COVID-19 Projections: Afghanistan

Report Date: 23 Sep 2020

This report summarizes the COVID-19 model results for Afghanistan, developed by the OCHA Centre for Humanitarian Data in partnership with the Johns Hopkins University Applied Physics Laboratory. These projections are based on COVID-19 cases and deaths data up to 23 September 2020. The data is sourced from World Health Organization (WHO) and the country's Ministry of Public Health (MOPH). For dynamic updates to this data and more, see the HDX COVID-19 Map Explorer. For additional information, please contact Leonardo Milano at: leonardo.milano@un.org.

1. Key Messages[1][2]

Current Situation (as of 23 Sep 2020)

- A total of 39,096 cases and 1,445 deaths have been reported.
- The current number of severe cases requiring healthcare support is estimated at 101 - 166 and is stable with respect to our last update.
- Cases had a first peak in early June and deaths had a first peak in early July.

National Projections (in the next 4 weeks or by 21 Oct 2020)

- In the next 4 weeks, the total number of cases is projected to reach 39,914 - 40,132 (a 2-3% increase) and the total number of deaths is projected to reach 1,490 - 1,509 (a 3-4% increase) if current NPIs are maintained.
- Lifting of NPIs would lead to a larger increase in cases and deaths (up to 1,130 more cases and up to 41 more deaths; see sections 2 and 3 for details).
- The number of severe cases requiring healthcare is projected to increase, and to increase at least 3 times more if NPIs are lifted (see section 3).

Subnational Projections (in the next 2 weeks or by 07 Oct 2020)

- Assuming all current NPIs are maintained, the number of active cases is expected to decrease in all regions (see section 4).

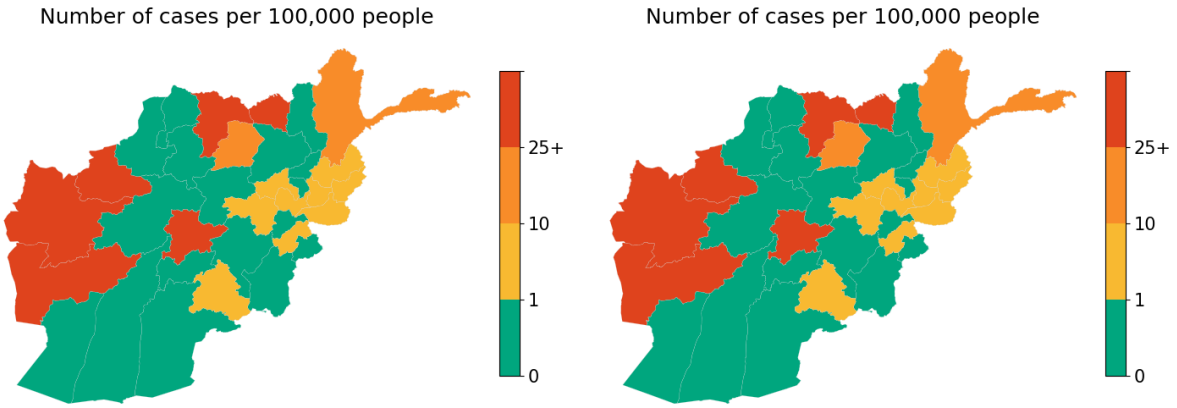
[1] **Reported cases** refers to the number of infections expected to be reported. It takes into account the **case reporting rate** which corresponds to the estimated number of COVID-19 infections that are actually tested, confirmed and reported. The case reporting rate is calculated based on the reported number of deaths and cases in the last 30 days.

[2] **Severe cases** refers to the number of people which will have severe symptoms and may require healthcare support. It is calculated as a proportion of the reported cases, and is based on planning parameters for case severity and the vulnerability of a given region.

2. Current Situation (as of 23 Sep 2020)

Containment Progress

The key performance indicators below can be used to evaluate how effective the response has been in containing the spread of the virus. The map on the left illustrates risk levels to help decision-makers and community members know where they are. The levels communicate whether a region is on track for containment and what intensity of effort is needed to control COVID at varying levels of community spread. The map on the right represents the current need for healthcare support.



Risk Level	Case Incidence*	Intensity of Control Effort Needed
Red	25+	Stay-at-home orders necessary
Orange	10-25	Strategic choices must be made about which package of non-pharmaceutical interventions to use for control. Stay-at-home orders are advised, unless viral testing and contact tracing capacity are implementable at levels meeting surge indicator standards.
Yellow	1-10	Strategic choices must be made about which package of non-pharmaceutical interventions to use for control
Green	<1	On track for containment, conditional on continuing use of viral testing and contact tracing for surveillance and to contain spikes and outbreaks.

*Daily new cases per 100,000 people
See Key Metrics for COVID Suppression for additional guidance on control effort needed.

Key Figures

	Reported Cases	Reported Deaths	Severe Cases Estimate
Cumulative Counts	39,096	1,445	101 - 166
Case Fatality Rate: 3.7%			

Case Fatality Rate: 3.7%

3. Subnational Projections

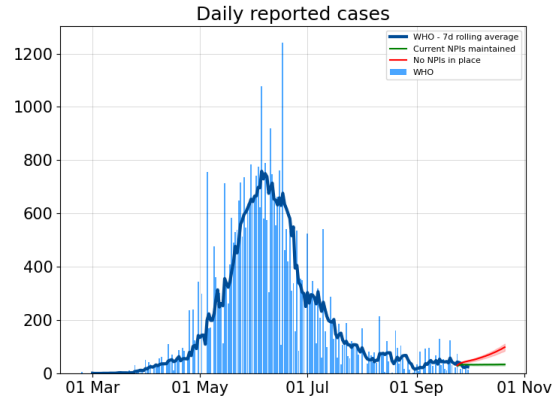
{Key Figures}

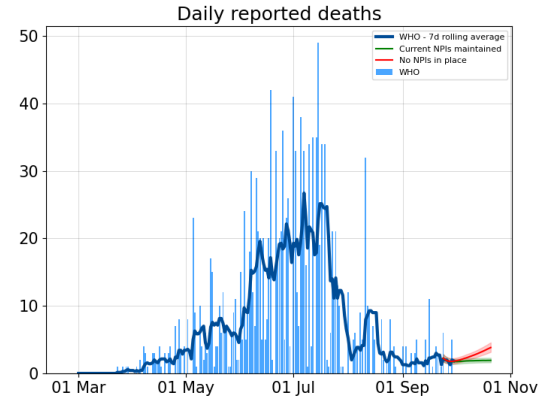
Cases and deaths projections for the next 4 weeks (by 21 Oct 2020)

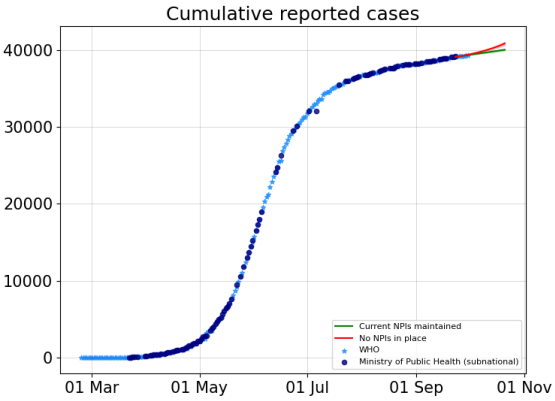
Projected situation in the next 4 weeks (by 21 Oct 2020)

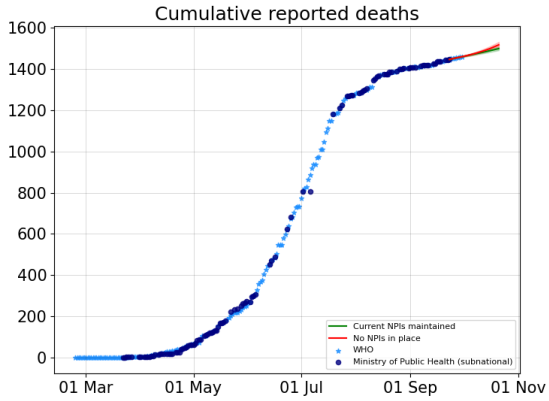
	Projected Cases	Projected Deaths
With current NPIs maintained	39,914 - 40,132	1,490 - 1,509
With no NPIs	40,624 - 41,044	1,506 - 1,531

Note that deaths typically lag reported cases by 2-8 weeks.





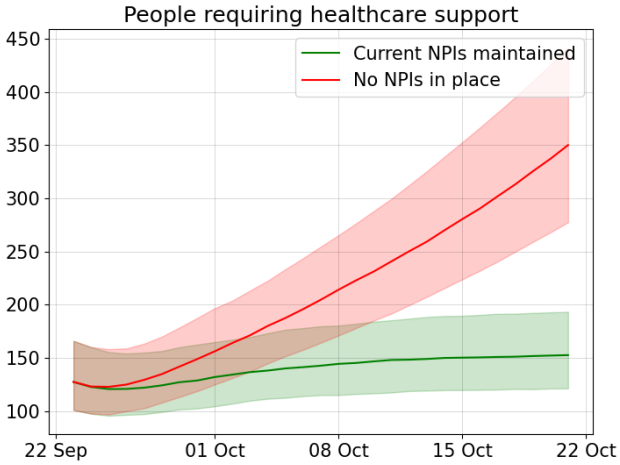




The figures above show the comparison between the reported cases and data from two different sources (national level data from WHO in light blue and subnational data from the Ministry of Public Health in dark blue) together with the projected trends. The two lines presented correspond to 'Current NPIs maintained' and 'No NPIs in place' scenarios.

Severe cases projections for the next 4 weeks (by 21 Oct 2020)

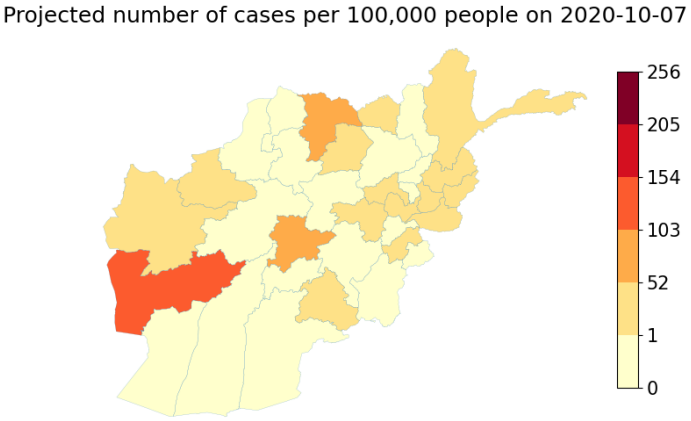
	Severe Cases (Estimated)
With current NPIs maintained	121 - 193
With no NPIs	277 - 442



4. National Summary

Projected situation in the next 2 weeks (by 07 Oct 2020) With current NPIs[3] maintained

Active cases per 100,000 people



Legend:

Low High

Largest Increases and Decreases In Active Cases

Highest Increases: No region showing an increase in cases.

Highest Decreases

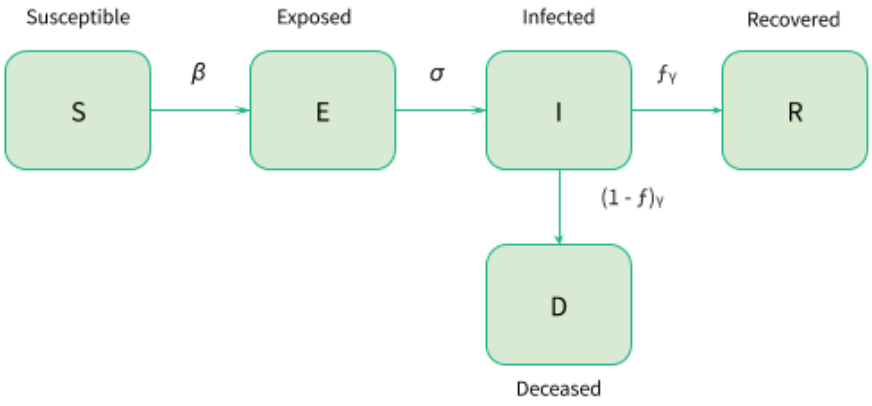
Region	Change (%)
Farah	-30
Paktya	-27
Kabul	-24
Hirat	-24
Zabul	-24

[3] **Non-pharmaceutical interventions - NPIs** are all measures implemented by different actors with the aim of reducing the spread and the impact of COVID-19. The NPIs currently in place in Afghanistan are extracted from the ACAPS database and complemented with additional contextual information provided by our partners in the country.

Background on Model Methodology

The Centre established a partnership with the Johns Hopkins University Applied Physics Laboratory to develop a COVID-19 model which provides projections and insights related to the **scale** of the crisis, the **duration** of the crisis in a specific location, and how different response **interventions** are expected to impact the epidemic curve.

The team is using an **SEIR (Susceptible, Exposed, Infectious, Recovered)** model of infectious disease dynamics which is considered the simplest and most effective technique used in the literature. The model is based on a progression from susceptible to either recovered or dead. Inputs include the reproduction rate (Ro), case fatality rate (CFR), and estimated probabilities that an individual person may contract COVID-19. The model then simulates an outbreak and provides estimates for cases, hospitalizations, and deaths.



Parameters
R_0 (β/γ) = Basic reproduction number
β = Transmission rate
1/γ = Infectious period
f = Probability of recovery
(1-f) = Case Fatality Ratio (CFR)
1/σ = Latent period after exposure

Limitations
- Multi-strain systems
- Time-varying infectivity
- Heterogeneous population
- Capturing pockets of an outbreak

The key features of the model include:

- **Tuning on reported data** The estimation of the main parameters (mainly the reproduction rate R0 and the case reporting rate) is tuned according to the observed recent trends in reported COVID-19 cases.
- **Subnational** The model provides COVID-19 projections at the subnational level, matching the administrative level at which COVID-19 cases are reported.
- **Spatial spread** The density of roads is used to estimate the expected mobility patterns and to simulate the spread of COVID-19 between administrative units.
- **Population stratification** The model fidelity is increased by taking into consideration:
  - The age structure of the population at the subnational level
  - The expected probability of contact between populations of different age groups, including contacts expected to happen at work, school, home and everywhere else (social mixing)
  - Vulnerability factors such as food insecurity, household air pollution and access to handwashing facilities.
- **Non-pharmaceutical interventions (NPIs)** The model simulates the expected impact of NPIs at the subnational level, and also how the outbreaks is influenced by changing NPIs implemented over time. The NPIs currently implemented can be categorised in three main groups:
  - Mobility based NPIs, which would limit the spread of disease between administrative units (e.g. border closures)
  - Contact based NPIs, which reduce the probability of contact between specific groups (e.g. shielding of the elderly, closing schools)
  - R0 based NPIs, which reduce the overall reproduction rate (e.g. awareness campaigns, curfews)