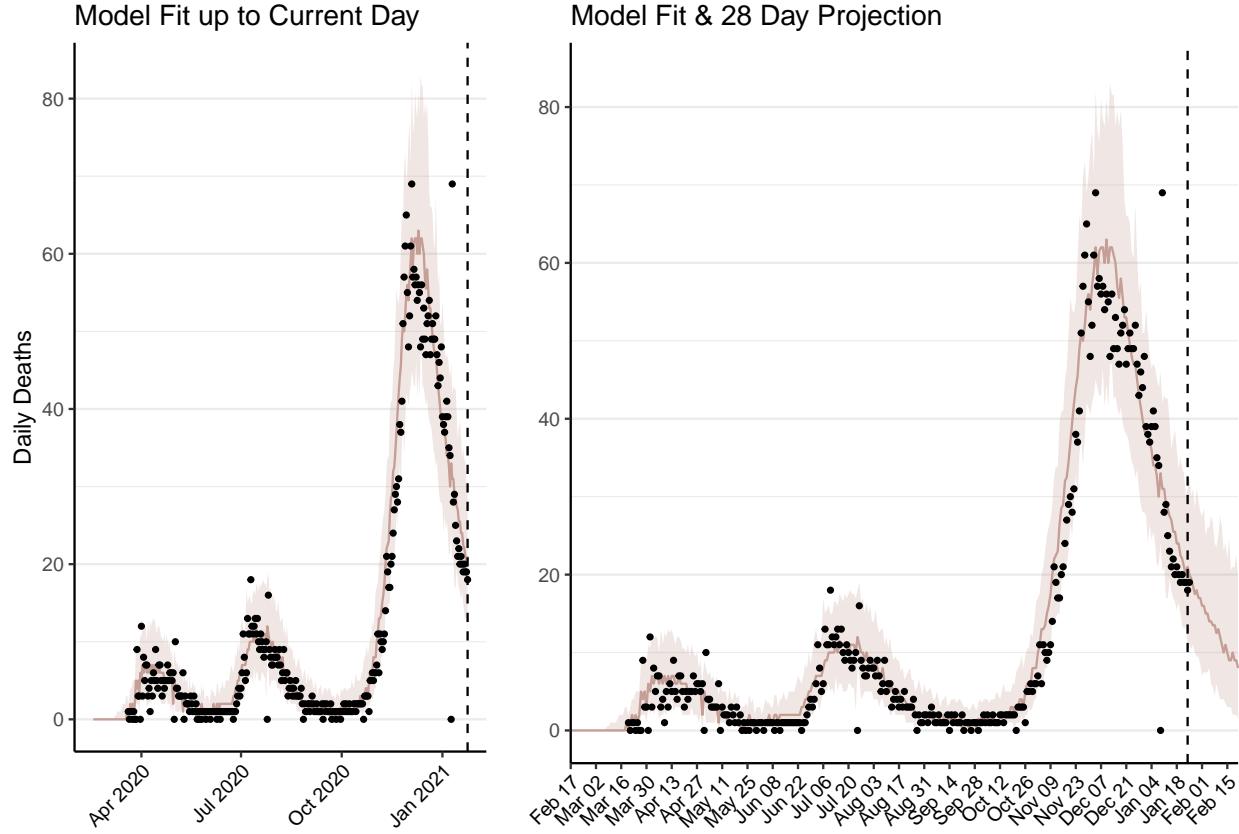


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 679 (95% CI: 652-705) patients requiring treatment with high-pressure oxygen at the current date to 313 (95% CI: 280-346) hospital beds being required on 2021-02-21 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 284 (95% CI: 274-294) patients requiring treatment with mechanical ventilation at the current date to 130 (95% CI: 118-142) by 2021-02-21. 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.**

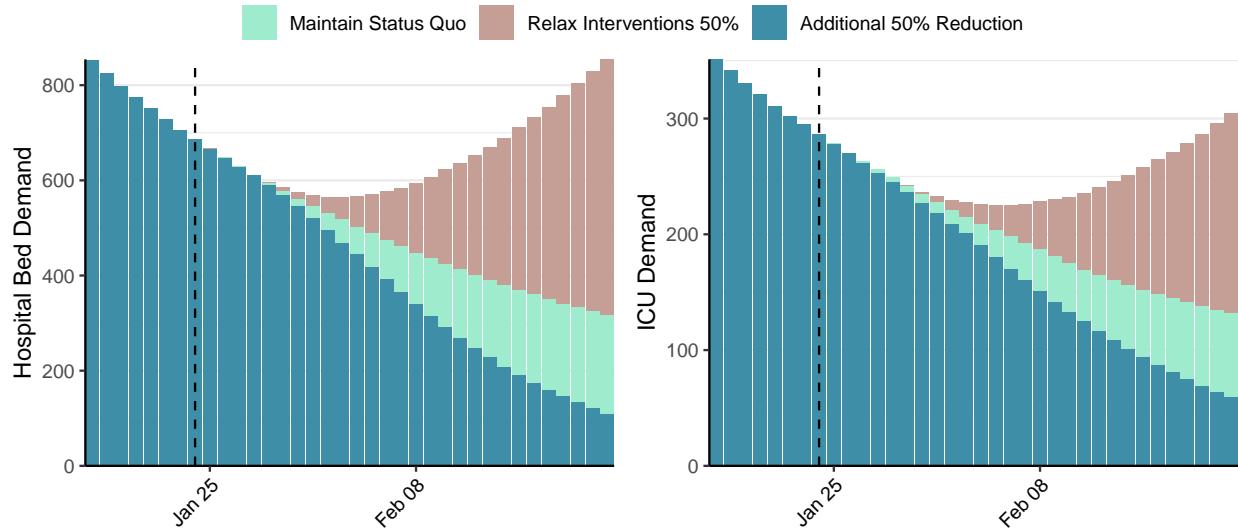


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 3,406 (95% CI: 3,186-3,625) at the current date to 158 (95% CI: 139-177) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,406 (95% CI: 3,186-3,625) at the current date to 8,271 (95% CI: 7,114-9,429) by 2021-02-21.

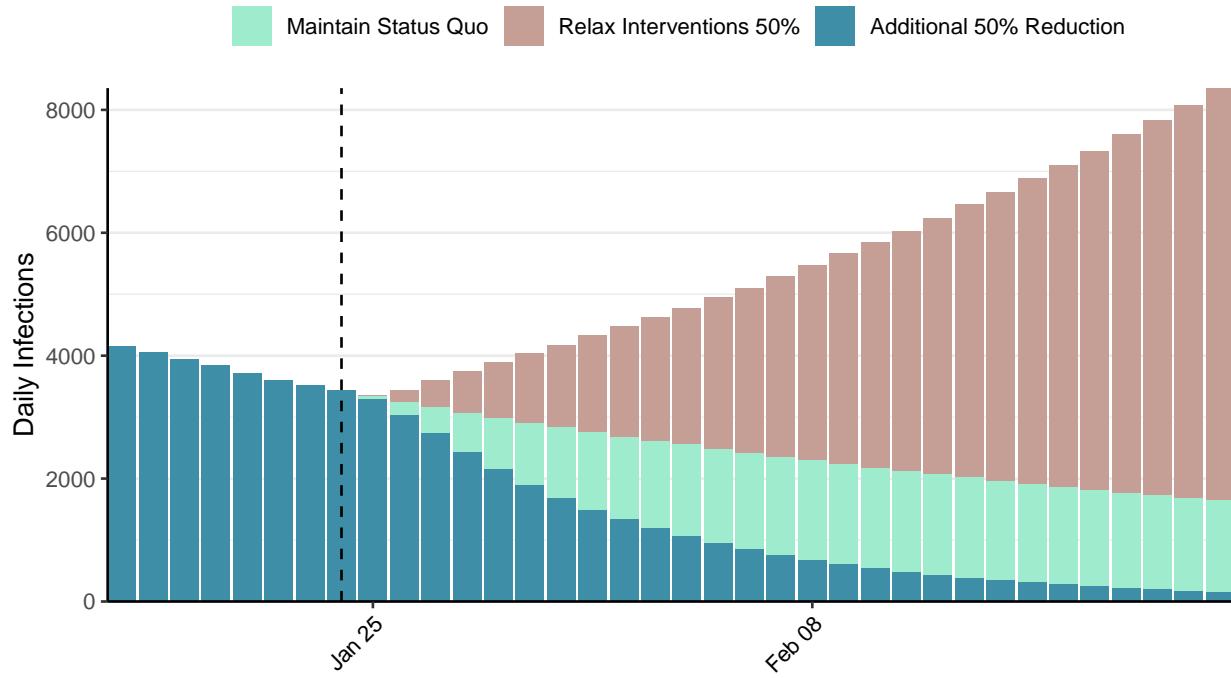


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for South Sudan, 2021-01-24 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: 0.57-1.13)

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. South Sudan is not shown in the following plot as only 0 deaths have been reported to date**

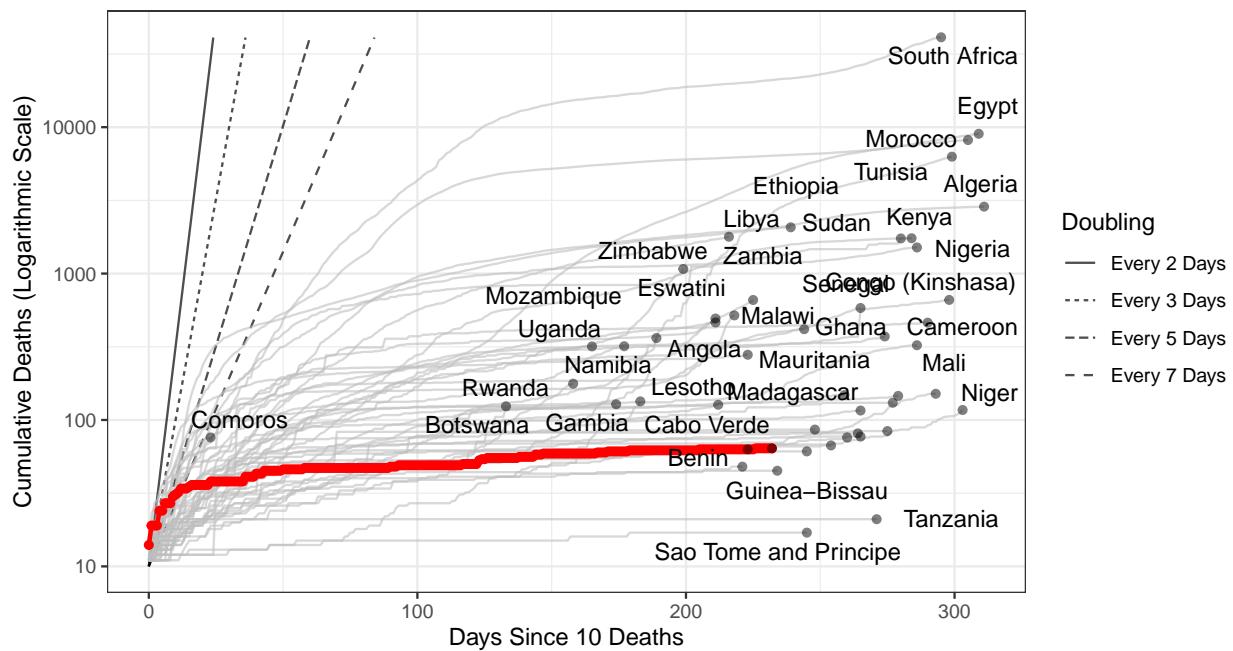


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 789 (95% CI: 662-917) 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).

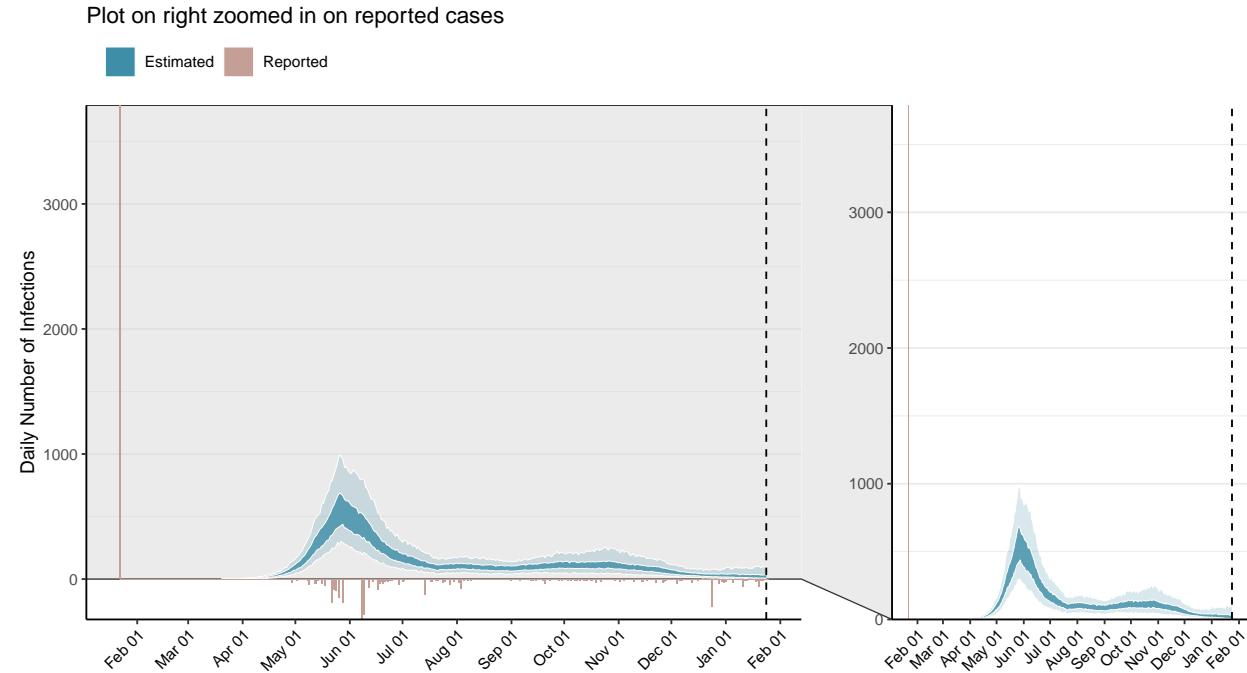


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

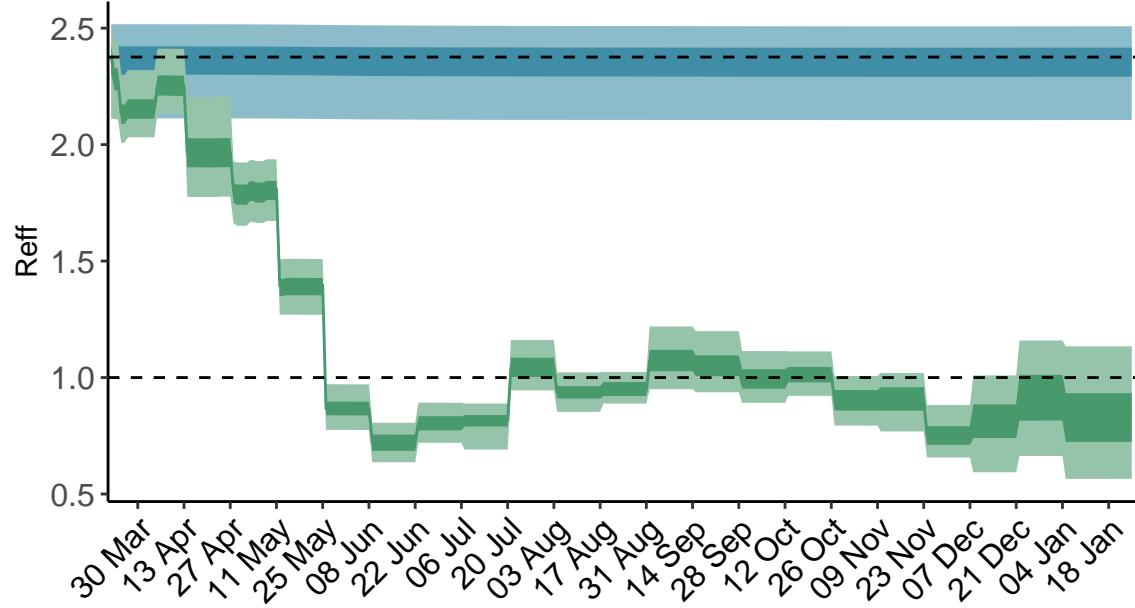


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

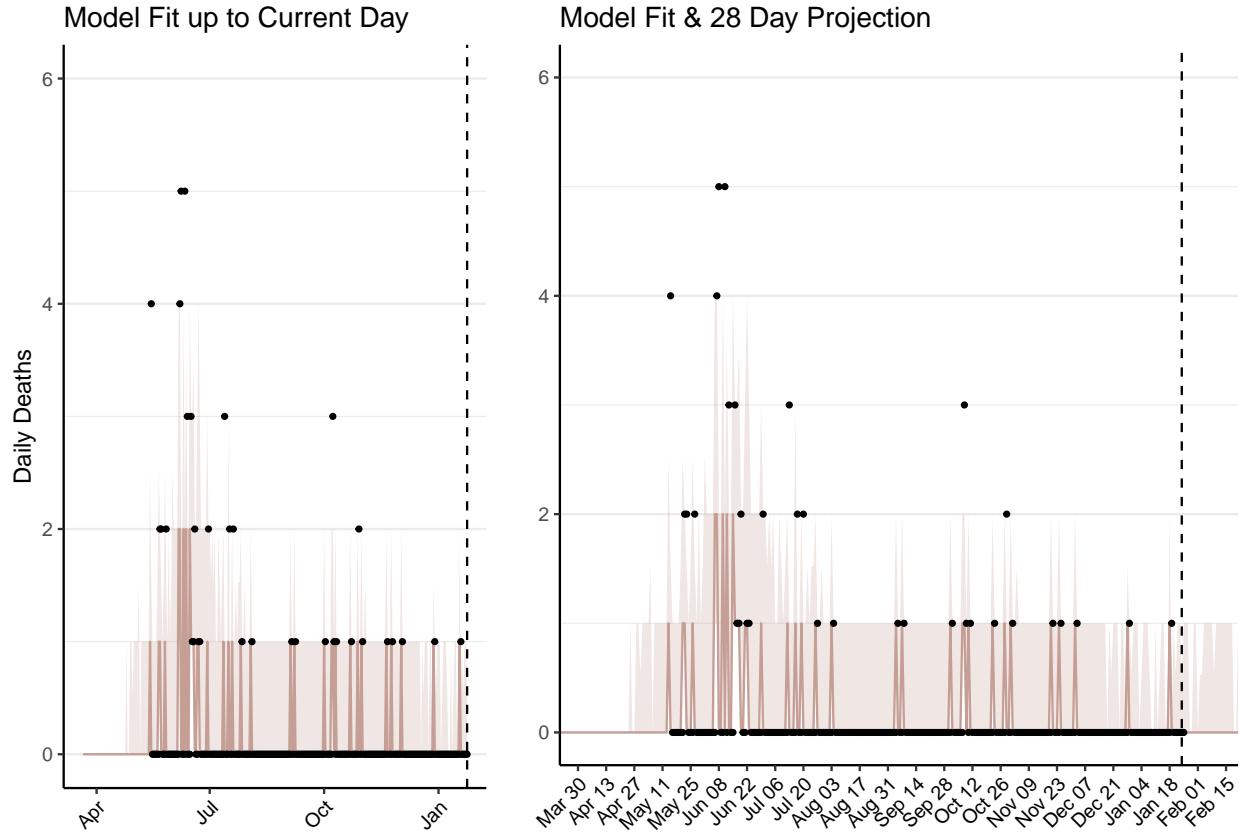


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 (95% CI: 2-3) patients requiring treatment with high-pressure oxygen at the current date to 2 (95% CI: 1-3) hospital beds being required on 2021-02-21 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: 1-1) by 2021-02-21. 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.**

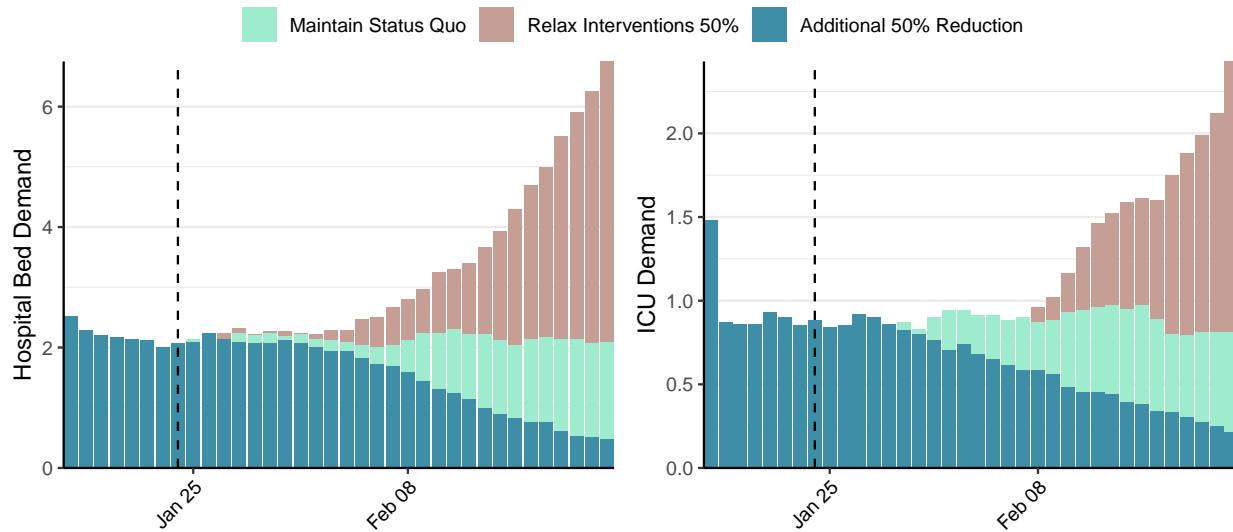


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 26 (95% CI: 20-32) at the current date to 2 (95% CI: 1-3) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 26 (95% CI: 20-32) at the current date to 163 (95% CI: 98-229) by 2021-02-21.

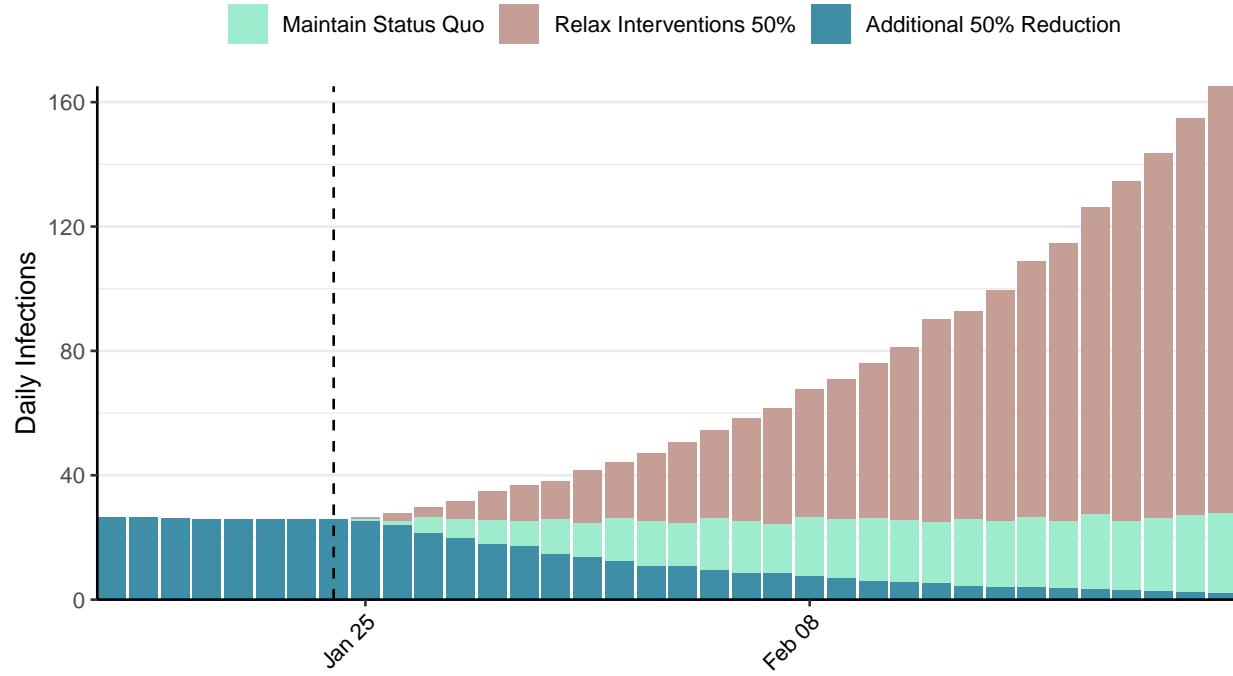


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Sao Tome and Principe, 2021-01-24

[Download the report for Sao Tome and Principe, 2021-01-24 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}
1	1	0	0	0.84 (95% CI: 0.48-1.17)

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.** Sao Tome and Principe is not shown in the following plot as only 0 deaths have been reported to date

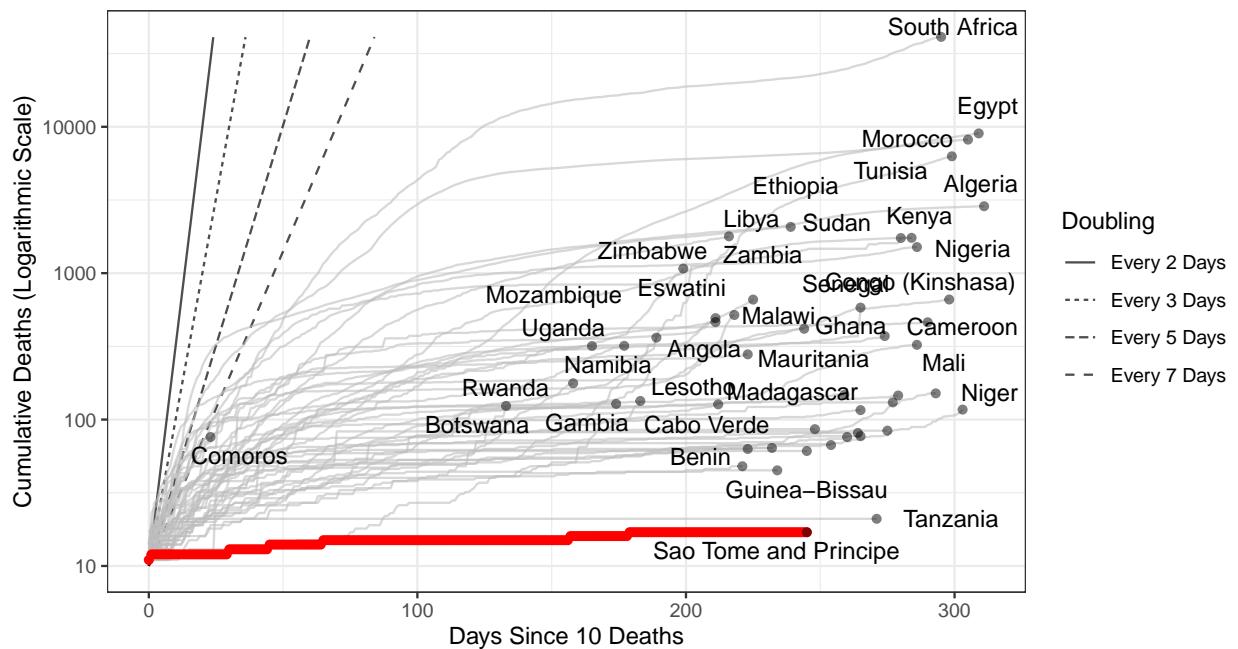


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 52 (95% CI: 20-85) 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

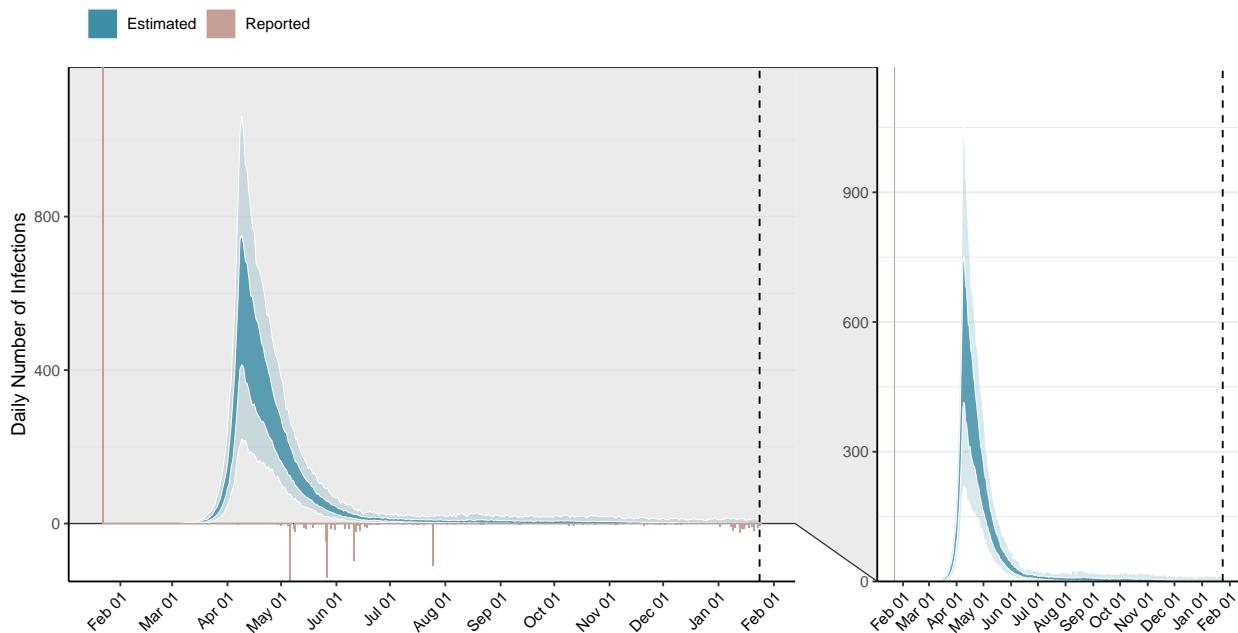


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

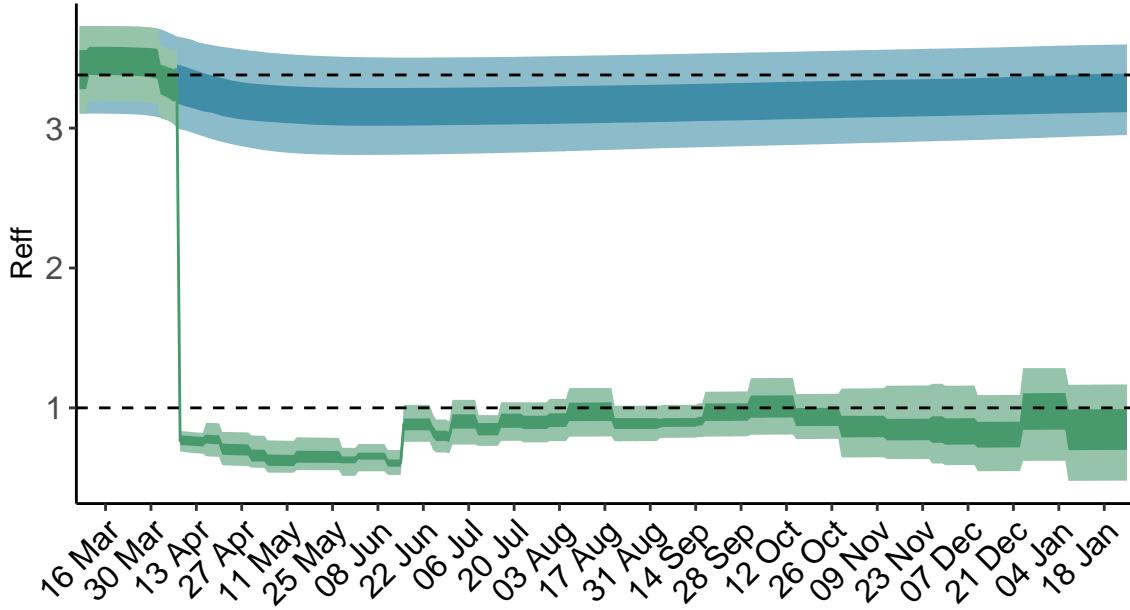


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

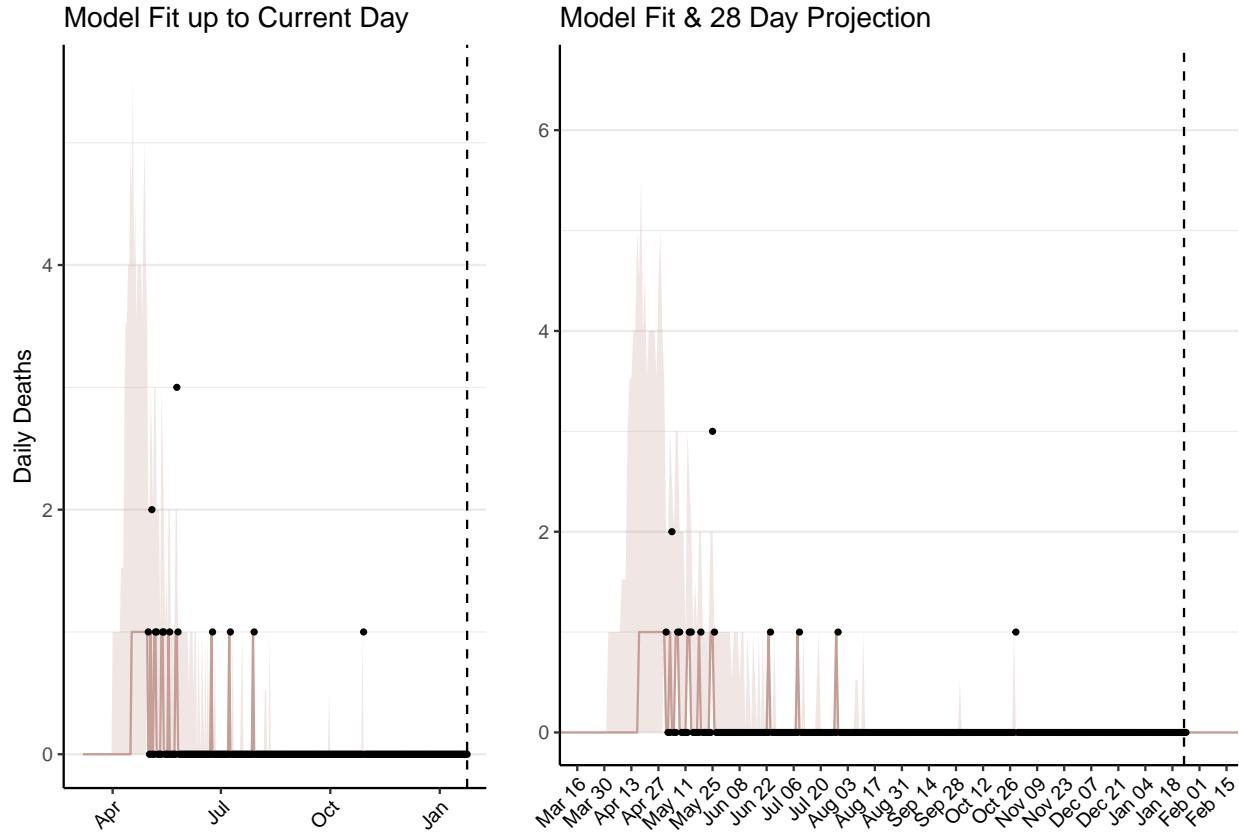


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 2021-02-21 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 2021-02-21. 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.**

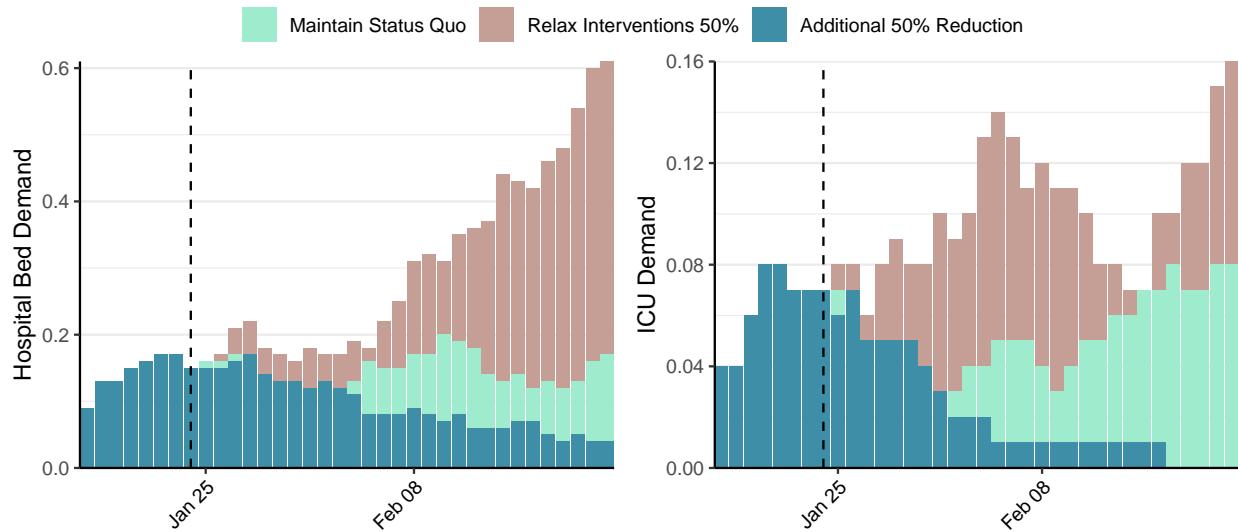


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 (95% CI: 1-4) at the current date to 0 (95% CI: 0-0) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2 (95% CI: 1-4) at the current date to 14 (95% CI: 2-27) by 2021-02-21.

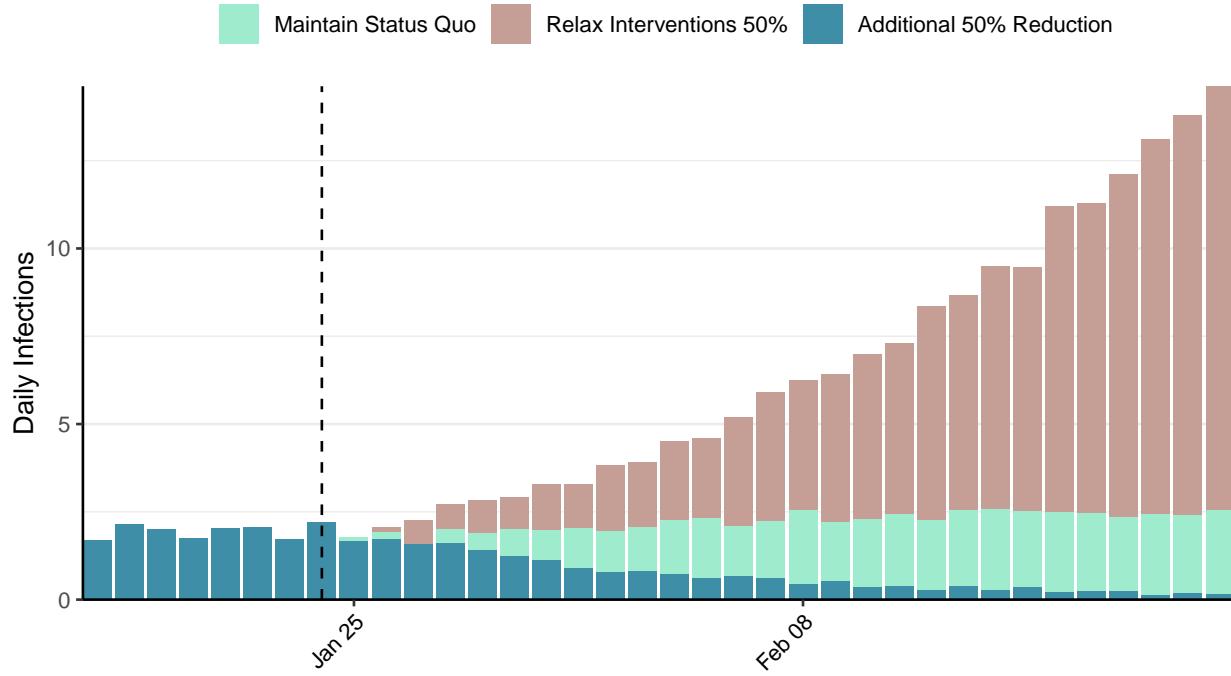


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Suriname, 2021-01-24

[Download the report for Suriname, 2021-01-24 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}
55	55	0	0	1.03 (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. Suriname is not shown in the following plot as only 0 deaths have been reported to date**

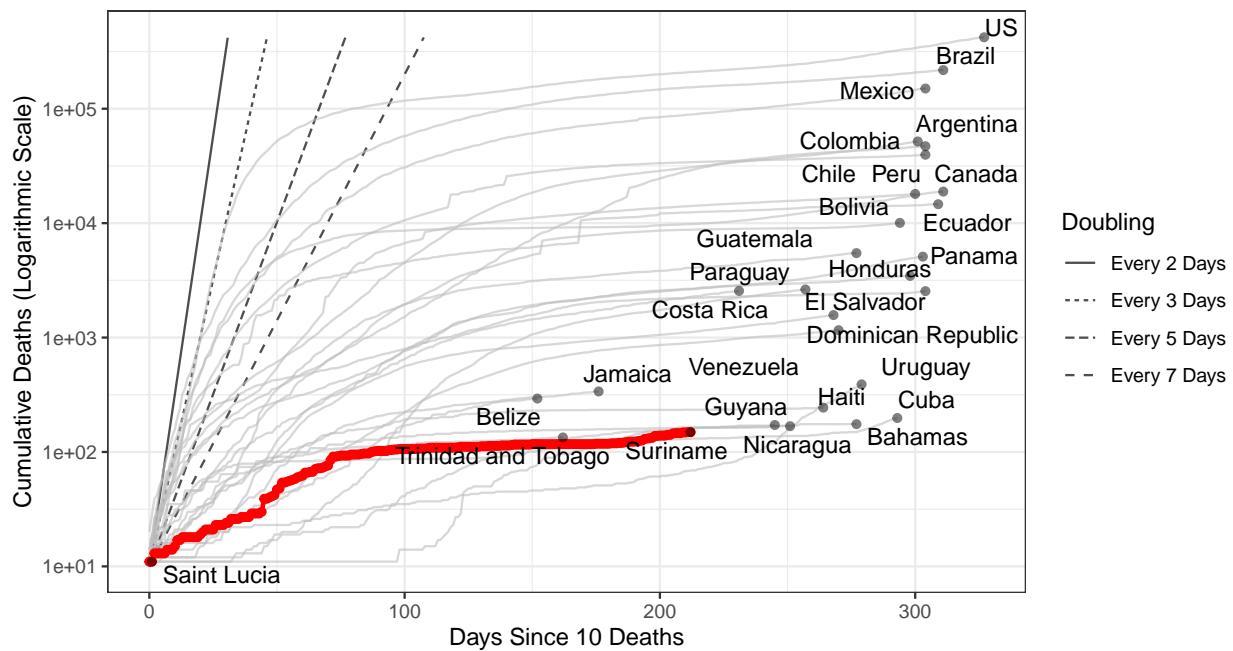


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 13,819 (95% CI: 12,378-15,260) 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).

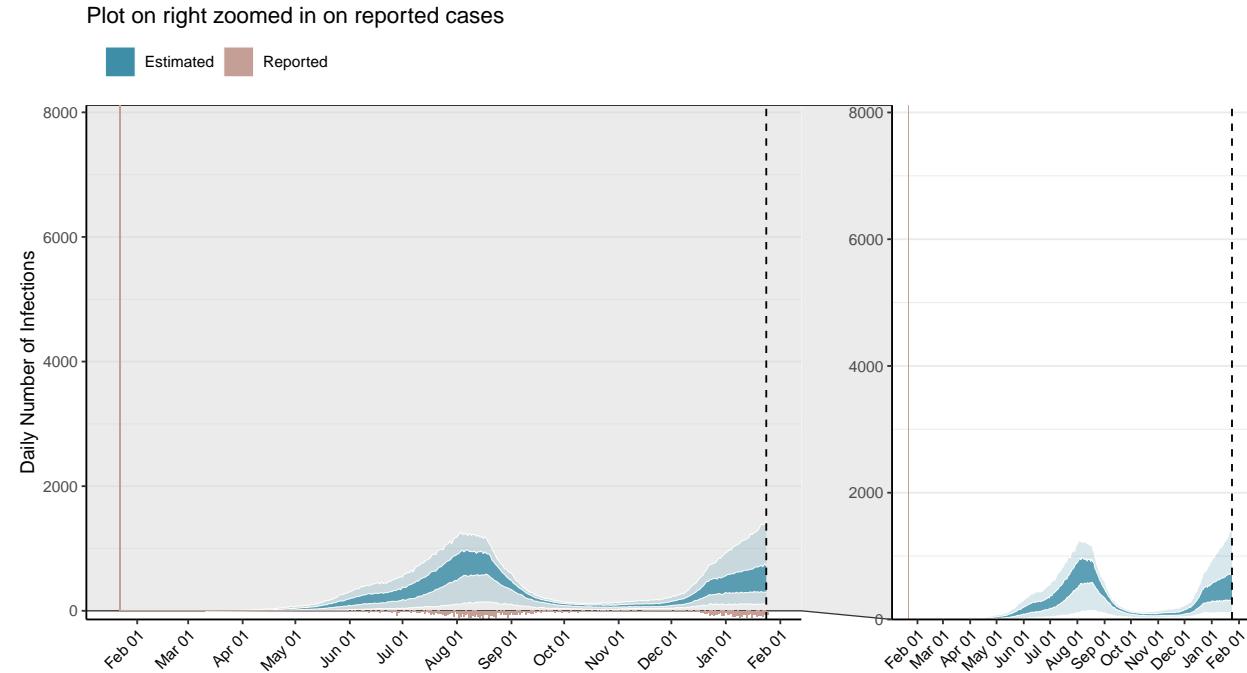


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

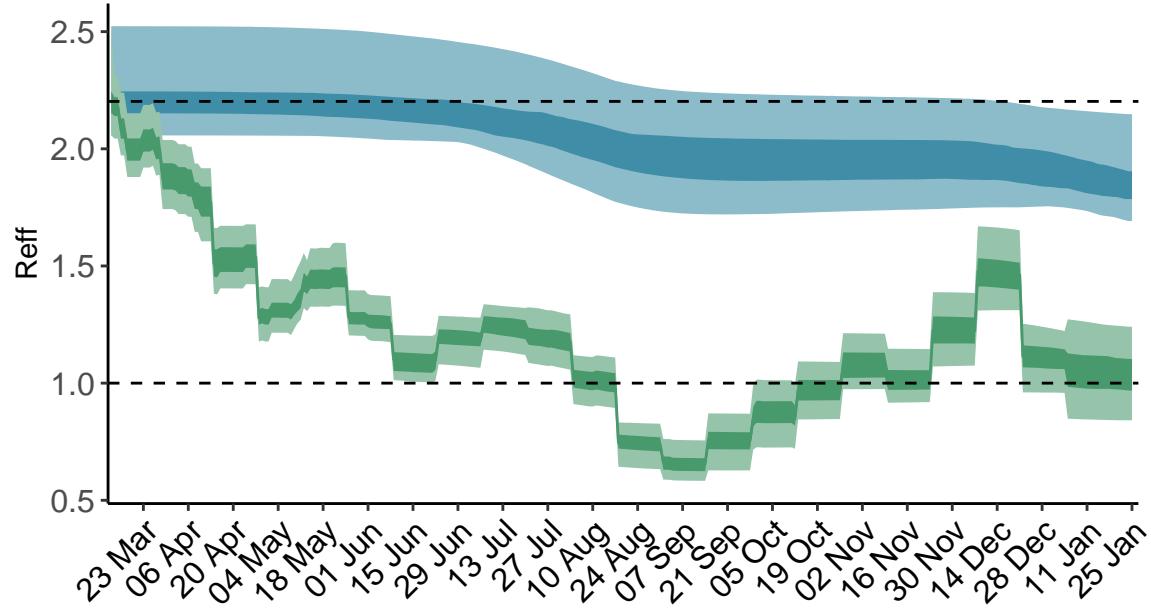


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

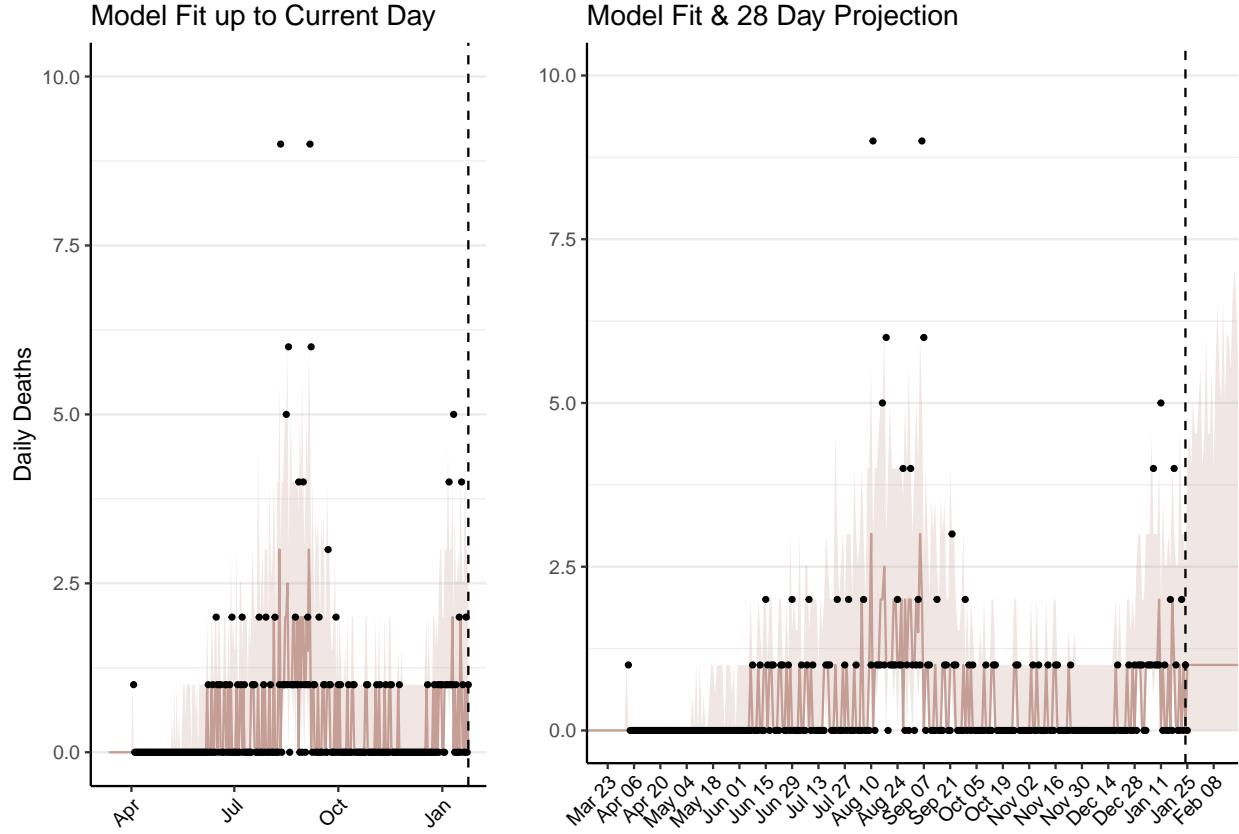


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 47 (95% CI: 42-52) patients requiring treatment with high-pressure oxygen at the current date to 60 (95% CI: 51-69) hospital beds being required on 2021-02-21 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 17 (95% CI: 15-19) patients requiring treatment with mechanical ventilation at the current date to 21 (95% CI: 18-24) by 2021-02-21. 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.**

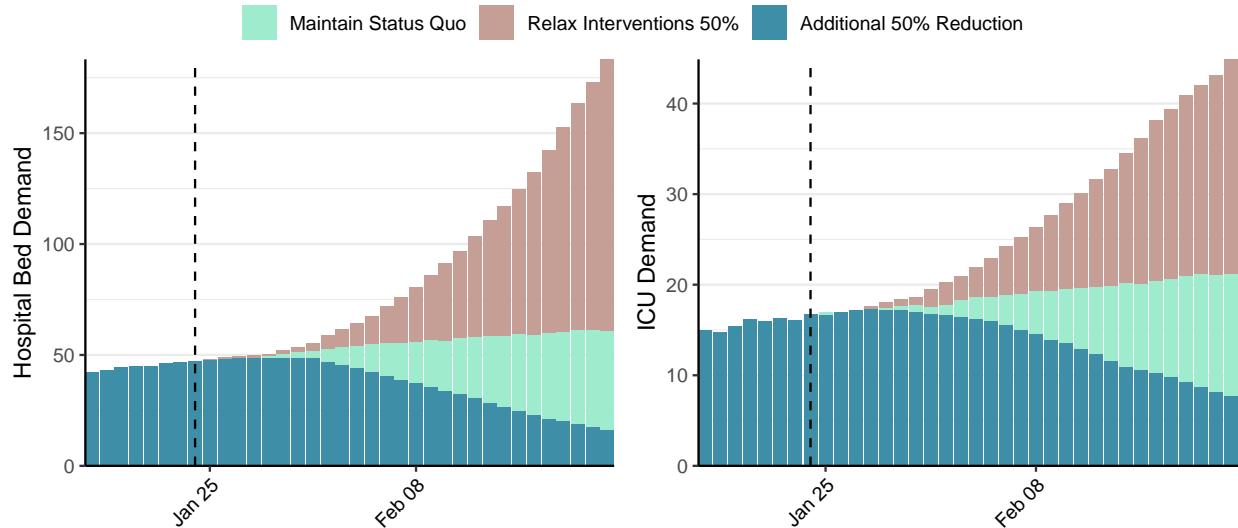


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 563 (95% CI: 494-632) at the current date to 58 (95% CI: 49-68) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 563 (95% CI: 494-632) at the current date to 3,194 (95% CI: 2,761-3,627) by 2021-02-21.

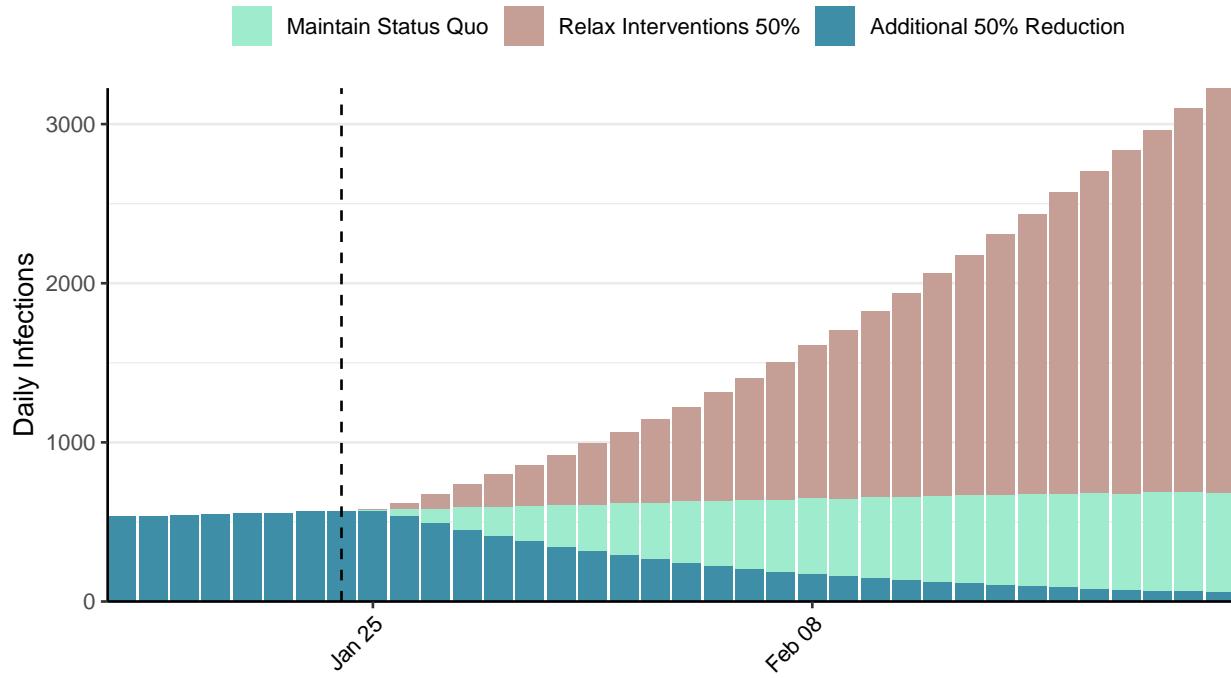


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Eswatini, 2021-01-24

[Download the report for Eswatini, 2021-01-24 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}
138	138	14	14	0.83 (95% CI: 0.75-0.93)

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.

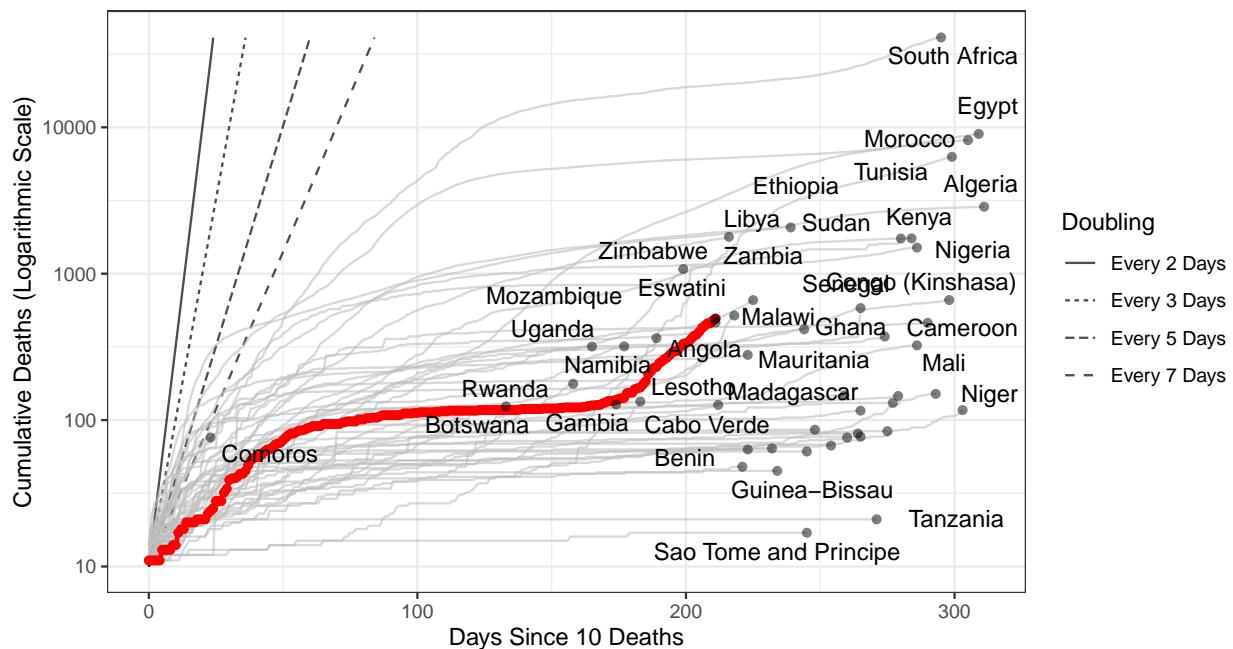


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 117,675 (95% CI: 113,299-122,052) 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

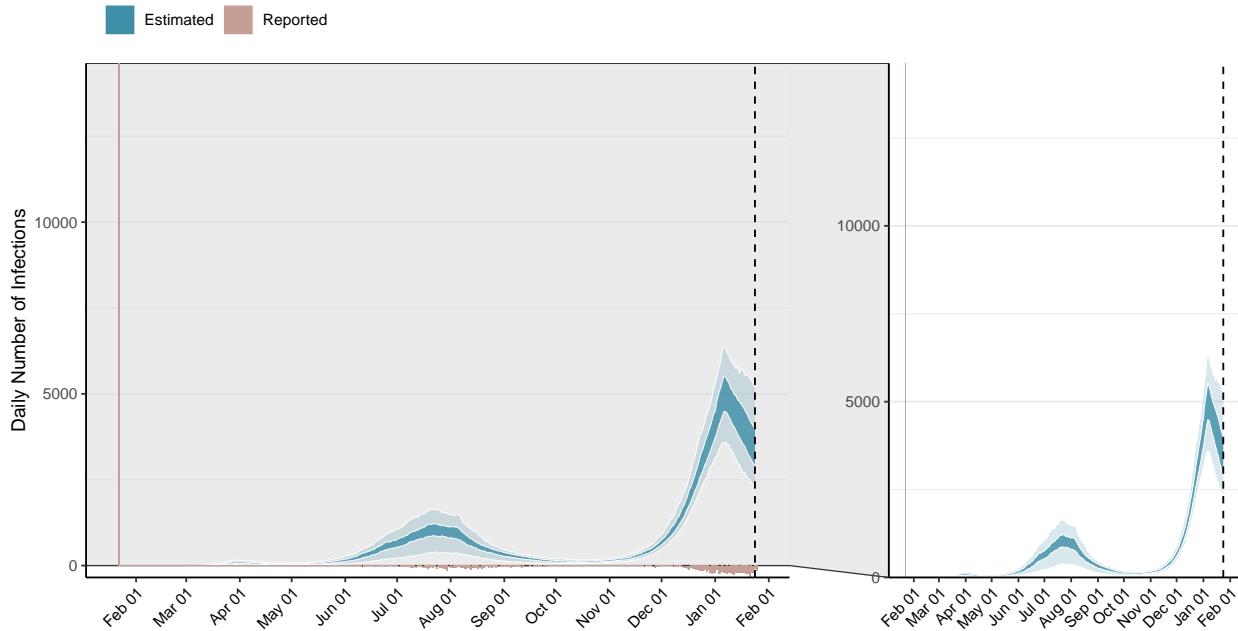


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

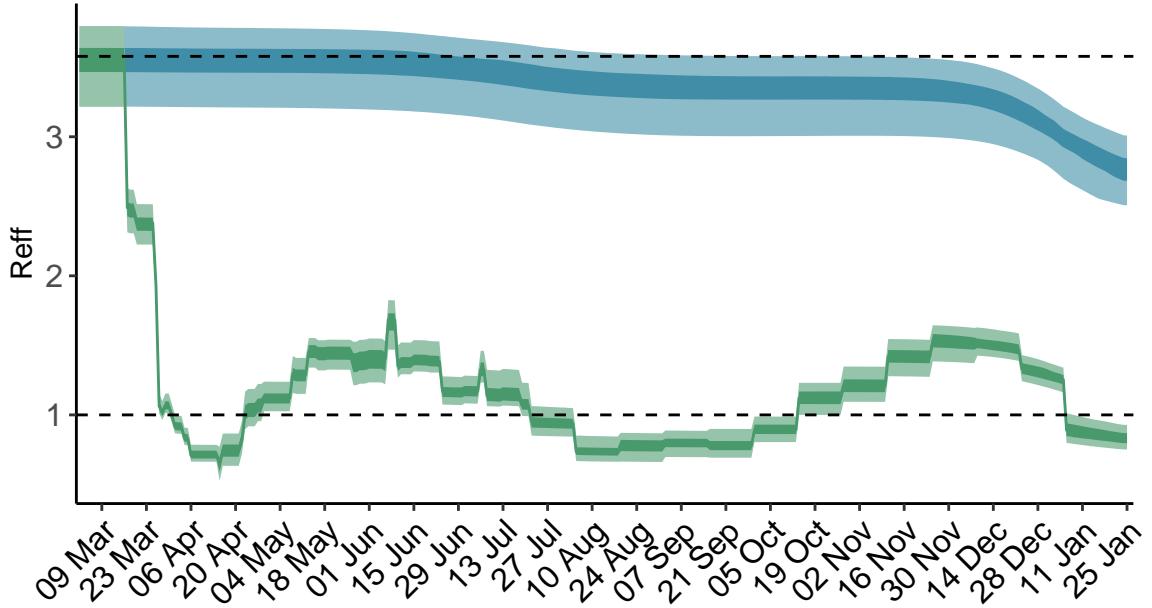


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

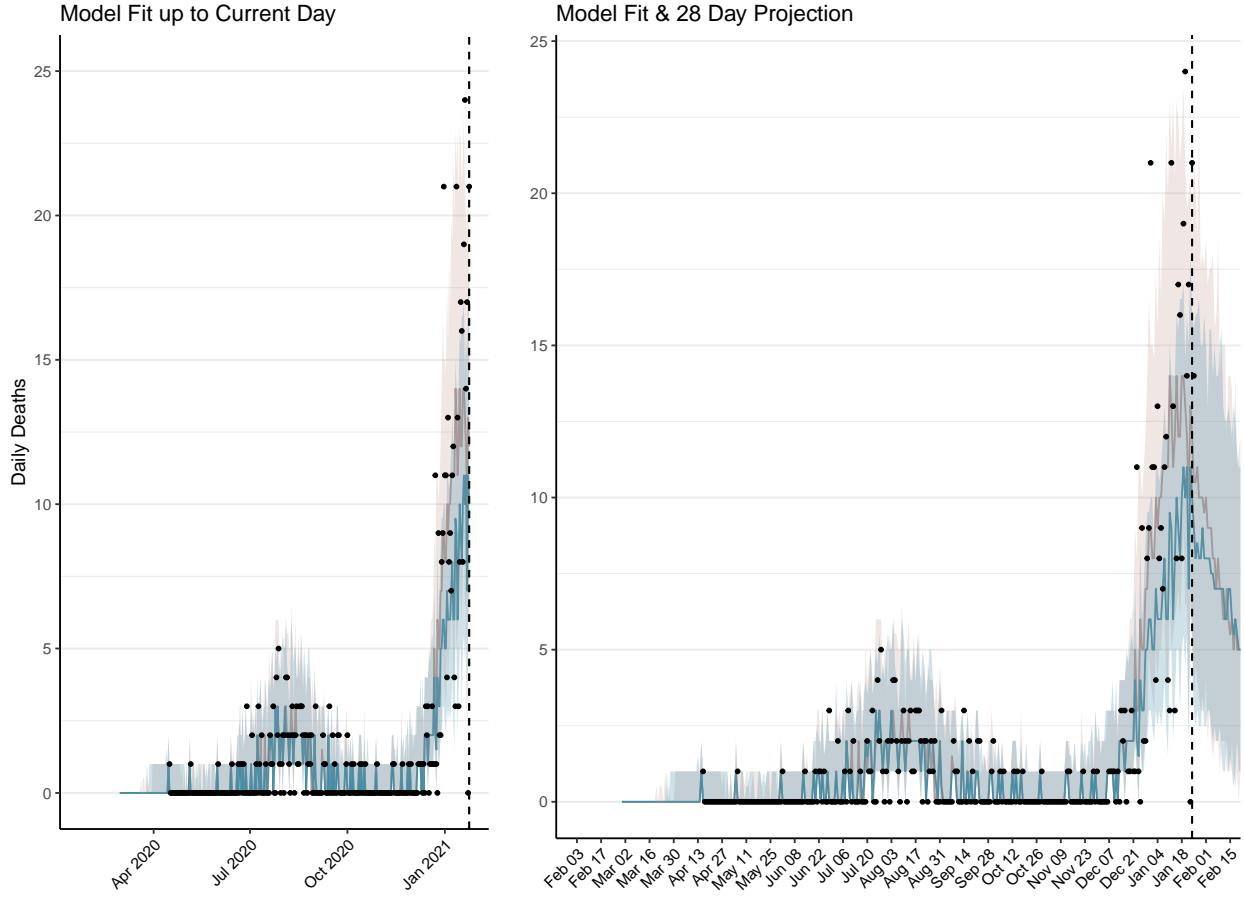


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 344 (95% CI: 330-357) patients requiring treatment with high-pressure oxygen at the current date to 182 (95% CI: 170-194) hospital beds being required on 2021-02-21 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 51 (95% CI: 49-52) patients requiring treatment with mechanical ventilation at the current date to 41 (95% CI: 39-42) by 2021-02-21. 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.**

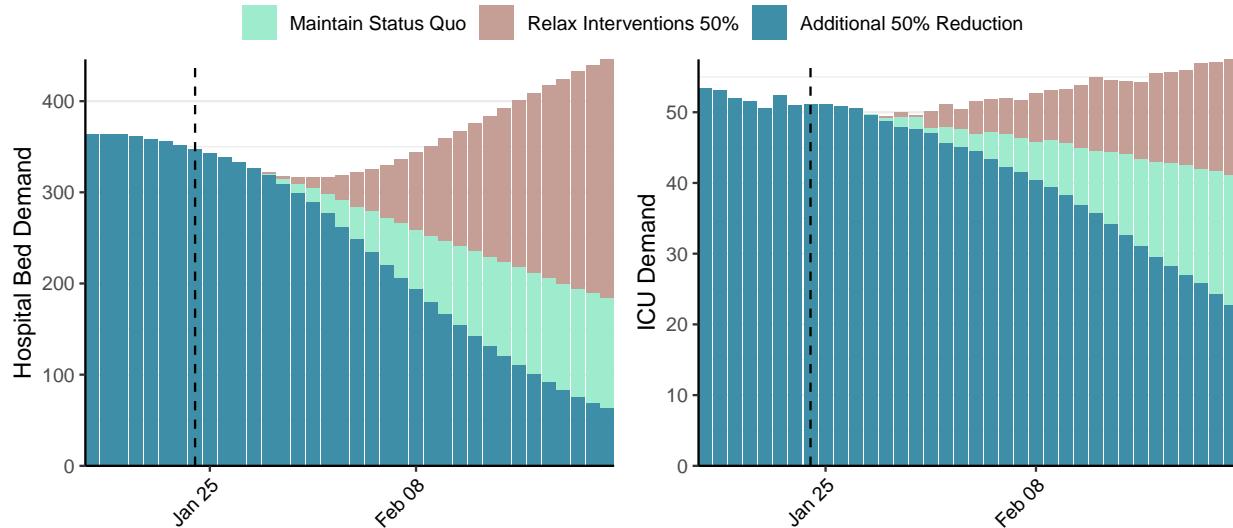


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 3,455 (95% CI: 3,288-3,622) at the current date to 163 (95% CI: 151-175) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,455 (95% CI: 3,288-3,622) at the current date to 6,343 (95% CI: 5,930-6,756) by 2021-02-21.

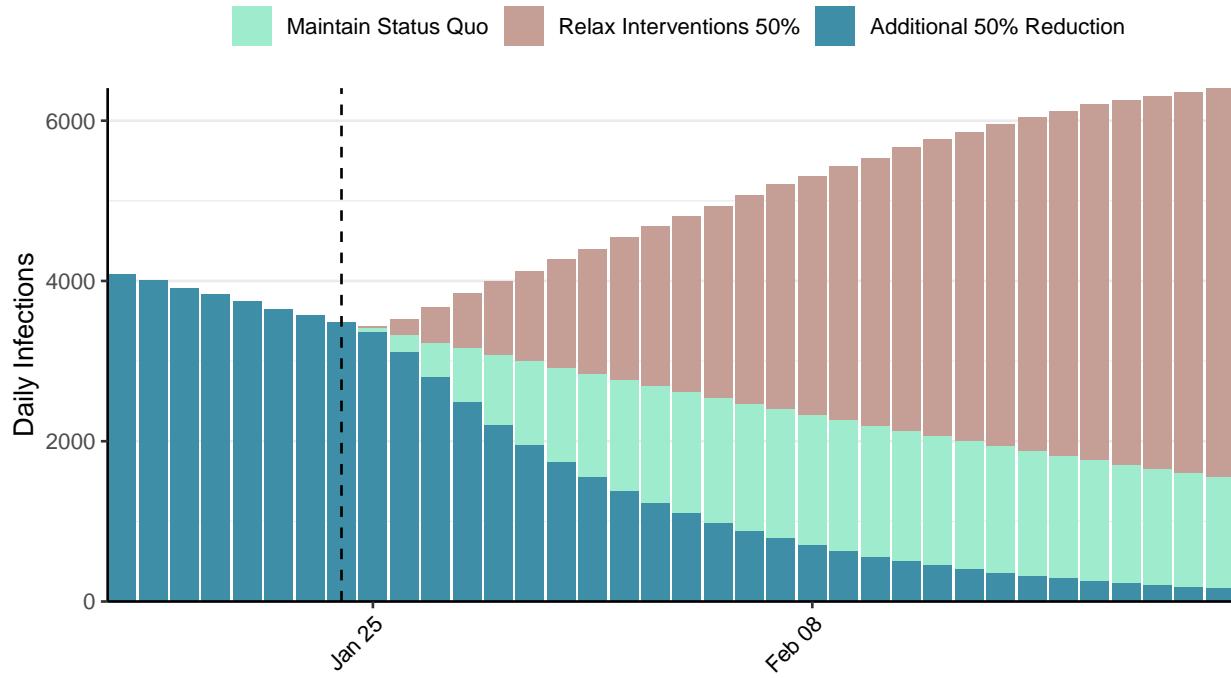


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

Download the report for Syria, 2021-01-24 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}
69	69	5	5	1.03 (95% CI: 0.88-1.21)

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.** **Syria is not shown in the following plot as only 5 deaths have been reported to date**

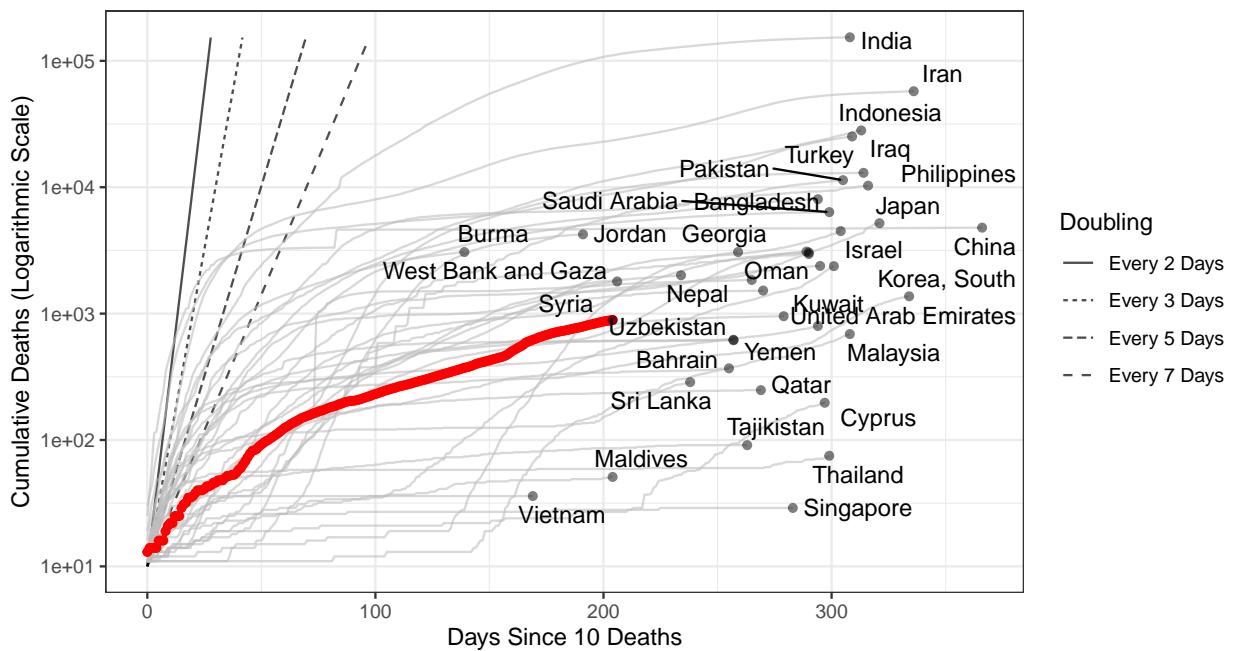


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 101,197 (95% CI: 92,601-109,794) 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

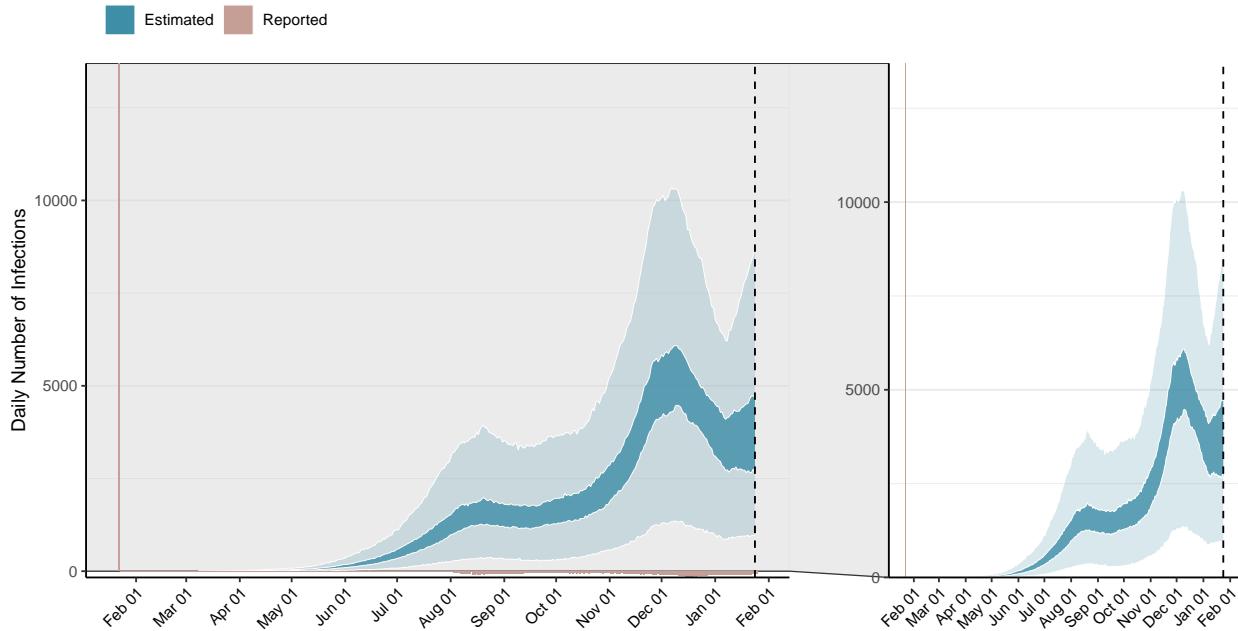


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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](#)

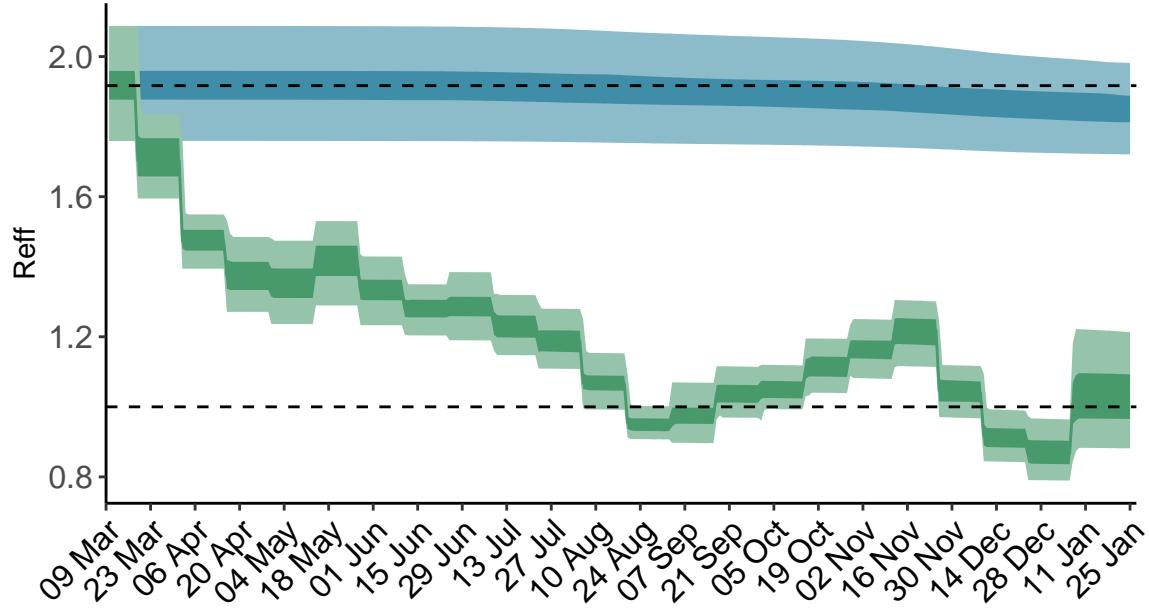


Figure 3: **Time-varying effective reproduction number, R_{eff} .** R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

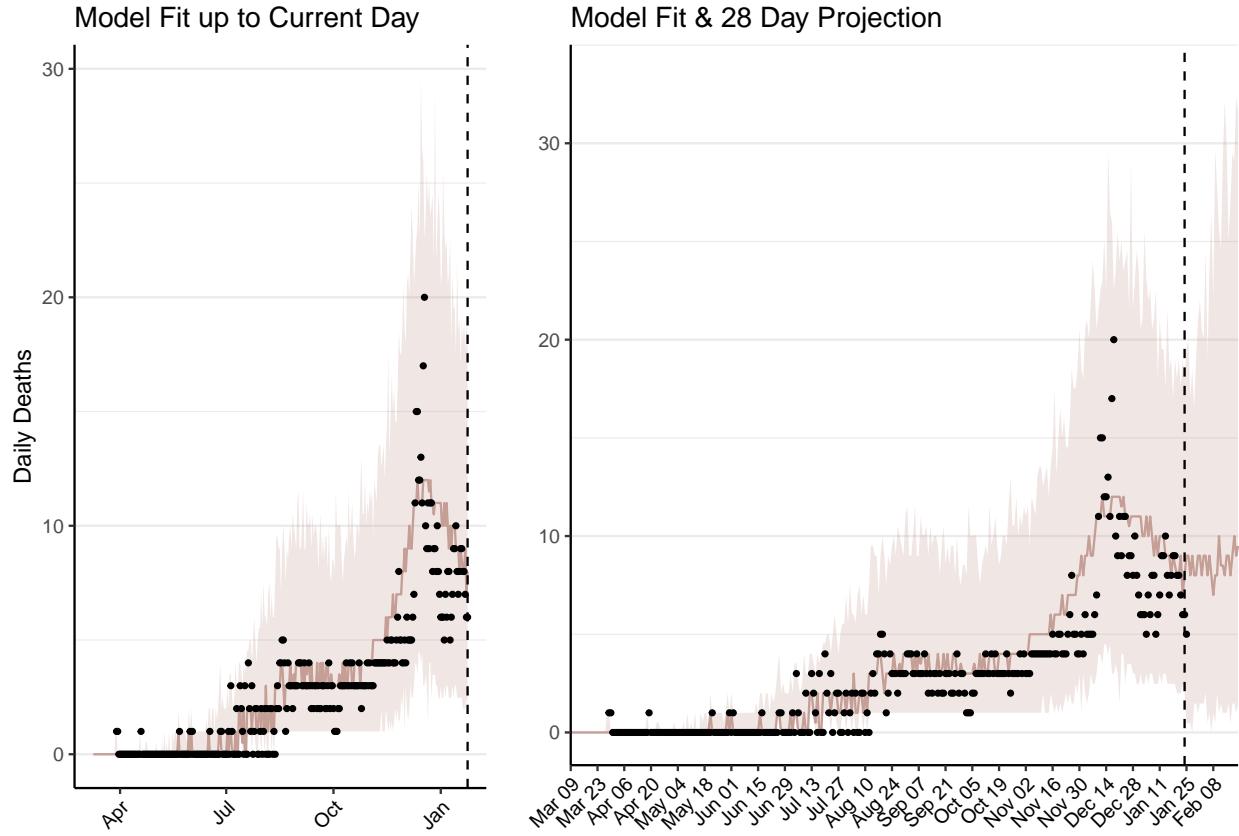


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 343 (95% CI: 314-373) patients requiring treatment with high-pressure oxygen at the current date to 422 (95% CI: 362-482) hospital beds being required on 2021-02-21 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 134 (95% CI: 123-146) patients requiring treatment with mechanical ventilation at the current date to 154 (95% CI: 136-173) by 2021-02-21. 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.**

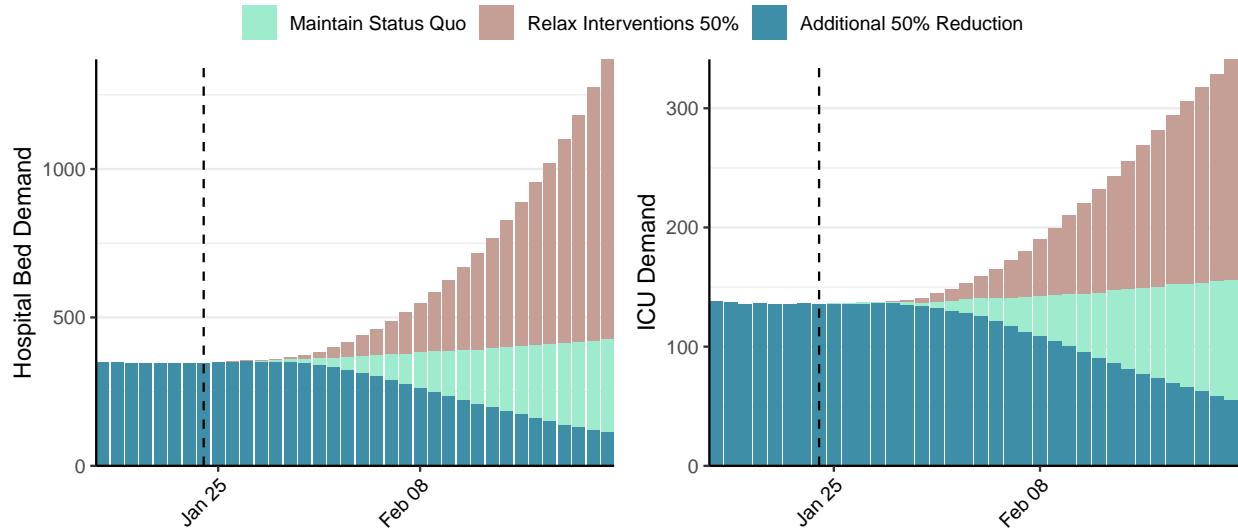


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 3,792 (95% CI: 3,397-4,186) at the current date to 390 (95% CI: 330-450) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 3,792 (95% CI: 3,397-4,186) at the current date to 28,561 (95% CI: 23,838-33,284) by 2021-02-21.

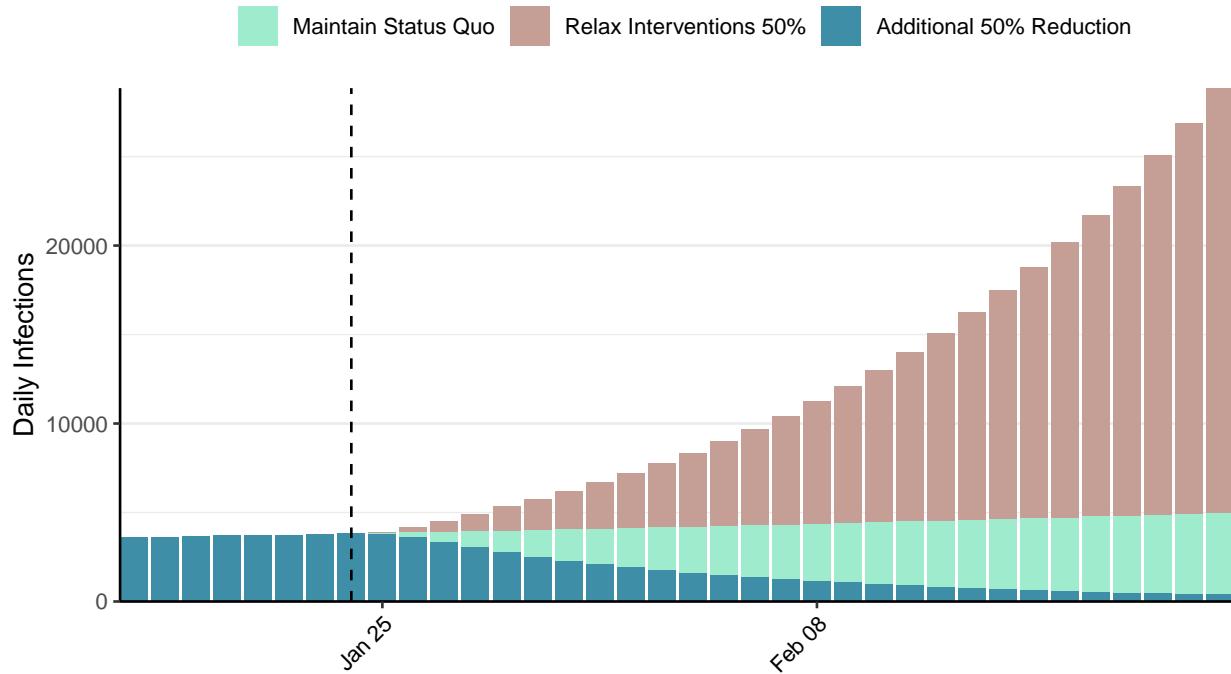


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Chad, 2021-01-24 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}
21	21	0	0	1.31 (95% CI: 0.91-1.81)

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. Chad is not shown in the following plot as only 0 deaths have been reported to date**

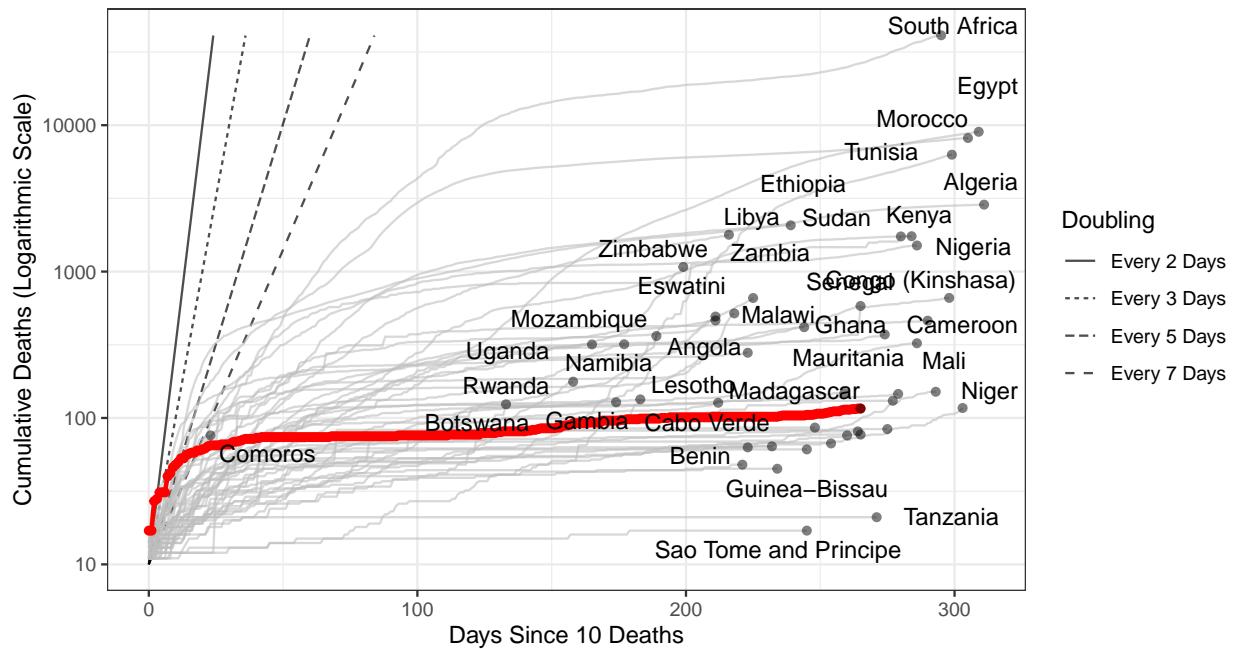


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 24,391 (95% CI: 22,042-26,739) 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).

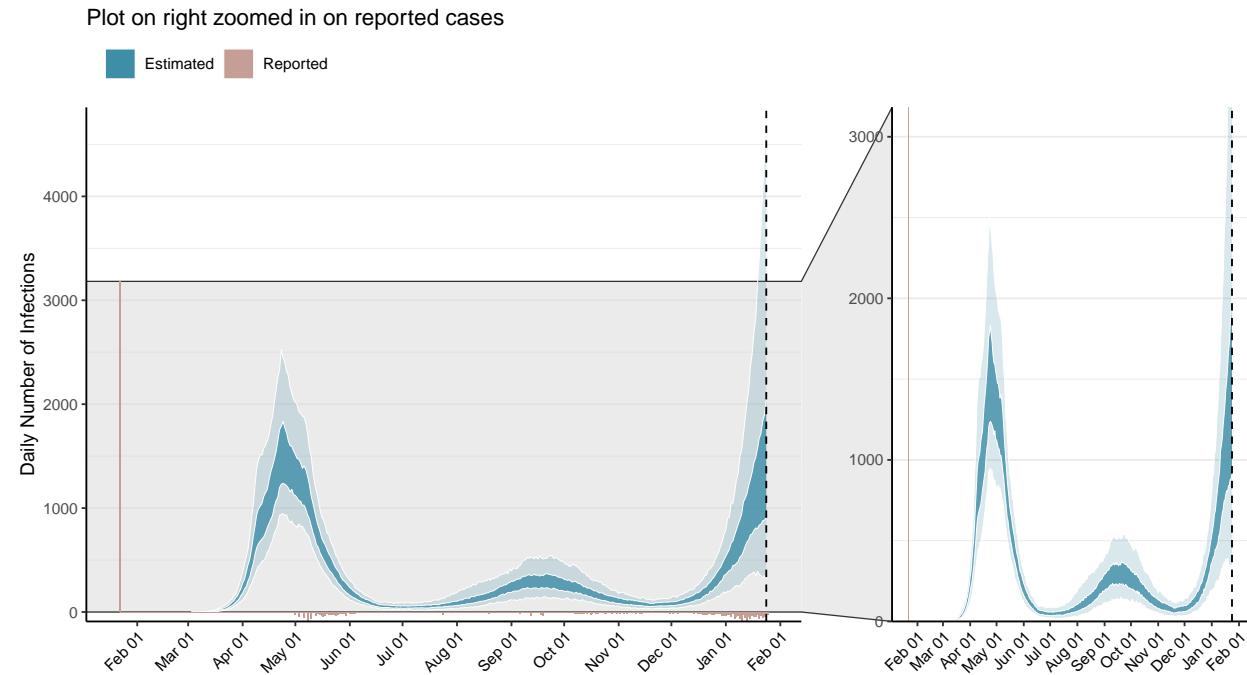


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

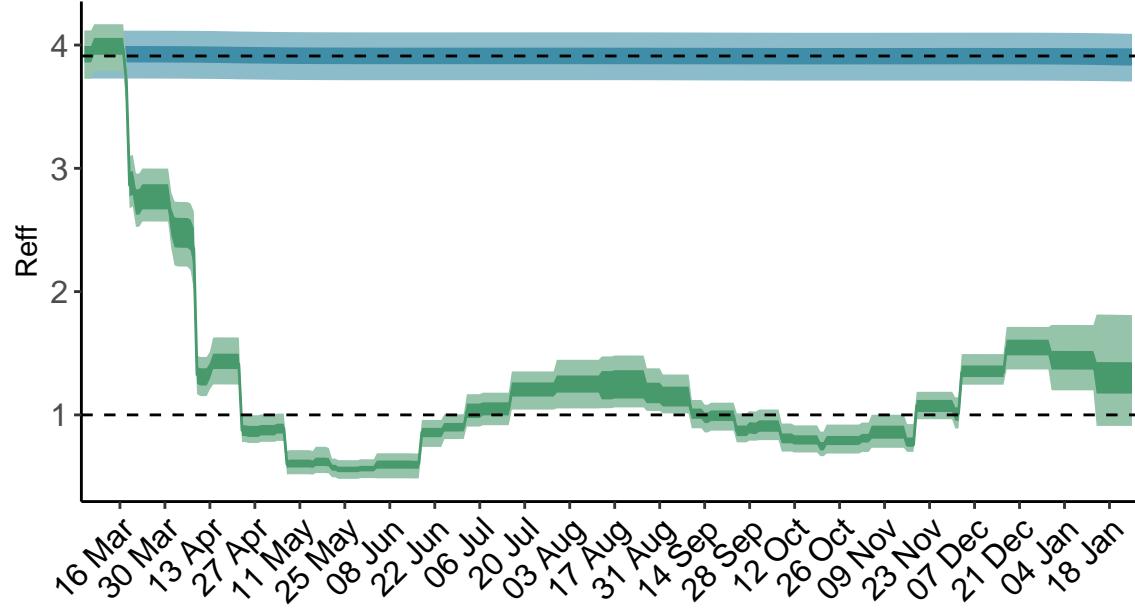


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

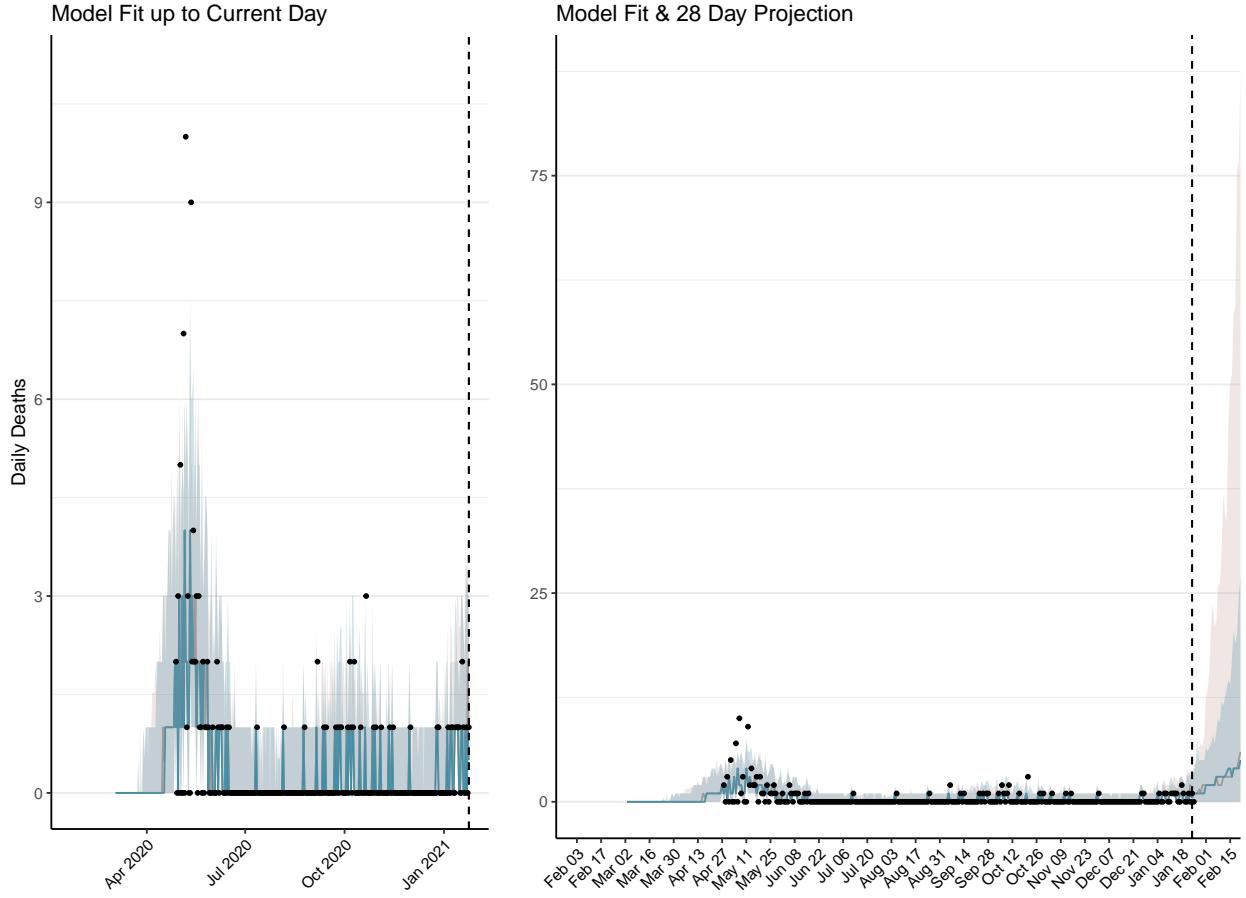


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 71 (95% CI: 64-79) patients requiring treatment with high-pressure oxygen at the current date to 361 (95% CI: 265-458) hospital beds being required on 2021-02-21 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 25 (95% CI: 22-27) patients requiring treatment with mechanical ventilation at the current date to 76 (95% CI: 66-86) by 2021-02-21. 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.**

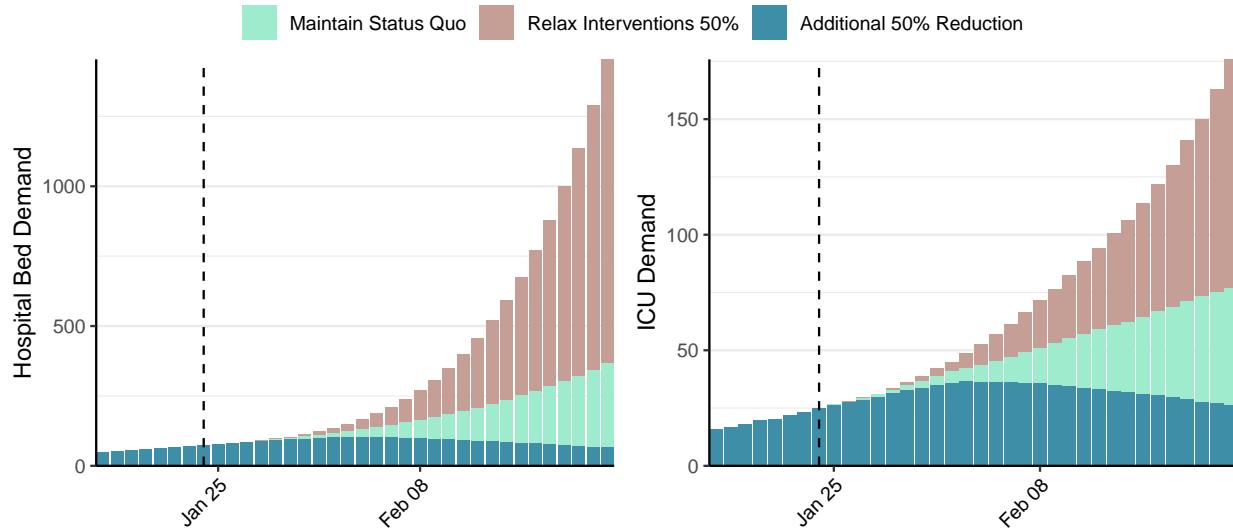


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 1,655 (95% CI: 1,428-1,882) at the current date to 558 (95% CI: 391-725) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 1,655 (95% CI: 1,428-1,882) at the current date to 61,757 (95% CI: 43,009-80,506) by 2021-02-21.

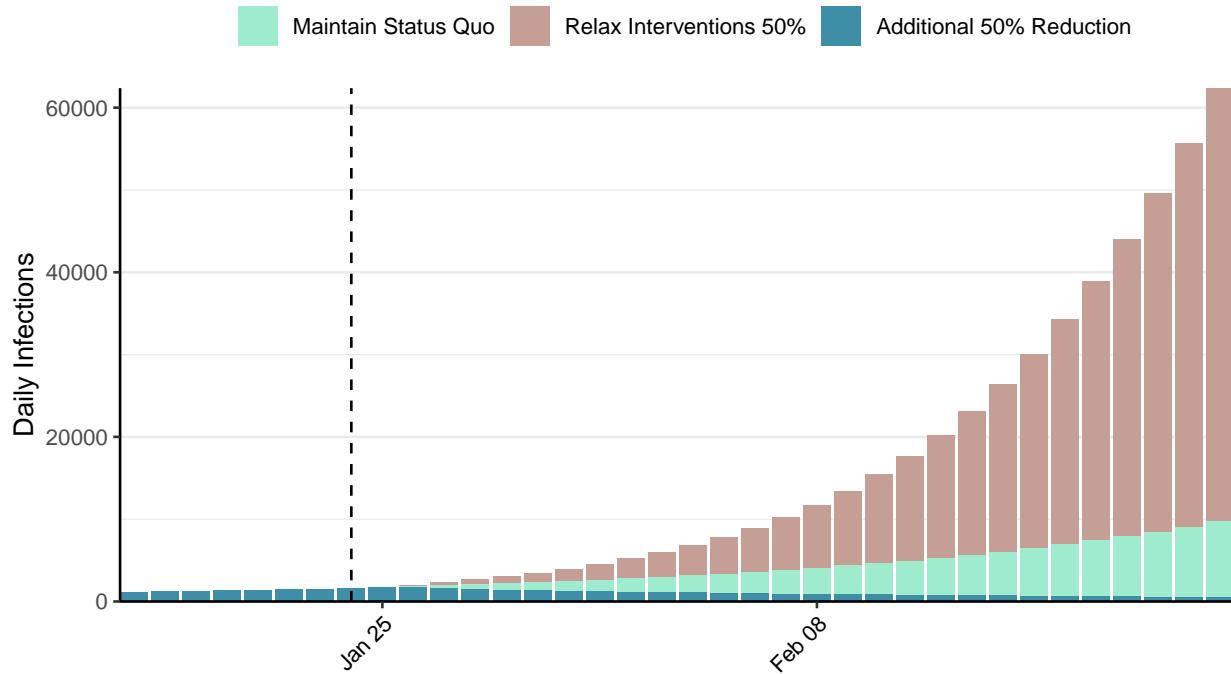


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Togo, 2021-01-24 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}
20	20	1	1	1.24 (95% CI: 0.92-1.53)

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. Togo is not shown in the following plot as only 1 deaths have been reported to date**

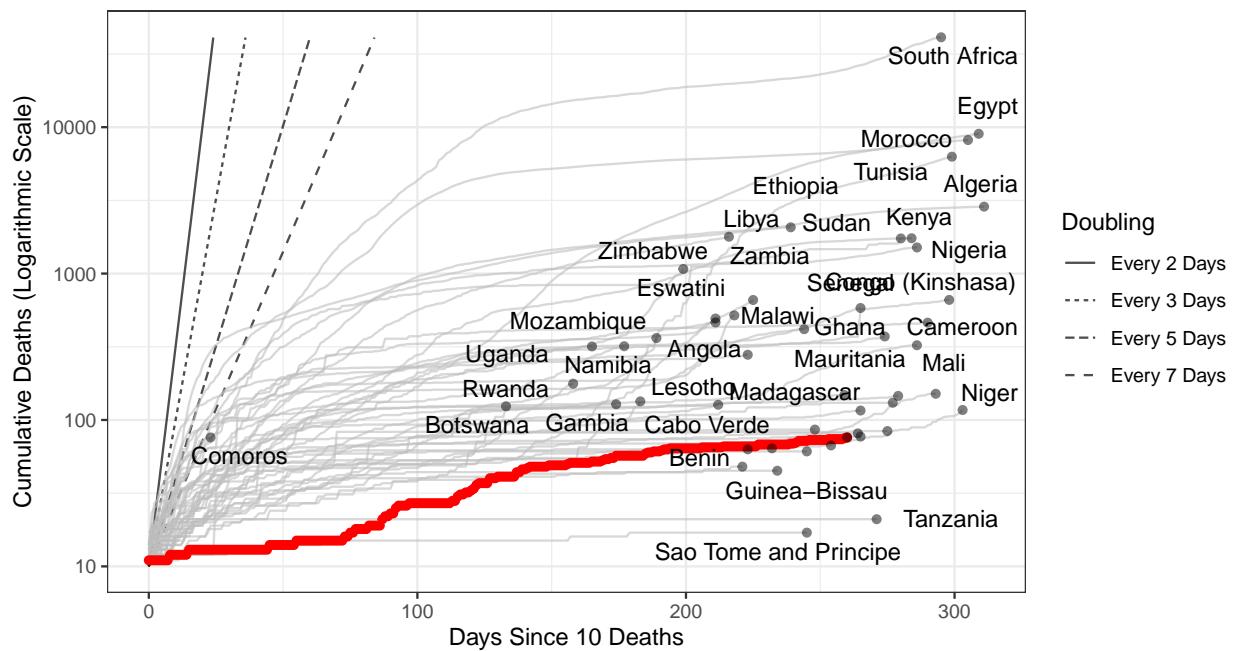


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 10,655 (95% CI: 9,677-11,633) 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).

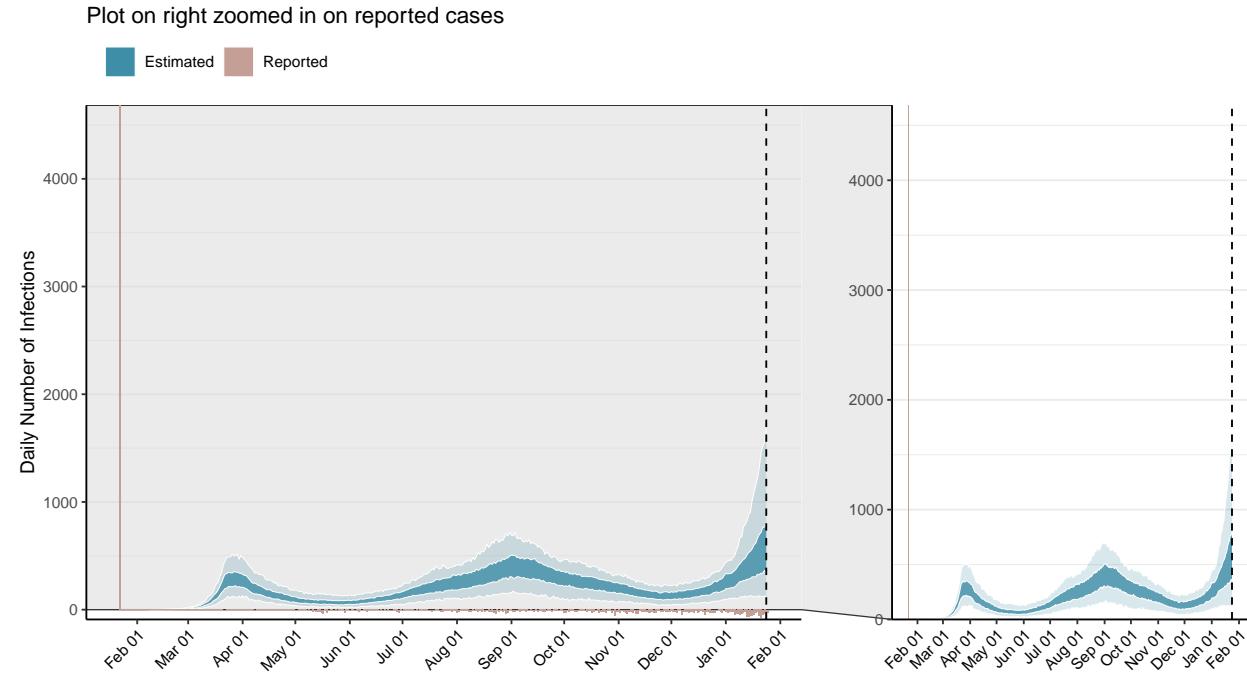


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

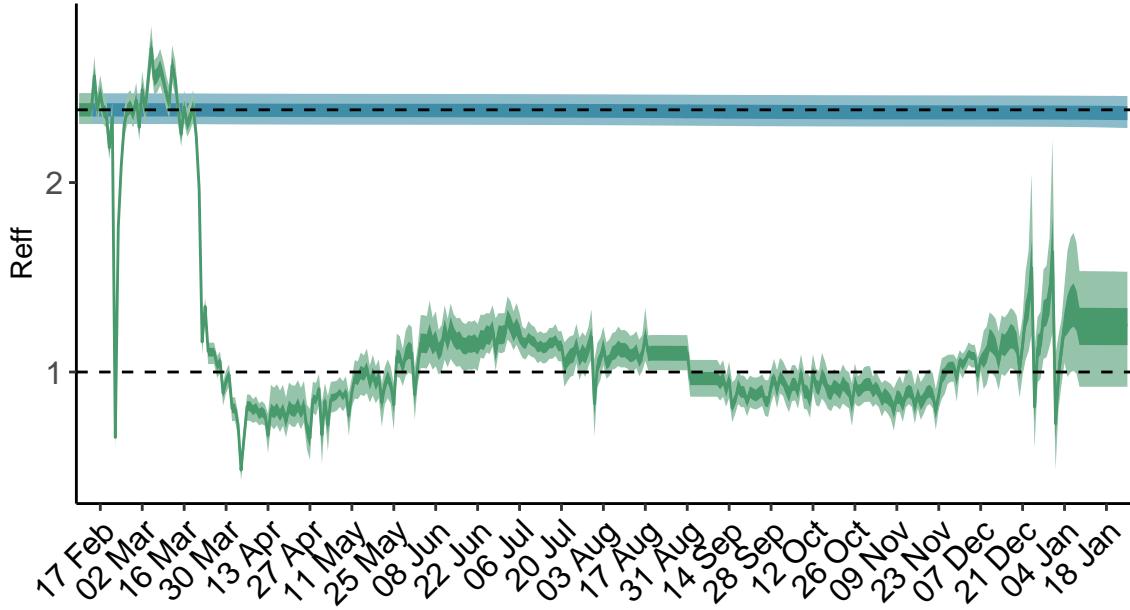


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

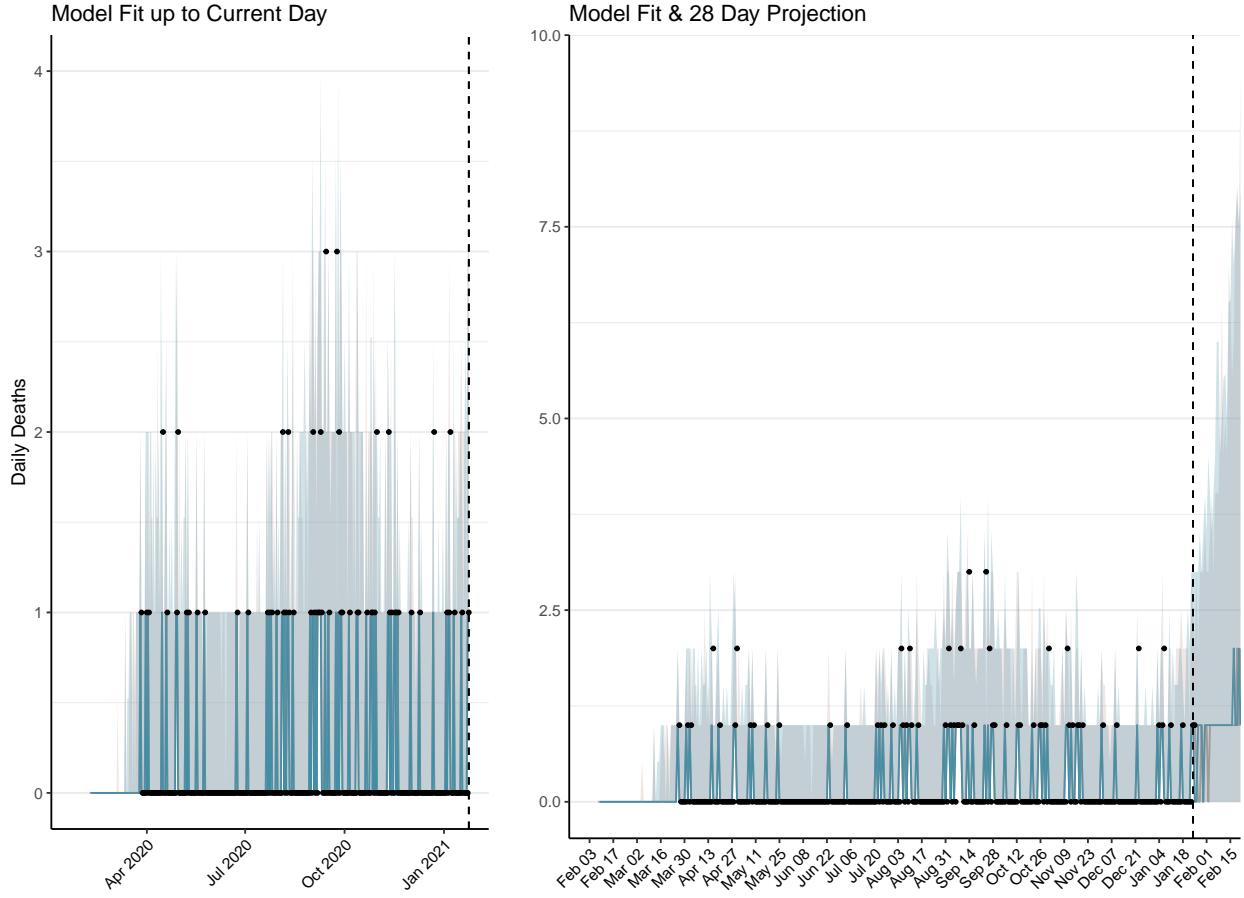


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 32 (95% CI: 29-36) patients requiring treatment with high-pressure oxygen at the current date to 109 (95% CI: 88-131) hospital beds being required on 2021-02-21 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: 11-13) patients requiring treatment with mechanical ventilation at the current date to 40 (95% CI: 33-47) by 2021-02-21. 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.**

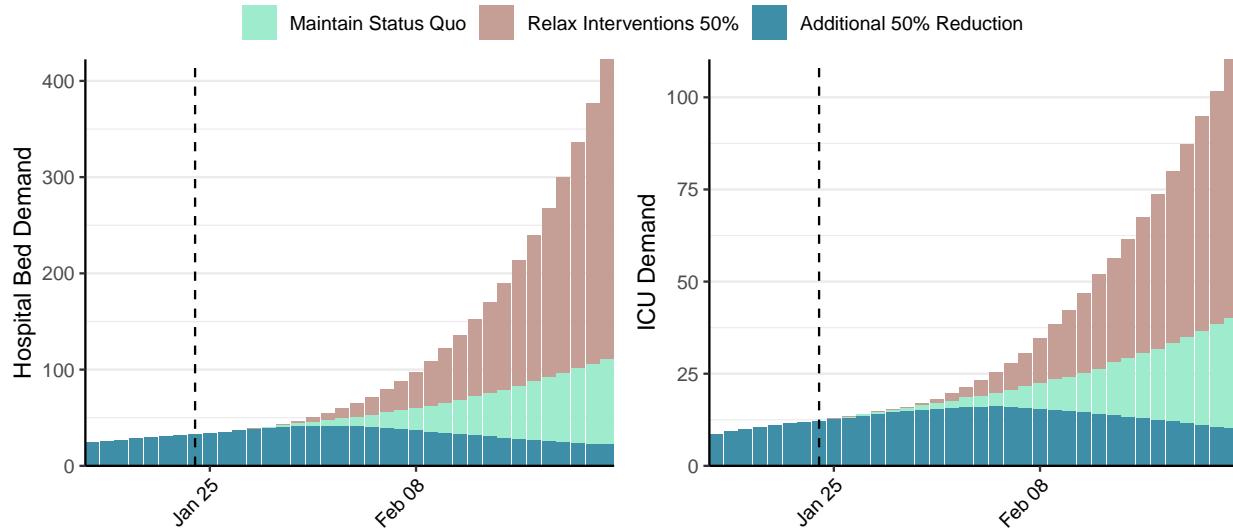


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 621 (95% CI: 545-696) at the current date to 145 (95% CI: 114-176) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 621 (95% CI: 545-696) at the current date to 15,219 (95% CI: 11,544-18,895) by 2021-02-21.

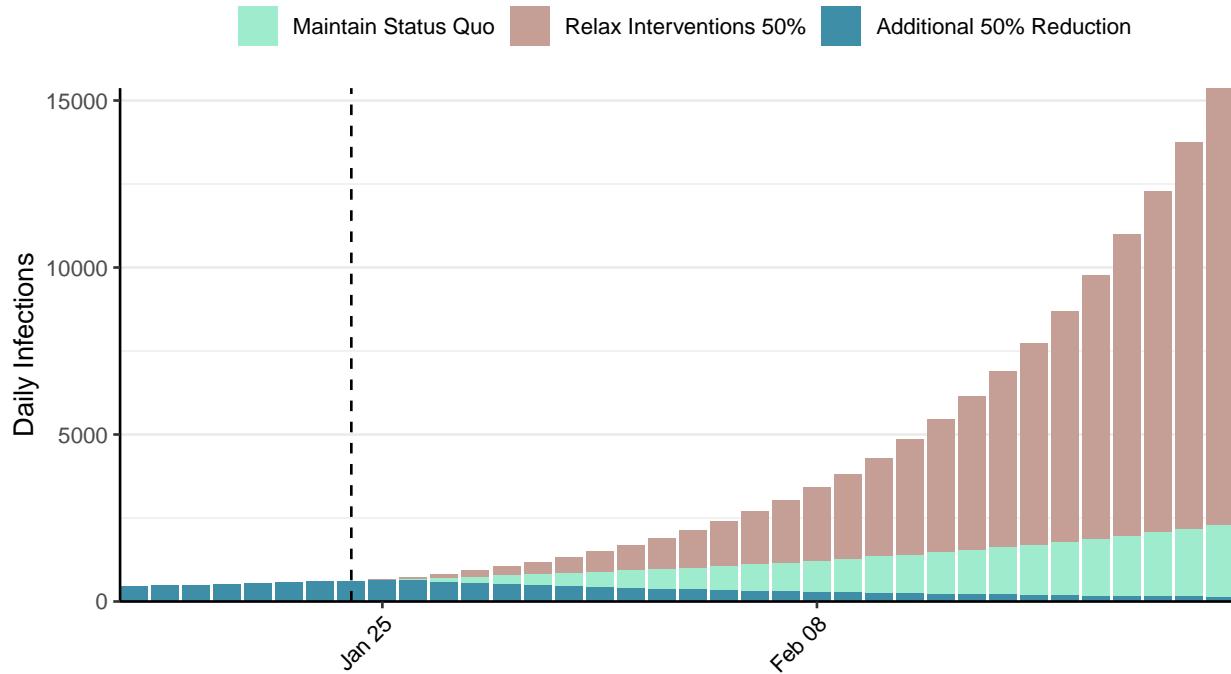


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Thailand, 2021-01-24 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}
1,146	1,146	2	2	1.05 (95% CI: 0.84-1.32)

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. Thailand is not shown in the following plot as only 2 deaths have been reported to date**

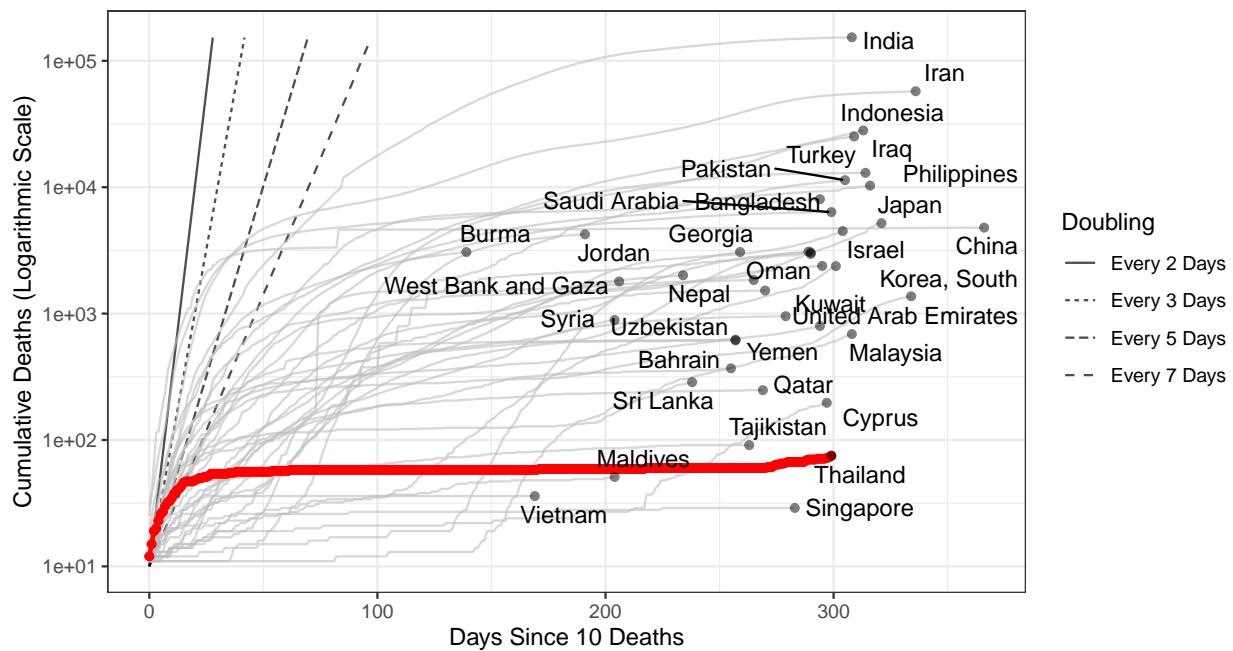


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 7,344 (95% CI: 5,450-9,238) 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

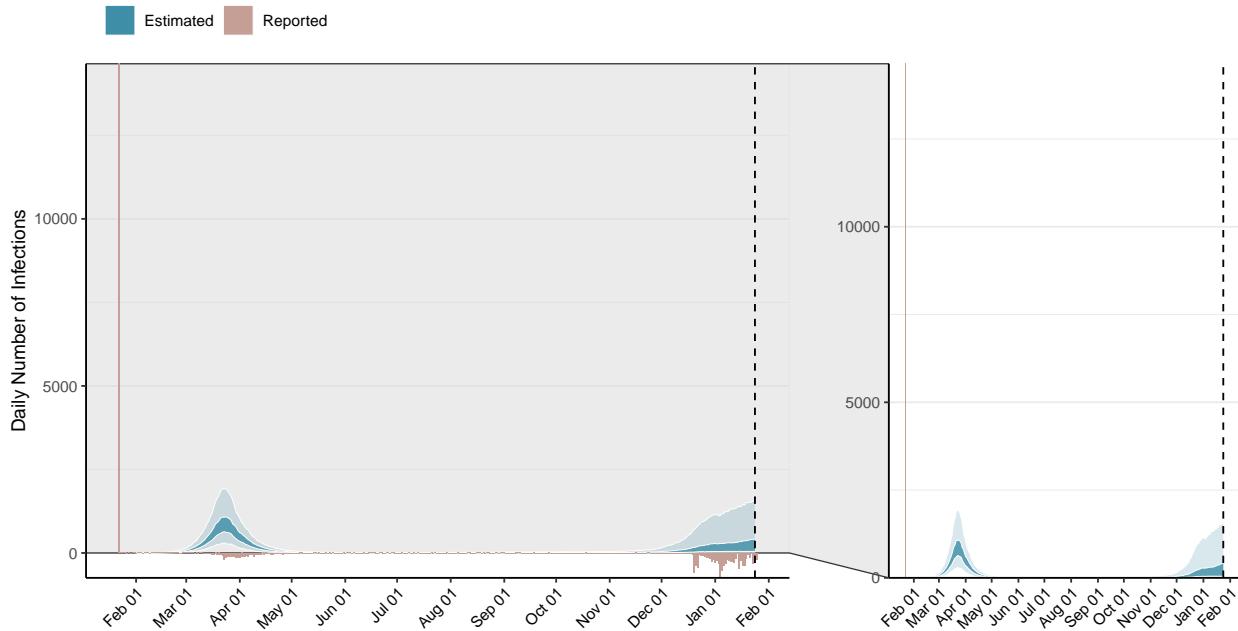


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

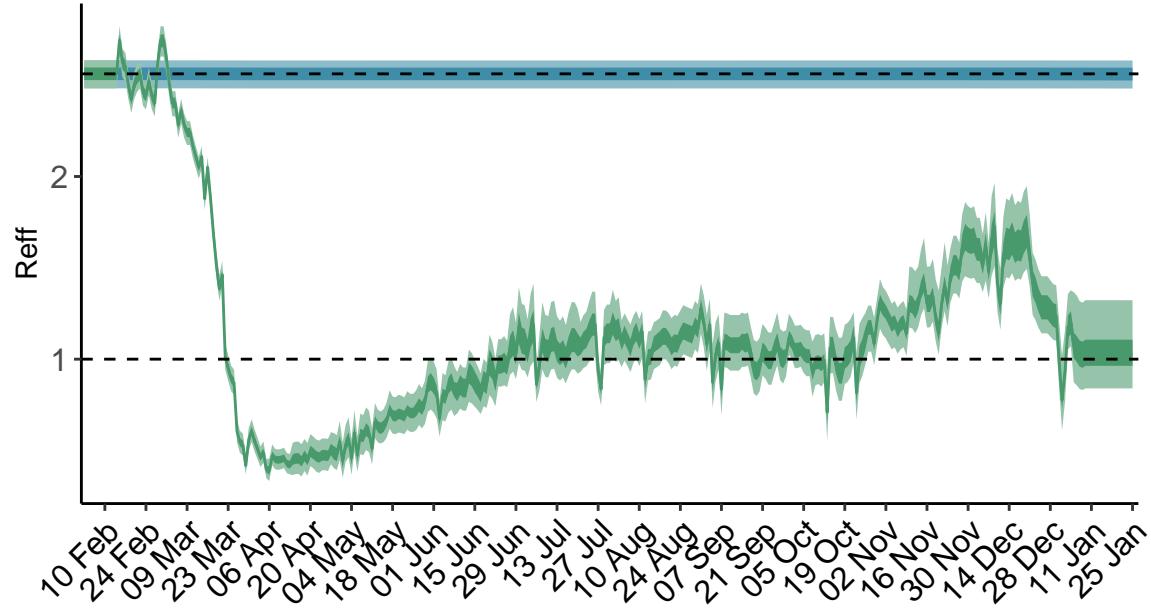


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

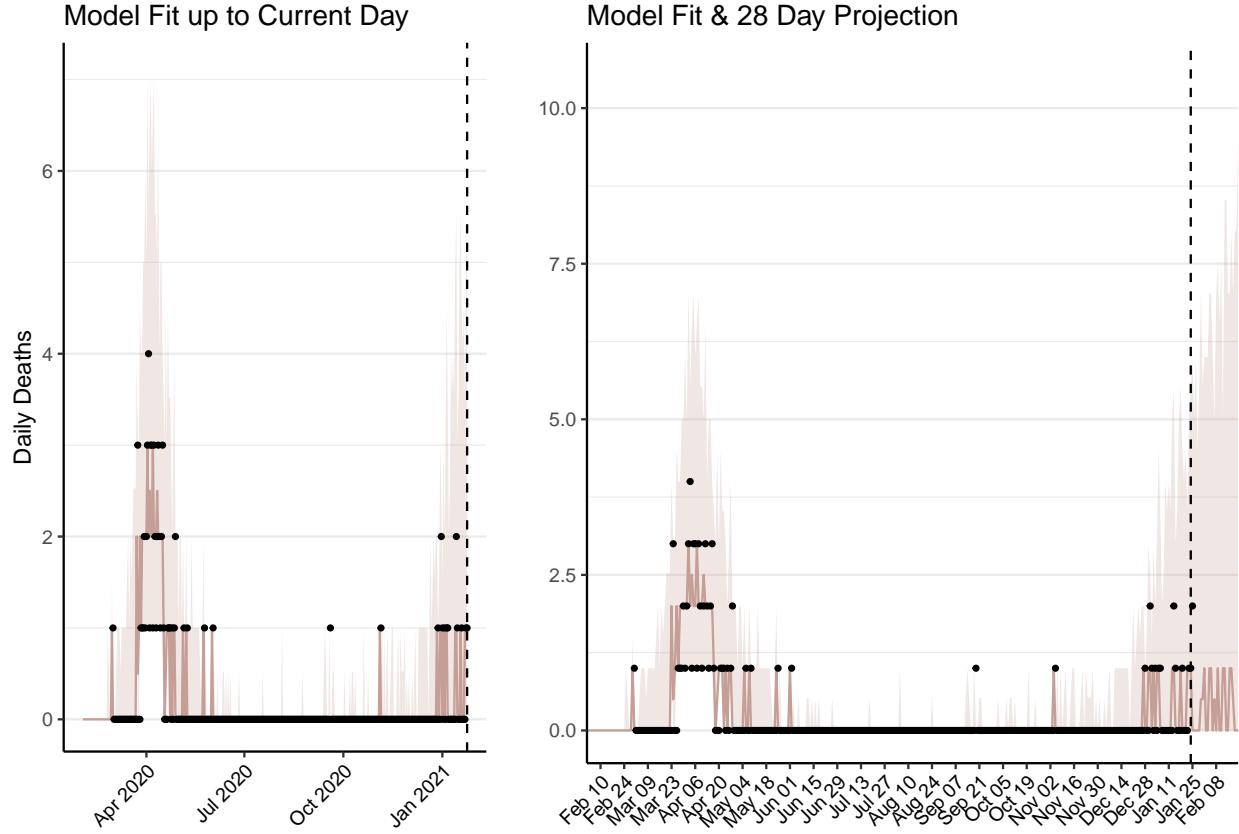


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 39 (95% CI: 28-49) patients requiring treatment with high-pressure oxygen at the current date to 63 (95% CI: 44-82) hospital beds being required on 2021-02-21 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: 11-18) patients requiring treatment with mechanical ventilation at the current date to 23 (95% CI: 16-30) by 2021-02-21. 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.**

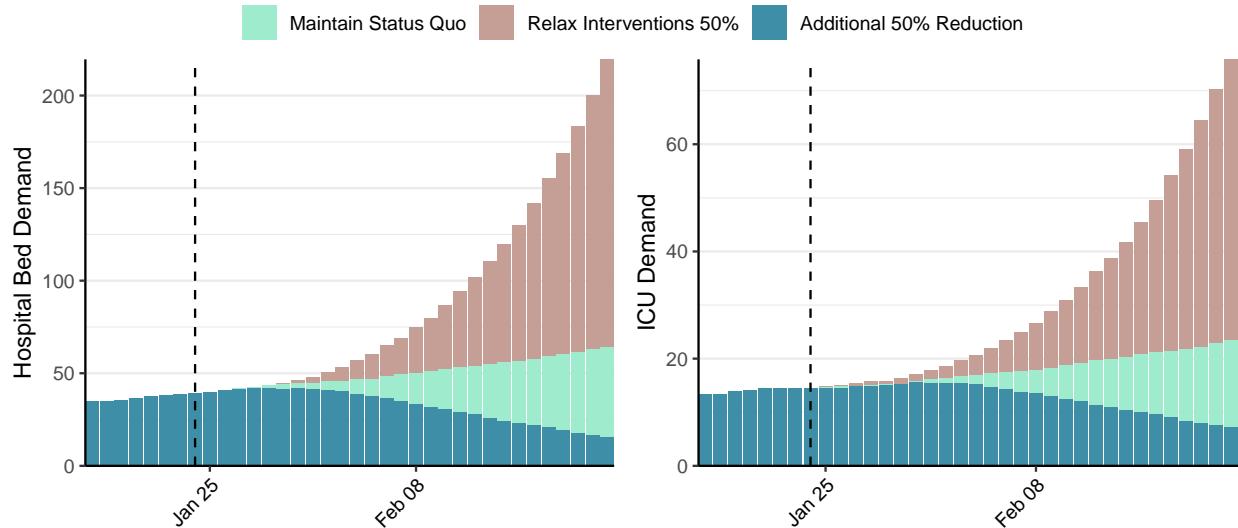


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 318 (95% CI: 233-404) at the current date to 41 (95% CI: 28-53) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 318 (95% CI: 233-404) at the current date to 3,583 (95% CI: 2,358-4,809) by 2021-02-21.

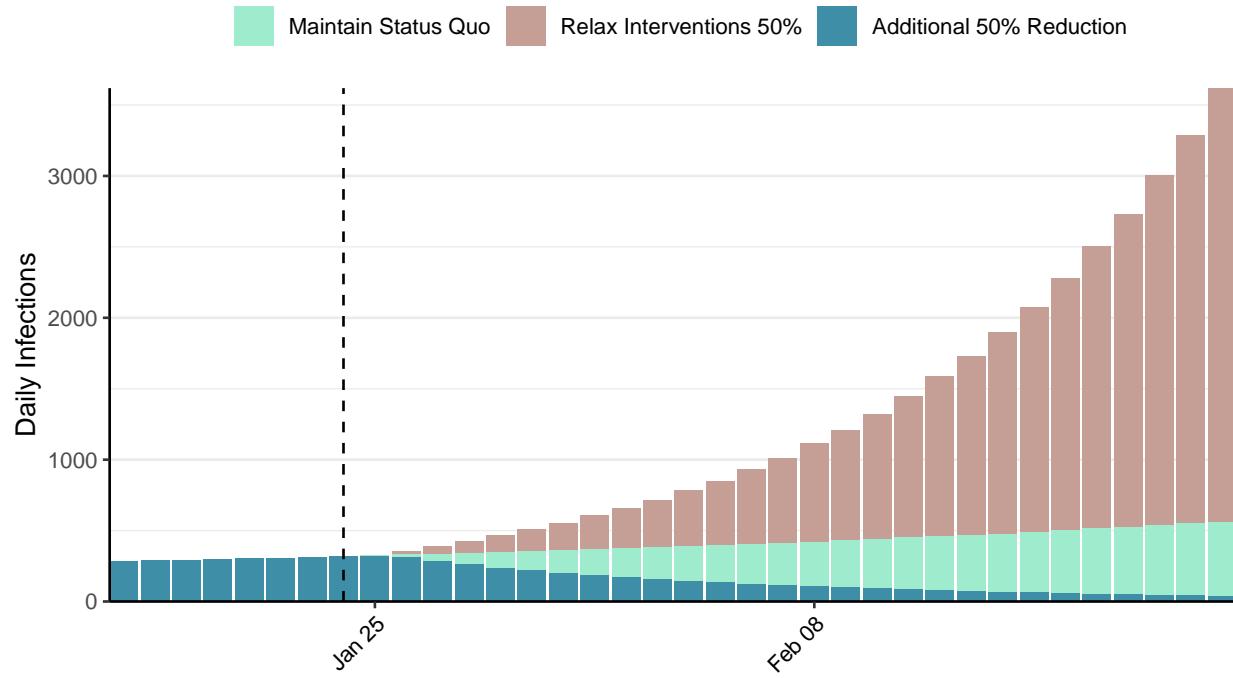


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Tajikistan, 2021-01-24 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: 0.54-0.88)

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. Tajikistan is not shown in the following plot as only 0 deaths have been reported to date**

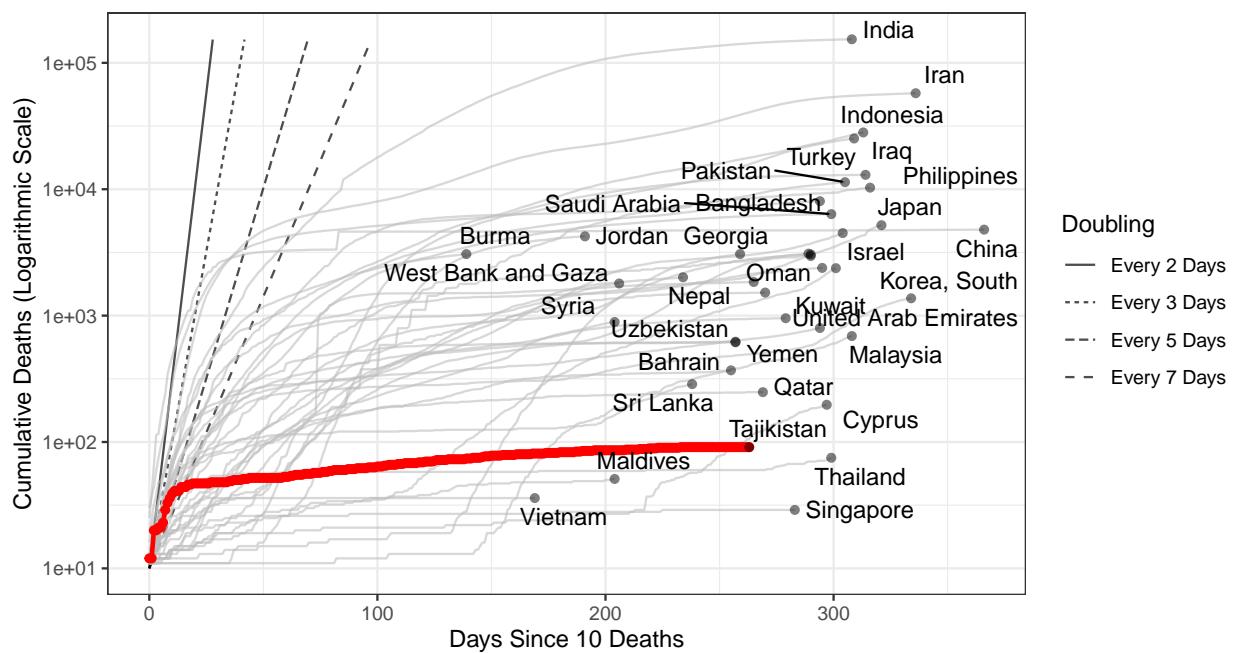


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 793 (95% CI: 710-876) 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

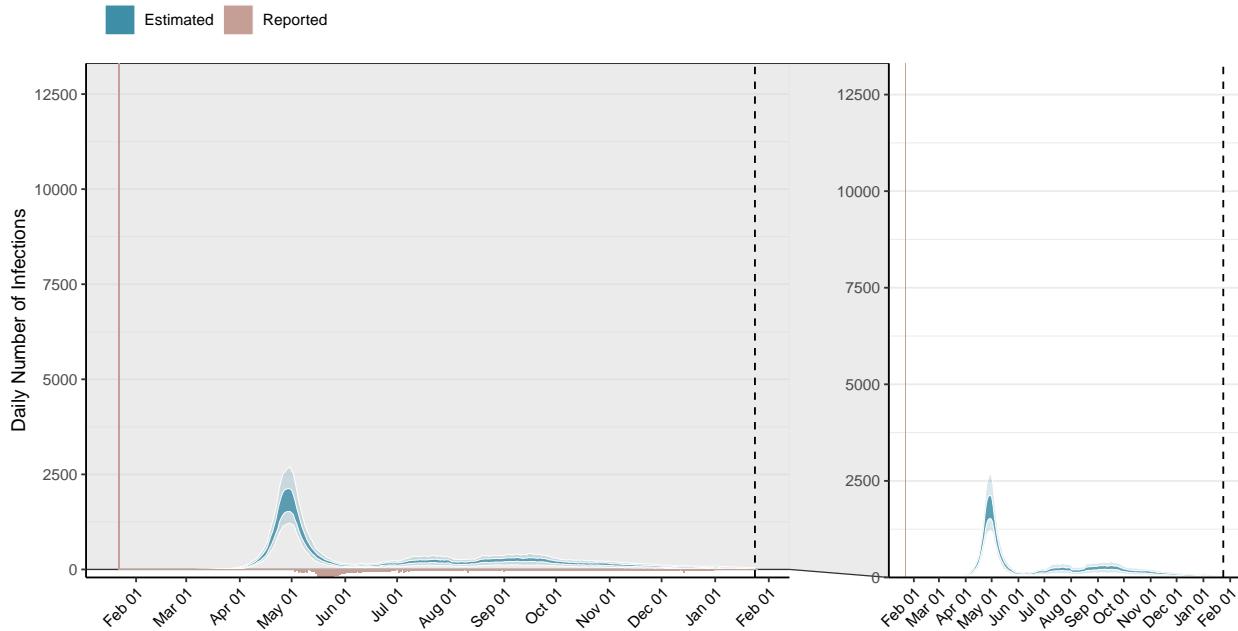


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

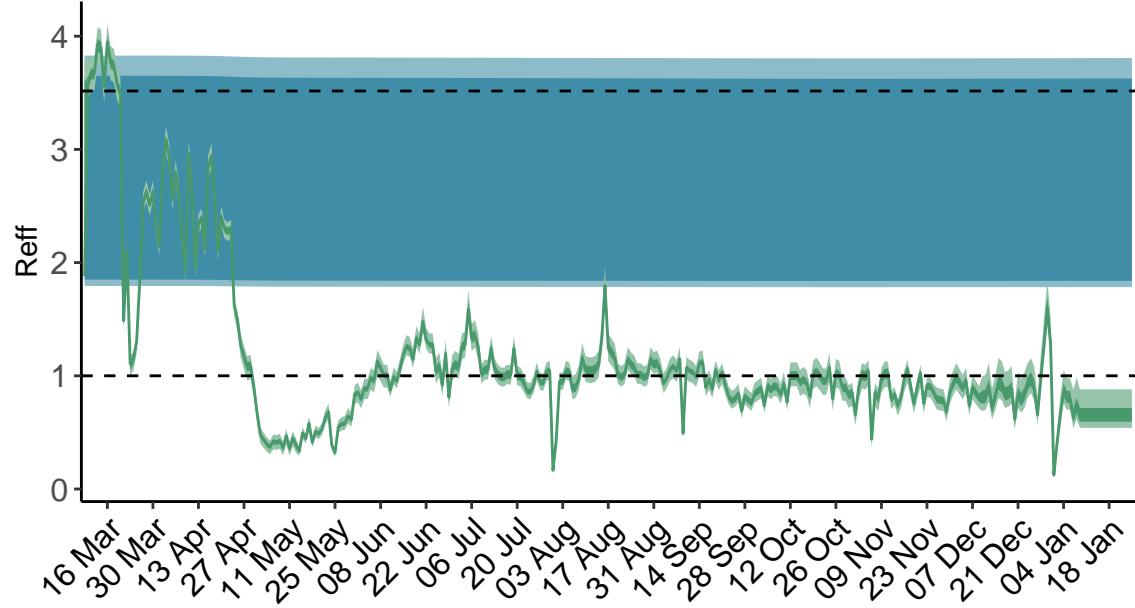


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

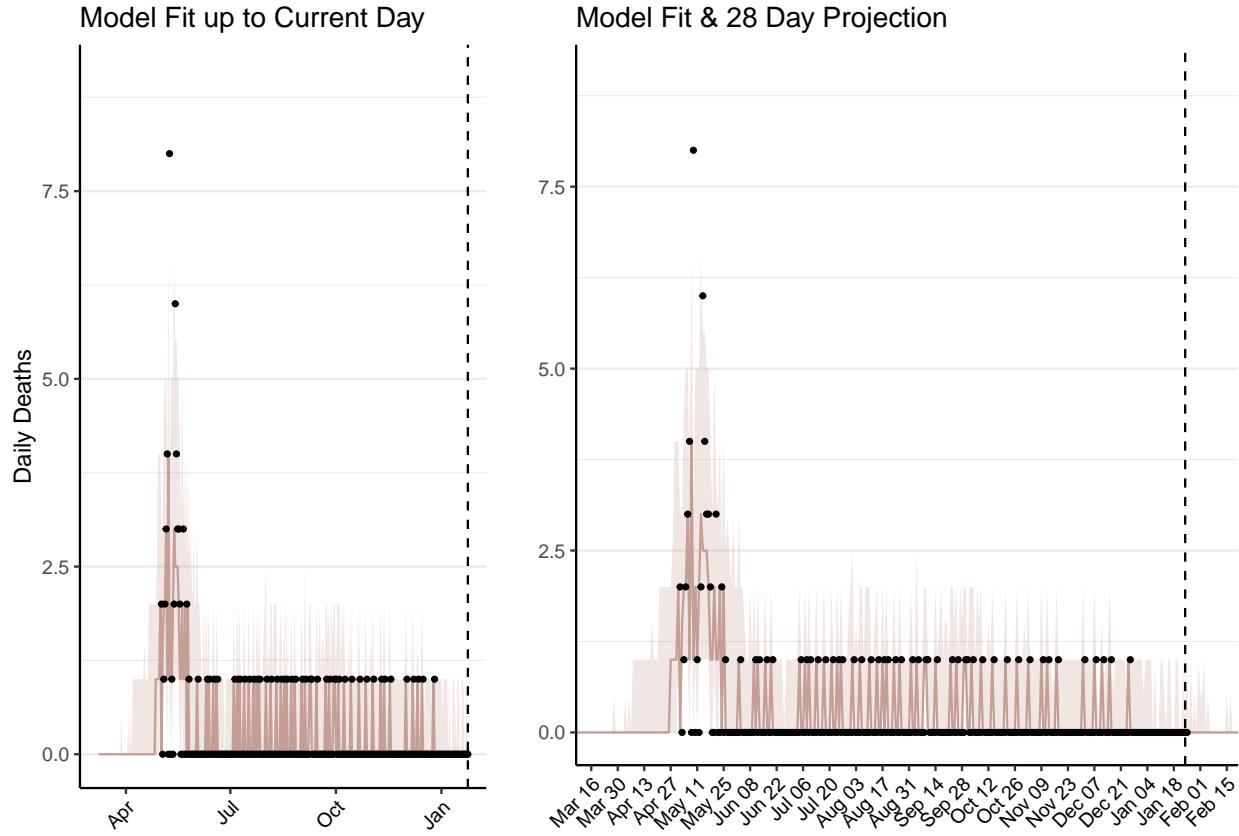


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 (95% CI: 1-2) patients requiring treatment with high-pressure oxygen at the current date to 1 (95% CI: 0-1) hospital beds being required on 2021-02-21 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: 0-1) patients requiring treatment with mechanical ventilation at the current date to 0 (95% CI: 0-0) by 2021-02-21. 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.**

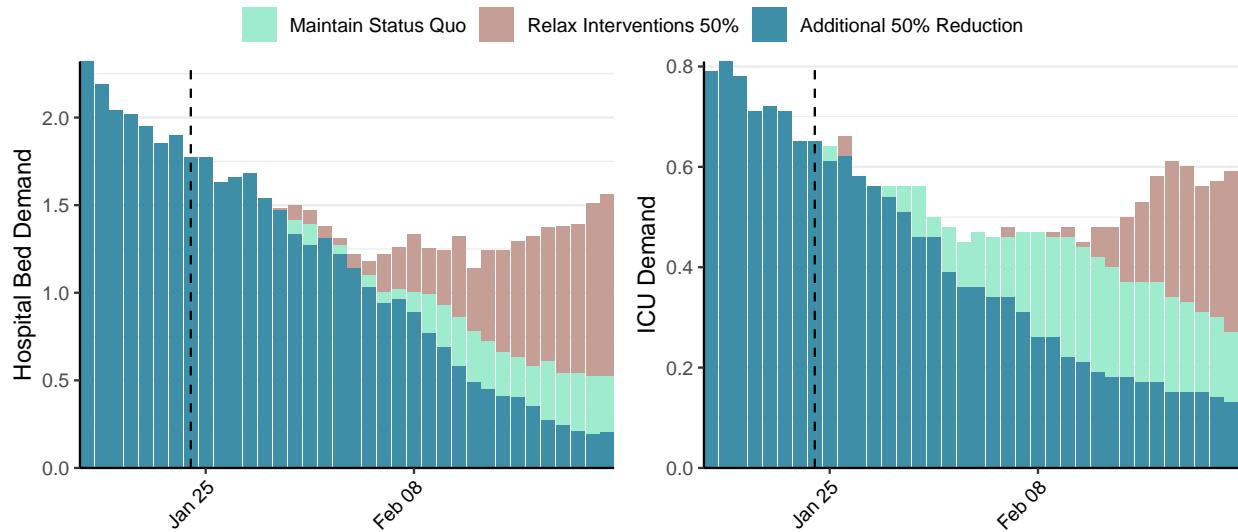


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 (95% CI: 12-17) at the current date to 0 (95% CI: 0-1) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 14 (95% CI: 12-17) at the current date to 25 (95% CI: 15-36) by 2021-02-21.

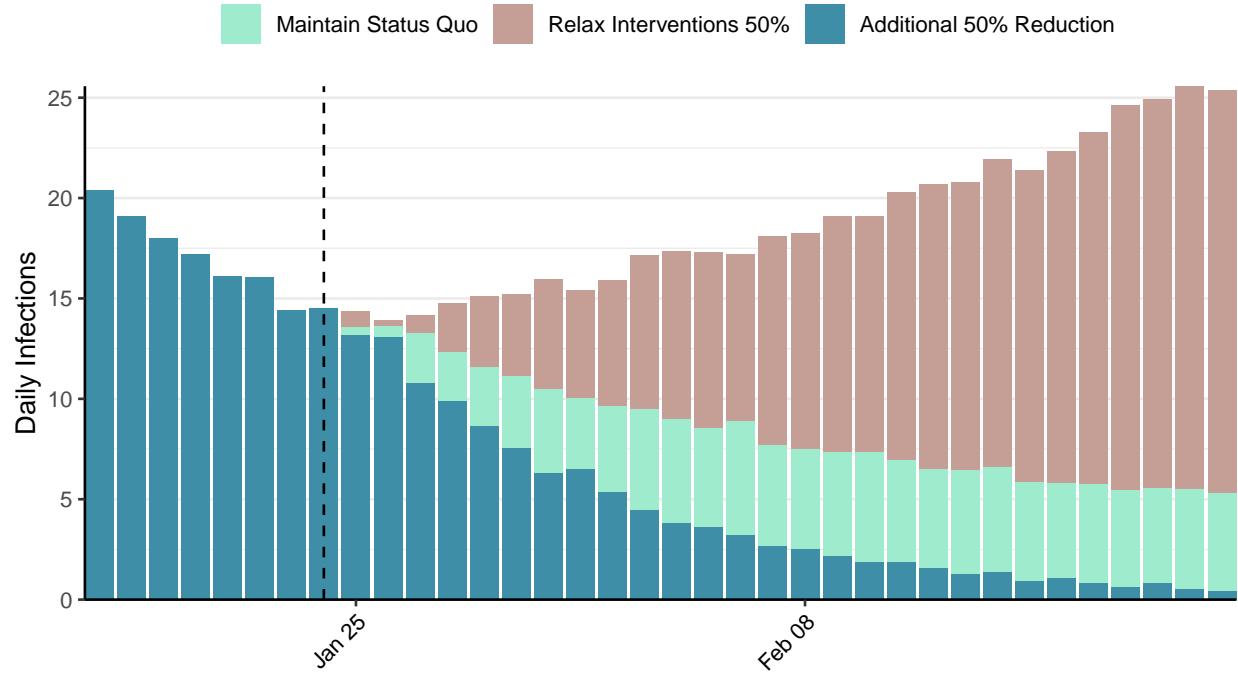


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Tunisia, 2021-01-24

[Download the report for Tunisia, 2021-01-24 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}
1,263	1,263	53	53	1.03 (95% CI: 0.85-1.21)

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.

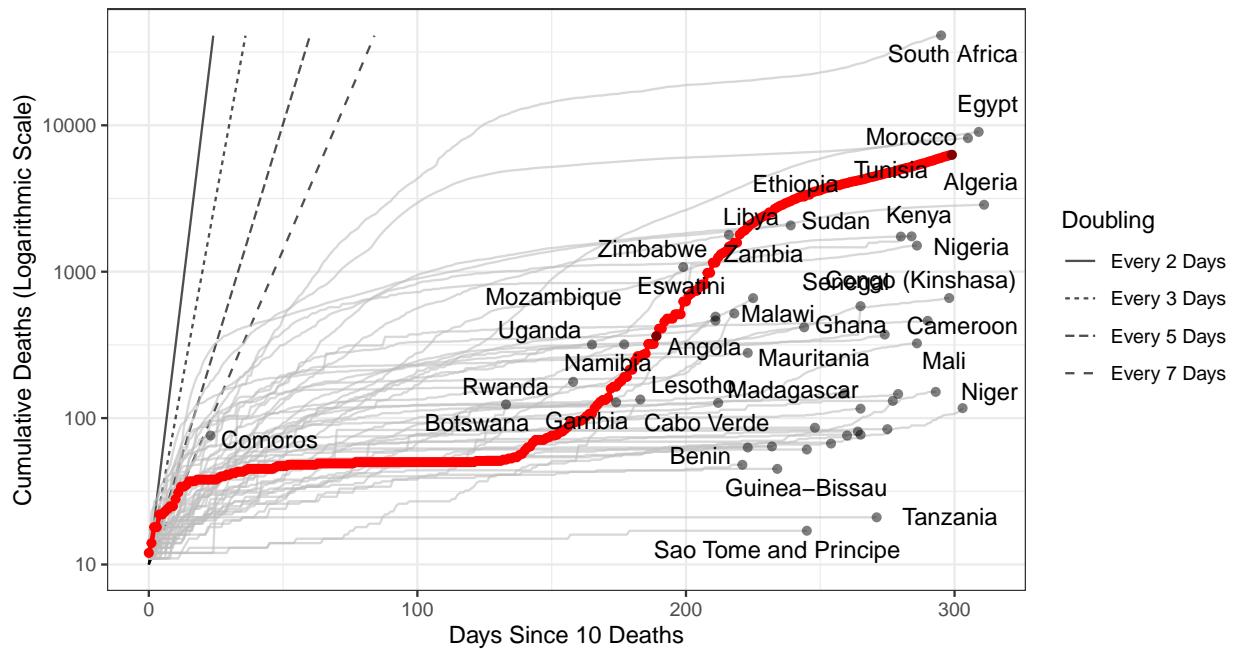


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 477,428 (95% CI: 464,064-490,792) 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).

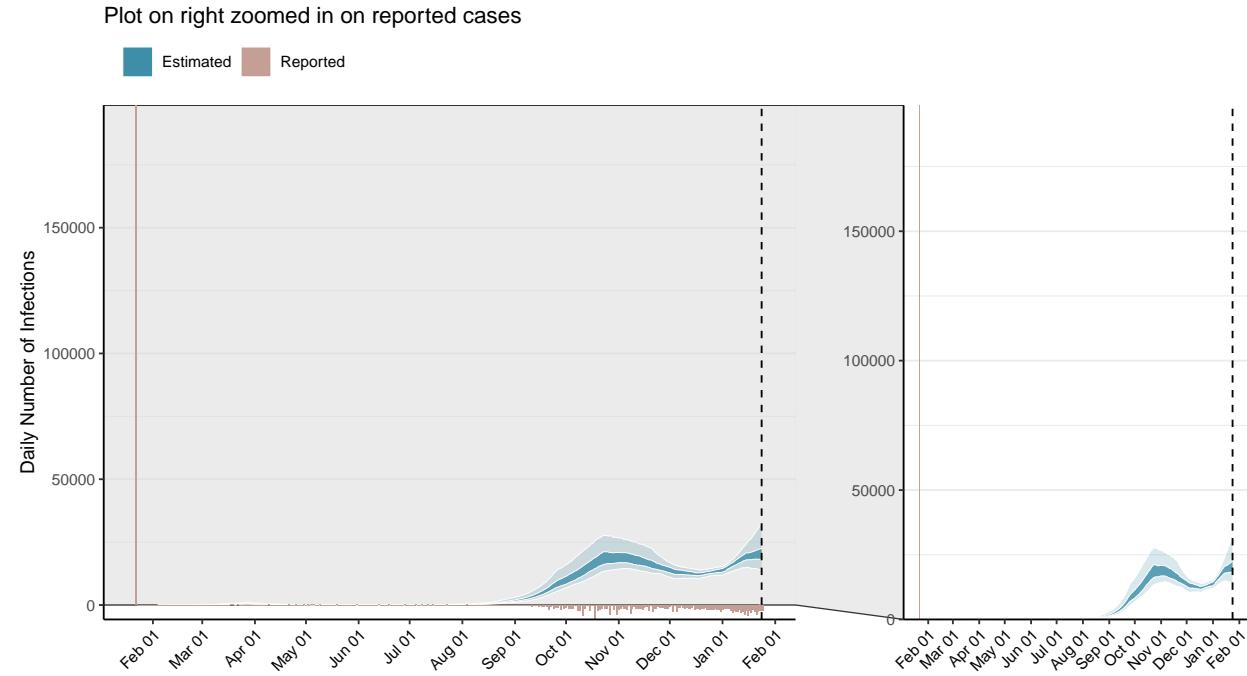


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

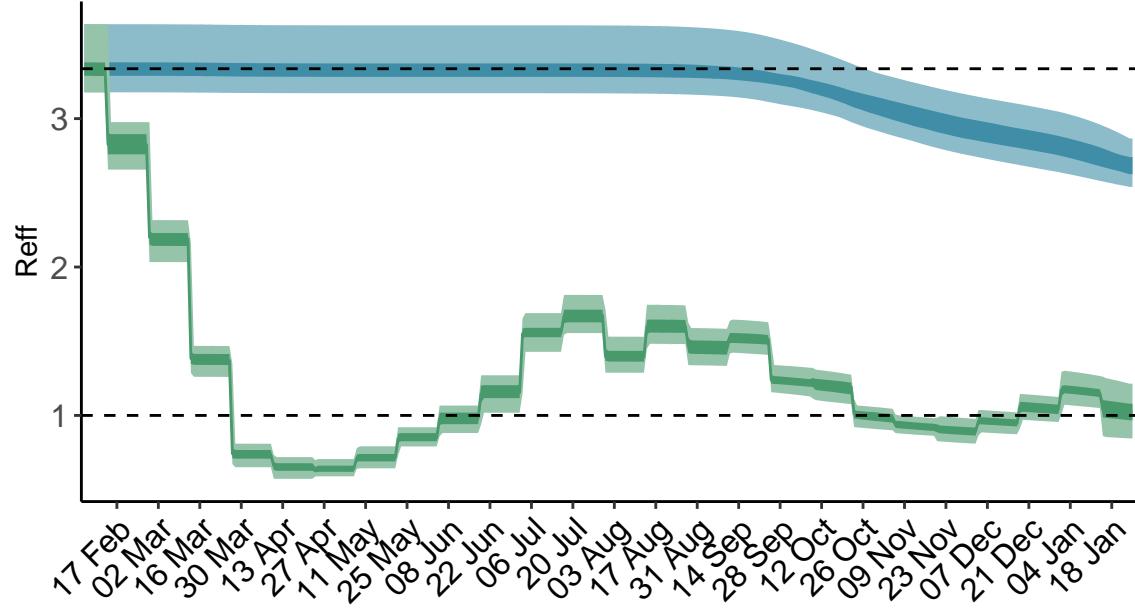


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

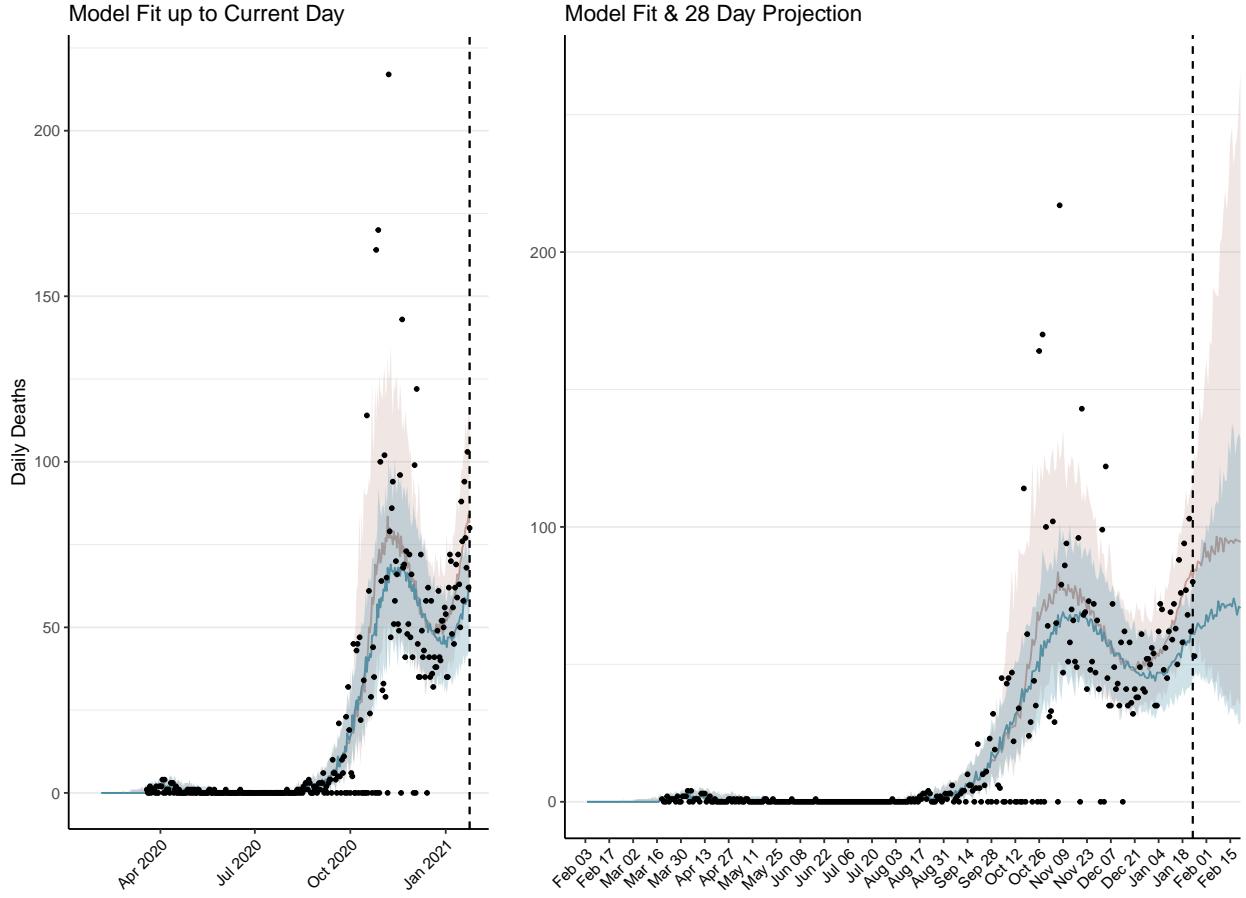


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 2,317 (95% CI: 2,249-2,385) patients requiring treatment with high-pressure oxygen at the current date to 2,903 (95% CI: 2,653-3,153) hospital beds being required on 2021-02-21 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 549 (95% CI: 538-561) patients requiring treatment with mechanical ventilation at the current date to 573 (95% CI: 554-592) by 2021-02-21. 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.**

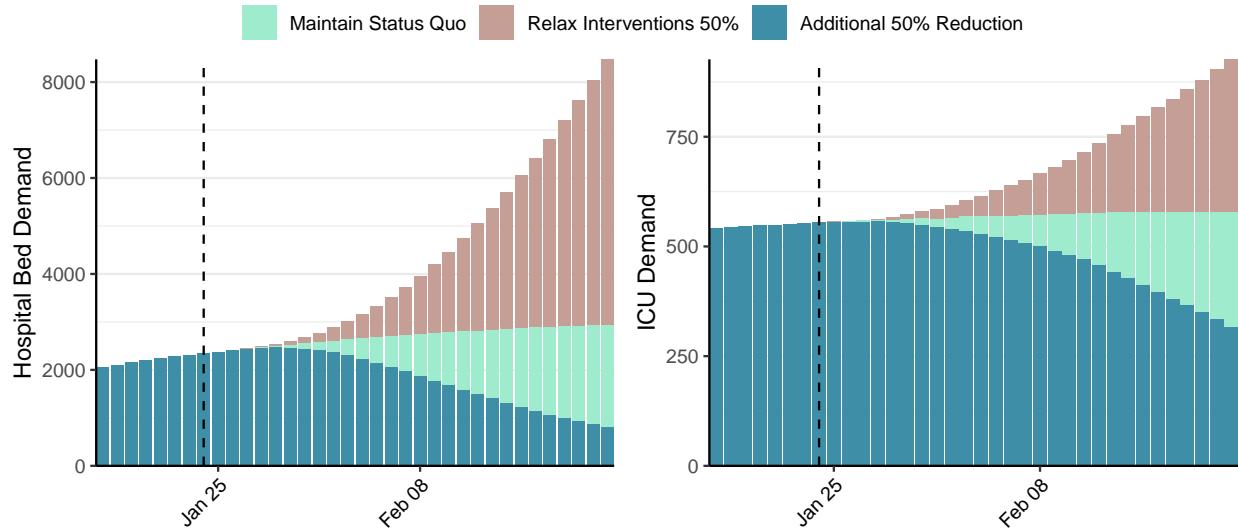


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 20,546 (95% CI: 19,579-21,514) at the current date to 2,043 (95% CI: 1,829-2,256) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 20,546 (95% CI: 19,579-21,514) at the current date to 99,972 (95% CI: 91,316-108,628) by 2021-02-21.

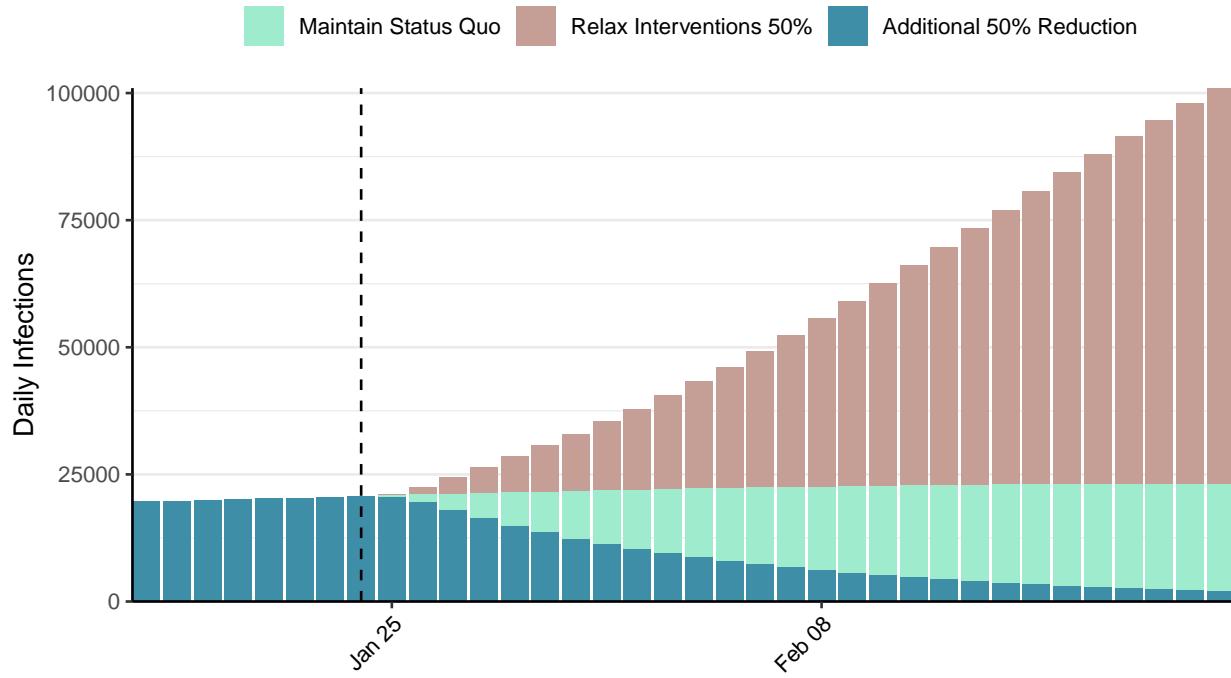


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Turkey, 2021-01-24 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}
5,642	5,642	137	137	0.68 (95% CI: 0.58-0.82)

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.

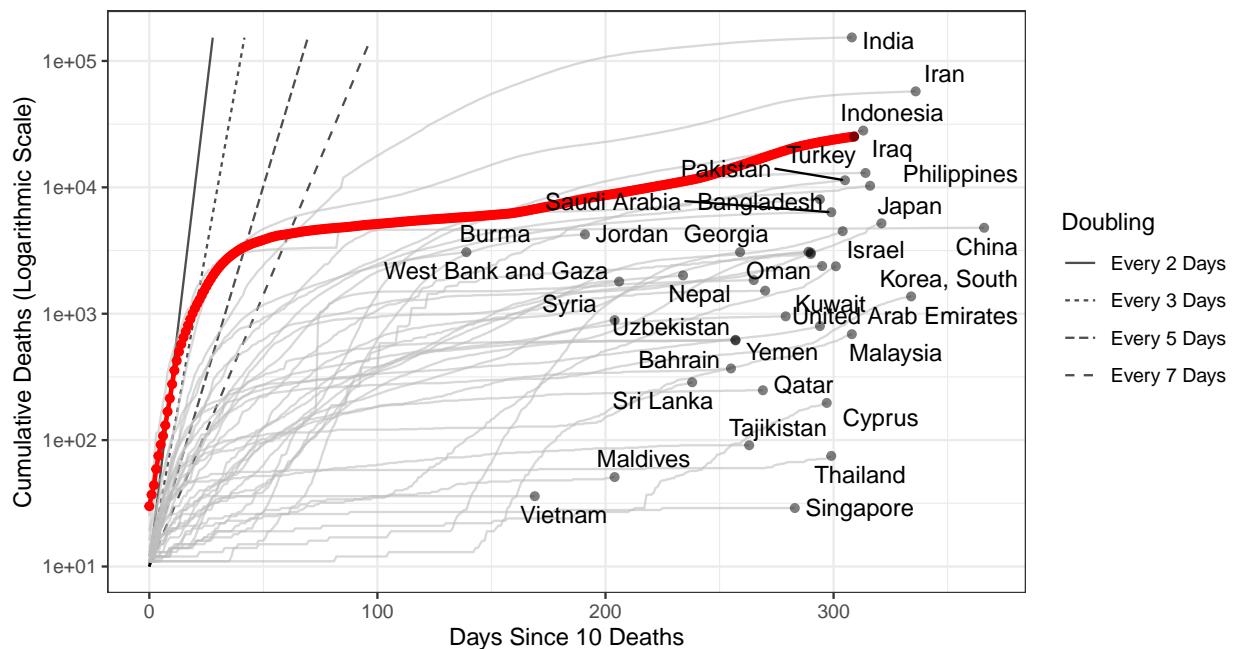


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 1,349,598 (95% CI: 1,308,321-1,390,874) 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

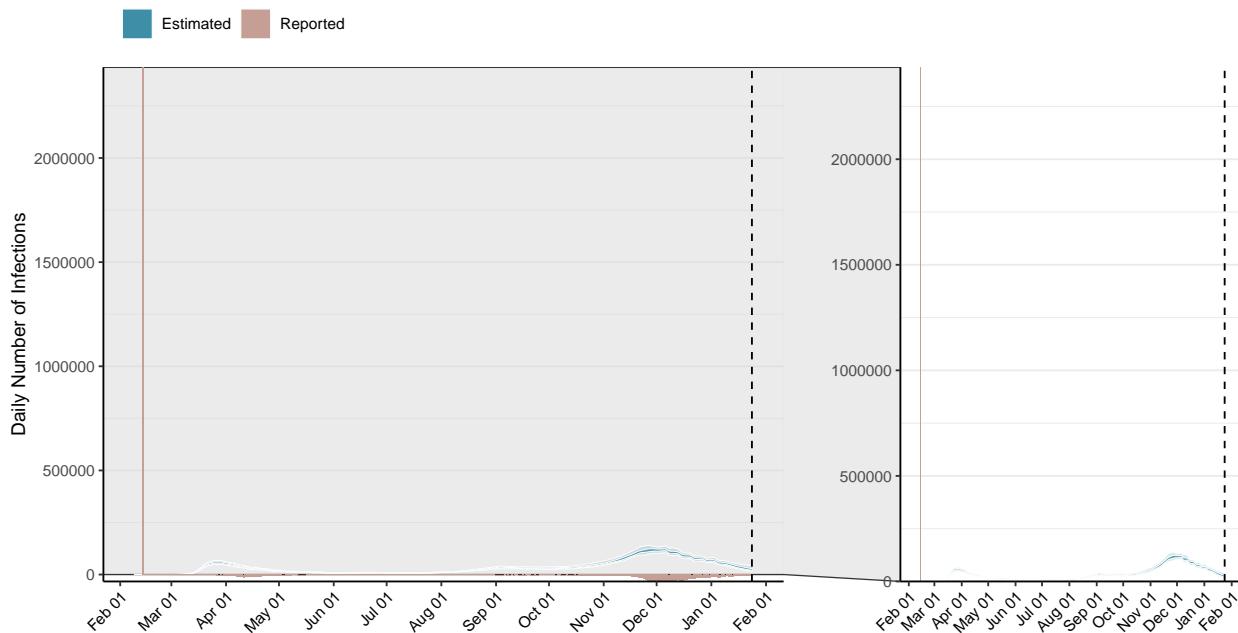


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

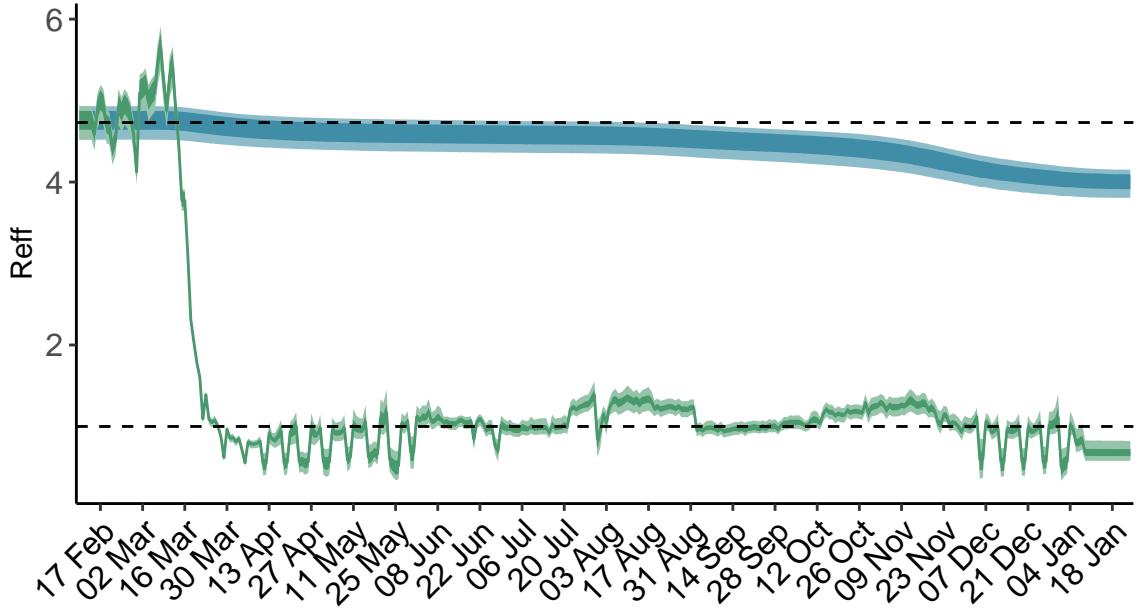


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

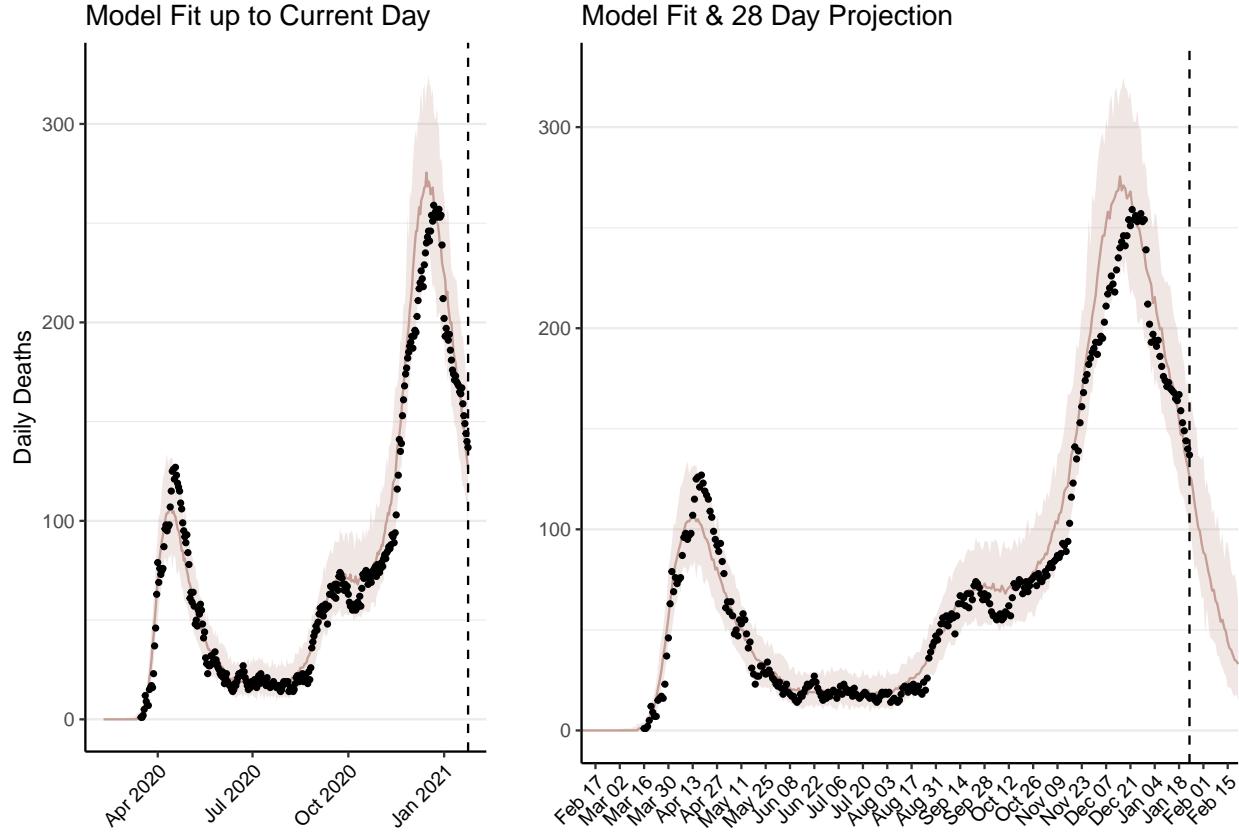


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 4,420 (95% CI: 4,272-4,568) patients requiring treatment with high-pressure oxygen at the current date to 1,182 (95% CI: 1,074-1,290) hospital beds being required on 2021-02-21 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 1,882 (95% CI: 1,825-1,939) patients requiring treatment with mechanical ventilation at the current date to 542 (95% CI: 500-584) by 2021-02-21. 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.**

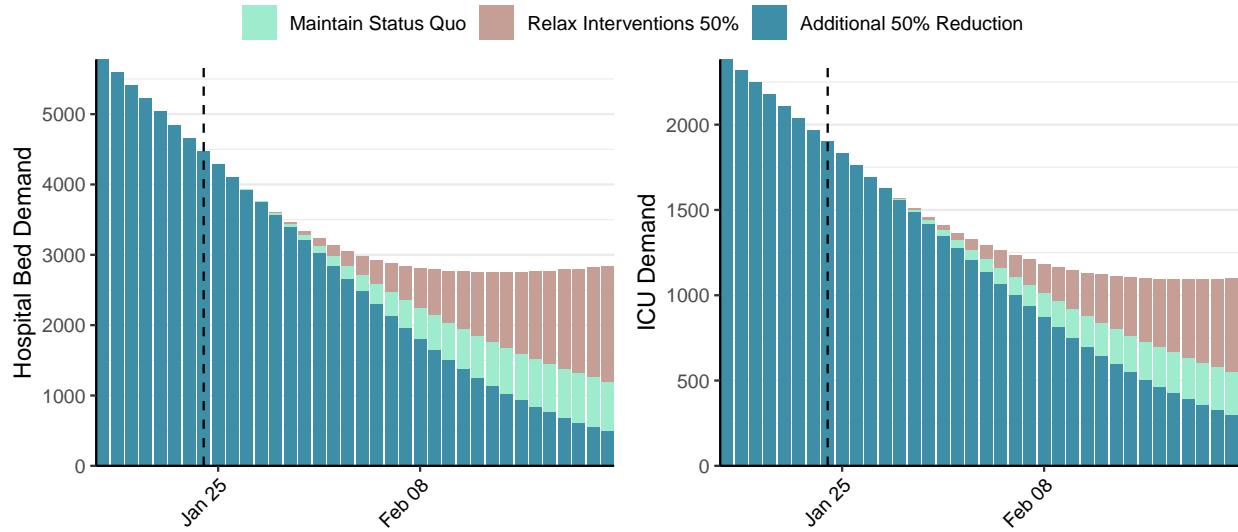


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 24,614 (95% CI: 23,222-26,006) at the current date to 687 (95% CI: 608-766) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 24,614 (95% CI: 23,222-26,006) at the current date to 30,188 (95% CI: 25,931-34,445) by 2021-02-21.

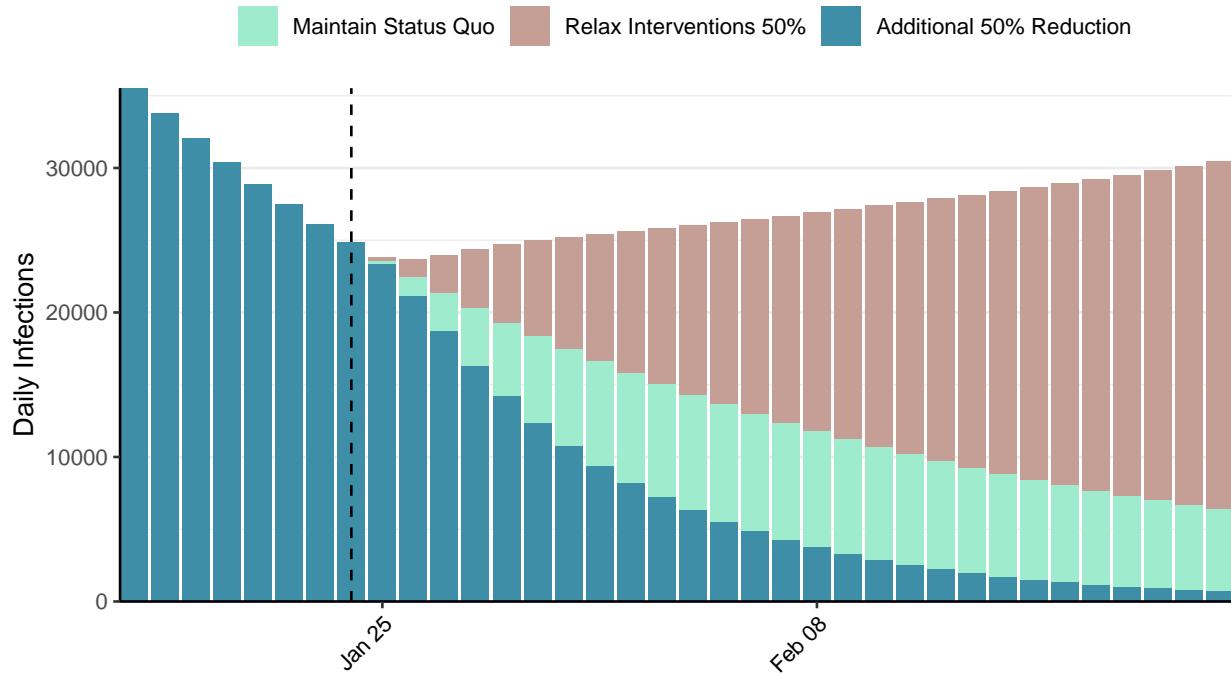


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Tanzania, 2021-01-24 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: 0.32-1.08)

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**

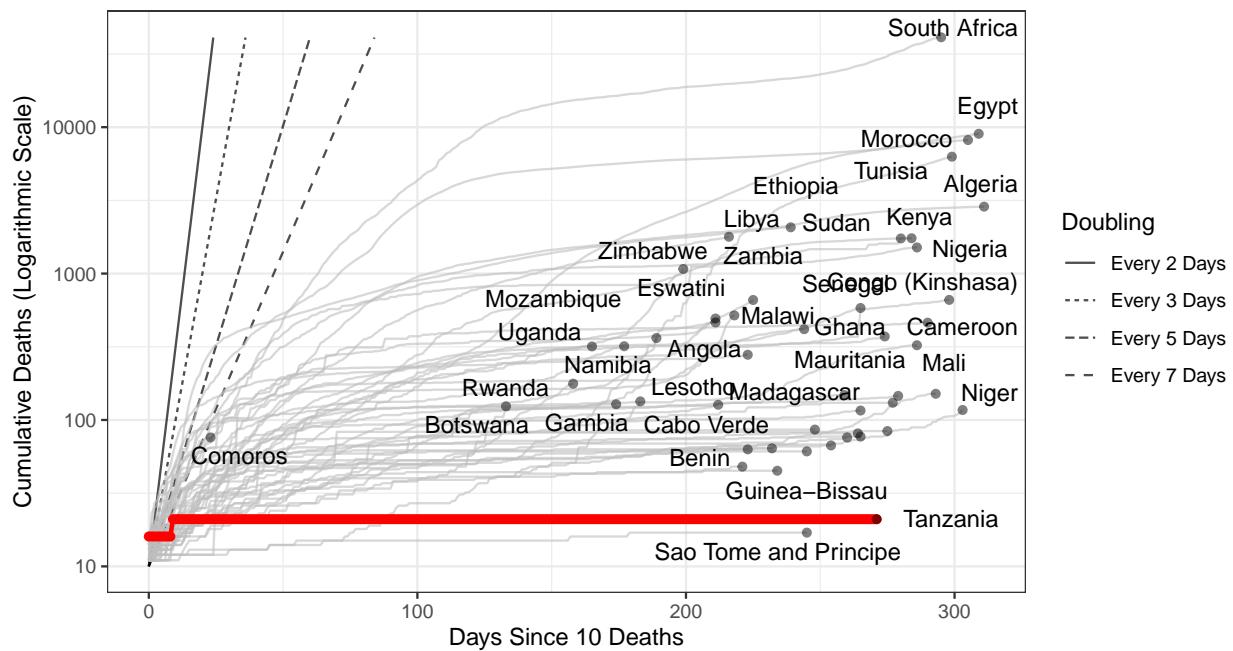


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 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).

Plot on right zoomed in on reported cases

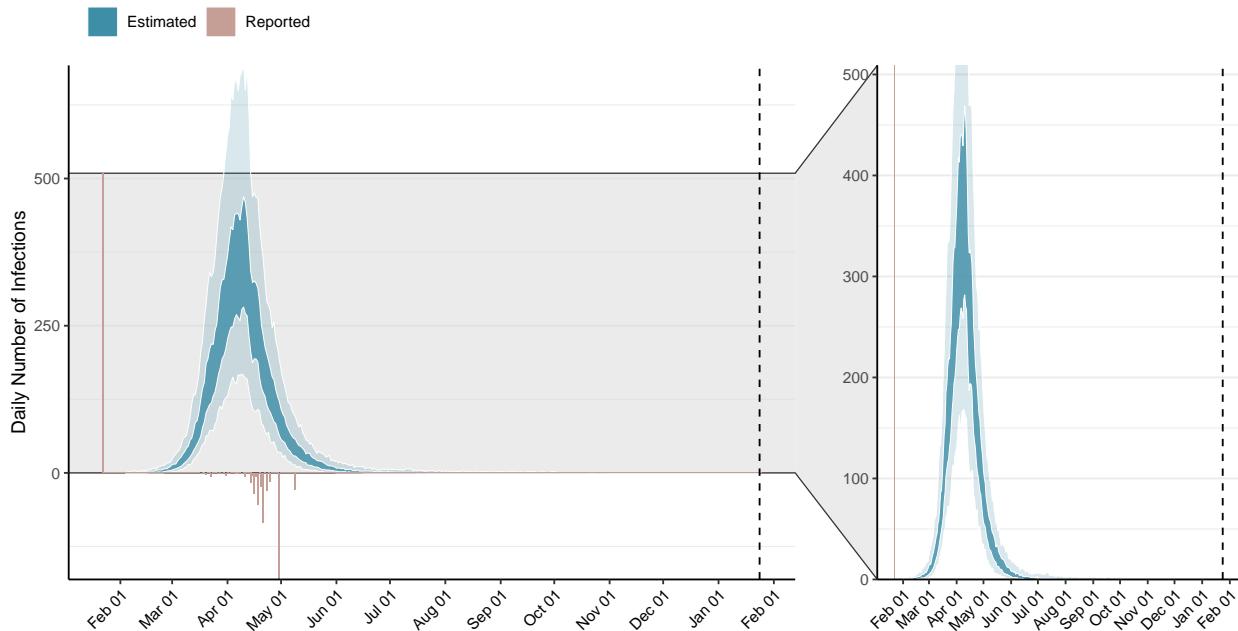


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

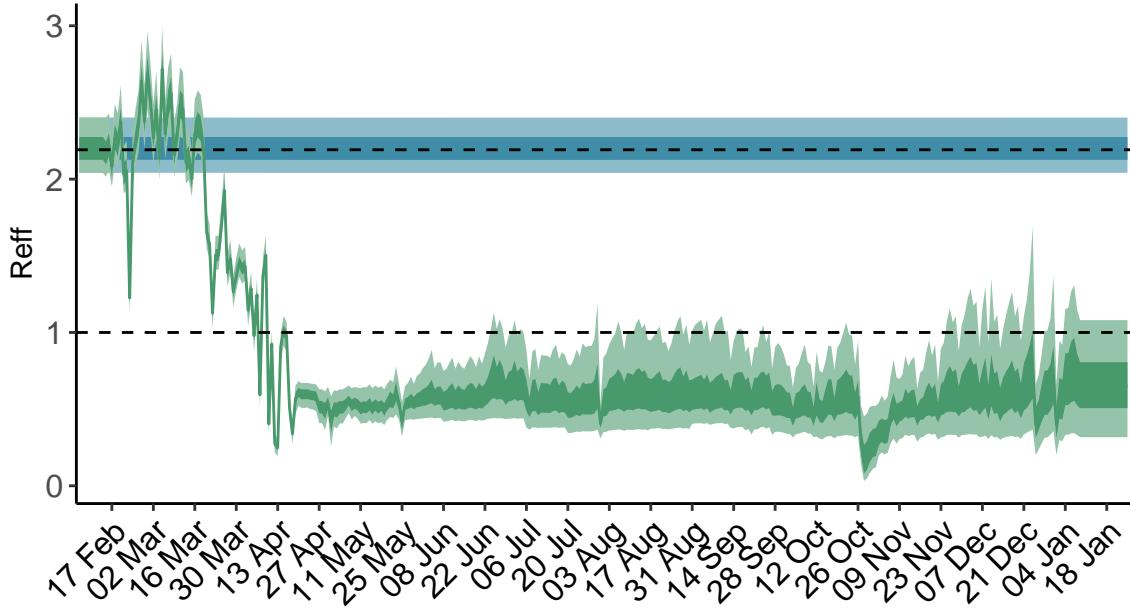


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

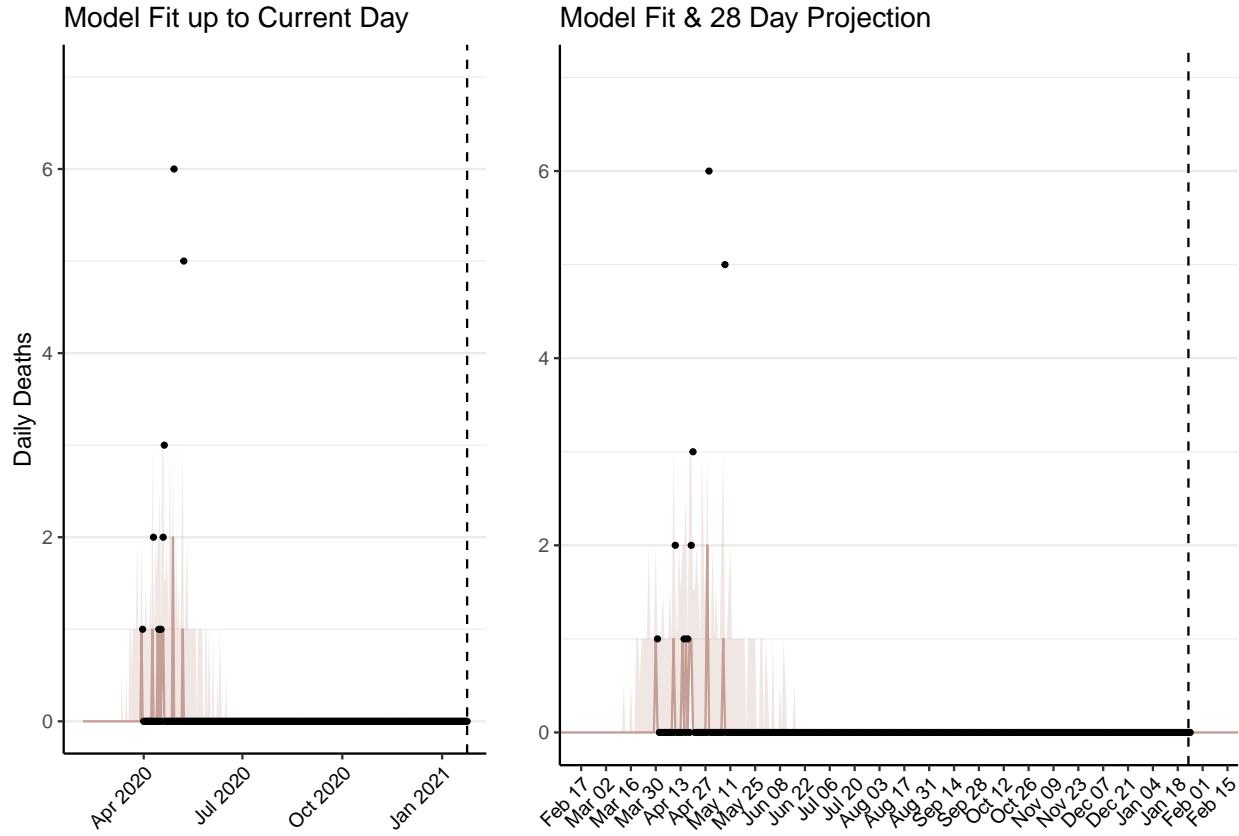


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 2021-02-21 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 2021-02-21. 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.**

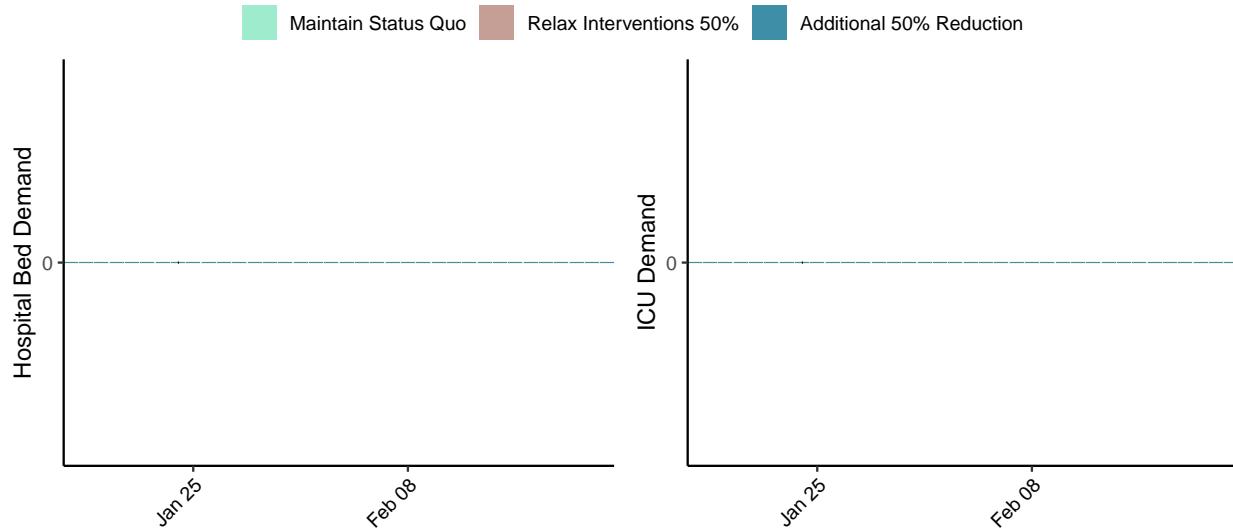


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 2021-02-21. 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 2021-02-21.

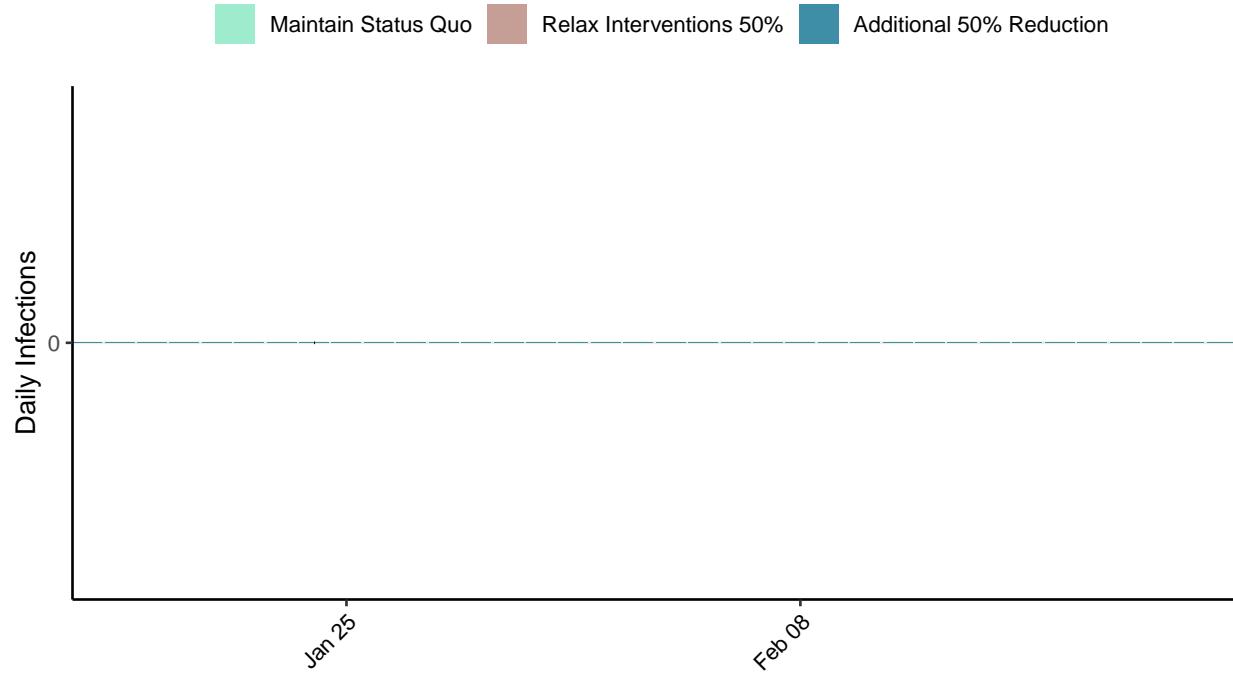


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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: Uganda, 2021-01-24

[Download the report for Uganda, 2021-01-24 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}
39	39	1	1	0.68 (95% CI: 0.57-0.8)

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. Uganda is not shown in the following plot as only 1 deaths have been reported to date**

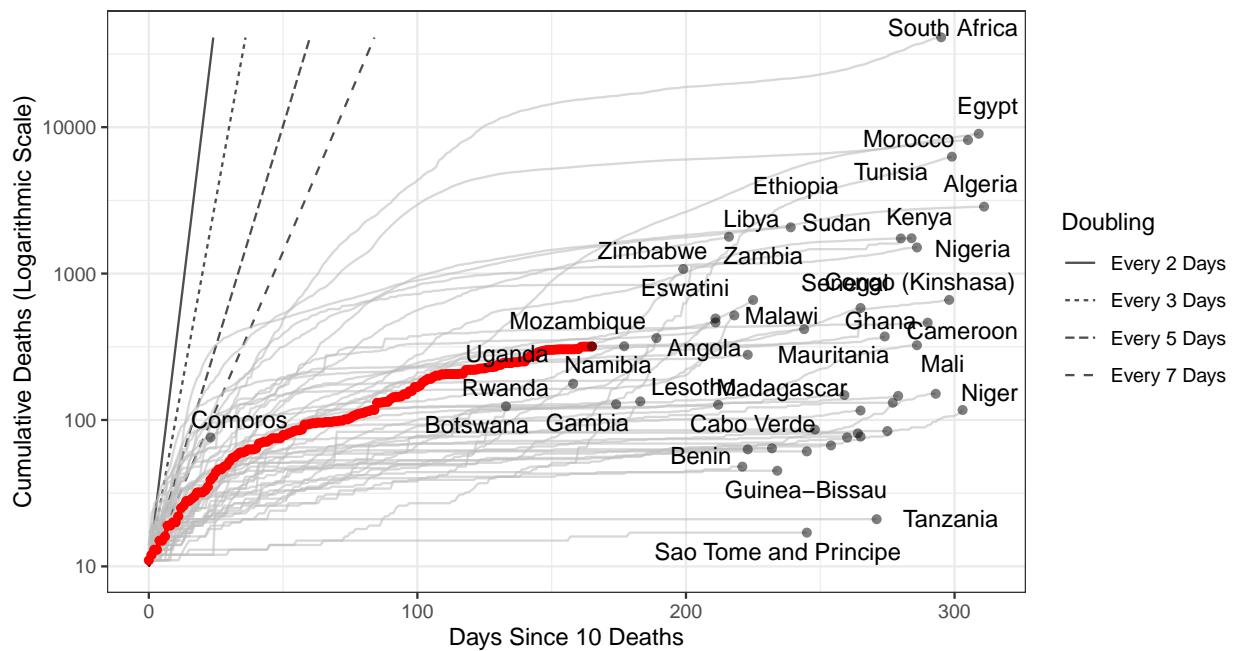


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 39,123 (95% CI: 36,699-41,546) 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

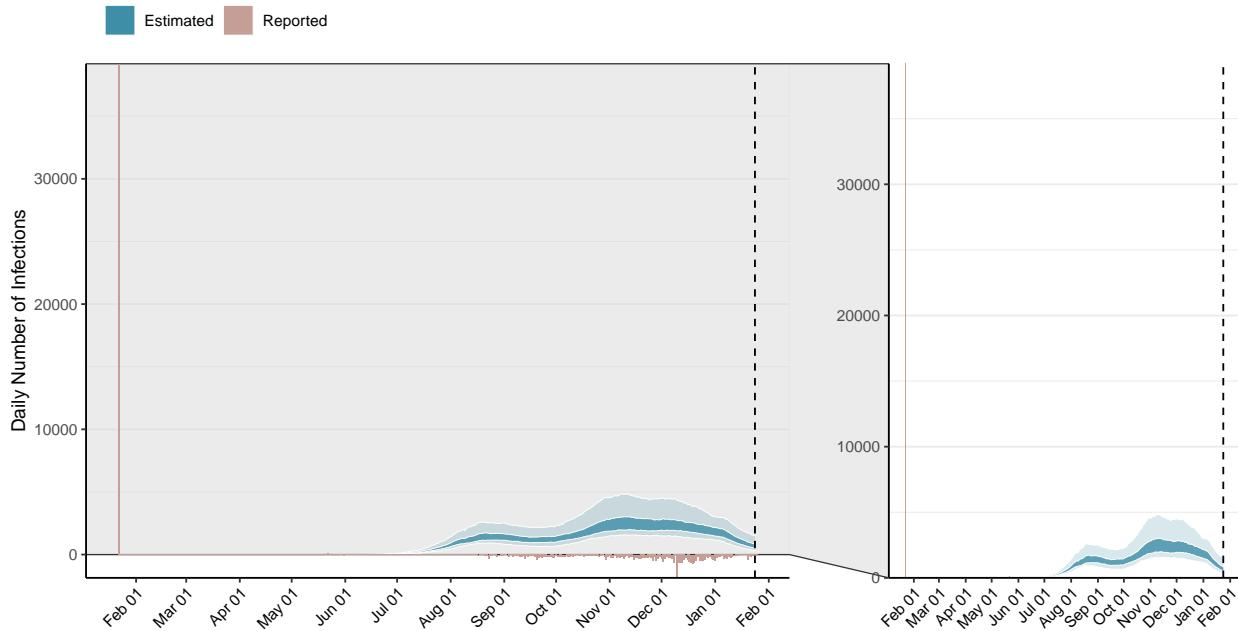


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

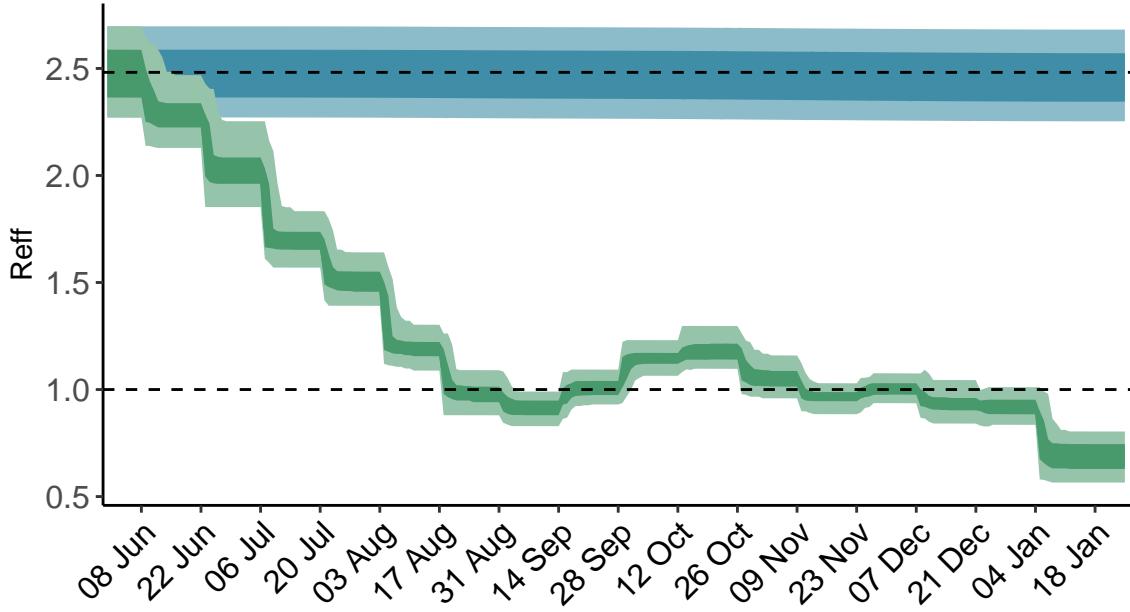


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

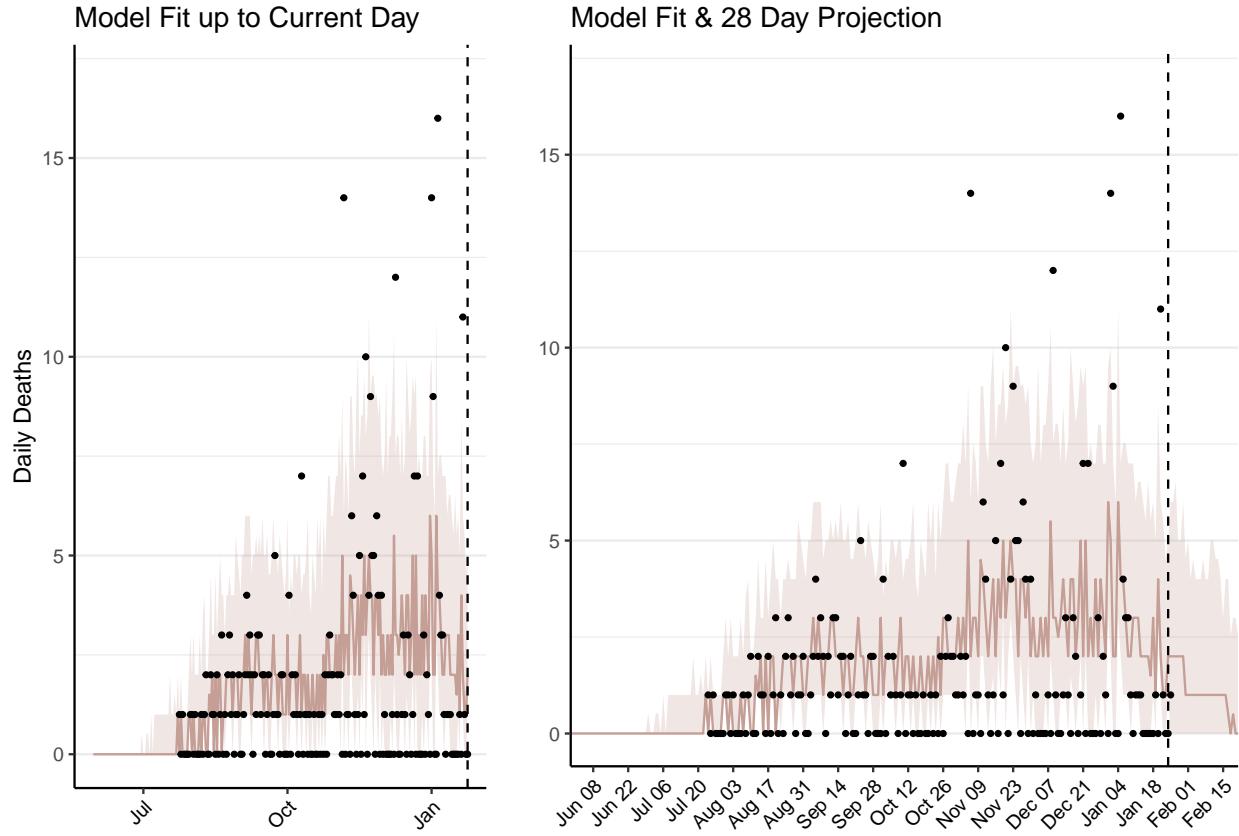


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 90 (95% CI: 84-96) patients requiring treatment with high-pressure oxygen at the current date to 24 (95% CI: 21-26) hospital beds being required on 2021-02-21 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 39 (95% CI: 36-42) patients requiring treatment with mechanical ventilation at the current date to 11 (95% CI: 10-12) by 2021-02-21. 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.**

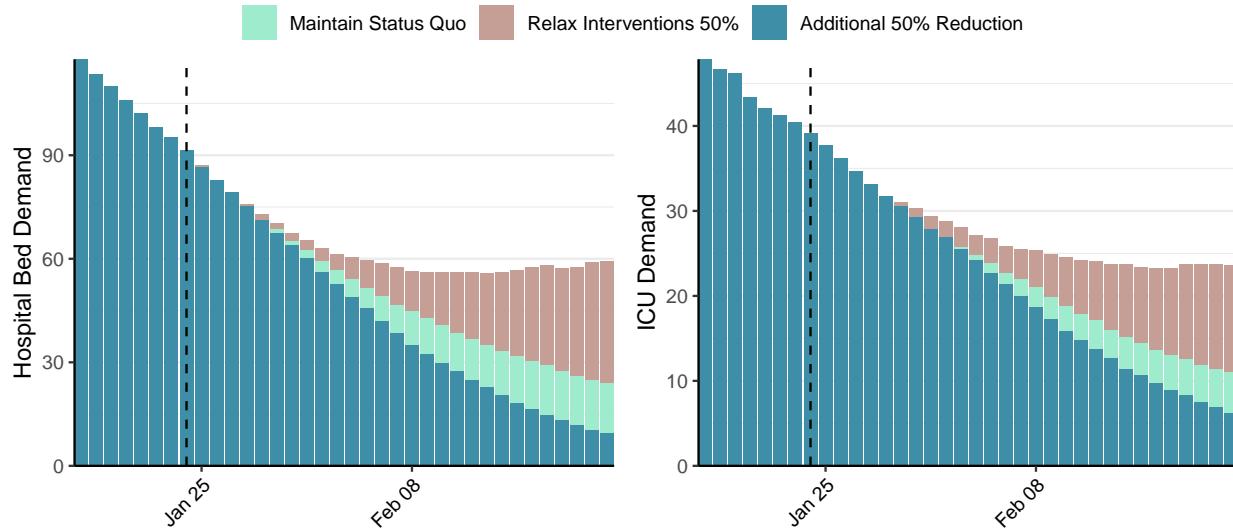


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 713 (95% CI: 652-774) at the current date to 20 (95% CI: 17-23) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 713 (95% CI: 652-774) at the current date to 940 (95% CI: 778-1,103) by 2021-02-21.

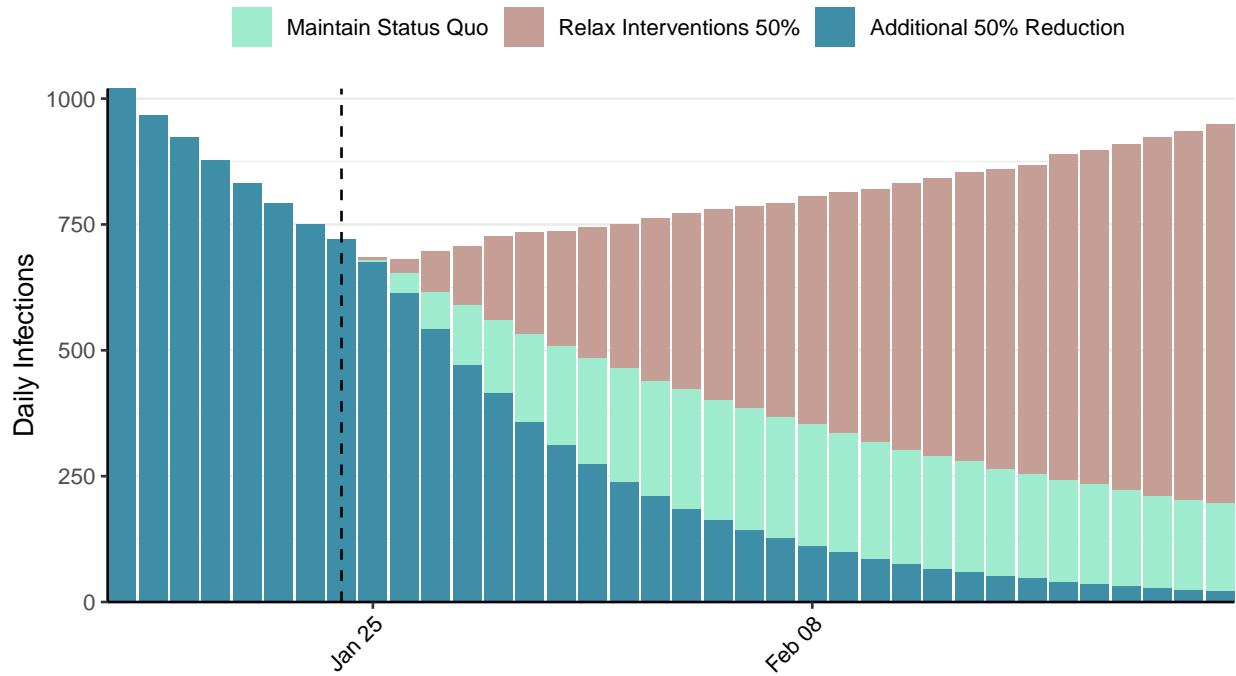


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Ukraine, 2021-01-24 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}
2,807	2,807	75	75	0.96 (95% CI: 0.77-1.13)

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.

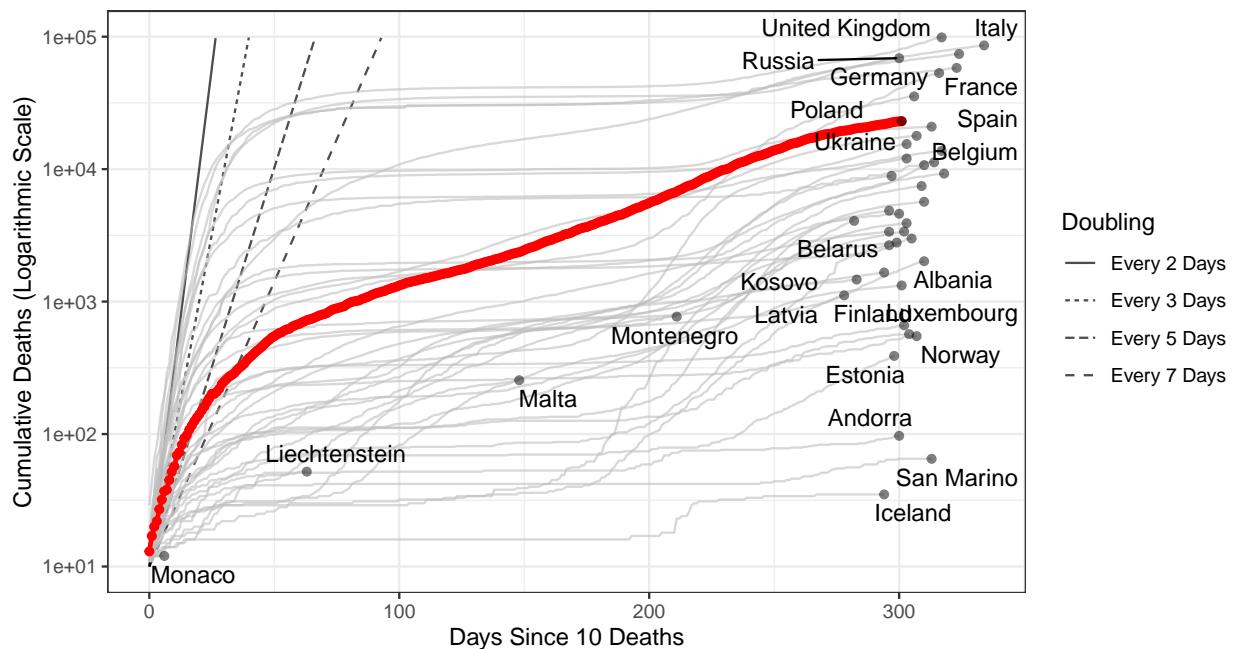


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 885,898 (95% CI: 850,392-921,405) 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).

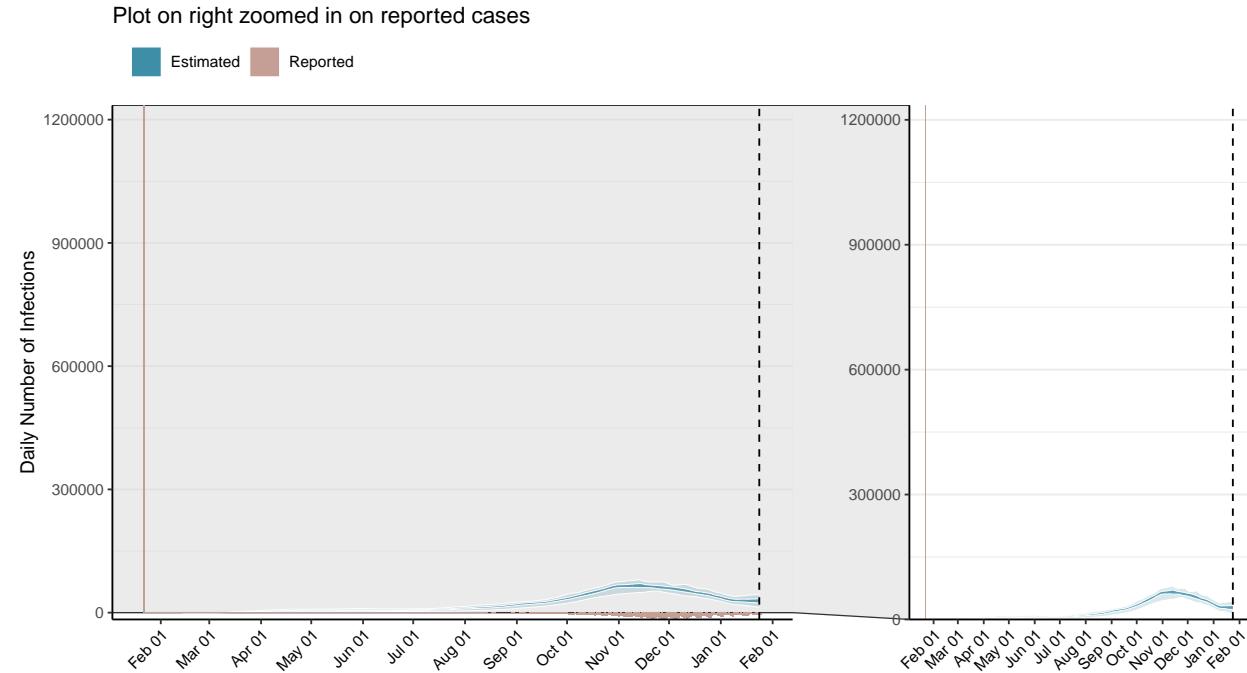


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

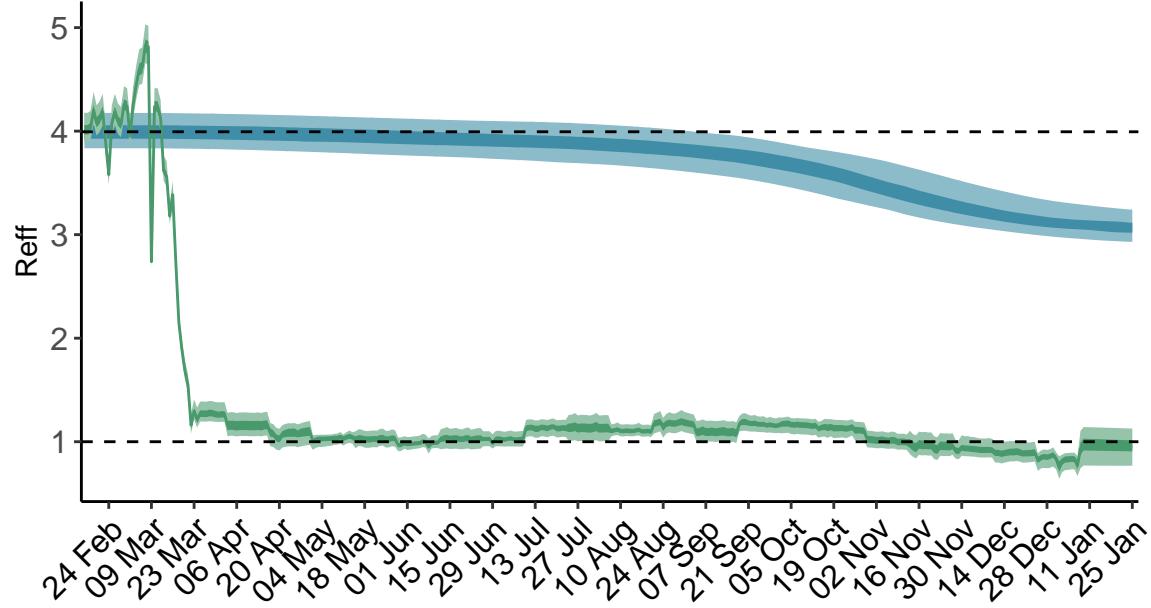


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

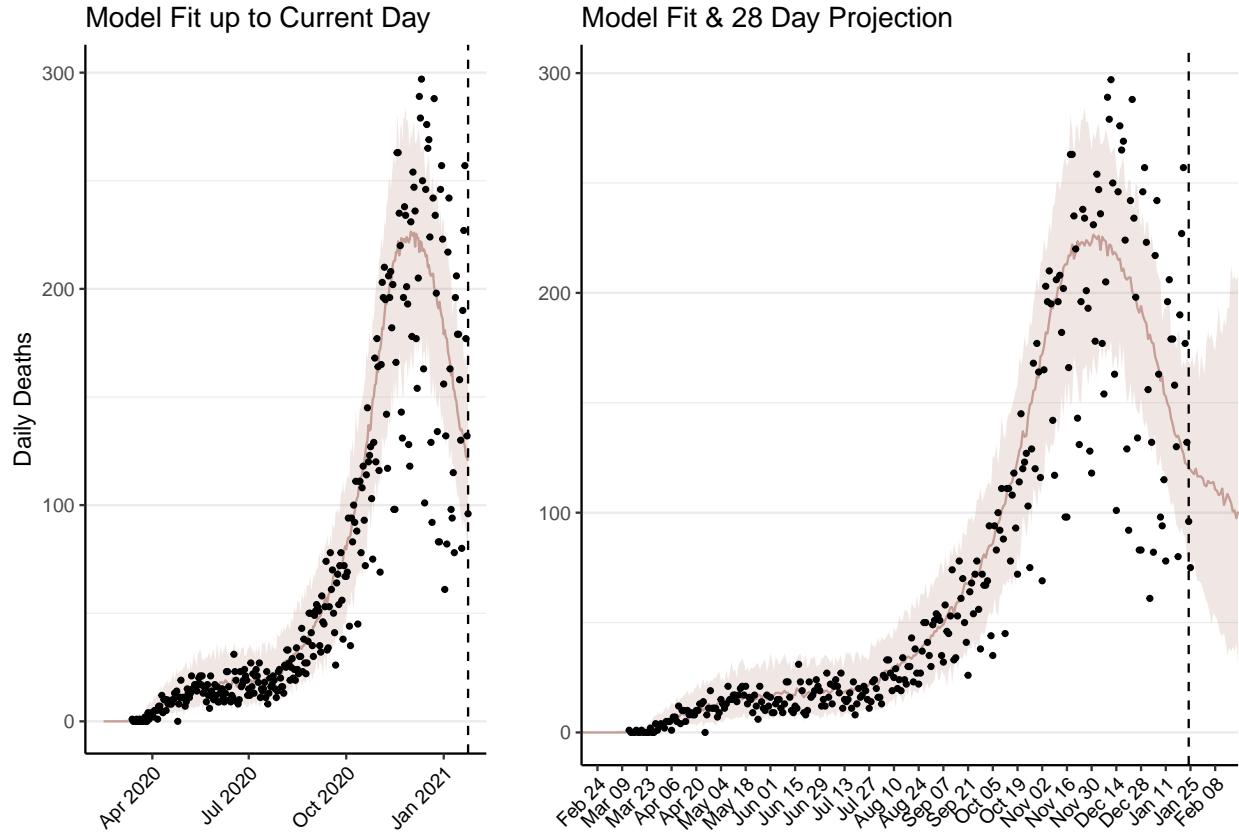


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 4,289 (95% CI: 4,104-4,474) patients requiring treatment with high-pressure oxygen at the current date to 3,937 (95% CI: 3,523-4,350) hospital beds being required on 2021-02-21 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 1,663 (95% CI: 1,599-1,728) patients requiring treatment with mechanical ventilation at the current date to 1,483 (95% CI: 1,338-1,628) by 2021-02-21. 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.**

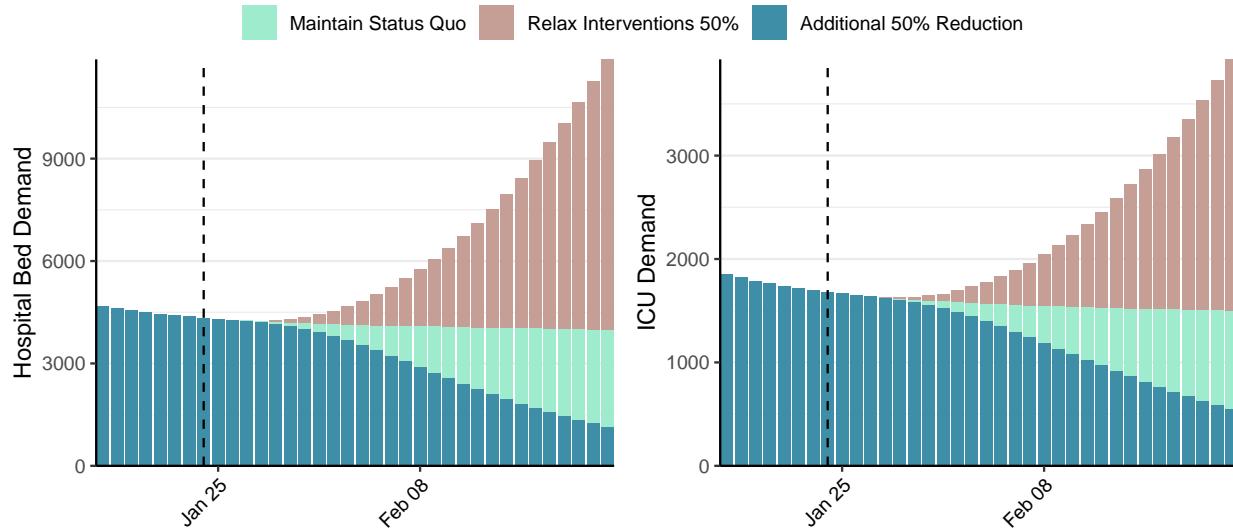


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 28,560 (95% CI: 26,710-30,409) at the current date to 2,334 (95% CI: 2,050-2,619) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 28,560 (95% CI: 26,710-30,409) at the current date to 137,800 (95% CI: 120,918-154,681) by 2021-02-21.

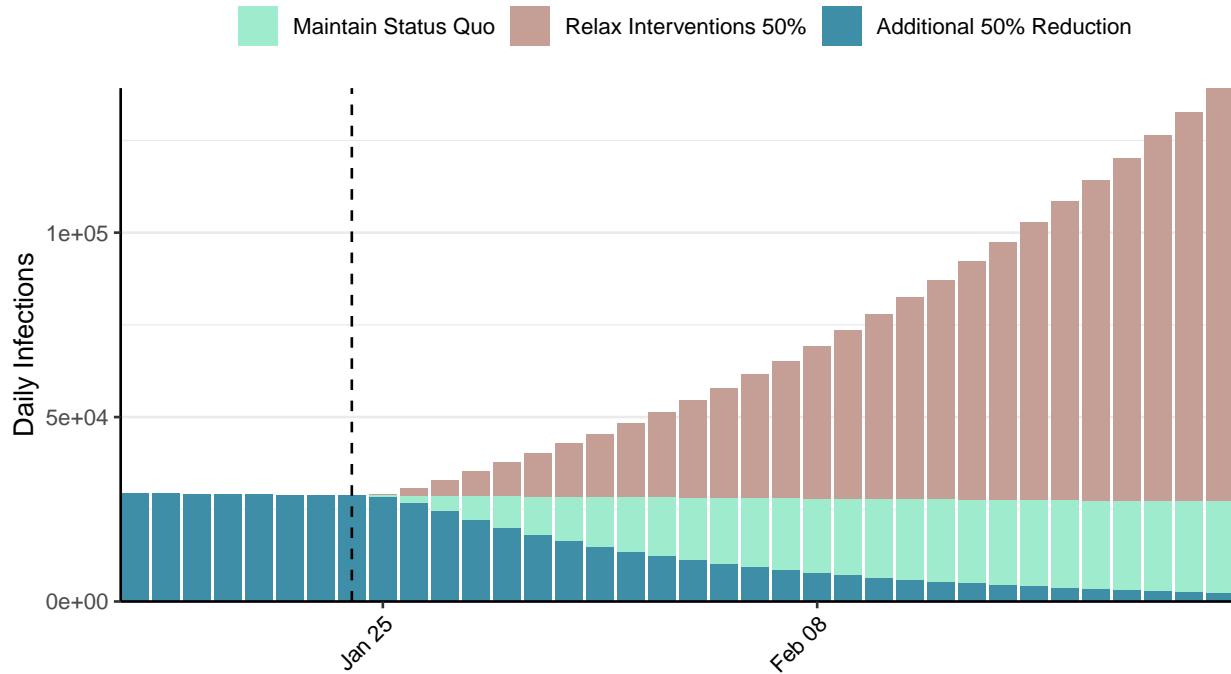


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Uruguay, 2021-01-24 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}
408	408	14	14	1.01 (95% CI: 0.82-1.18)

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.

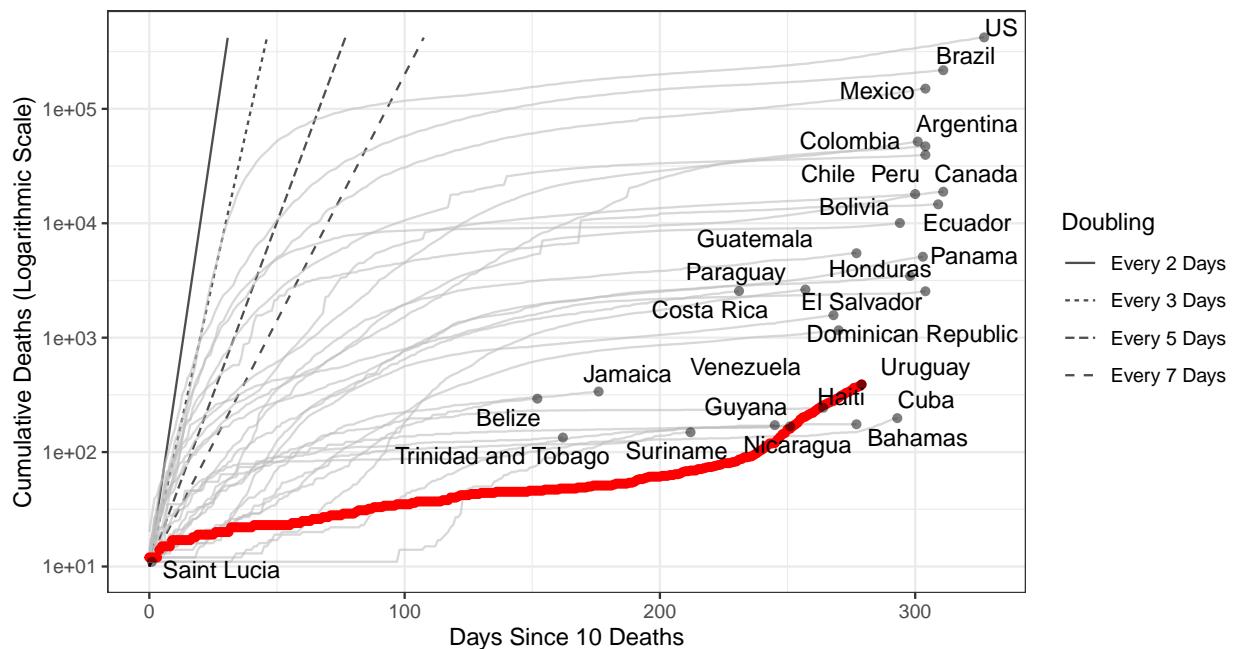


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 107,113 (95% CI: 102,370-111,855) 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). **N.B. Uruguay has revised their historic reported cases and thus have reported negative cases.**

Plot on right zoomed in on reported cases

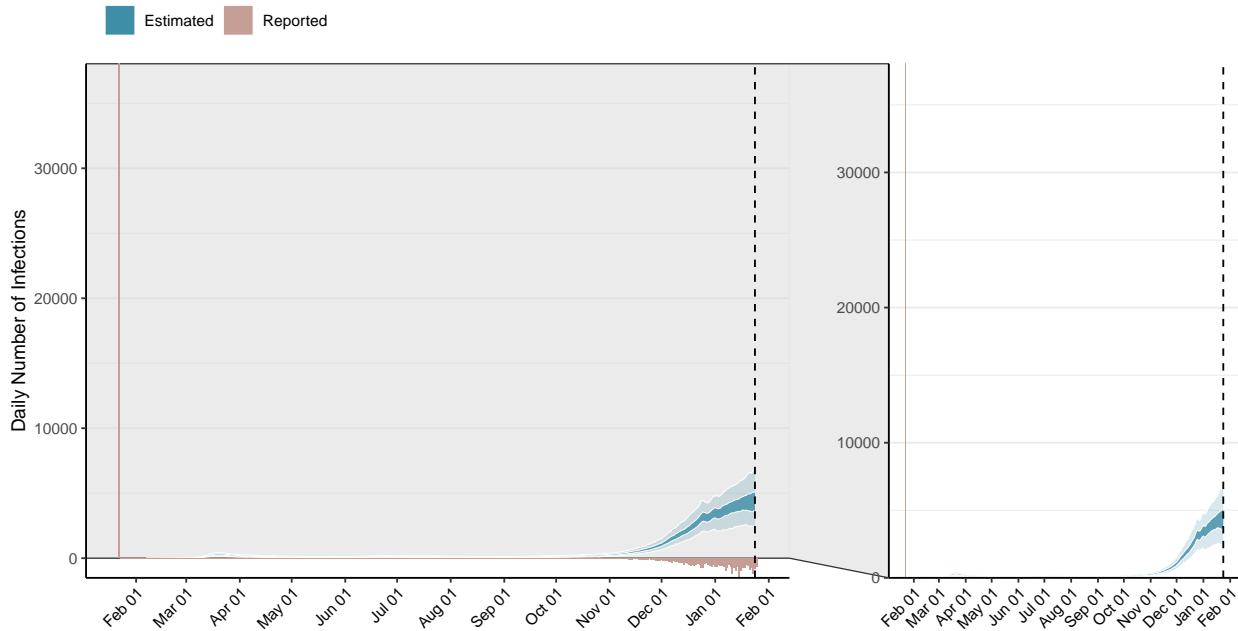


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

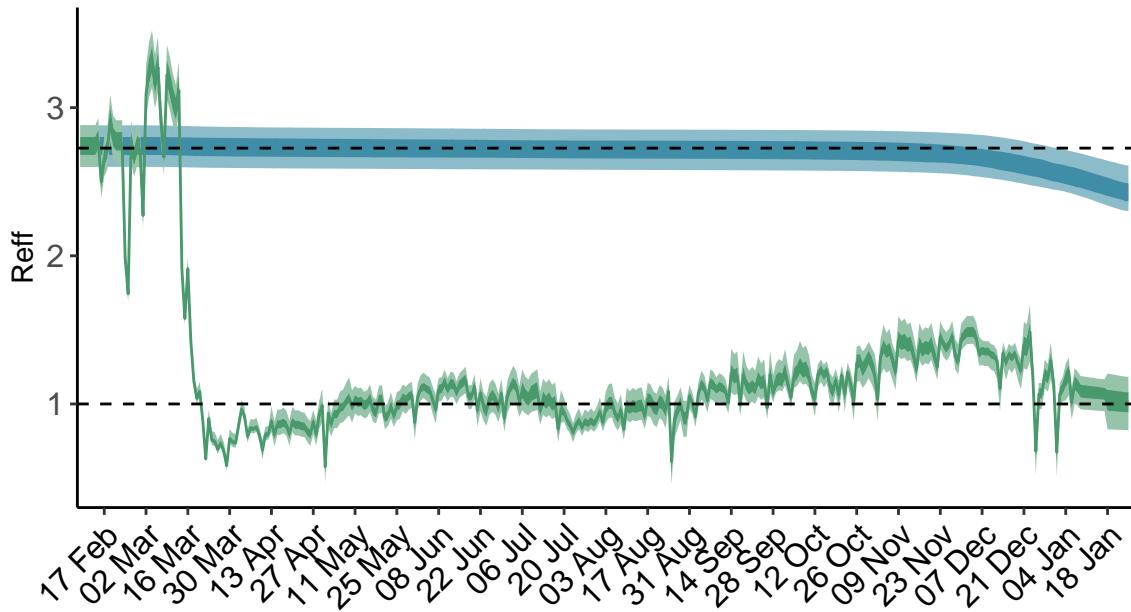


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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. **N.B. Uruguay 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.](#)

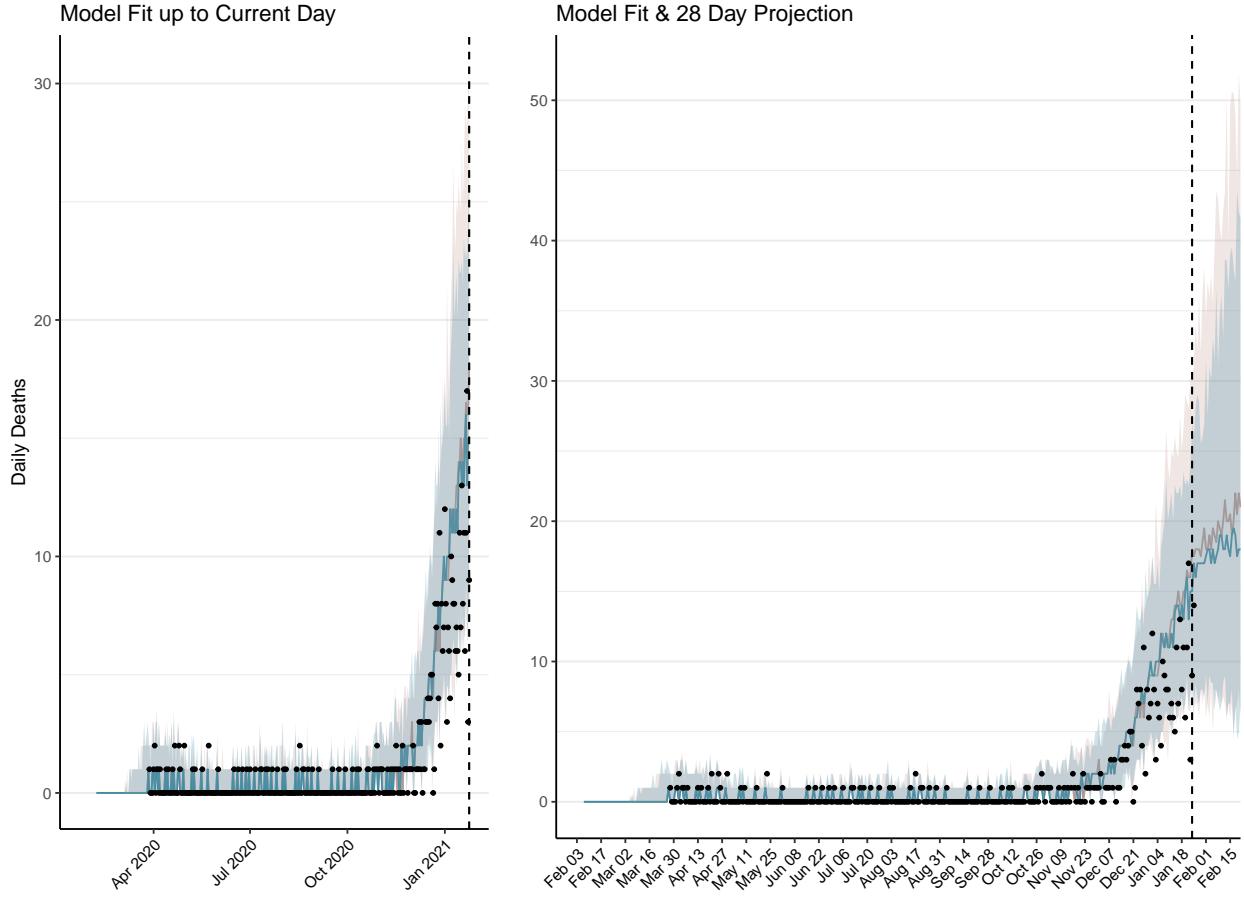


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 501 (95% CI: 477-524) patients requiring treatment with high-pressure oxygen at the current date to 597 (95% CI: 544-649) hospital beds being required on 2021-02-21 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 135 (95% CI: 131-139) patients requiring treatment with mechanical ventilation at the current date to 136 (95% CI: 130-141) by 2021-02-21. 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.**

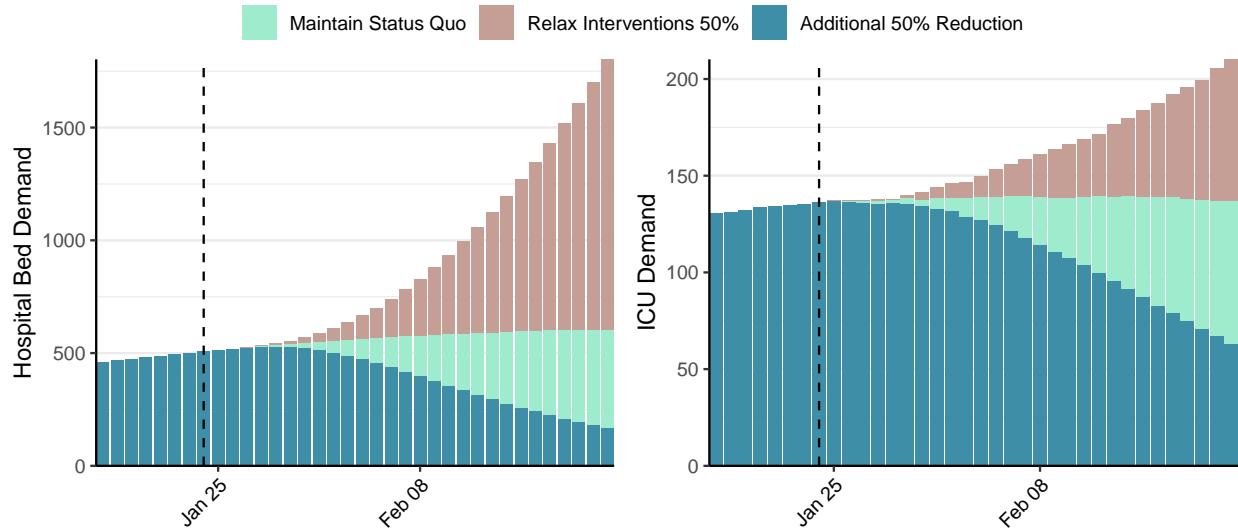


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 4,360 (95% CI: 4,116-4,603) at the current date to 402 (95% CI: 362-442) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 4,360 (95% CI: 4,116-4,603) at the current date to 20,831 (95% CI: 18,880-22,782) by 2021-02-21.

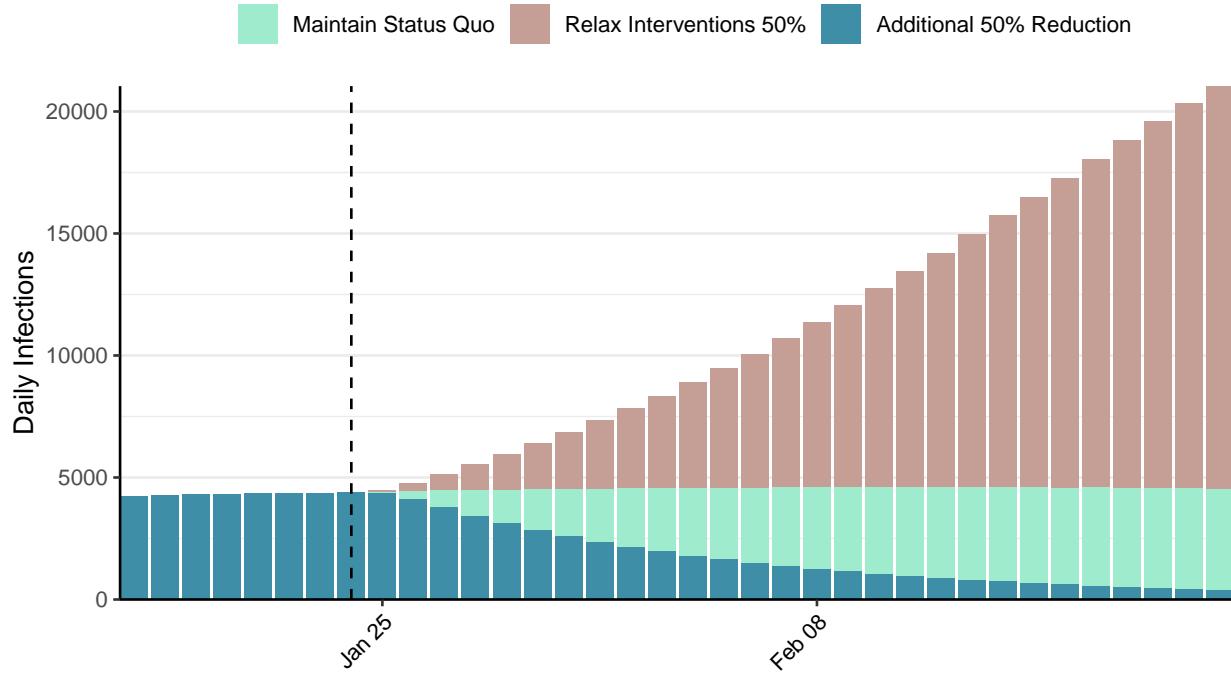


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Uzbekistan, 2021-01-24 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}
54	54	0	0	0.87 (95% CI: 0.69-1.1)

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. Uzbekistan is not shown in the following plot as only 0 deaths have been reported to date**

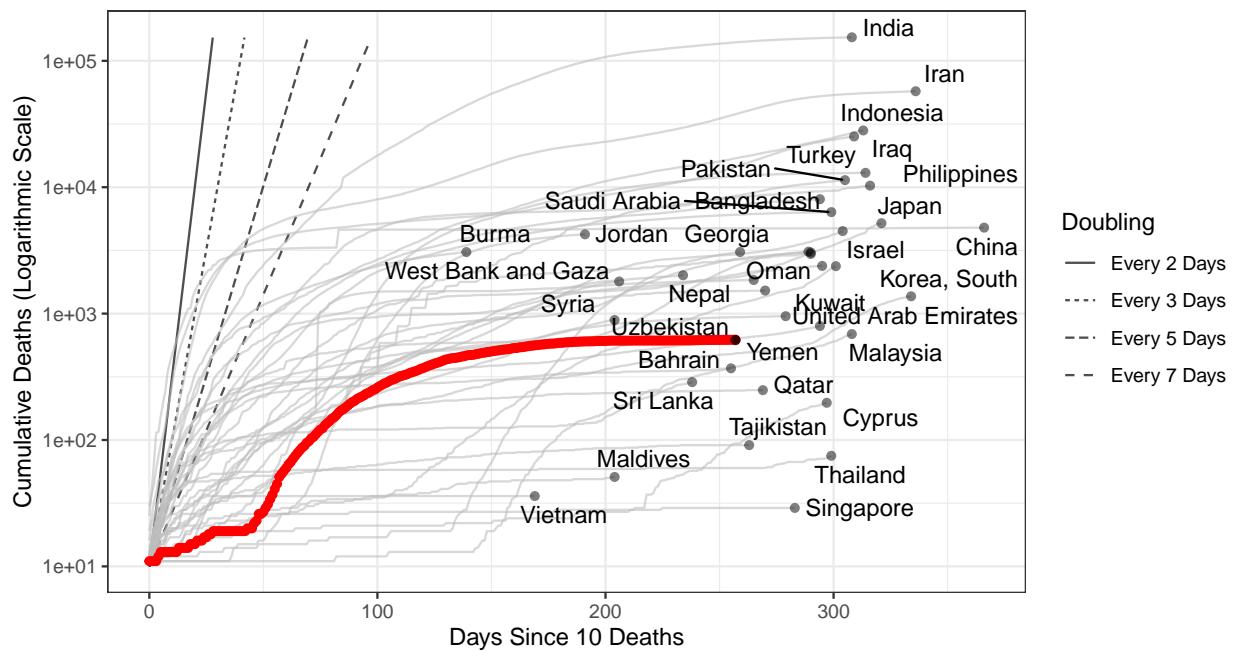


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 2,739 (95% CI: 2,481-2,998) 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

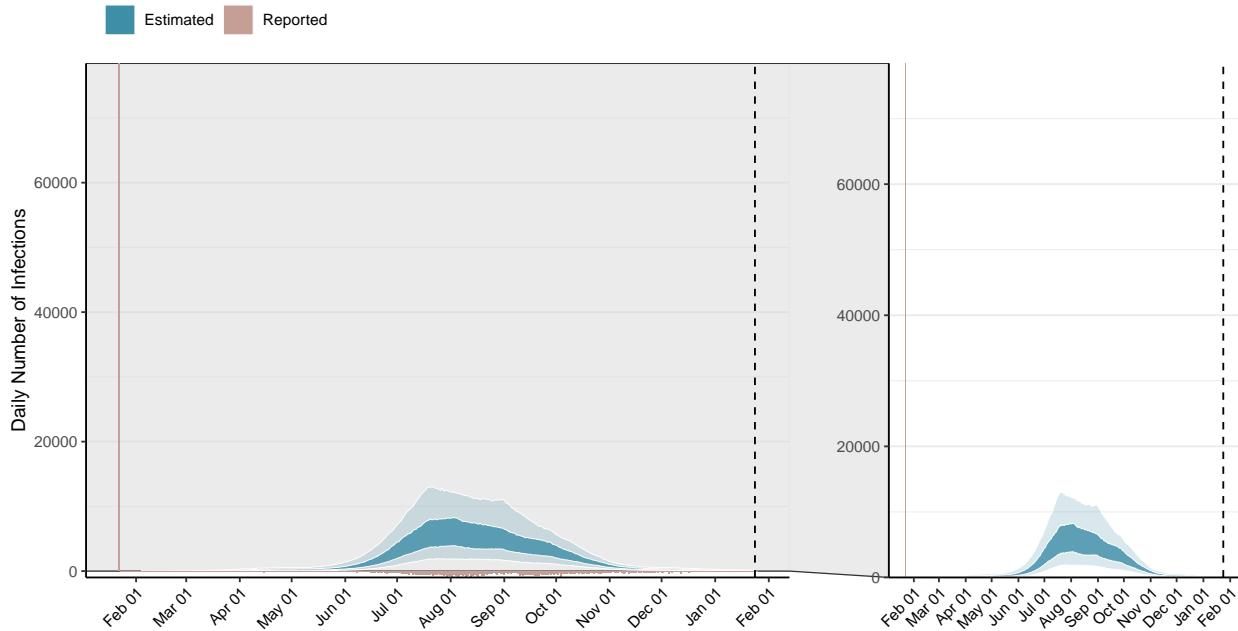


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

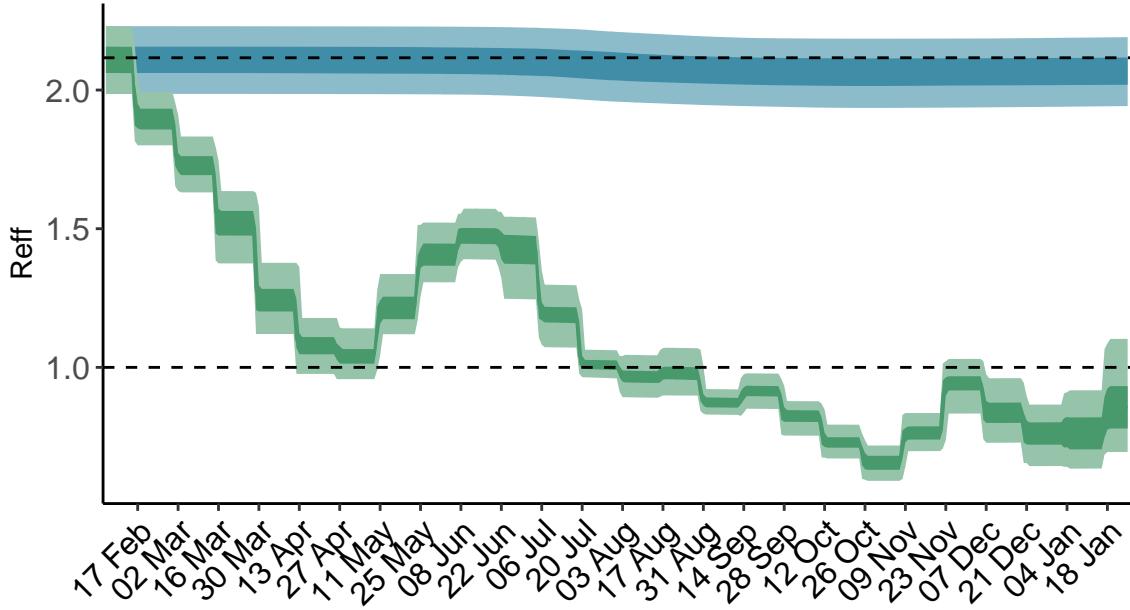


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

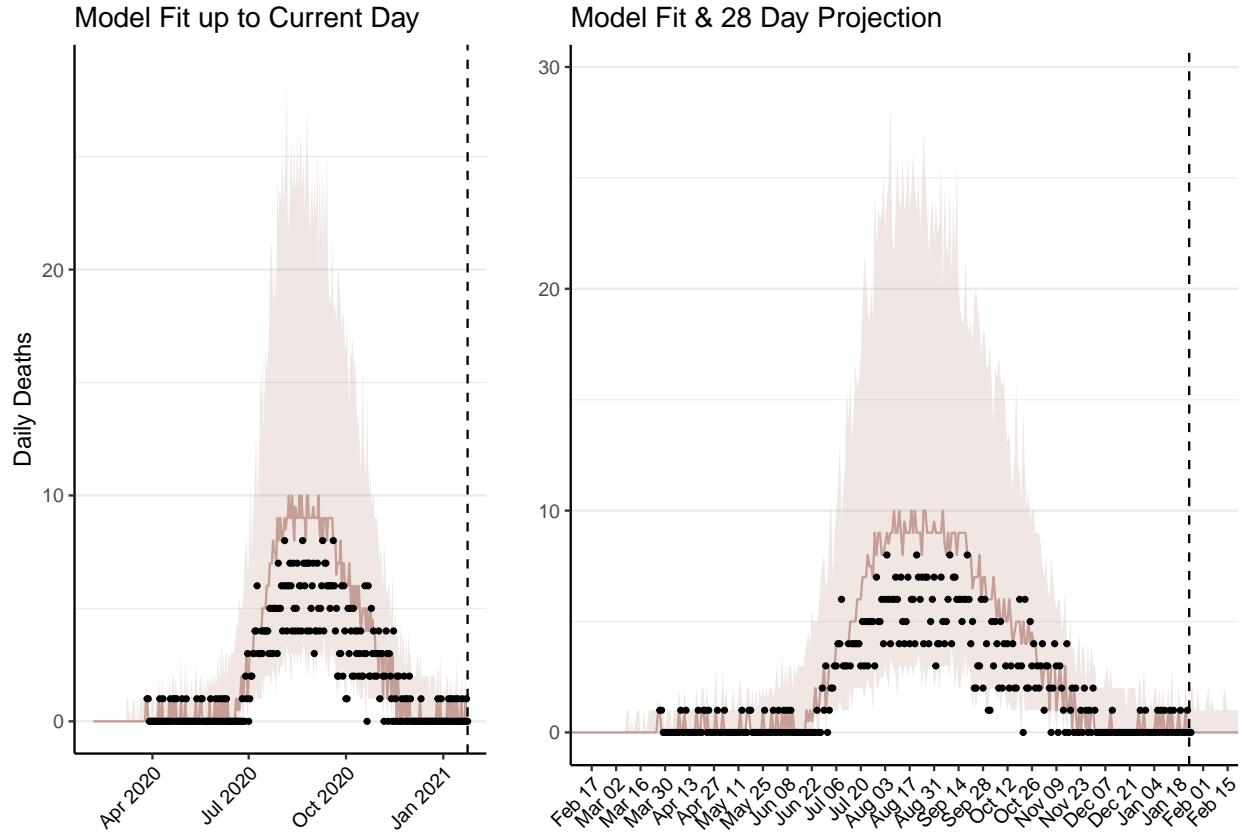


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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: 6-8) patients requiring treatment with high-pressure oxygen at the current date to 5 (95% CI: 4-6) hospital beds being required on 2021-02-21 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: 1-2) by 2021-02-21. 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.**

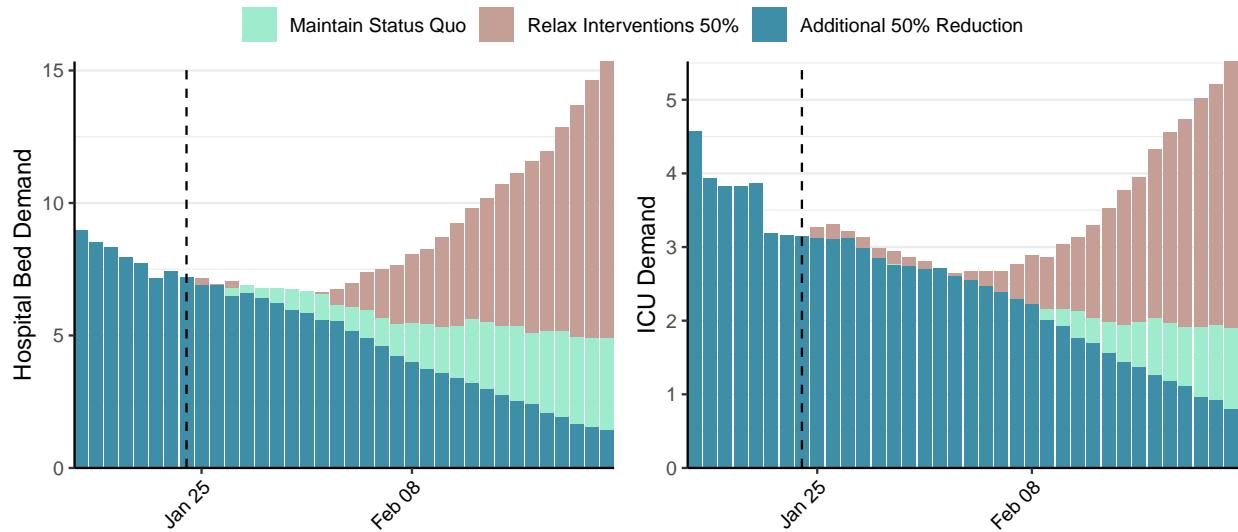


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 67 (95% CI: 58-76) at the current date to 5 (95% CI: 3-6) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 67 (95% CI: 58-76) at the current date to 343 (95% CI: 230-457) by 2021-02-21.

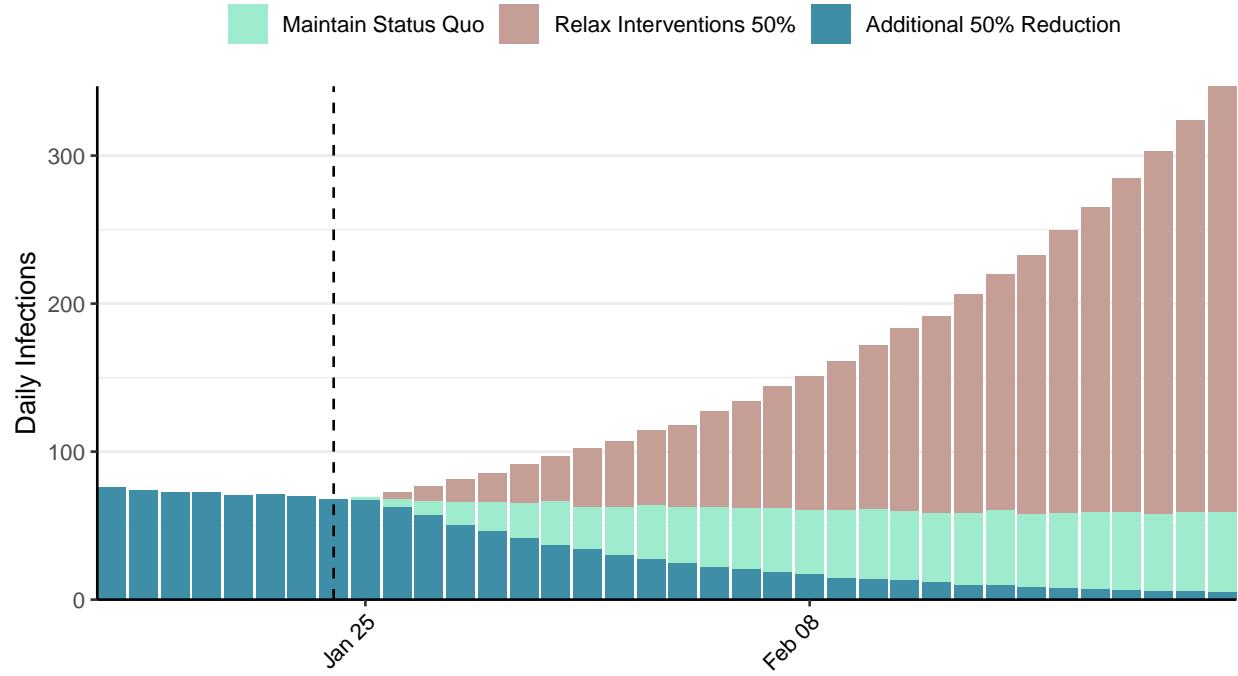


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for St. Vincent and the Grenadines, 2021-01-24 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}
8	8	0	0	1.85 (95% CI: 1.47-2.37)

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.** St. Vincent and the Grenadines is not shown in the following plot as only 0 deaths have been reported to date

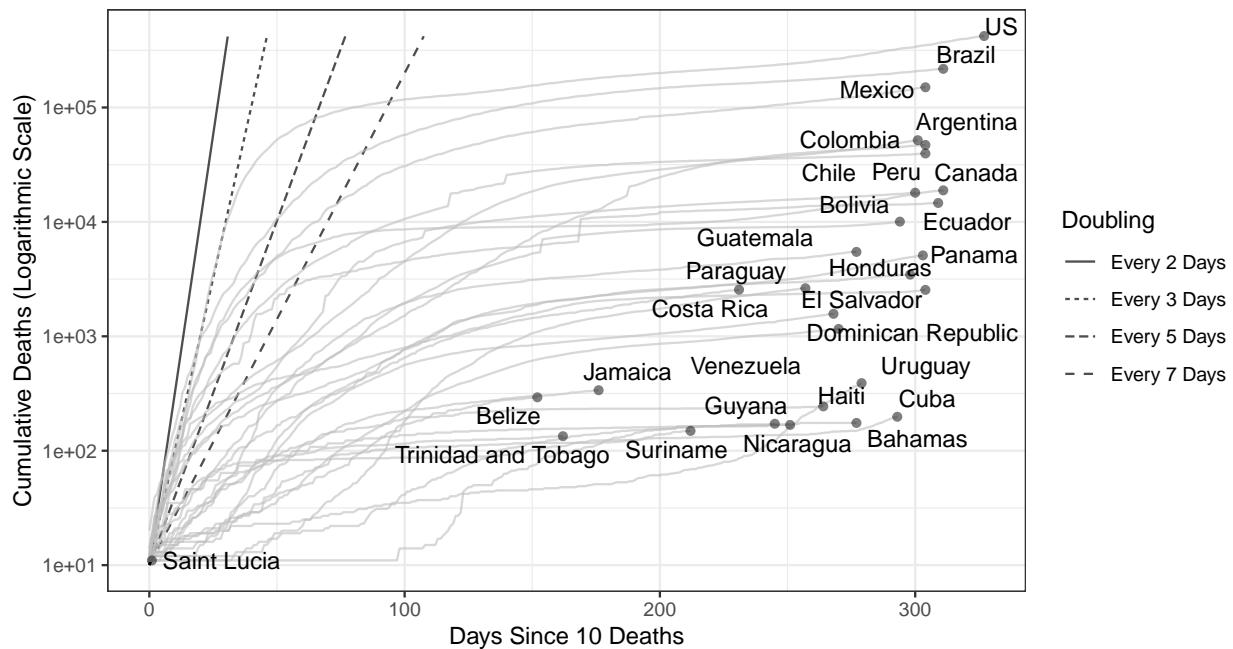


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 4,684 (95% CI: 4,117-5,251) 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

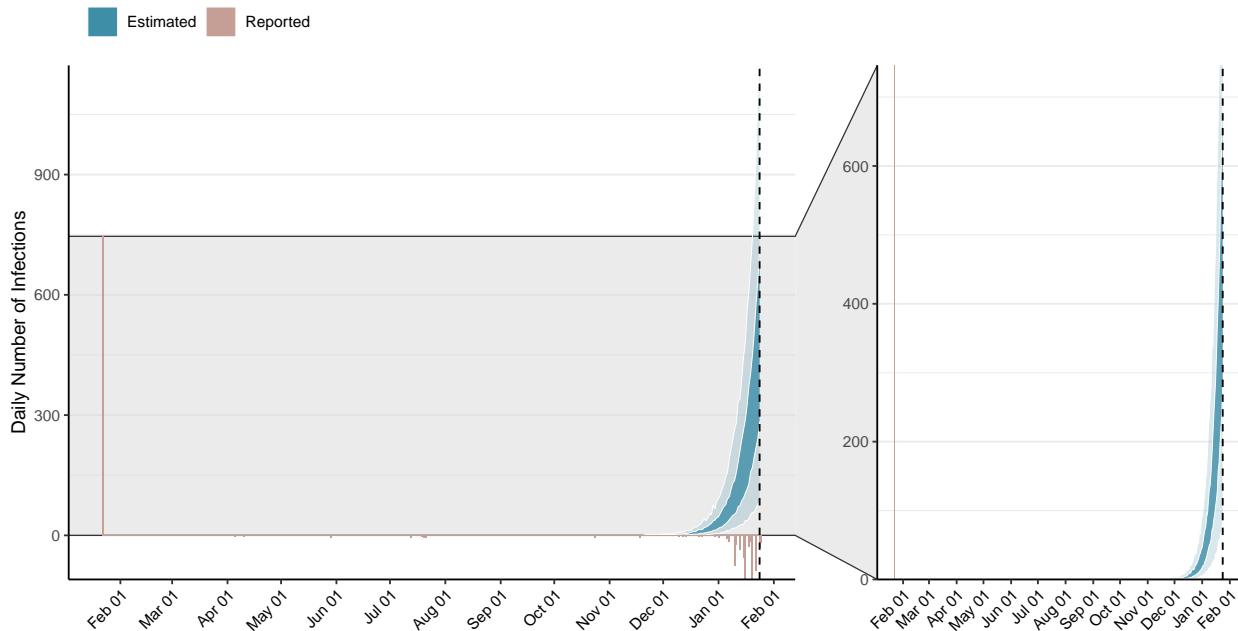


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

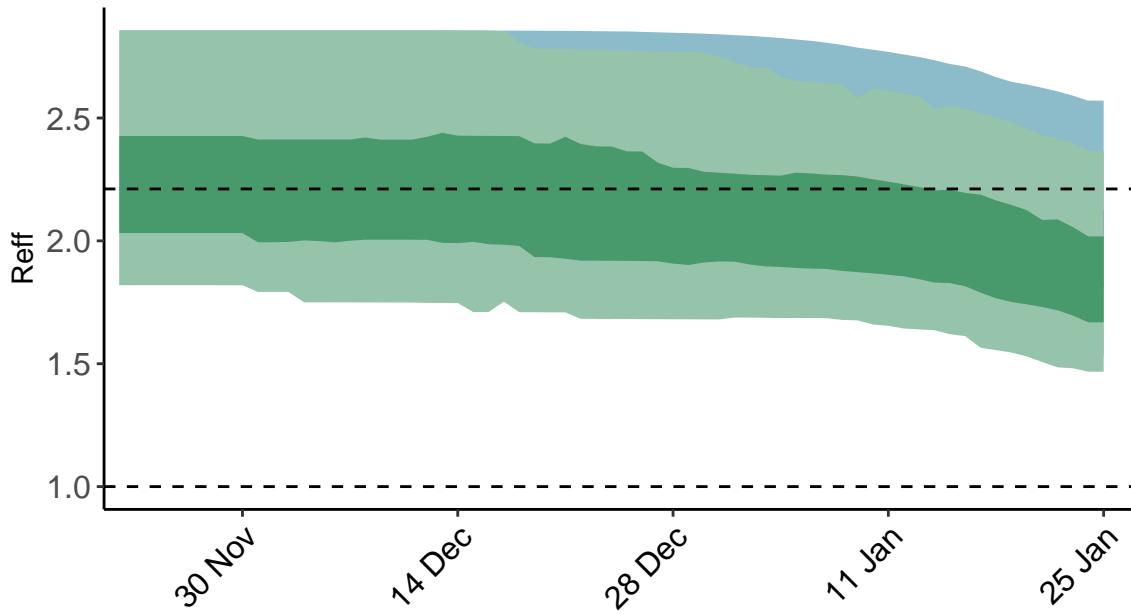


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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. 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.](#)

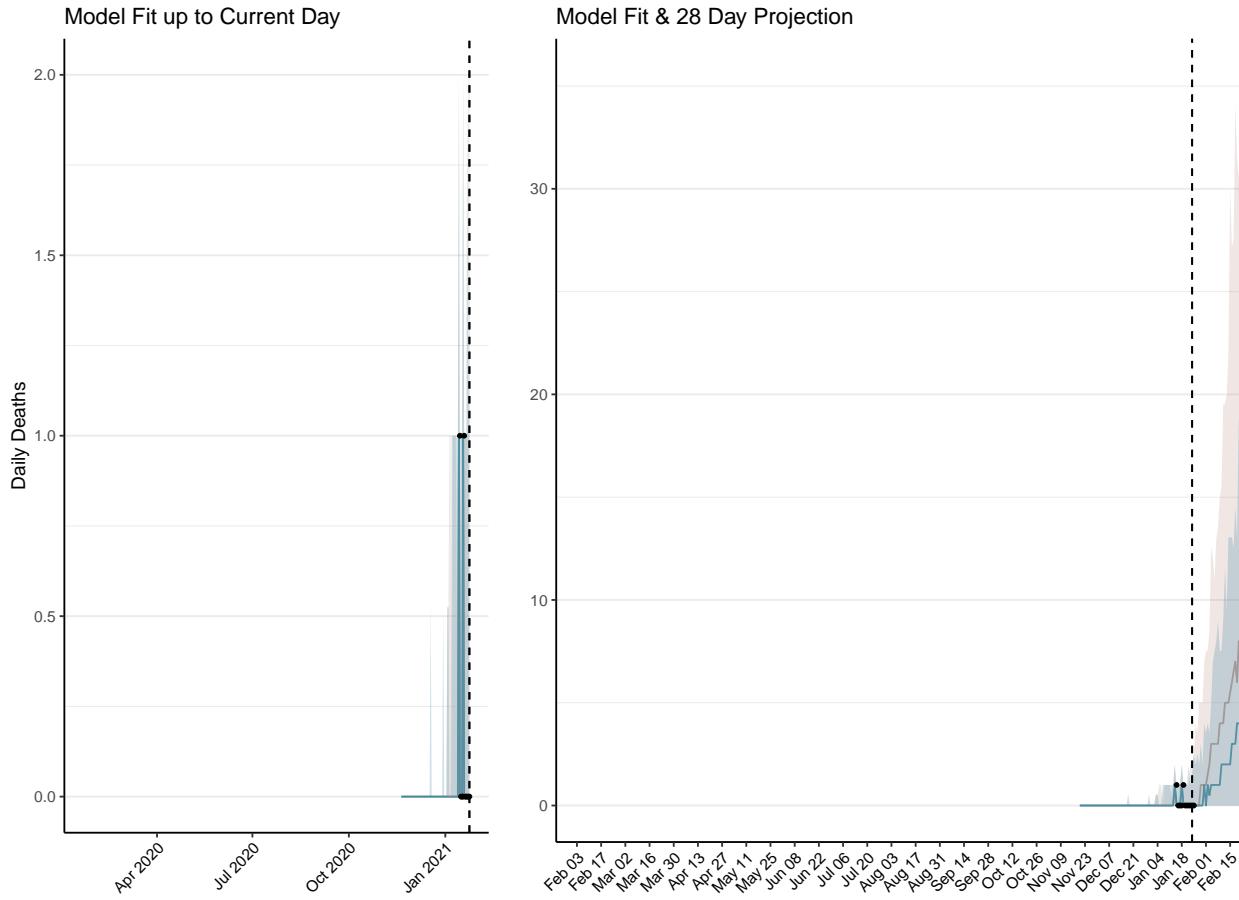


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 19 (95% CI: 16-21) patients requiring treatment with high-pressure oxygen at the current date to 201 (95% CI: 176-227) hospital beds being required on 2021-02-21 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: 4-5) patients requiring treatment with mechanical ventilation at the current date to 18 (95% CI: 16-19) by 2021-02-21. 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.**

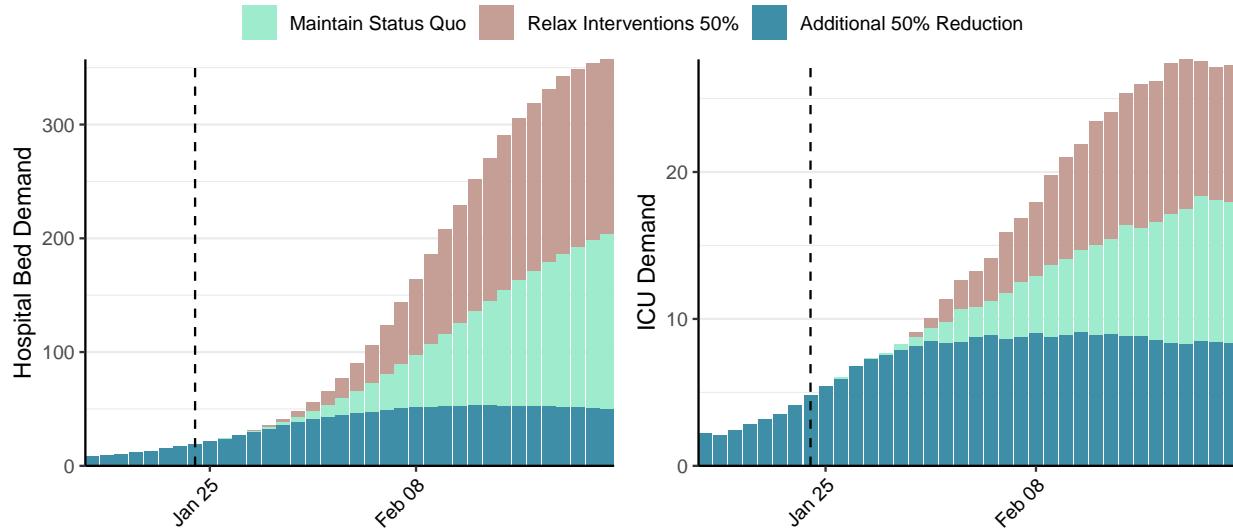


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 528 (95% CI: 463-593) at the current date to 336 (95% CI: 275-397) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 528 (95% CI: 463-593) at the current date to 2,070 (95% CI: 1,886-2,254) by 2021-02-21.

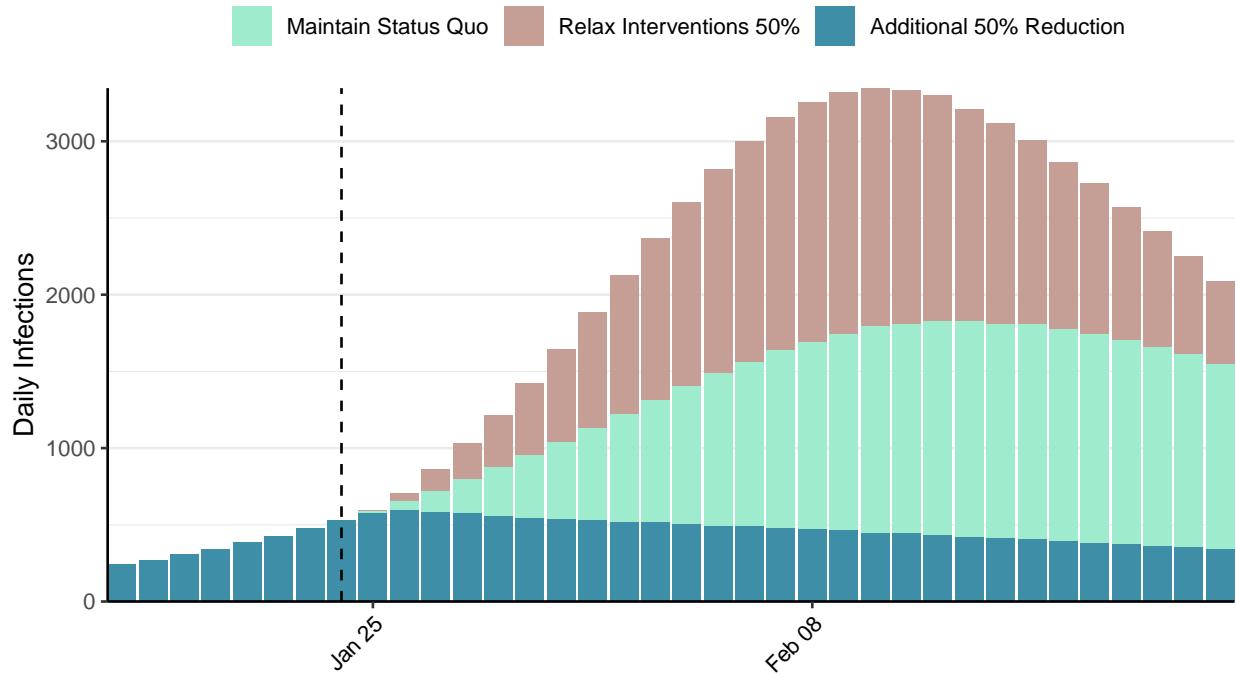


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Venezuela, 2021-01-24 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}
403	403	6	6	0.98 (95% CI: 0.8-1.14)

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 6 deaths have been reported to date**

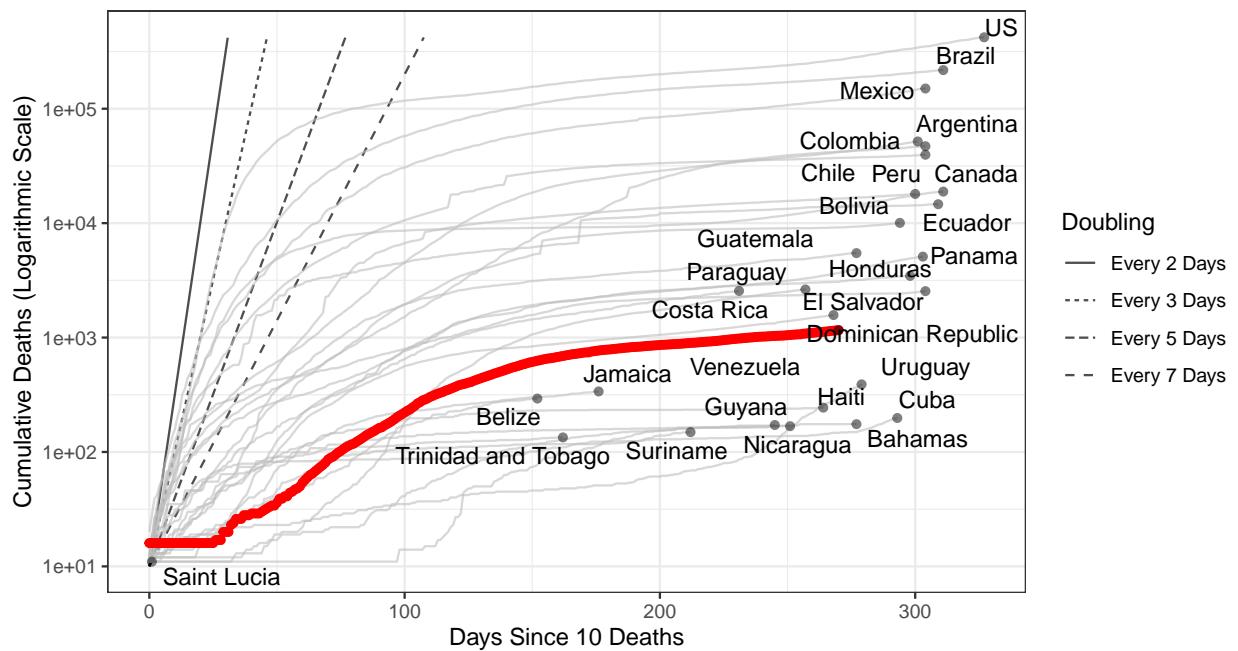


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 83,048 (95% CI: 79,829-86,268) 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).

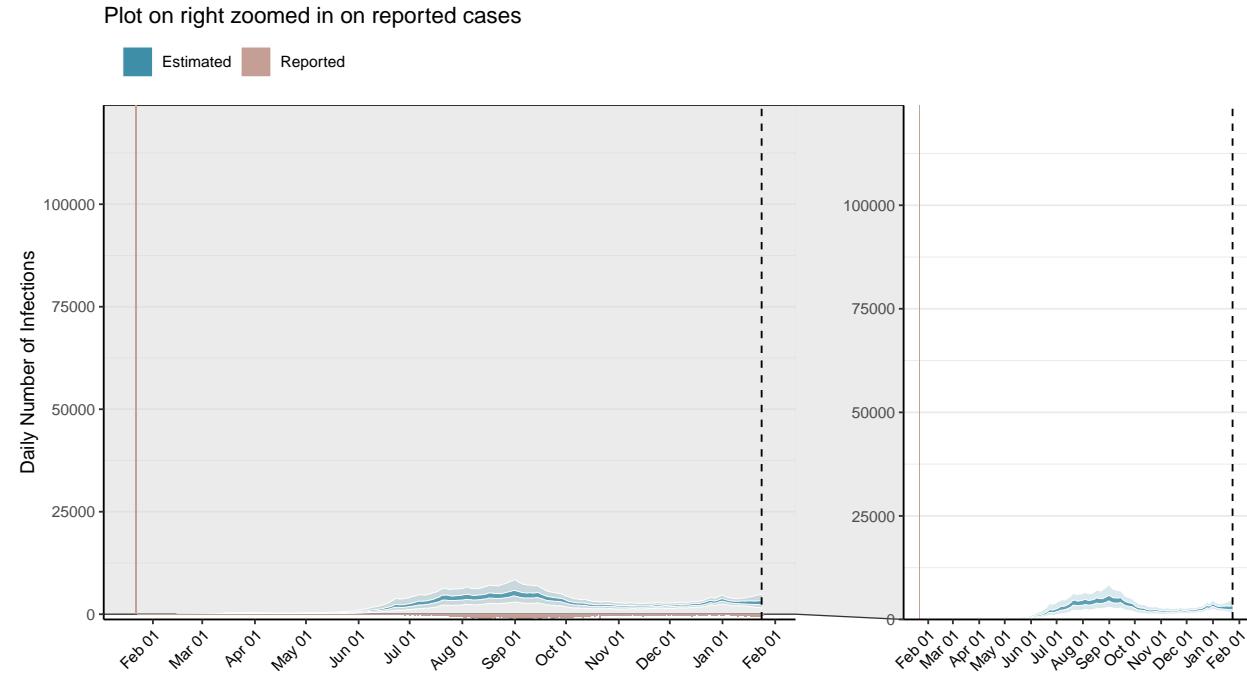


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

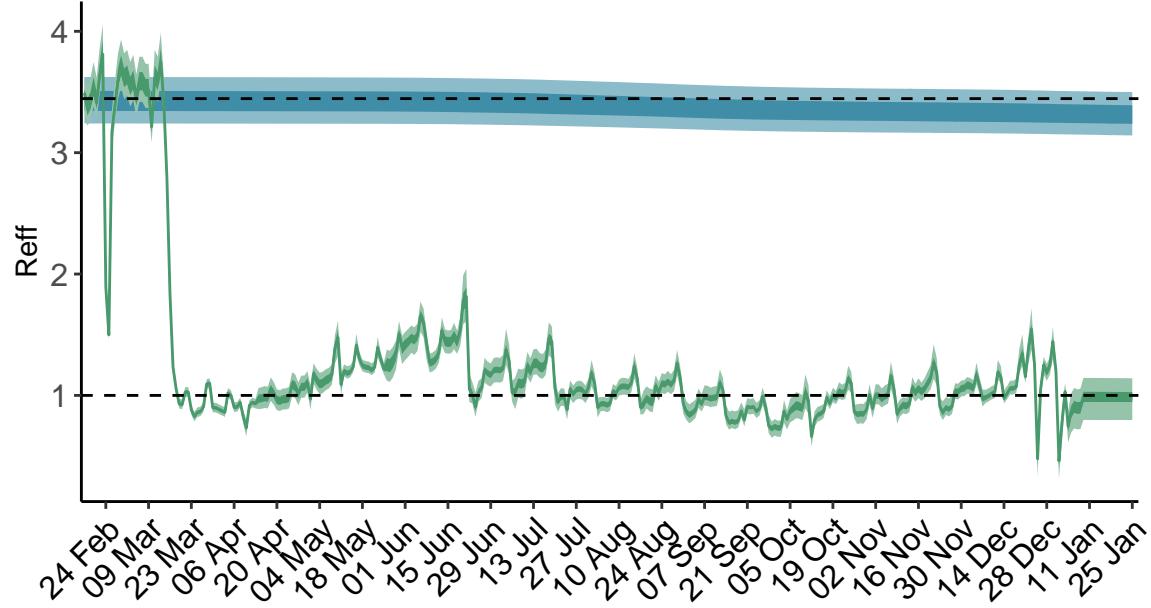


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

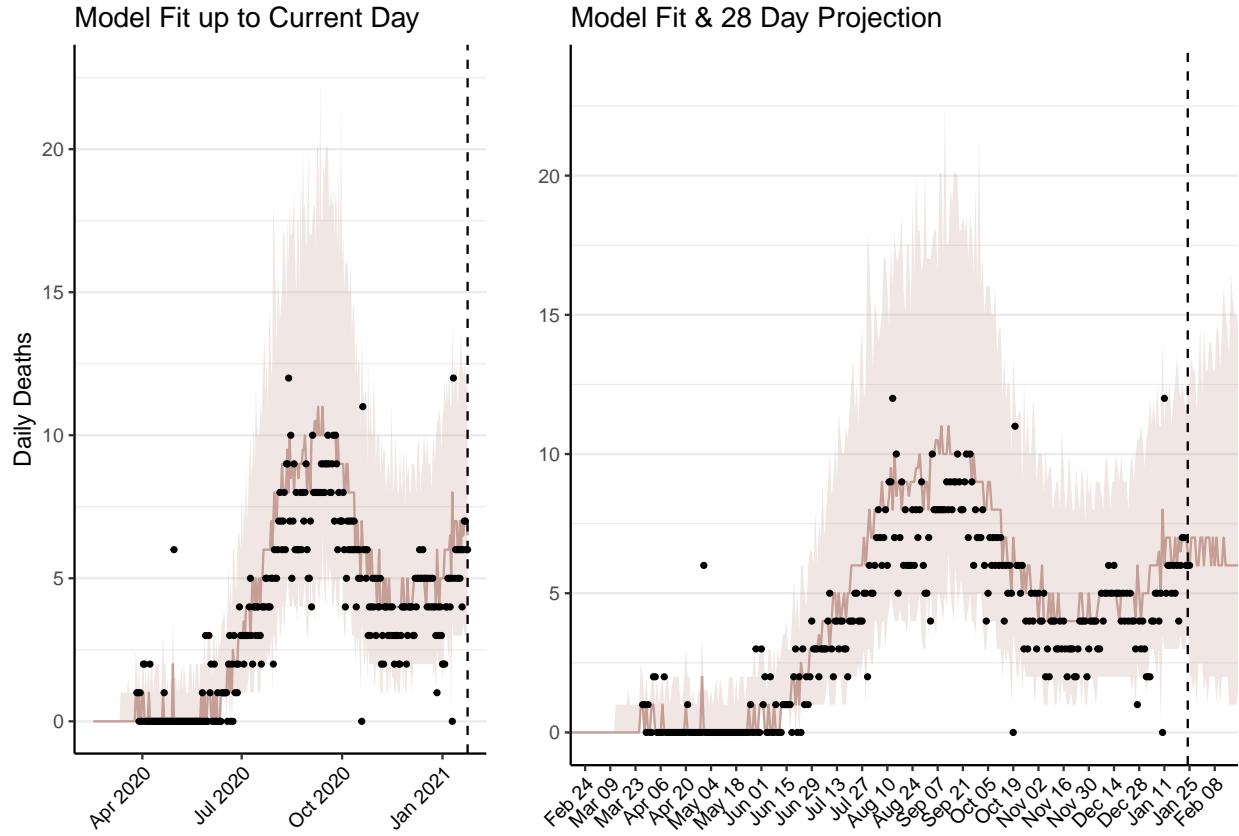


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 251 (95% CI: 240-262) patients requiring treatment with high-pressure oxygen at the current date to 255 (95% CI: 229-281) hospital beds being required on 2021-02-21 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 94 (95% CI: 90-98) patients requiring treatment with mechanical ventilation at the current date to 93 (95% CI: 84-102) by 2021-02-21. 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.**

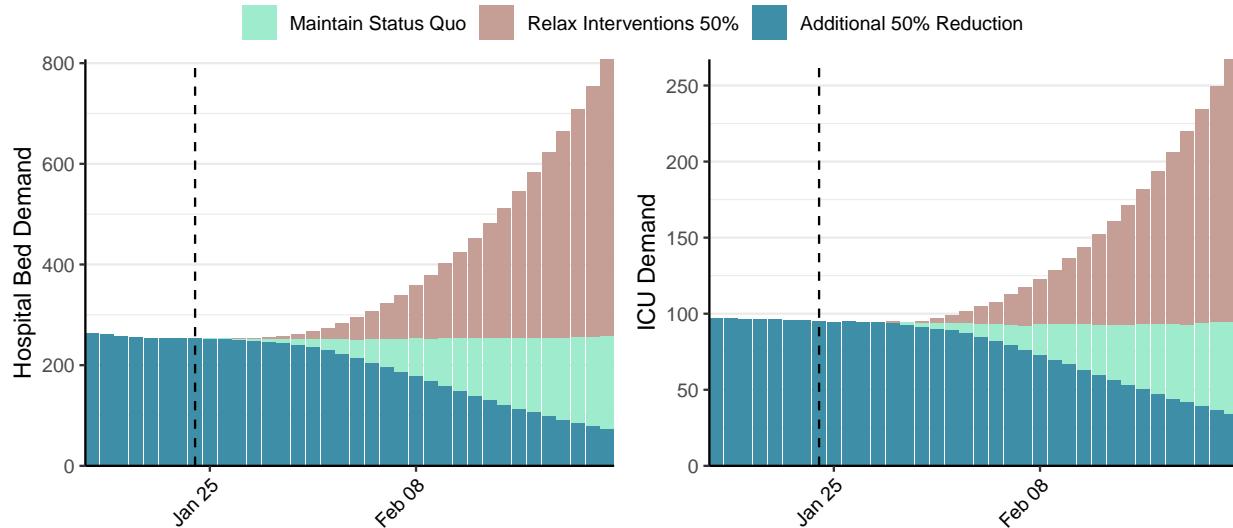


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 2,823 (95% CI: 2,650-2,996) at the current date to 244 (95% CI: 216-272) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 2,823 (95% CI: 2,650-2,996) at the current date to 17,580 (95% CI: 15,180-19,980) by 2021-02-21.

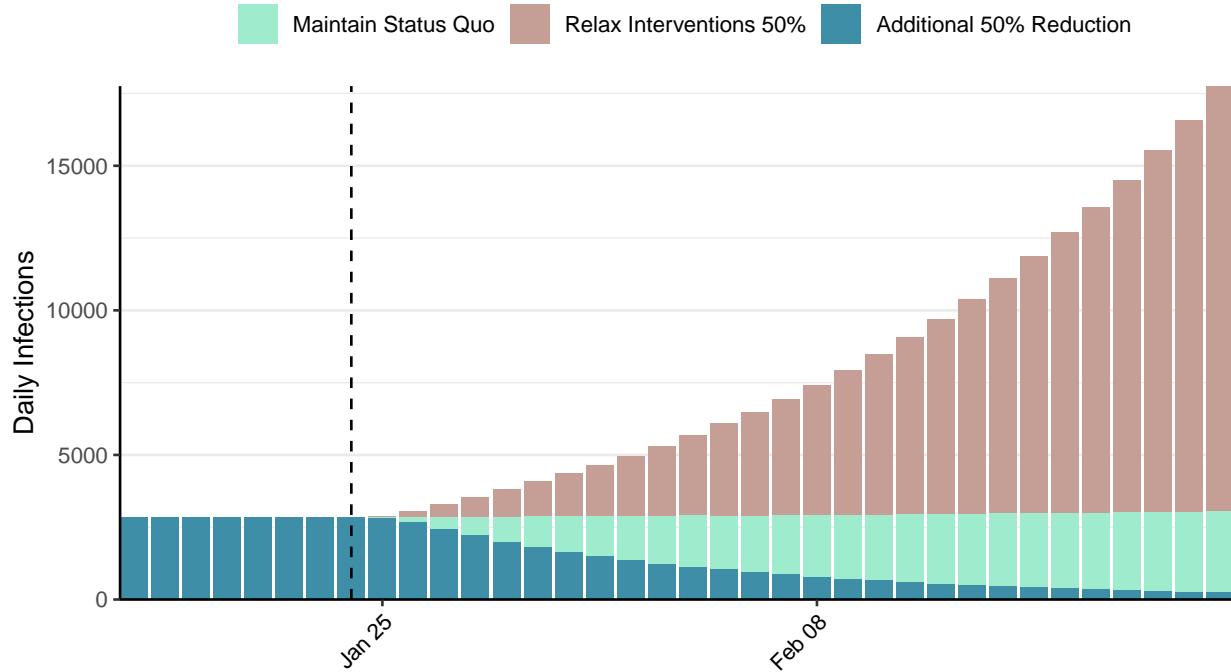


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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, 2021-01-24

[Download the report for Vietnam, 2021-01-24 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}
1	1	0	0	0.67 (95% CI: 0.41-0.94)

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. Vietnam is not shown in the following plot as only 0 deaths have been reported to date**

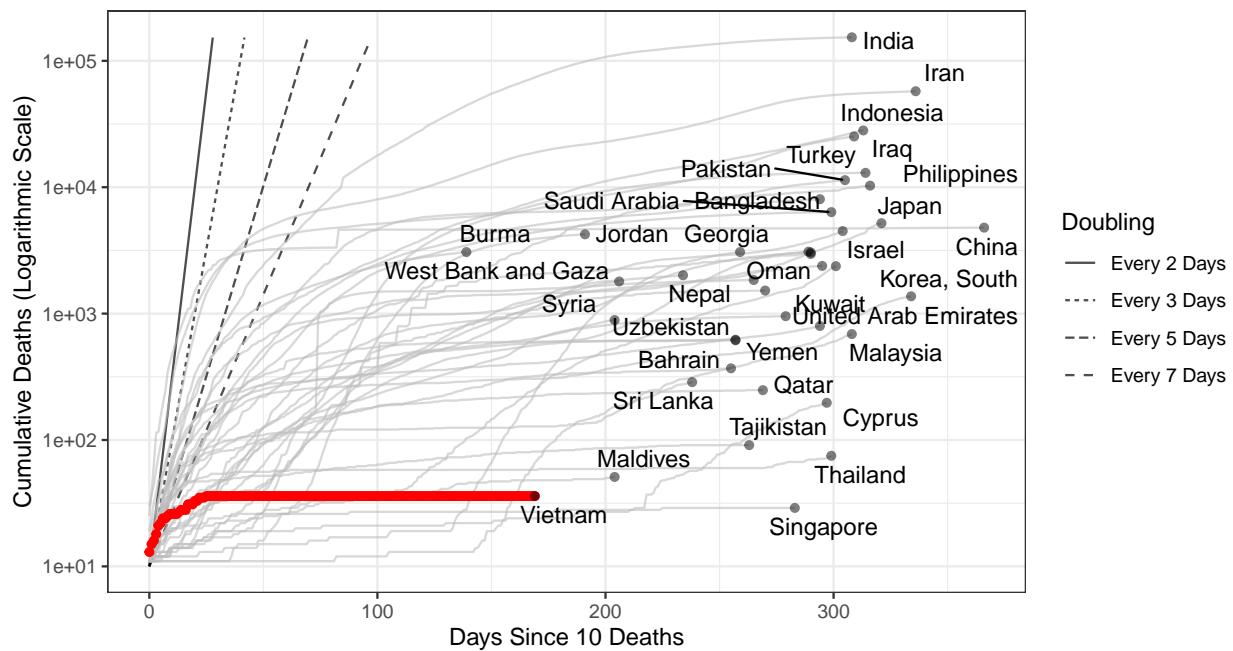


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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: 0-3) 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).

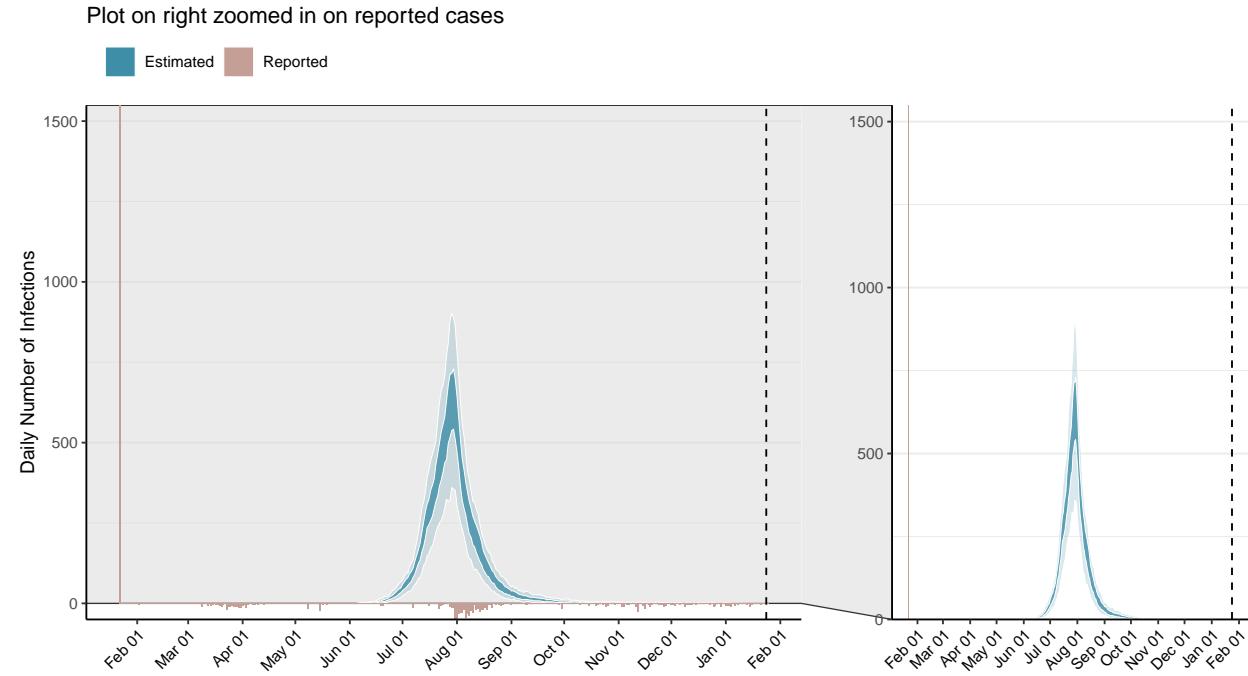


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

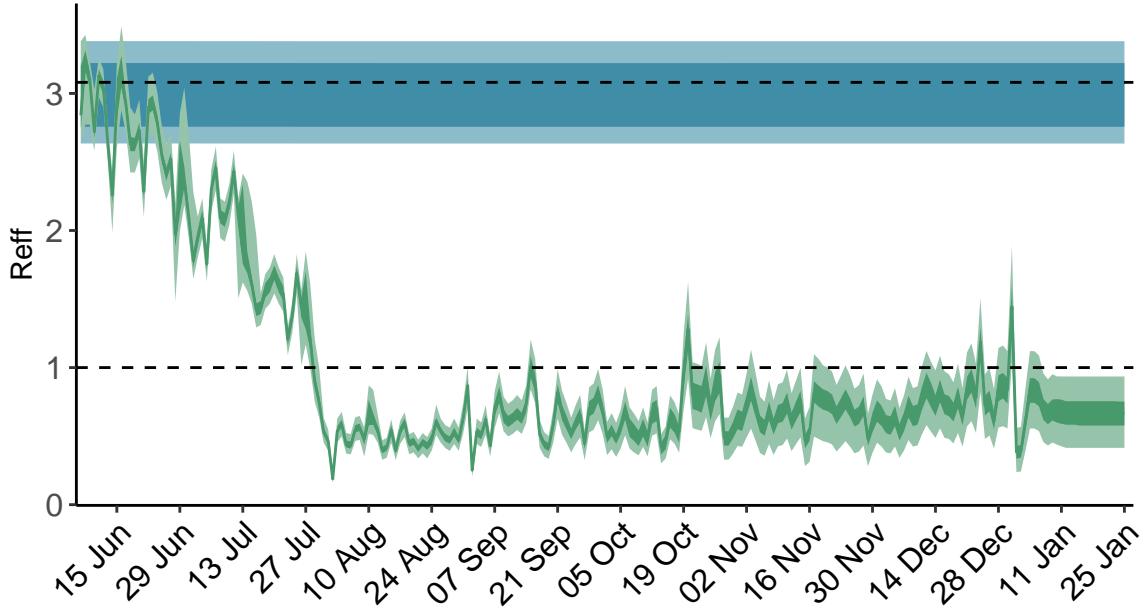


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

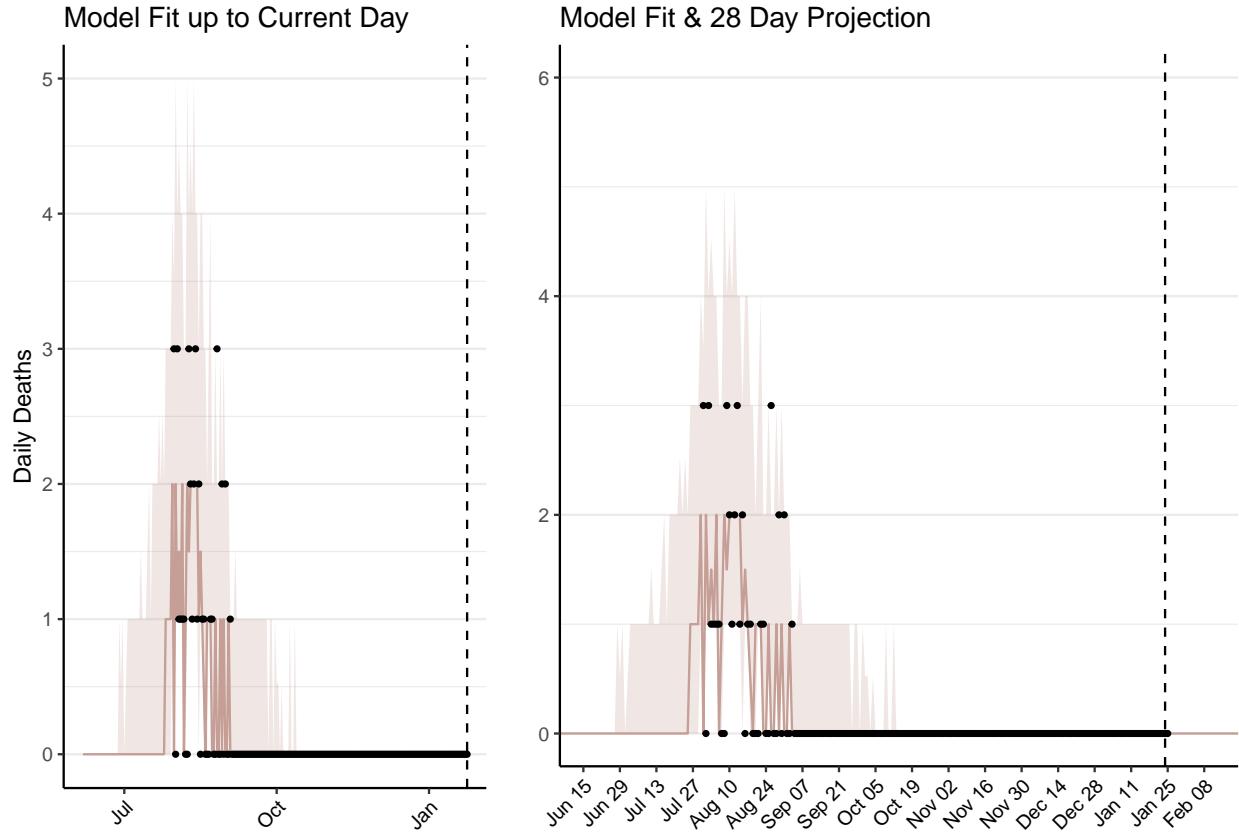


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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: 0-0) patients requiring treatment with high-pressure oxygen at the current date to 0 (95% CI: NaN-NaN) hospital beds being required on 2021-02-21 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 2021-02-21. 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.**

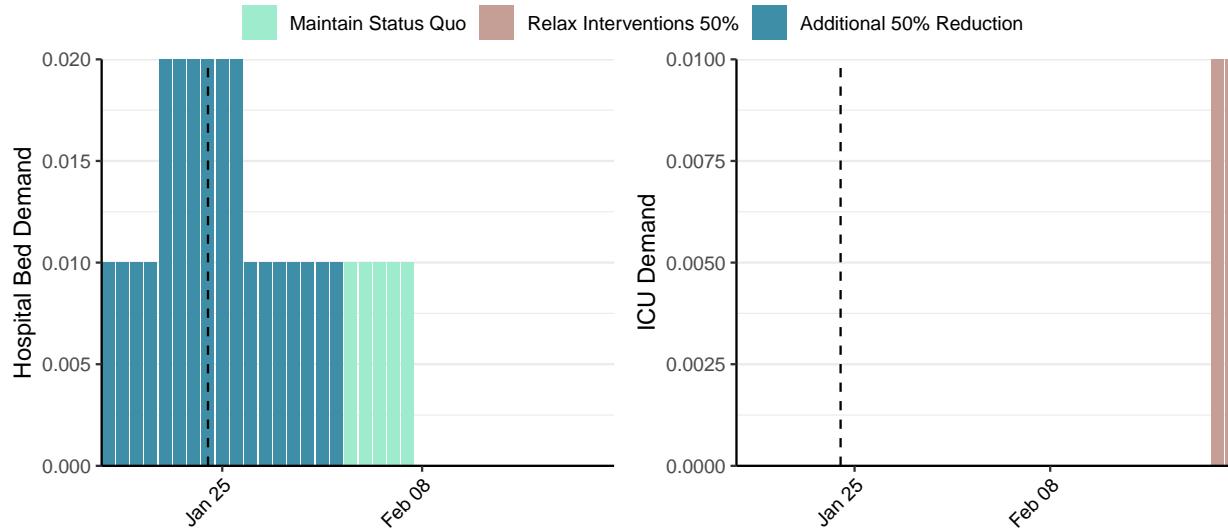


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 2021-02-21. 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 2021-02-21.

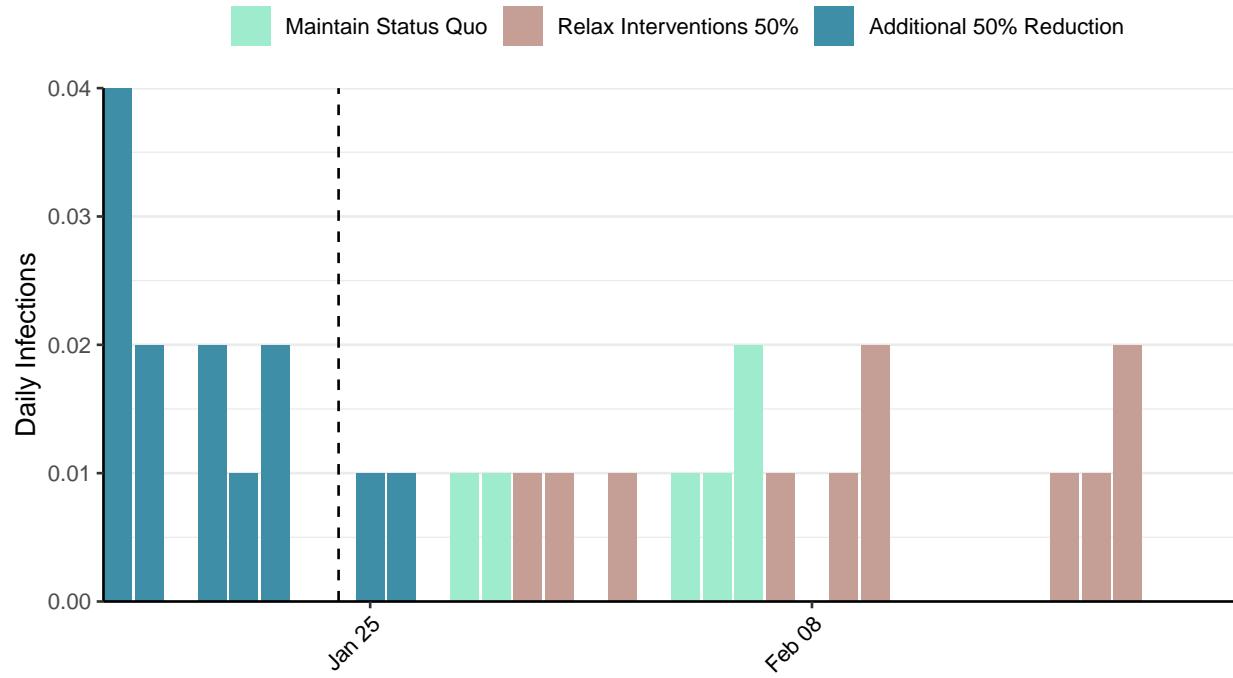


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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: Yemen, 2021-01-24

[Download the report for Yemen, 2021-01-24 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: 0.92-1.35)

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. Yemen is not shown in the following plot as only 0 deaths have been reported to date**

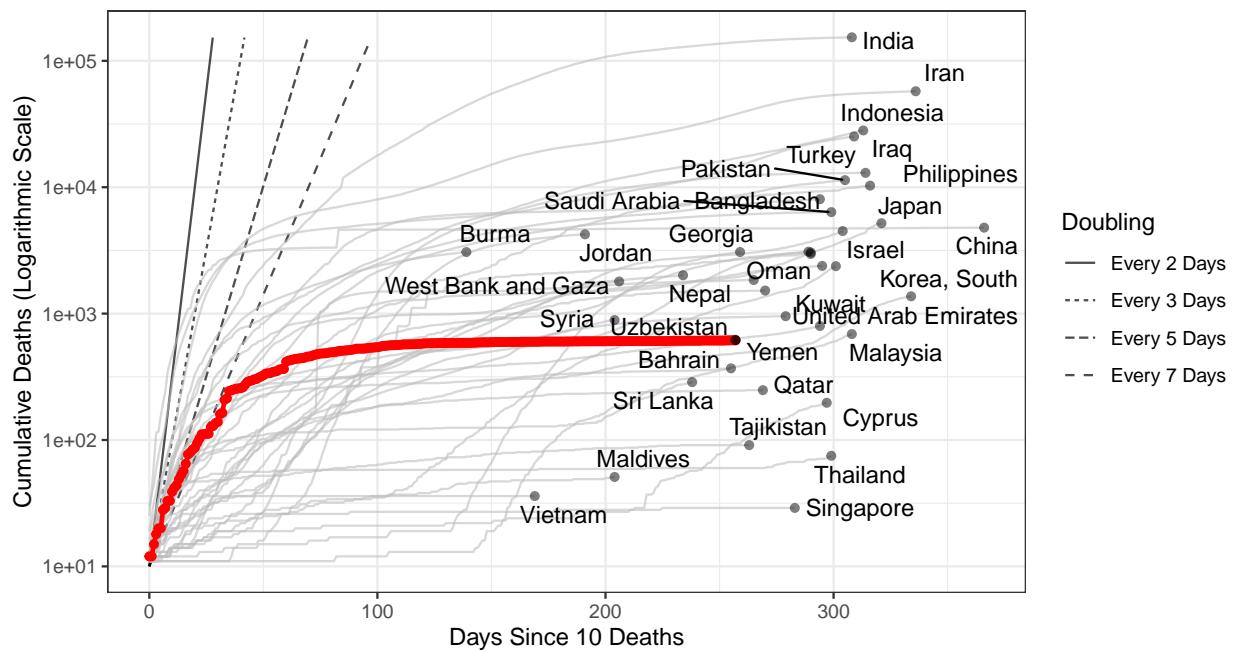


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 5,008 (95% CI: 4,522-5,494) 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.**

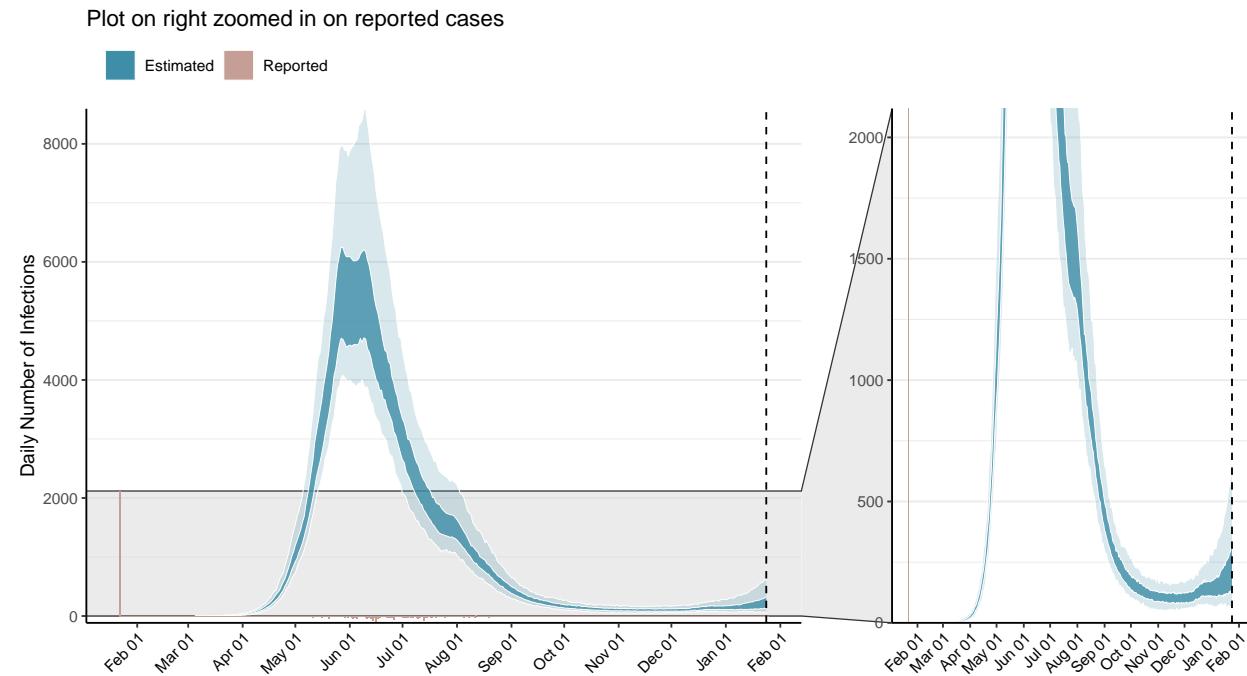


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

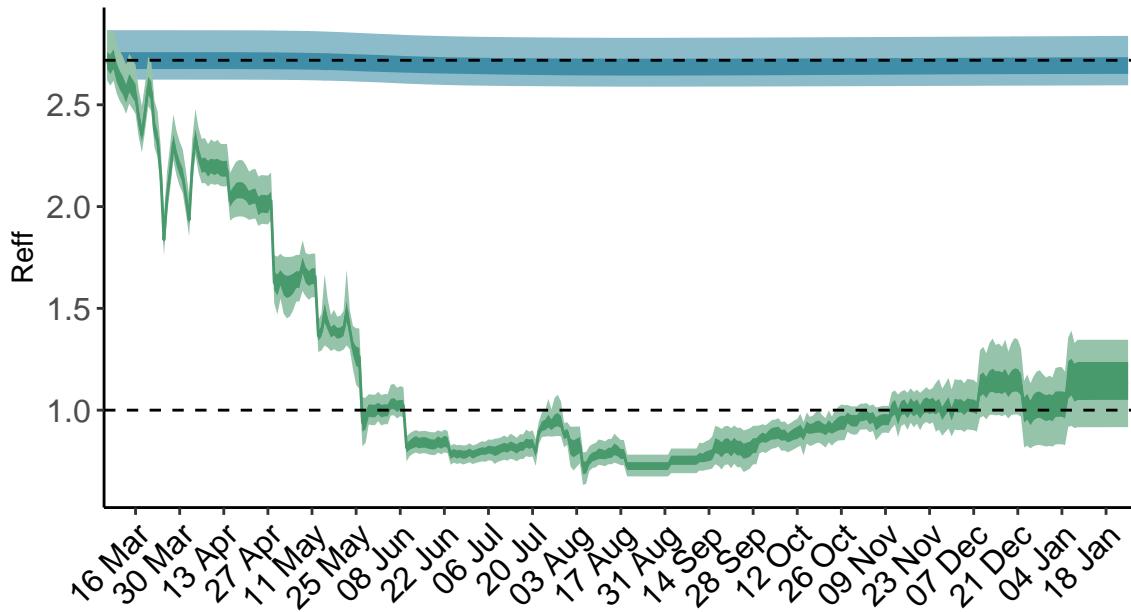


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

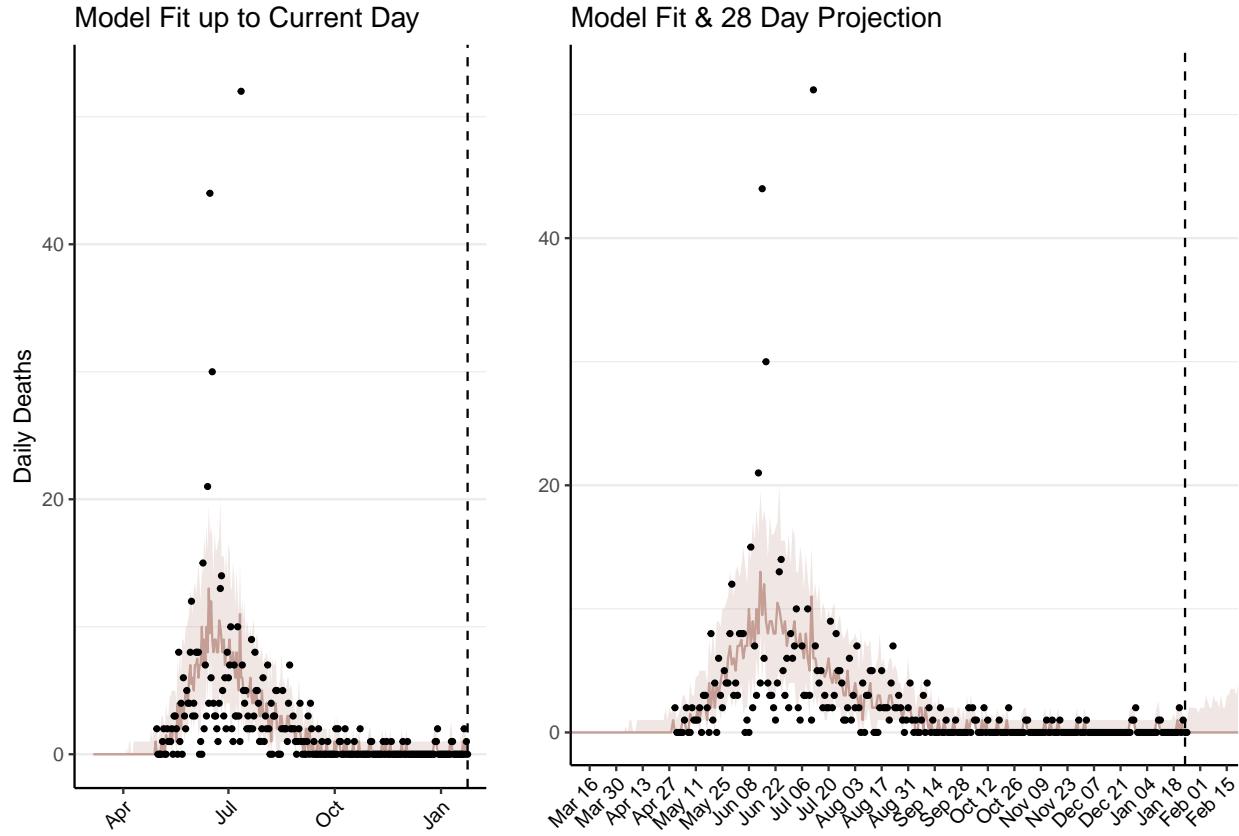


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 14 (95% CI: 13-16) patients requiring treatment with high-pressure oxygen at the current date to 33 (95% CI: 27-40) hospital beds being required on 2021-02-21 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: 5-6) patients requiring treatment with mechanical ventilation at the current date to 13 (95% CI: 10-15) by 2021-02-21. 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.**

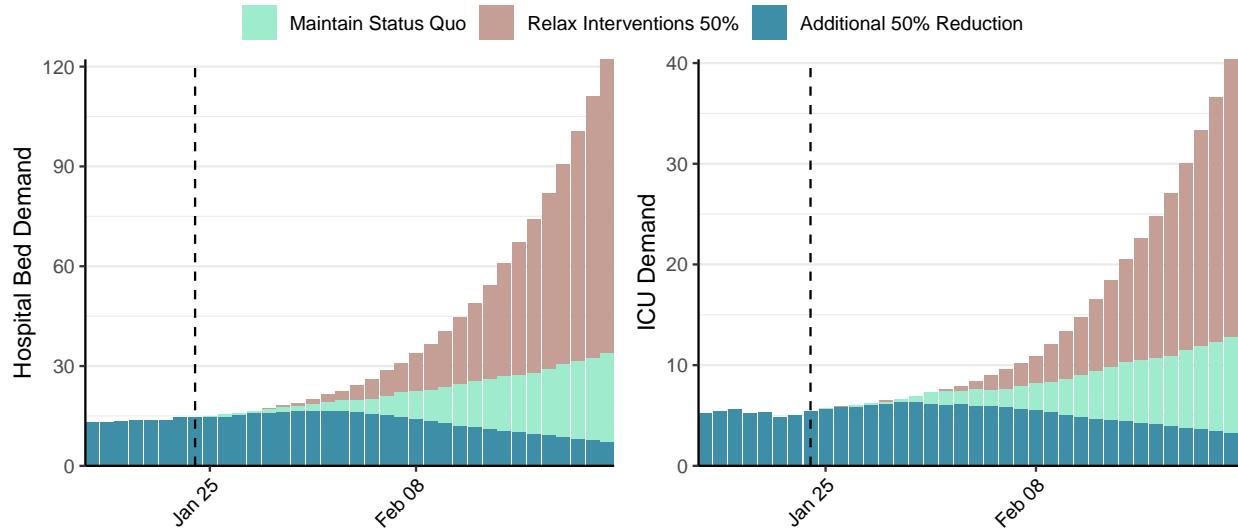


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 244 (95% CI: 212-276) at the current date to 41 (95% CI: 33-50) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 244 (95% CI: 212-276) at the current date to 3,976 (95% CI: 3,018-4,934) by 2021-02-21.

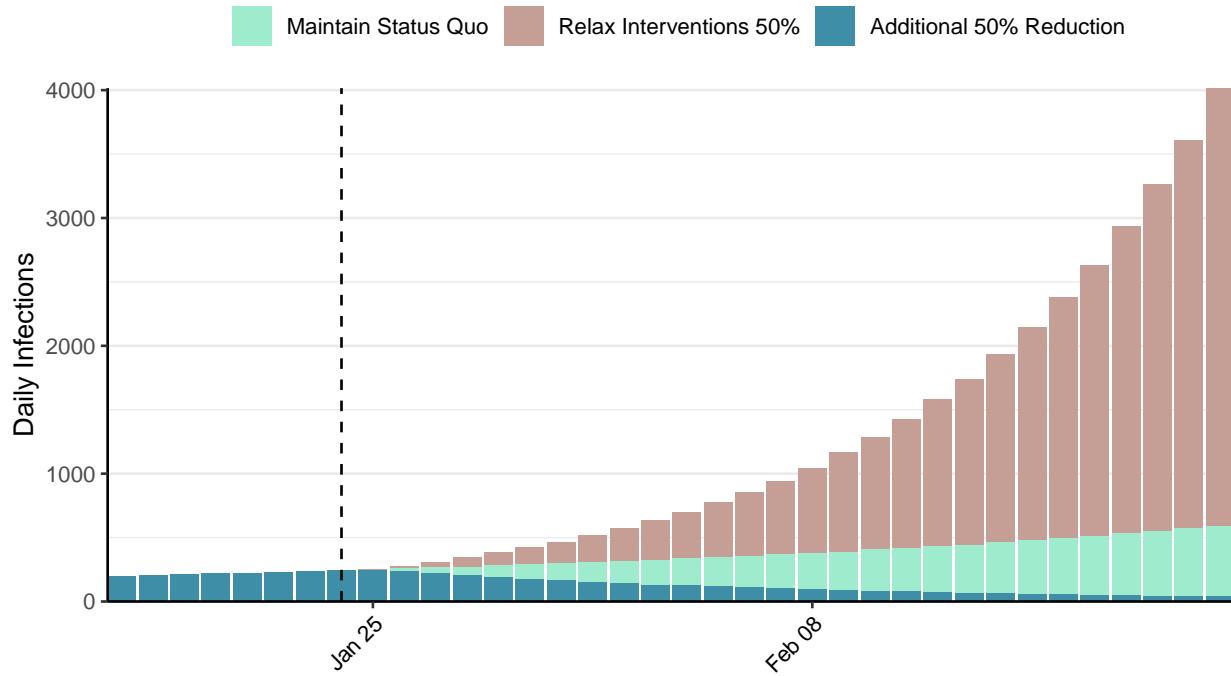


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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 Africa, 2021-01-24

[Download the report for South Africa, 2021-01-24 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}
4,551	4,551	243	243	0.8 (95% CI: 0.63-0.96)

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.

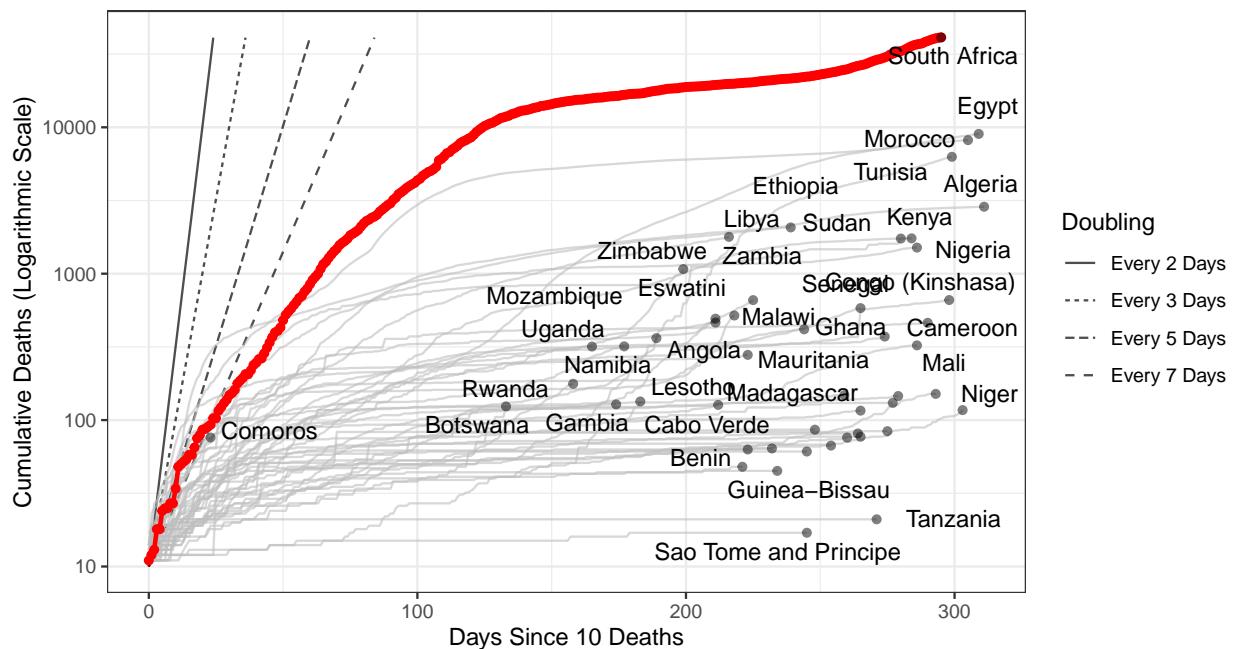


Figure 1: **Cumulative Deaths since 10 deaths.** Country not shown if fewer than 10 deaths.

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 3,766,665 (95% CI: 3,647,657-3,885,674) 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

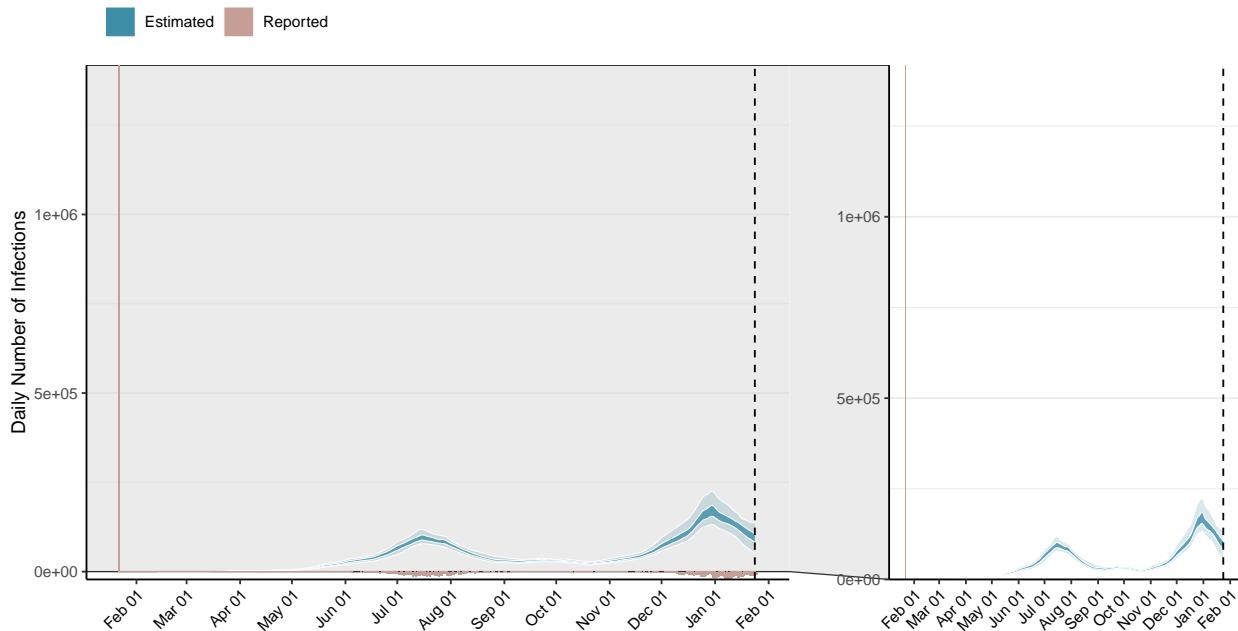


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

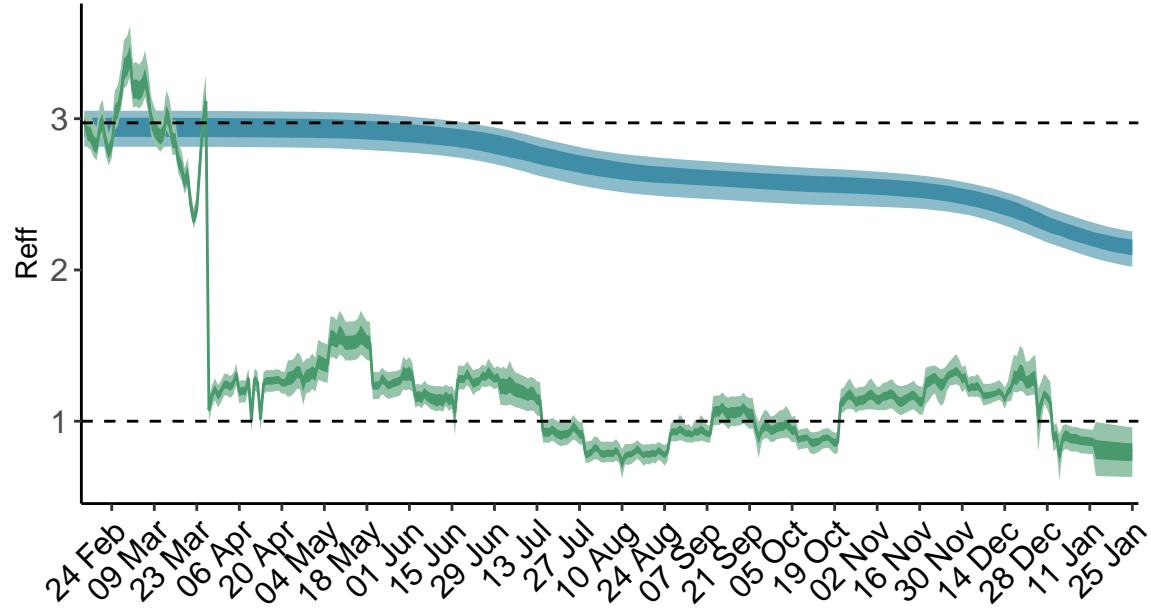


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.](#)

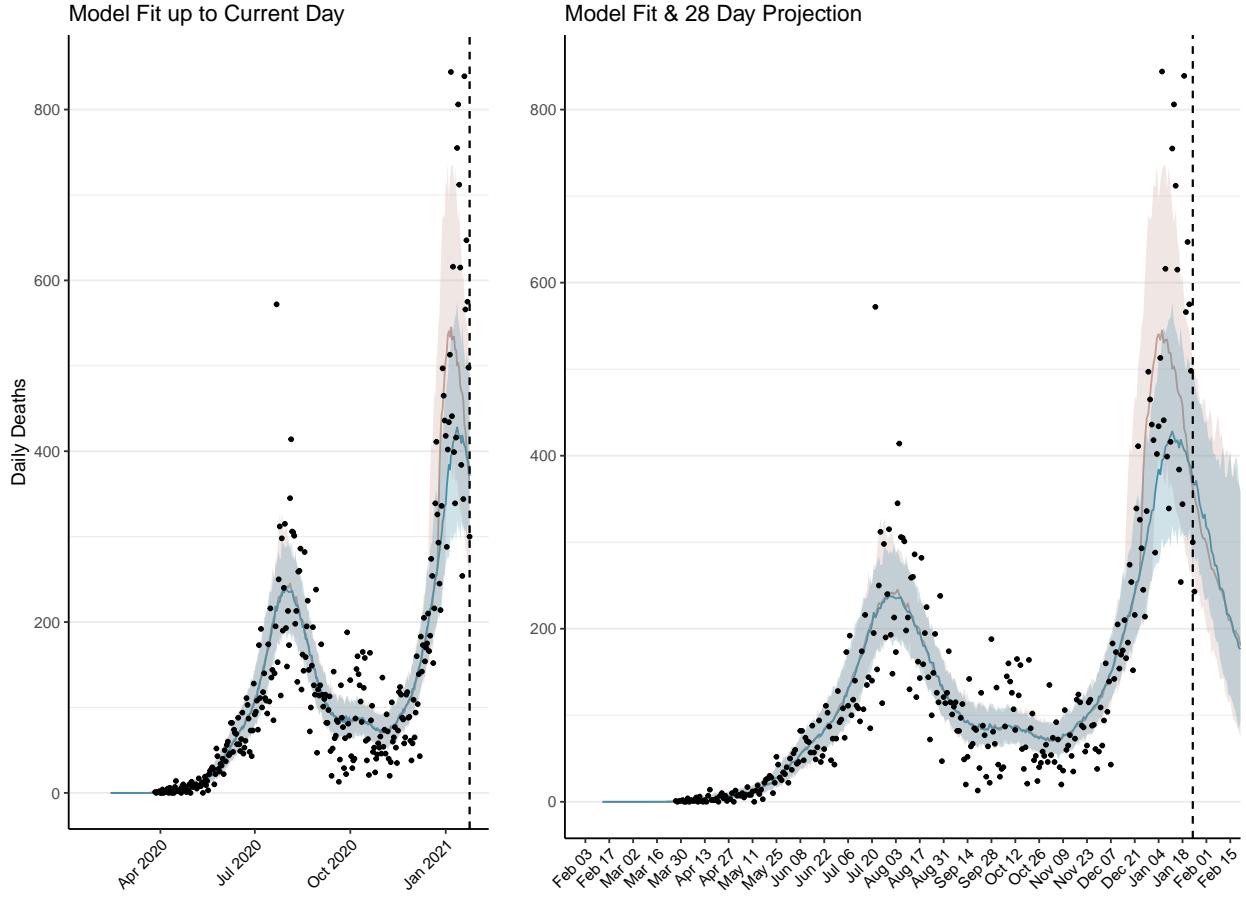


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 14,139 (95% CI: 13,685-14,593) patients requiring treatment with high-pressure oxygen at the current date to 6,702 (95% CI: 6,122-7,283) hospital beds being required on 2021-02-21 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 4,359 (95% CI: 4,267-4,451) patients requiring treatment with mechanical ventilation at the current date to 2,760 (95% CI: 2,584-2,936) by 2021-02-21. 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.

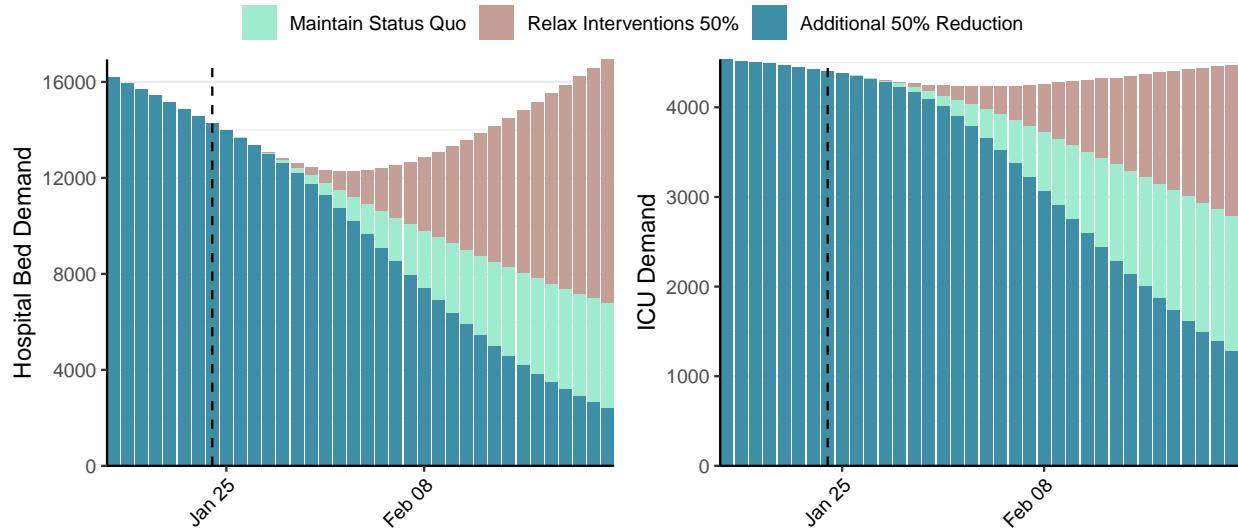


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 94,069 (95% CI: 89,426-98,711) at the current date to 4,276 (95% CI: 3,792-4,760) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 94,069 (95% CI: 89,426-98,711) at the current date to 186,655 (95% CI: 165,593-207,718) by 2021-02-21.

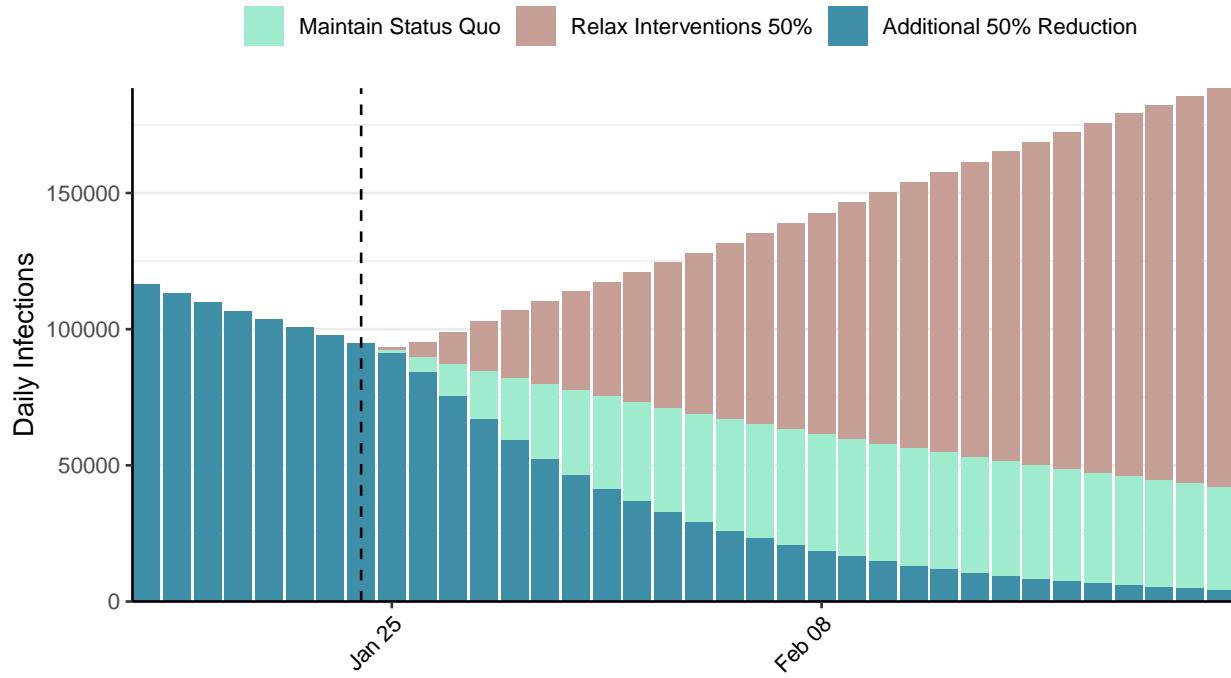


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections 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: Zambia, 2021-01-24

[Download the report for Zambia, 2021-01-24 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}
809	809	21	21	1.34 (95% CI: 1.13-1.53)

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.

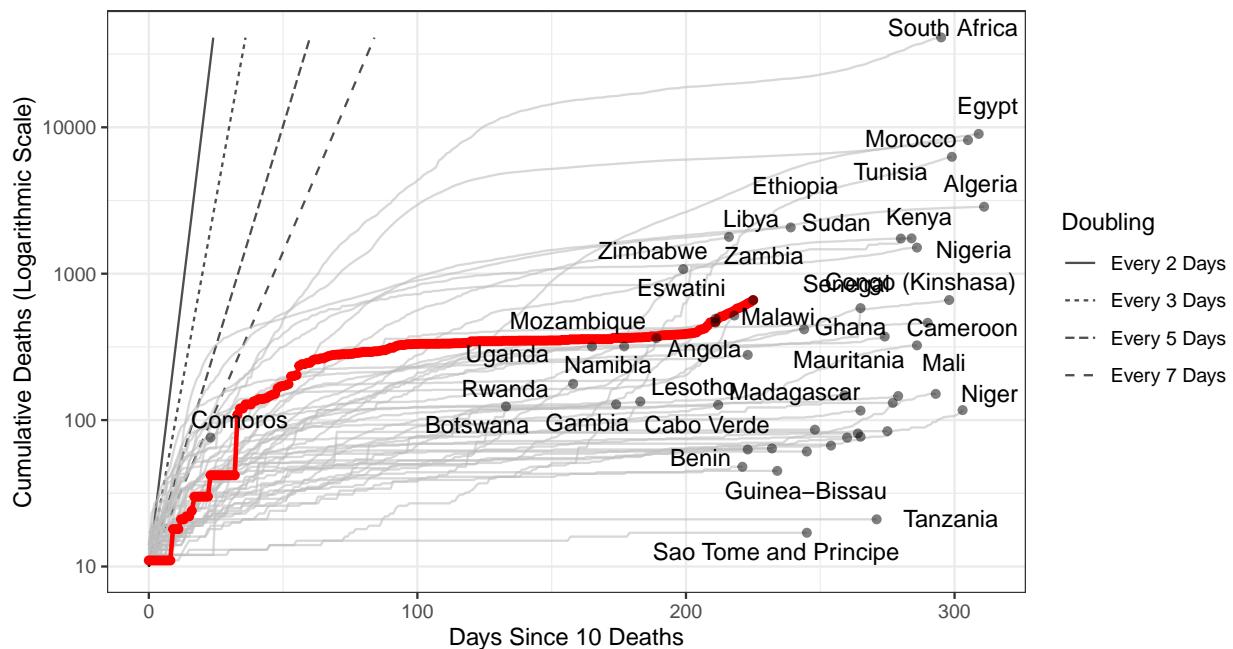


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 564,820 (95% CI: 531,063–598,577) 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

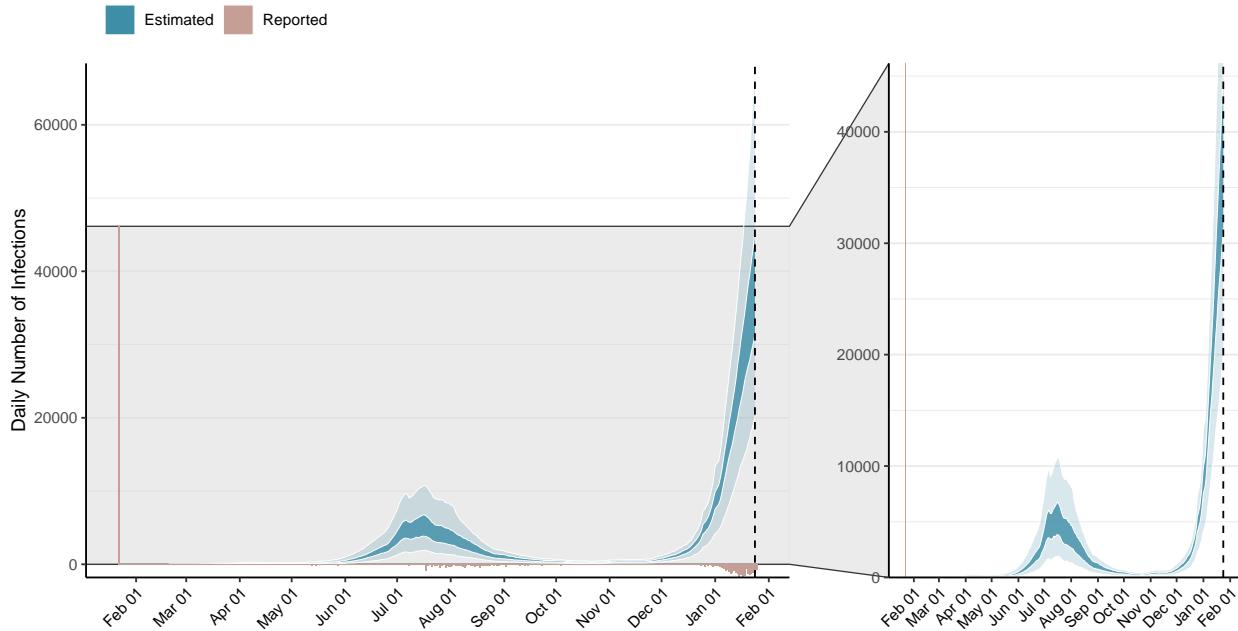


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

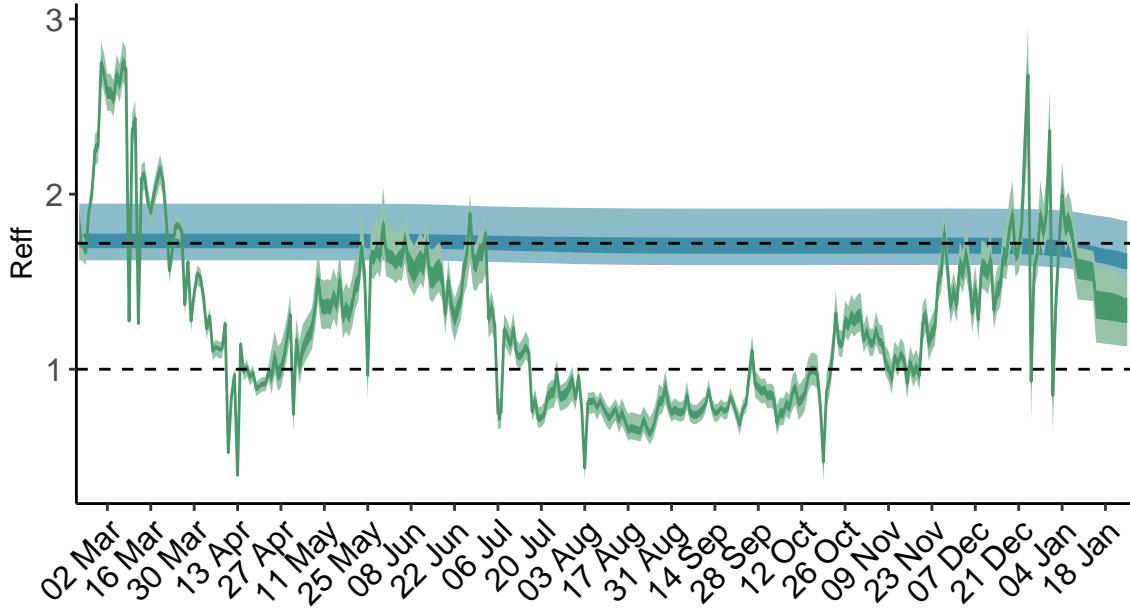


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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. 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.](#)

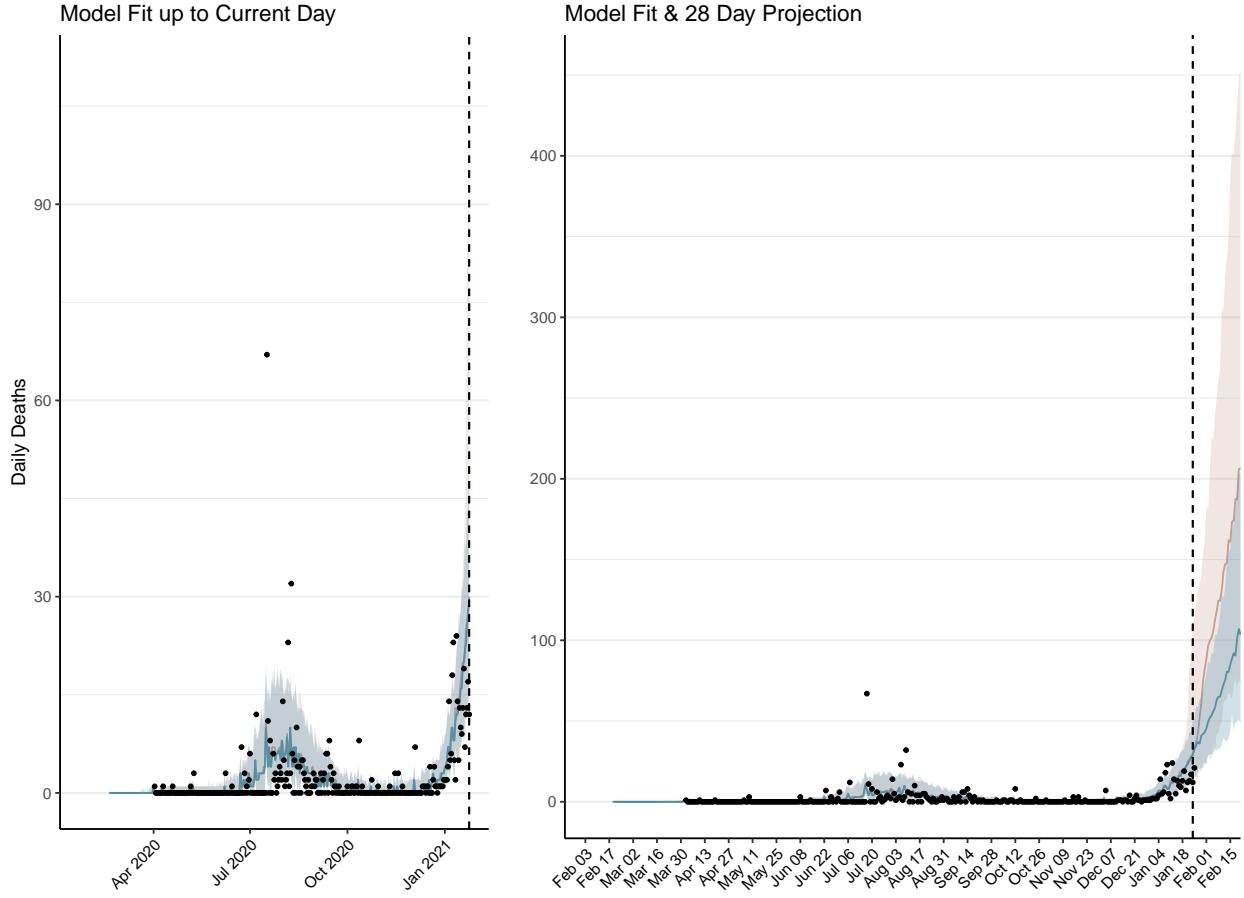


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 1,661 (95% CI: 1,562-1,759) patients requiring treatment with high-pressure oxygen at the current date to 5,704 (95% CI: 5,228-6,180) hospital beds being required on 2021-02-21 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 550 (95% CI: 525-575) patients requiring treatment with mechanical ventilation at the current date to 880 (95% CI: 849-912) by 2021-02-21. 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.**

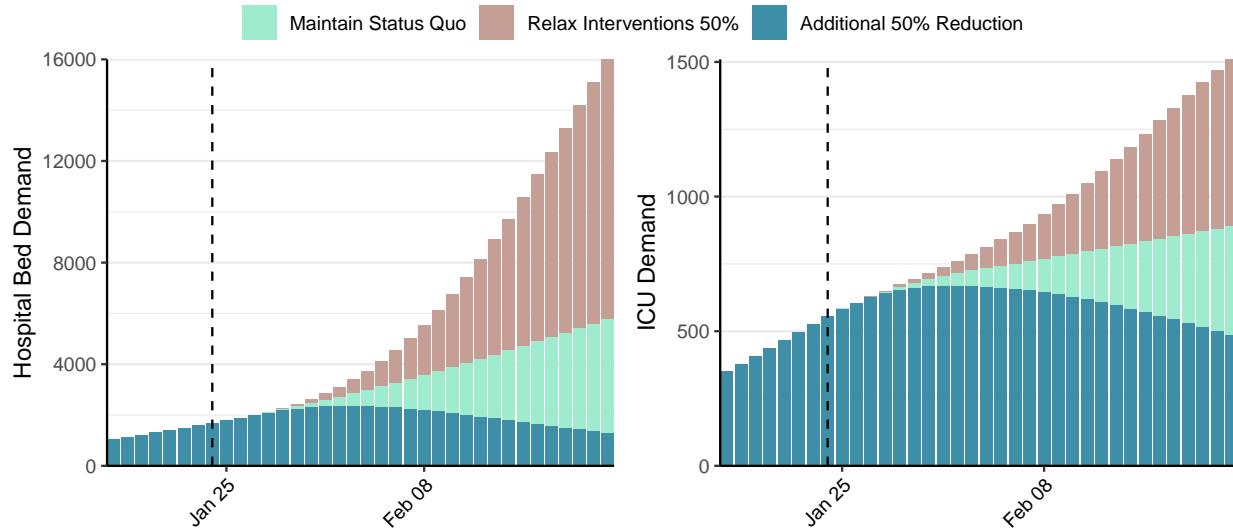


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 40,302 (95% CI: 37,414-43,190) at the current date to 9,429 (95% CI: 8,436-10,422) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 40,302 (95% CI: 37,414-43,190) at the current date to 389,233 (95% CI: 370,549-407,917) by 2021-02-21.

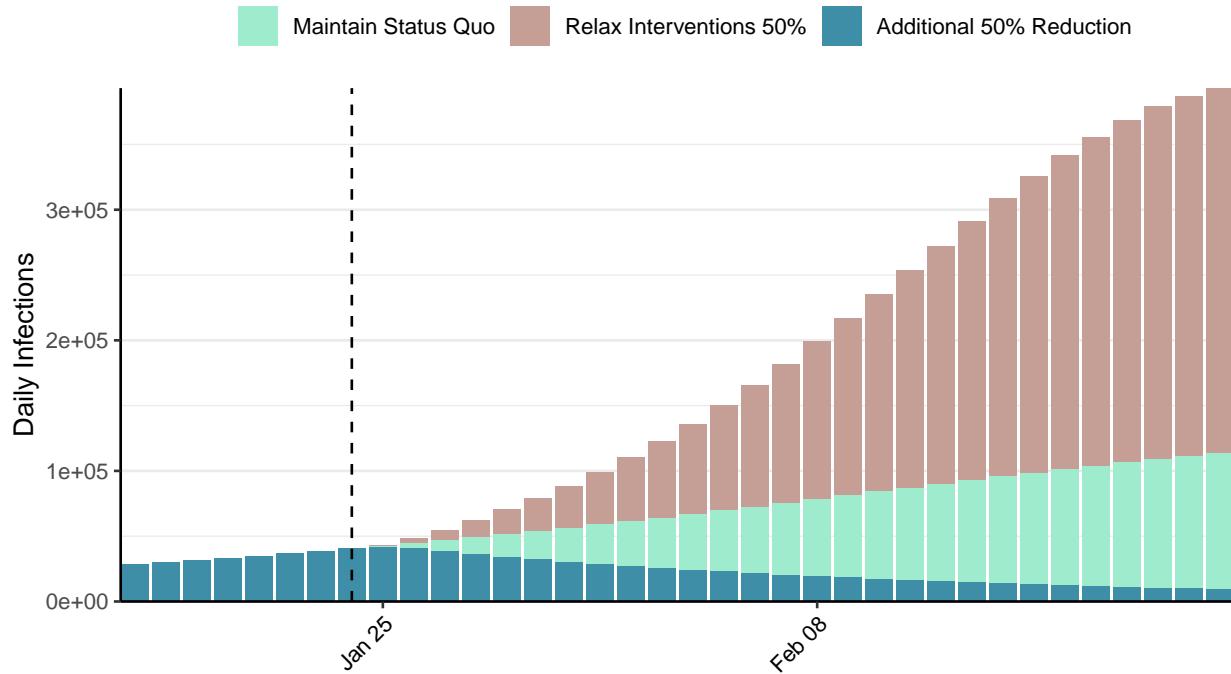


Figure 6: Daily number of infections estimated by fitting to deaths. Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections for 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, 2021-01-24

[Download the report for Zimbabwe, 2021-01-24 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}
326	326	70	70	0.97 (95% CI: 0.77-1.16)

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.

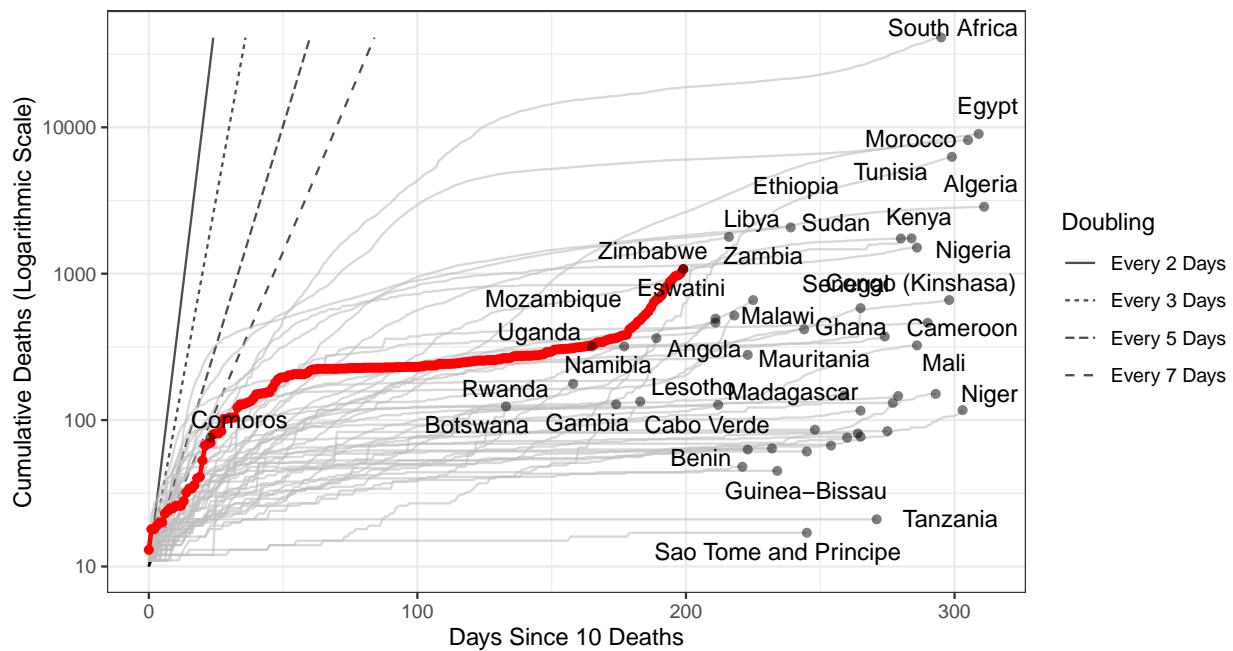


Figure 1: Cumulative Deaths since 10 deaths. Country not shown if fewer than 10 deaths.

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 636,873 (95% CI: 604,114–669,633) 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

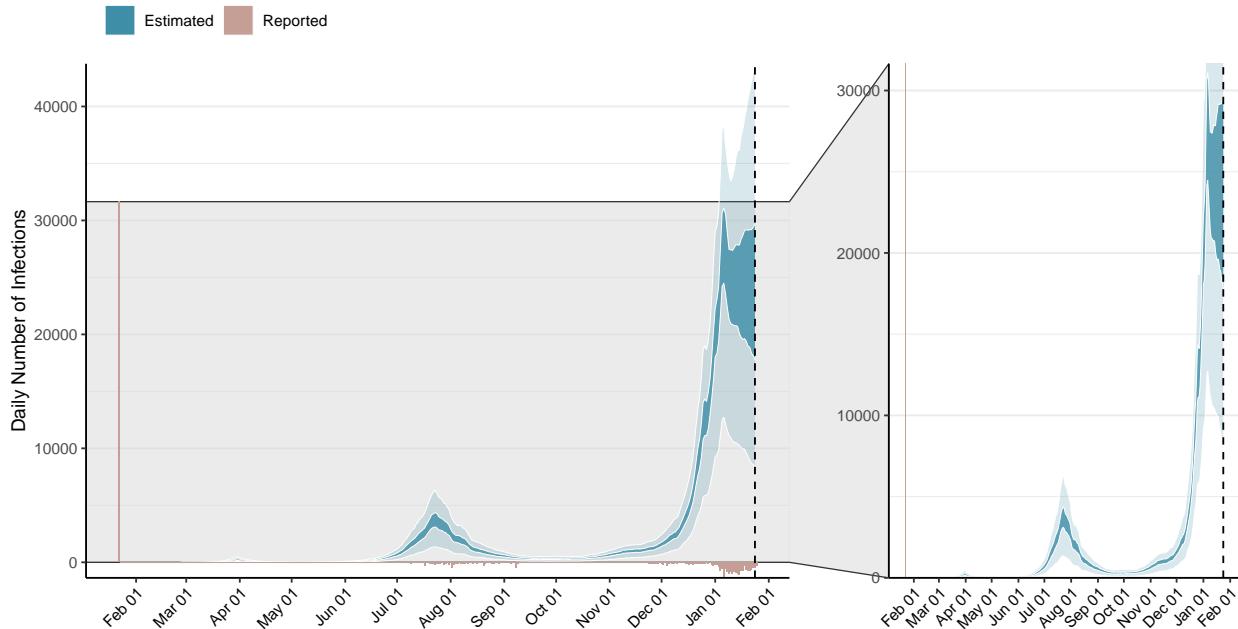


Figure 2: **Daily number of infections estimated by fitting to the current total of deaths.** Reported cases are shown in red. Model estimated infections are shown in blue (dark blue 50% interquartile range, light blue 95% quantile). The dashed line shows the current day.

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.

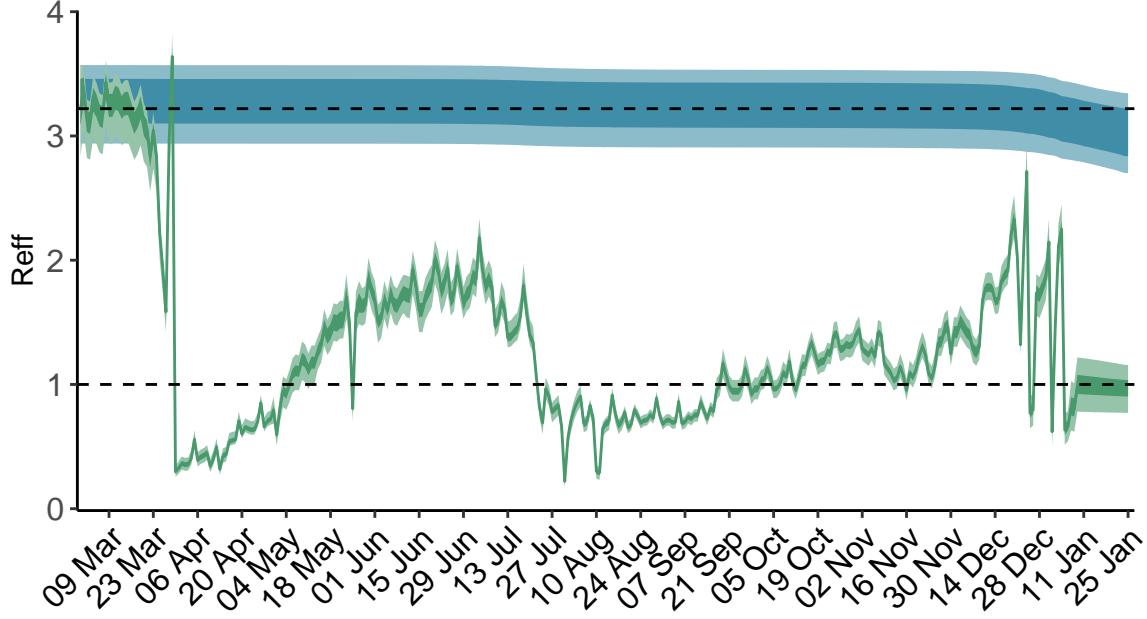


Figure 3: Time-varying effective reproduction number, R_{eff} . R_{eff} (green) is the average number of secondary infections caused by a single infected person at time equal to t . A horizontal dashed line is shown at $R_{eff} = 1$. $R_{eff} < 1$ indicates a slowing epidemic in which new infections 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.

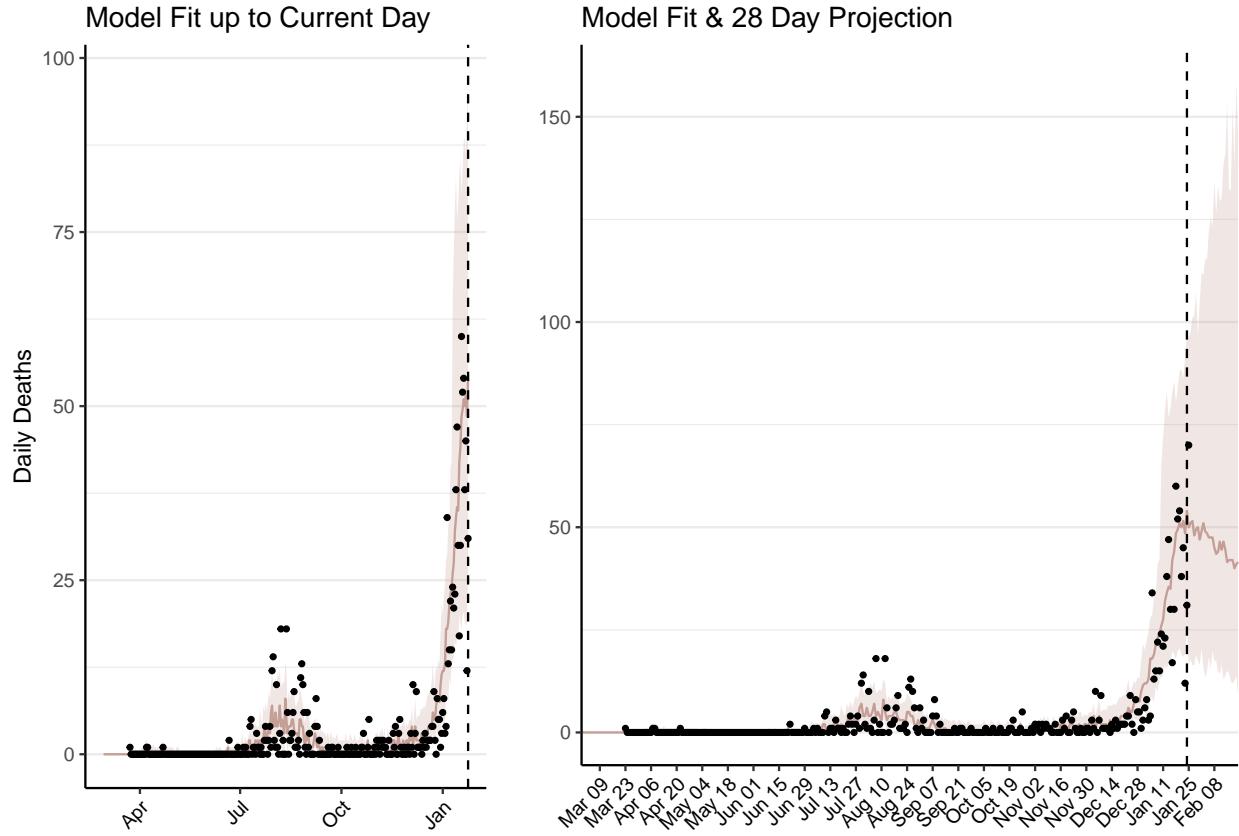


Figure 4: **Estimated daily deaths.** Projected deaths assuming the current level of interventions are maintained are shown in red (median and 95% quantile). Reported deaths are plotted in black. The plot on the left is focussed on the model fit prior to today, while the plot on the right forecasts the 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 1,828 (95% CI: 1,731-1,925) patients requiring treatment with high-pressure oxygen at the current date to 1,803 (95% CI: 1,607-1,999) hospital beds being required on 2021-02-21 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 566 (95% CI: 546-586) patients requiring treatment with mechanical ventilation at the current date to 522 (95% CI: 492-552) by 2021-02-21. 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.**

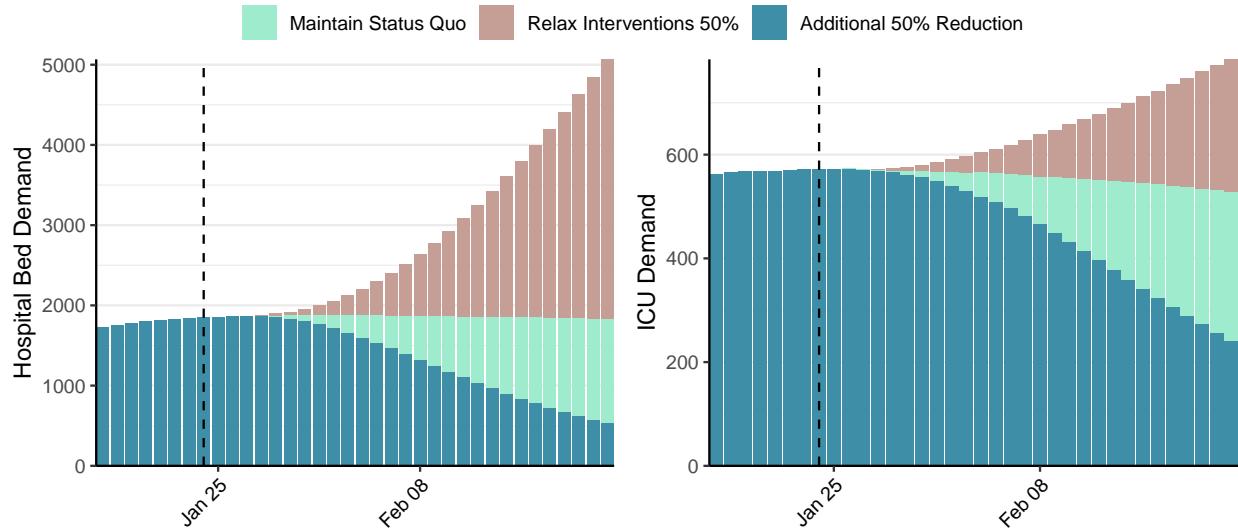


Figure 5: **Healthcare demands in the next 28 days.** Individuals needing an ICU bed are assumed to need mechanical ventilation. Projected demand for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction 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 24,065 (95% CI: 22,257-25,874) at the current date to 2,021 (95% CI: 1,754-2,288) by 2021-02-21. If current interventions were relaxed by 50%, we estimate the daily number of infections will change from 24,065 (95% CI: 22,257-25,874) at the current date to 101,753 (95% CI: 89,979-113,527) by 2021-02-21.

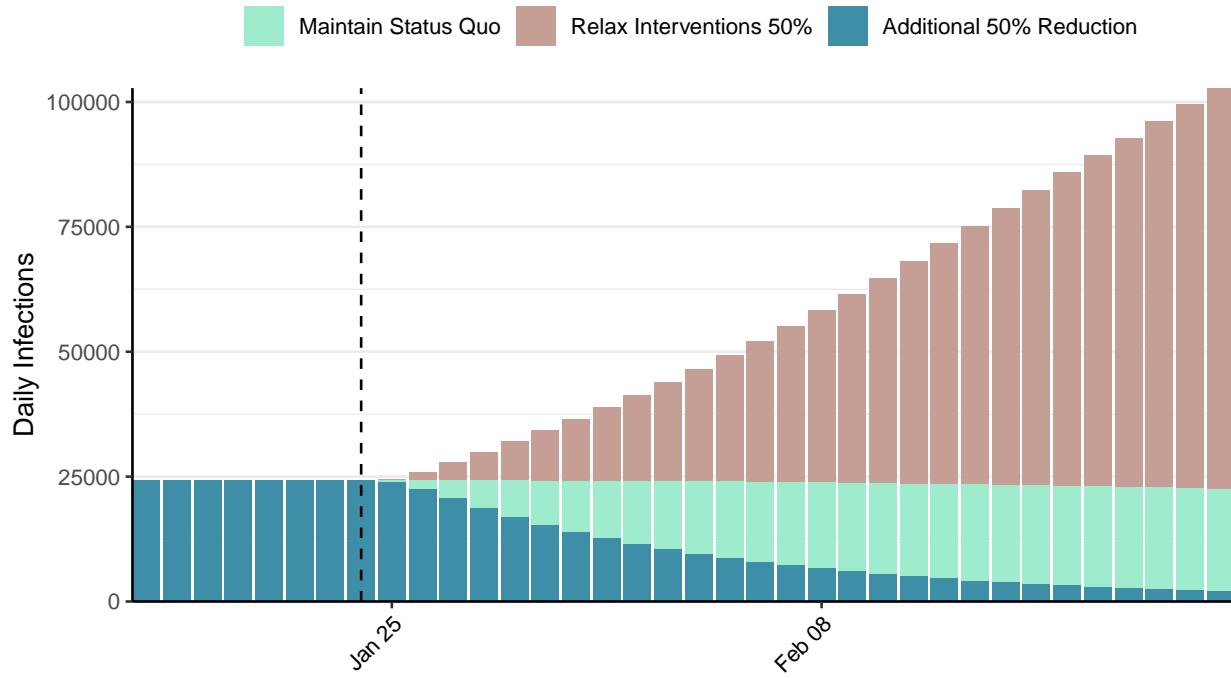


Figure 6: **Daily number of infections estimated by fitting to deaths.** Projected infections for Scenario 1 (the epidemic continues to grow at the current rate) are shown in green (Maintain status quo). Projections for Scenario 2 (a further 50% reduction in transmission) are shown in blue. Projections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