

COVID-19 Results Briefing

Pakistan

February 18, 2022

This document contains summary information on the latest projections from the IHME model on COVID-19 in Pakistan. The model was run on February 17, 2022, with data through February 14, 2022.

Current situation

The Omicron wave continues to subside globally. Based on vaccination, previous infection, and the current wave of Omicron, we estimate that 57% of the population is immune to Omicron. In our reference scenario, which does not include the emergence of a new variant, we expect transmission, cases, hospitalizations, and deaths to reach low levels in the coming months. Given seasonality, transmission should stay low throughout the summer unless a new, more transmissible variant with immune escape emerges.

We expect countries to continue to relax mandates; these steps should not lead to an increase in transmission given we believe that the declines in cases are likely due to the exhaustion of susceptible individuals in the population. Given the extremely low infection-fatality rate in children and declining transmission, consideration should be given to lifting mask and other mitigation measures in schools in the coming weeks.

The majority of the Omicron wave has dissipated in Pakistan. Infections and reported cases have significantly decreased in the last month. Additionally, deaths and hospitalizations are on the decrease and are projected to reach minimal levels by early March. The trends in deaths will lead to a total of 30,510 reported deaths on June 1, which is 700 more deaths than on February 14.

While the current trajectory is very favorable, several steps should be taken to protect against risks from future variants. First, surveillance efforts should be maintained and strengthened so that if a new variant emerges anywhere in the world, the country is prepared in advance. Second, purchasing effective antivirals should be accelerated if possible so that sufficient doses are available if a new variant, particularly one that is more severe than Omicron, emerges. We expect Omicron, in the absence of a new variant, to return in the winter of 2022, so there will be a need for antivirals even in the absence of a new variant. Third, efforts to persuade the unvaccinated to get vaccinated should continue. And careful consideration should be given to need and timing for a fourth dose of vaccine. Evidence has accumulated that shows immunity after a third dose wanes steadily. Given that the Omicron wave is rapidly subsiding, a major push on a fourth dose now seems unnecessary except in high-risk individuals. A fourth dose push when a new variant emerges, or later in the year in anticipation of a winter increase in Omicron, may be more appropriate. Fourth, even as most individuals return to pre-COVID-19 activities, individuals at risk (over 65, immunocompromised, and multiple co-morbidities) should take precautions if and when transmission increases. These precautions should include using a high-quality mask, avoiding high-risk indoor settings, and social distancing.

- Daily infections in the last week decreased to 743,000 per day on average compared to 1,185,000 the week before (Figure 1.1). Daily hospital census in the last week (through February 14) decreased to 24,000 per day on average compared to 37,000 the week before.
- Daily reported cases in the last week decreased to 2,700 per day on average compared to 5,100 the week before (Figure 2.1).
- Reported deaths due to COVID-19 in the last week increased to 41 per day on average compared to 36 the week before (Figure 3.1).
- Total deaths due to COVID-19 in the last week increased to 610 per day on average compared to 520 the week before (Figure 3.1). This makes COVID-19 the number 2 cause of death in Pakistan this week (Table 1). Estimated total daily deaths due to COVID-19 in the past week were 15.1 times larger than the reported number of deaths.
- The daily rate of reported deaths due to COVID-19 is greater than 4 per million in no provinces or territories (Figure 4.1).
- The daily rate of total deaths due to COVID-19 is greater than 4 per million in one province or territory (Figure 4.2).
- We estimate that 88% of people in Pakistan have been infected at least once as of February 14 (Figure 6.1). Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in one province or territory (Figure 7.1).
- The infection-detection rate in Pakistan was close to 0% on February 14 (Figure 8.1).
- Based on the GISAID and various national databases, combined with our variant spread model, we estimate the current prevalence of variants of concern (Figures 9.1–9.5). We estimate that the Alpha variant is circulating in six provinces and territories, that the Beta variant is circulating in two provinces and territories, that the Delta variant is circulating in seven provinces and territories, that the Gamma variant is circulating in five provinces and territories, and that the Omicron variant is circulating in seven provinces and territories.

Trends in drivers of transmission

- Mobility last week was 52% higher than the pre-COVID-19 baseline (Figure 11.1). Mobility was lower than 30% of baseline in no locations.
- As of February 14, in the COVID-19 Trends and Impact Survey, 40% of people self-report that they always wore a mask when leaving their home, the same as last week (Figure 13.1).
- There were 26 diagnostic tests per 100,000 people on February 14 (Figure 15.1).

- As of February 14, no provinces or territories have reached 70% or more of the population who have received at least one vaccine dose, and no provinces or territories have reached 70% or more of the population who are fully vaccinated (Figure 17.1). 49% of people in Pakistan have received at least one vaccine dose, and 41% are fully vaccinated.
- In Pakistan, 84.9% of the population that is 12 years and older say they would accept, or would probably accept, a vaccine for COVID-19. Note that vaccine acceptance is calculated using survey data from the 18+ population. This is down by 0.4 percentage points from last week. The proportion of the population who are open to receiving a COVID-19 vaccine ranges from 42% in Azad Jammu & Kashmir to 95% in Islamabad Capital Territory (Figure 19.1).
- In our current reference scenario, we expect that 124.4 million people will be vaccinated with at least one dose by June 1 (Figure 20.1). We expect that 52% of the population will be fully vaccinated by June 1.

Projections and scenarios

We produce three scenarios when projecting COVID-19. The **reference scenario** is our forecast of what we think is most likely to happen:

- Vaccines are distributed at the expected pace. Brand- and variant-specific vaccine efficacy is updated using the latest available information from peer-reviewed publications and other reports.
- Future mask use is the mean of mask use over the last seven days.
- Mobility increases as vaccine coverage increases.
- Omicron variant spreads according to our flight and local spread model.
- 80% of those who have had two doses of vaccine (or one dose for Johnson & Johnson) receive a third dose at six months after their second dose.

The **80% mask use scenario** makes all the same assumptions as the reference scenario but assumes all locations reach 80% mask use within seven days. If a location currently has higher than 80% use, mask use remains at the current level.

The **third dose scenario** is the same as the reference scenario but assumes that 100% of those who have received two doses of vaccine will get a third dose at six months.

Projections

Infections

- Daily estimated infections in the **reference scenario** will decline to 36,590 by June 1, 2022 (Figure 22.1).
- Daily estimated infections in the **80% mask use scenario** will decline to 15,200 by June 1, 2022 (Figure 22.1).

- Daily estimated infections in the **third dose scenario** will decline to 19,120 by June 1, 2022 (Figure 22.1).

Cases

- Daily estimated cases in the **reference scenario** will decline to 170 by June 1, 2022 (Figure 22.2).
- Daily estimated cases in the **80% mask use scenario** will decline to 60 by June 1, 2022 (Figure 22.2).
- Daily estimated cases in the **third dose scenario** will decline to 80 by June 1, 2022 (Figure 22.2).

Hospitalizations

- Daily hospital census in the **reference scenario** will decline to 500 by June 1, 2022 (Figure 22.3).
- Daily hospital census in the **80% mask use scenario** will decline to 220 by June 1, 2022 (Figure 22.3).
- Daily hospital census in the **third dose scenario** will decline to 260 by June 1, 2022 (Figure 22.3).

Deaths

- In our **reference scenario**, our model projects 31,000 cumulative reported deaths due to COVID-19 on June 1. This represents 710 additional deaths from February 14 to June 1. Daily reported COVID-19 deaths in the **reference scenario** will decline to zero by June 1, 2022 (Figure 22.4).
- Under our **reference scenario**, our model projects 455,000 cumulative total deaths due to COVID-19 on June 1. This represents 11,000 additional deaths from February 14 to June 1 (Figure 25.2).
- In our **80% mask use scenario**, our model projects 30,000 cumulative reported deaths due to COVID-19 on June 1. This represents 620 additional deaths from February 14 to June 1. Daily reported COVID-19 deaths in the **80% mask use scenario** will decline to zero by June 1, 2022 (Figure 22.4).
- In our **third dose scenario**, our model projects 30,000 cumulative reported deaths due to COVID-19 on June 1. This represents 620 additional deaths from February 14 to June 1. Daily reported COVID-19 deaths in the **third dose scenario** will decline to zero by June 1, 2022 (Figure 22.4).
- Figure 23.1 compares our reference scenario forecasts to other publicly archived models. Forecasts are widely divergent.
- At some point from February through June 1, five provinces and territories will have high or extreme stress on hospital beds (Figure 24.1). At some point from February through June 1, six provinces and territories will have high or extreme stress on intensive care unit (ICU) capacity (Figure 25.1).

Model updates

No model updates.

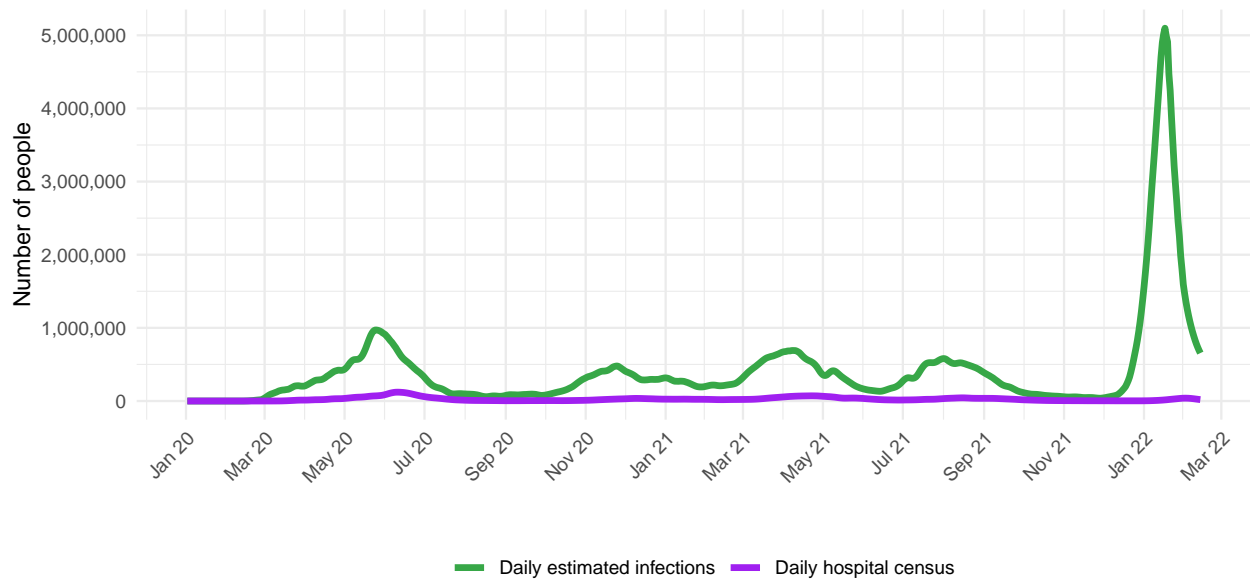
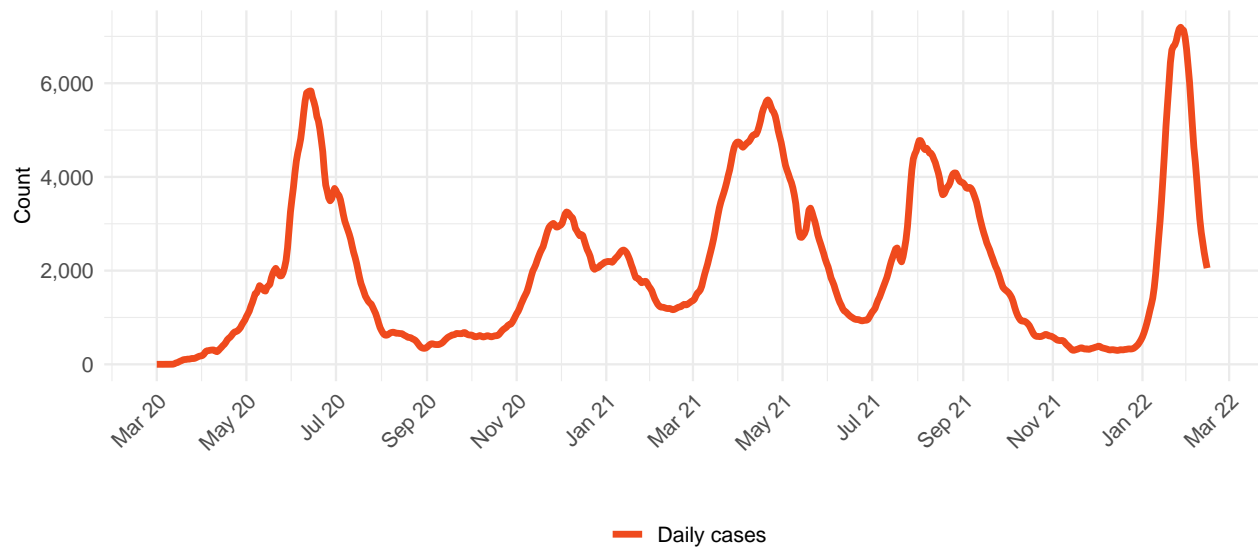
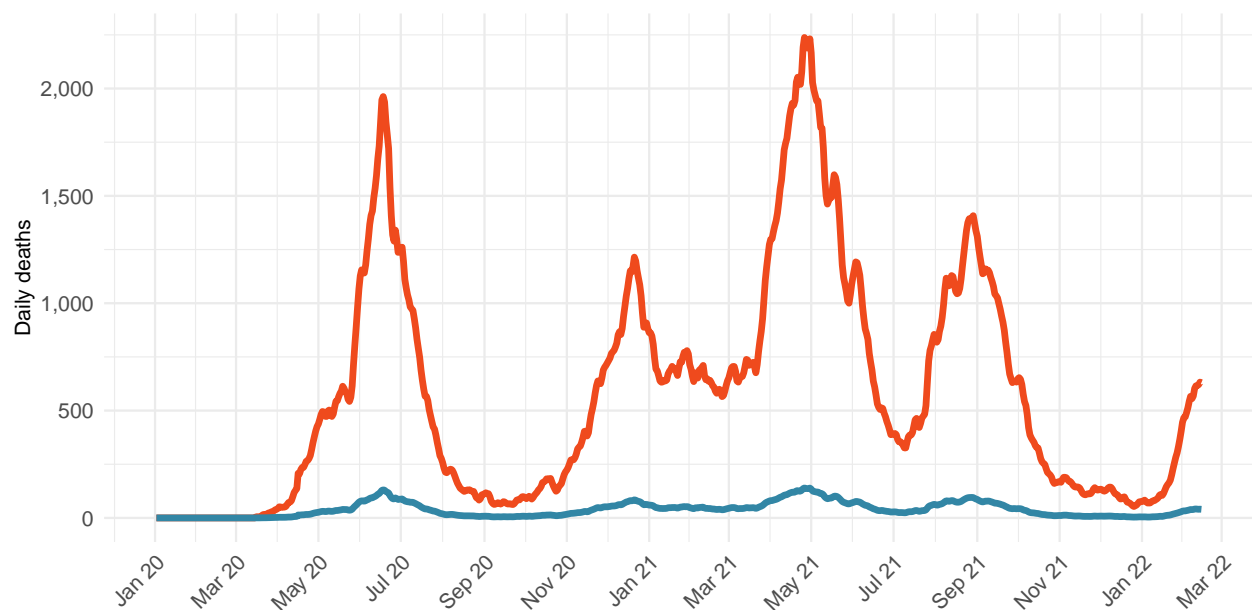
Figure 1.1: Daily COVID-19 hospital census and estimated infections

Figure 2.1: Reported daily COVID-19 cases, moving average


Table 1: Ranking of total deaths due to COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

Cause name	Weekly deaths	Ranking
Neonatal disorders	4,804	1
COVID-19	4,286	2
Ischemic heart disease	3,527	3
Stroke	2,028	4
Diarrheal diseases	1,481	5
Lower respiratory infections	1,311	6
Tuberculosis	1,207	7
Chronic obstructive pulmonary disease	1,205	8
Diabetes mellitus	917	9
Chronic kidney disease	854	10

Figure 3.1: Smoothed trend estimate of reported daily COVID-19 deaths (blue) and total daily deaths due to COVID-19 (orange)



Daily COVID-19 death rate per 1 million on February 14, 2022

Figure 4.1: Daily reported COVID-19 death rate per 1 million

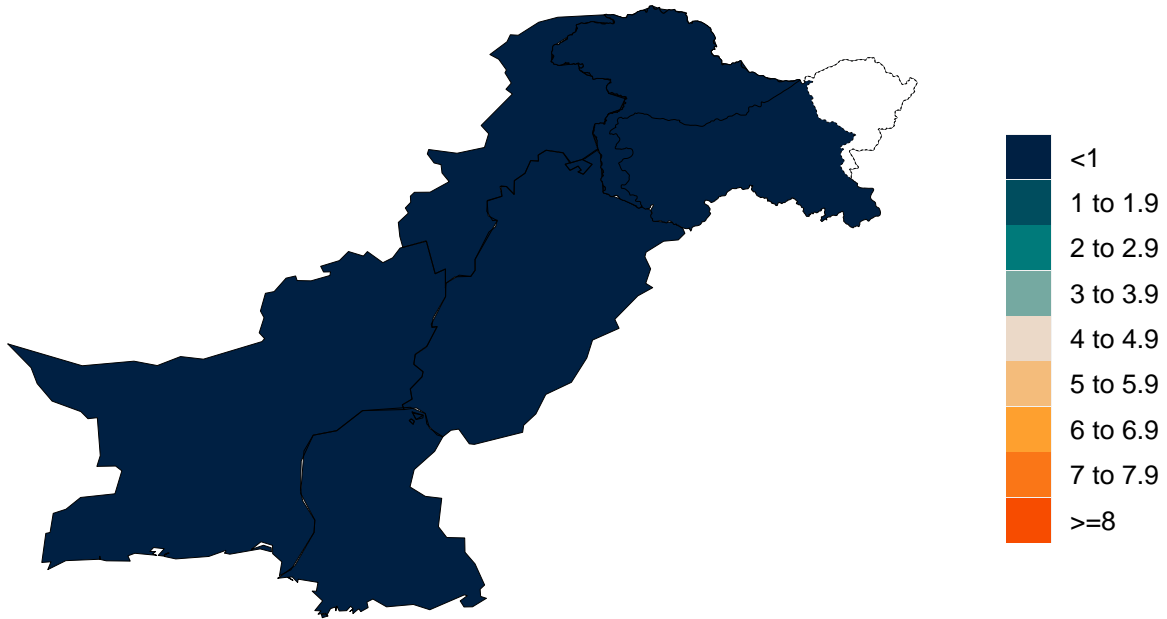
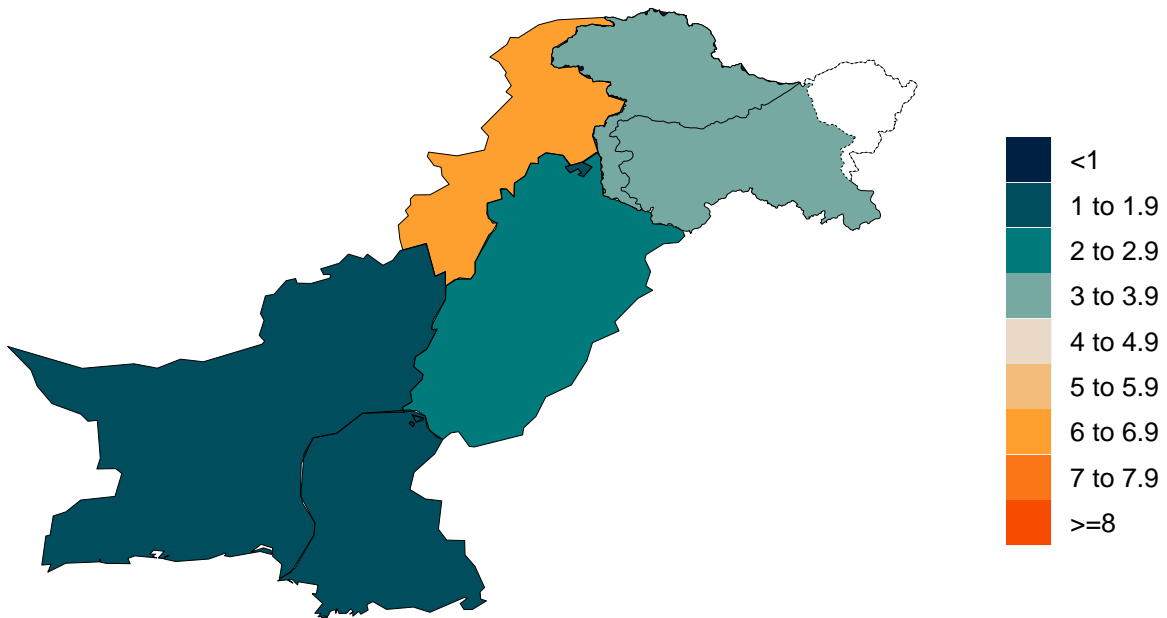


Figure 4.2: Daily total COVID-19 death rate per 1 million



Cumulative COVID-19 deaths per 100,000 on February 14, 2022

Figure 5.1: Reported cumulative COVID-19 deaths per 100,000

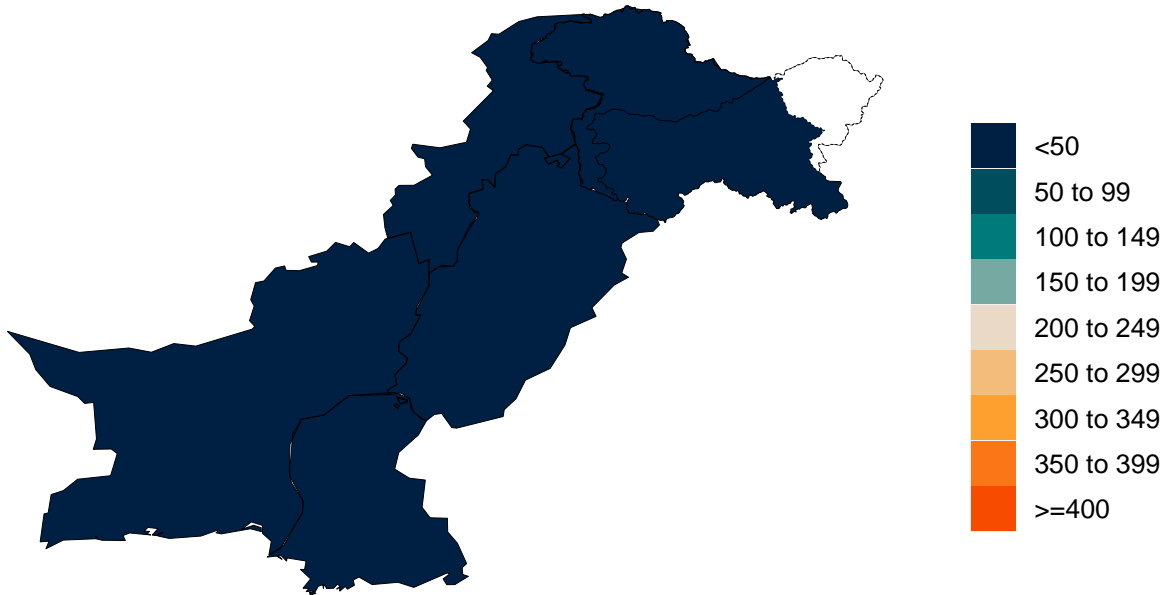


Figure 5.2: Total cumulative COVID-19 deaths per 100,000

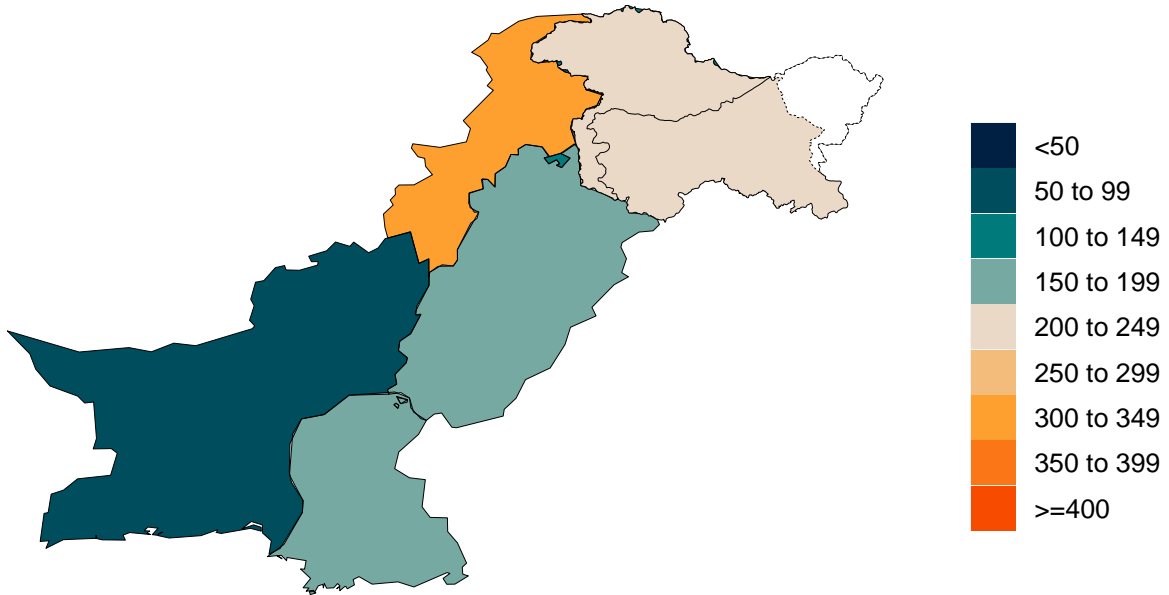


Figure 6.1: Estimated percent of the population infected with COVID-19 on February 14, 2022

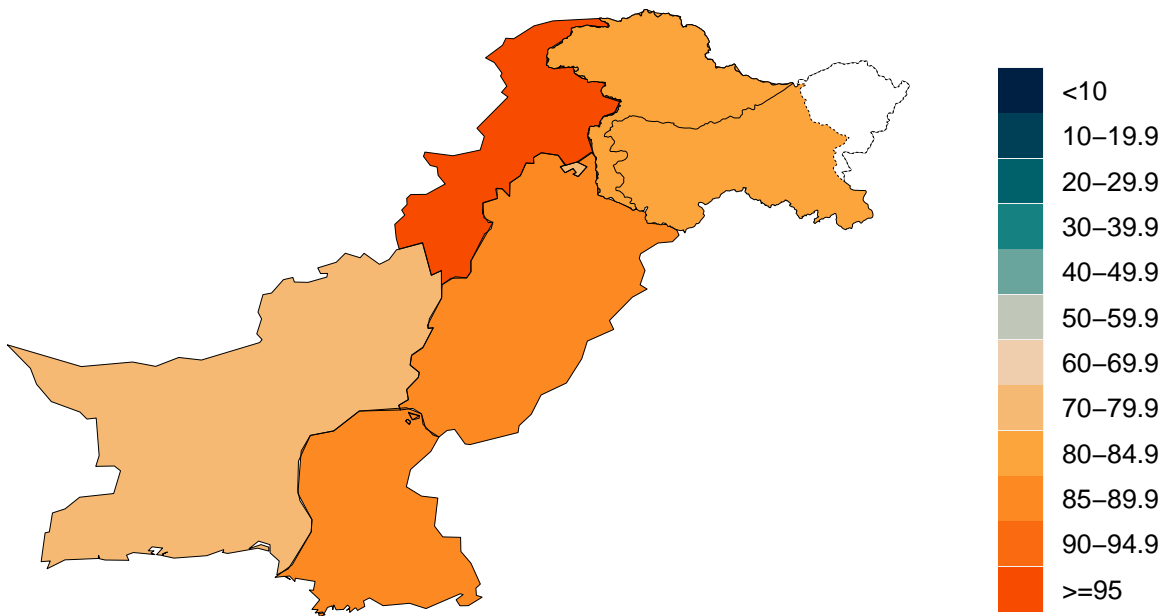


Figure 7.1: Mean effective R on February 3, 2022. Effective R less than 1 means that transmission should decline, all other things being held the same. The estimate of effective R is based on the combined analysis of deaths, case reporting, and hospitalizations where available. Current reported cases reflect infections 11-13 days prior, so estimates of effective R can only be made for the recent past.

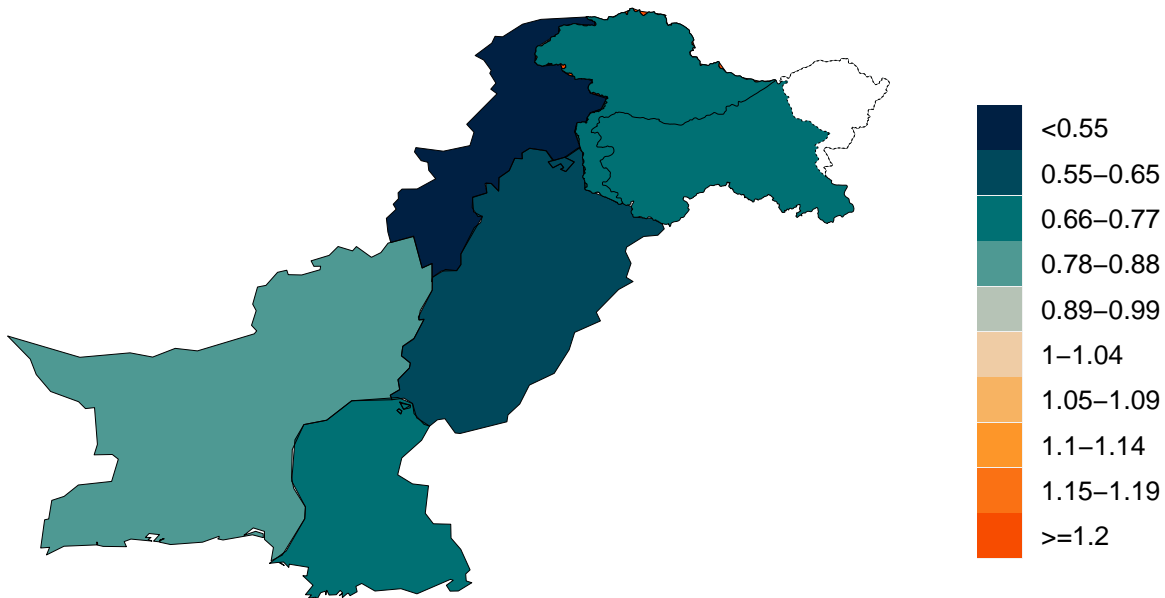
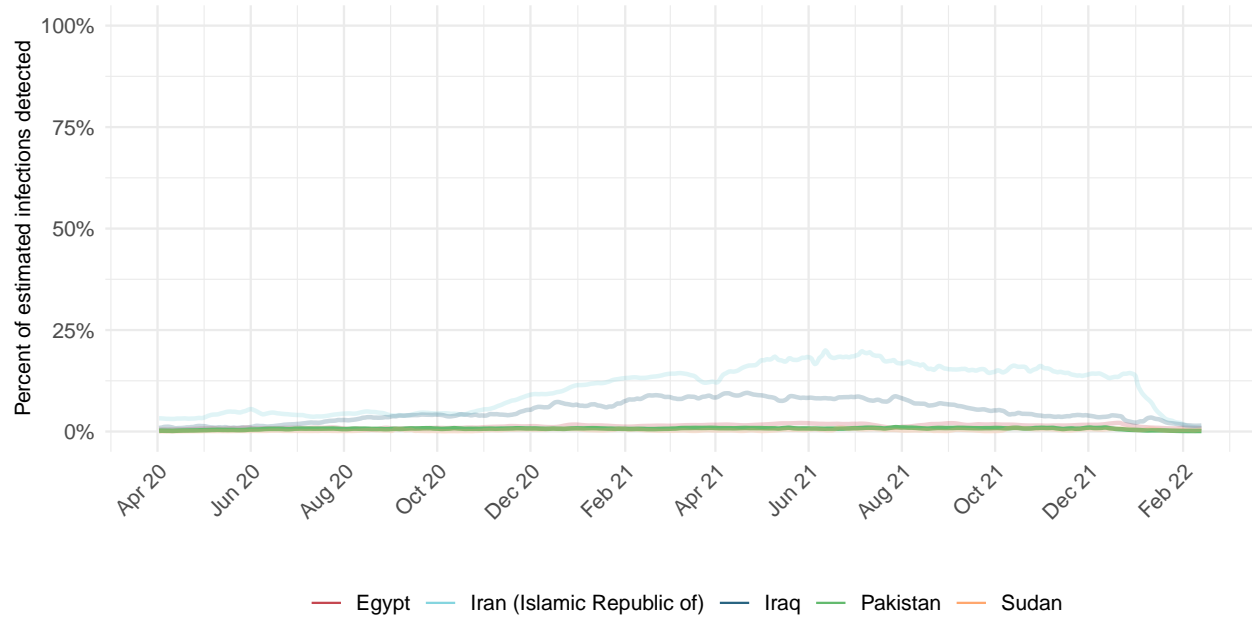


Figure 8.1: Percent of estimated COVID-19 infections detected. This is estimated as the ratio of reported daily COVID-19 cases to estimated daily COVID-19 infections based on the SEIR disease transmission model. Due to measurement errors in cases and testing rates, the infection-detection rate can exceed 100% at particular points in time.



Estimated percent of circulating SARS-CoV-2 for primary variant families on February 14, 2022

Figure 9.1: Estimated percent of new infections that are Alpha variant

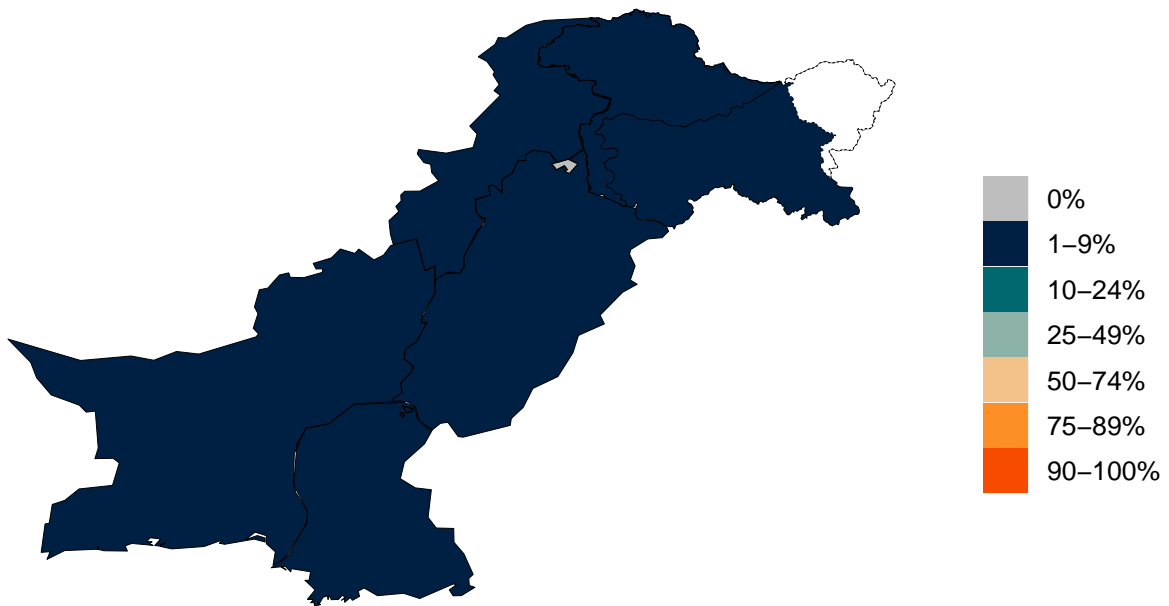


Figure 9.2: Estimated percent of new infections that are Beta variant

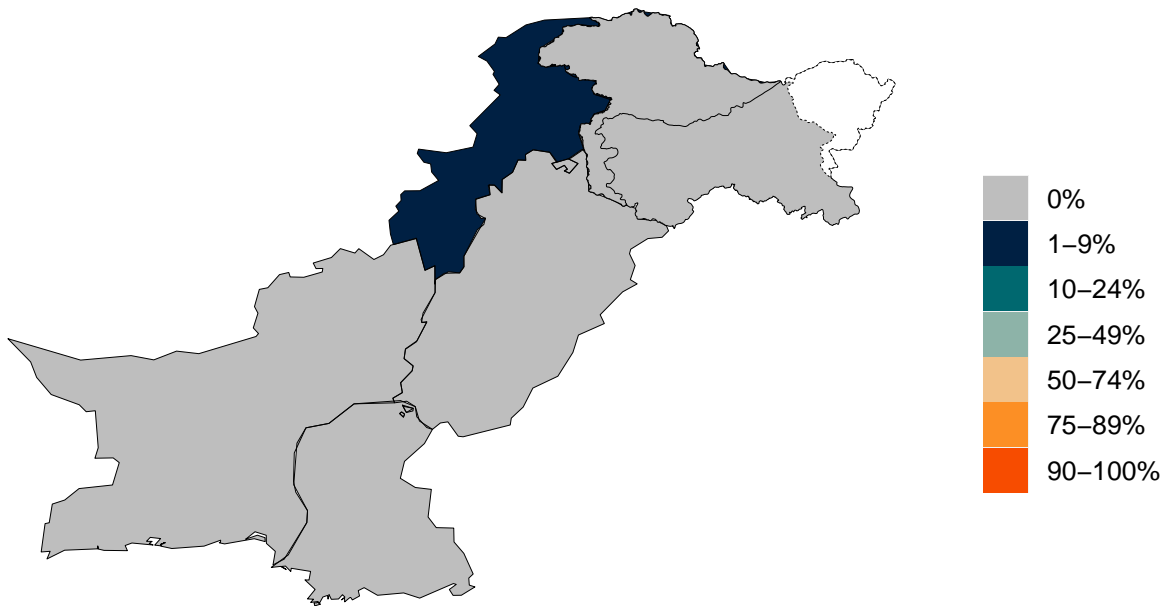


Figure 9.3: Estimated percent of new infections that are Delta variant

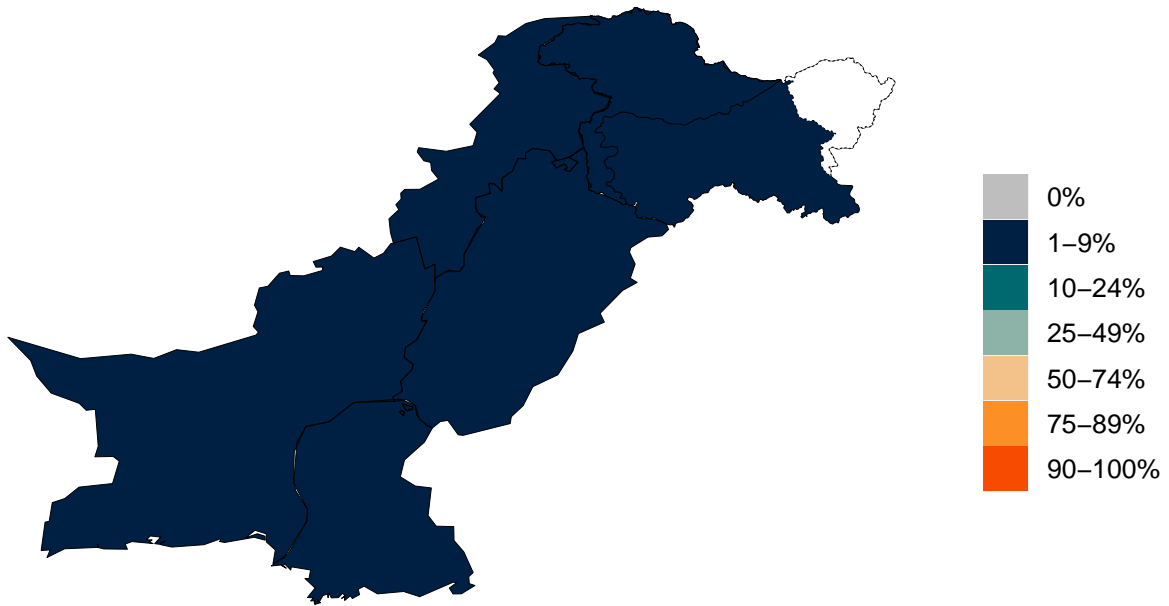


Figure 9.4: Estimated percent of new infections that are Gamma variant

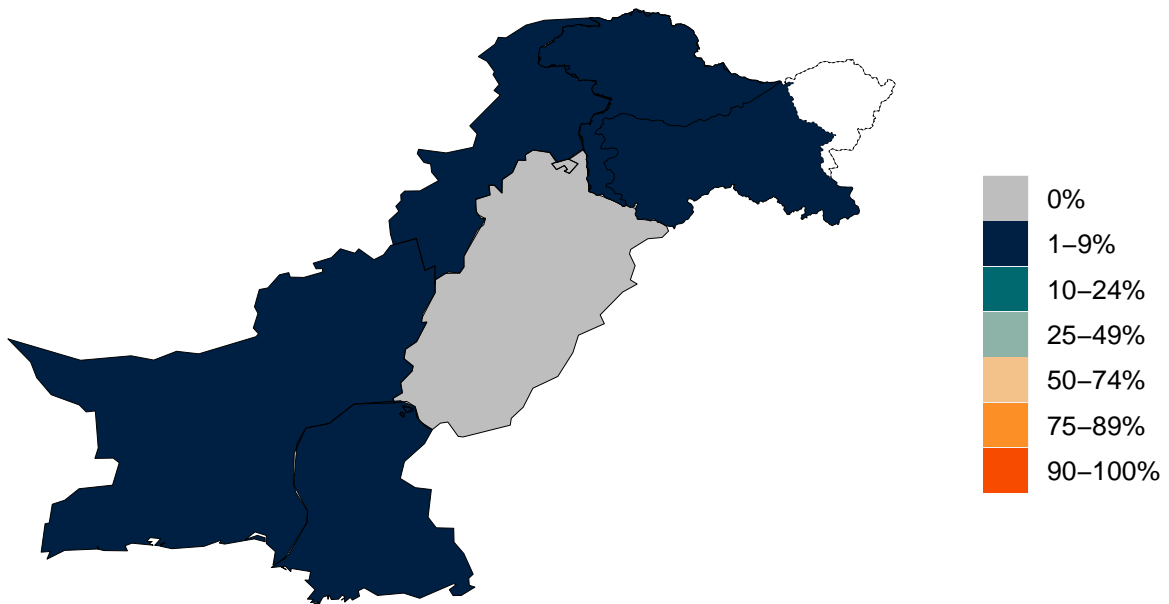


Figure 9.5: Estimated percent of new infections that are Omicron variant

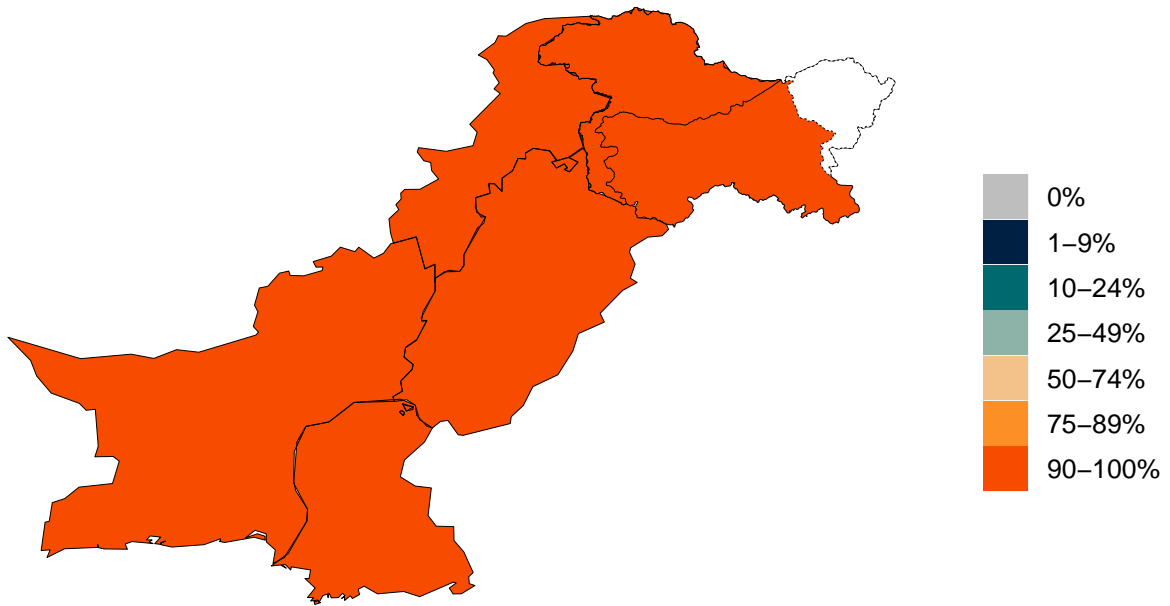
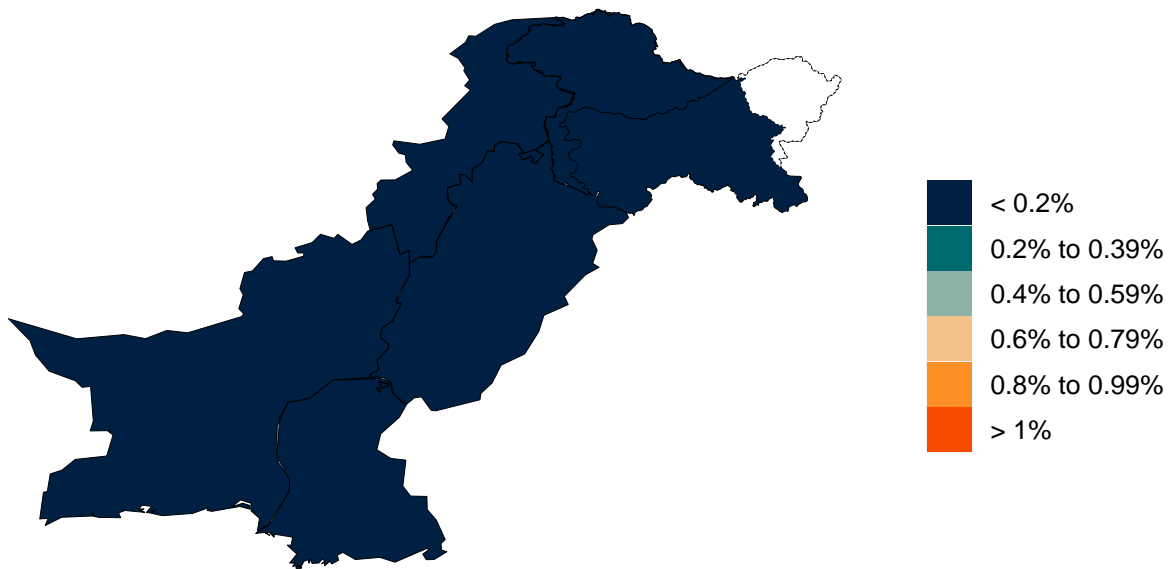


Figure 10.1: Infection-fatality rate on February 14, 2022. This is estimated as the ratio of COVID-19 deaths to estimated daily COVID-19 infections.



Critical drivers

Table 2: Current mandate implementation

	Primary school closure	Secondary school closure	Higher school closure	Entry restrictions for some non-residents	Entry restrictions for all non-residents	Individual movements restricted	Curfew for businesses	Individual curfew	Gathering limit: 6 indoor, 10 outdoor	Gathering limit: 10 indoor, 25 outdoor	Gathering limit: 25 indoor, 50 outdoor	Gathering limit: 50 indoor, 100 outdoor	Gathering limit: 100 indoor, 250 outdoor	Restaurants closed	Bars closed	Restaurants / bars closed	Restaurants / bars curbside only	Gyms, pools, other leisure closed	Non-essential retail closed	Non-essential retail curbside only	Non-essential workplaces closed	Stay home order	Stay home fine	Mask mandate	Mask mandate fine
Azad Jammu & Kashmir	No mandate	No mandate	No mandate	Mandate in place (updated from previous reporting)	No mandate	No mandate	Mandate in place (updated from previous reporting)	Mandate in place (updated from previous reporting)	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	Mandate in place (updated from previous reporting)	Mandate in place (updated from previous reporting)
Balochistan	No mandate	No mandate	No mandate	Mandate in place (updated from previous reporting)	No mandate	No mandate	Mandate in place (updated from previous reporting)	Mandate in place (updated from previous reporting)	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	Mandate in place (updated from previous reporting)	Mandate in place (updated from previous reporting)
Gilgit-Baltistan	No mandate	No mandate	No mandate	Mandate in place (updated from previous reporting)	Mandate in place (updated from previous reporting)	No mandate	Mandate in place (updated from previous reporting)	Mandate in place (updated from previous reporting)	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	Mandate in place (updated from previous reporting)	Mandate in place (updated from previous reporting)
Islamabad Capital Territory	No mandate	No mandate	No mandate	Mandate in place (updated from previous reporting)	No mandate	No mandate	Mandate in place (updated from previous reporting)	Mandate in place (updated from previous reporting)	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	Mandate in place (updated from previous reporting)	Mandate in place (updated from previous reporting)
Khyber Pakhtunkhwa	No mandate	No mandate	No mandate	Mandate in place (updated from previous reporting)	No mandate	No mandate	Mandate in place (updated from previous reporting)	Mandate in place (updated from previous reporting)	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	Mandate in place (updated from previous reporting)	Mandate in place (updated from previous reporting)
Punjab	No mandate	No mandate	No mandate	Mandate in place (updated from previous reporting)	No mandate	No mandate	Mandate in place (updated from previous reporting)	Mandate in place (updated from previous reporting)	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	Mandate in place (updated from previous reporting)	Mandate in place (updated from previous reporting)
Sindh	No mandate	No mandate	No mandate	Mandate in place (updated from previous reporting)	No mandate	No mandate	Mandate in place (updated from previous reporting)	Mandate in place (updated from previous reporting)	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	Mandate in place (updated from previous reporting)	No mandate	No mandate	No mandate	No mandate	Mandate in place (updated from previous reporting)	Mandate in place (updated from previous reporting)

Figure 11.1: Trend in mobility as measured through smartphone app use, compared to January 2020 baseline

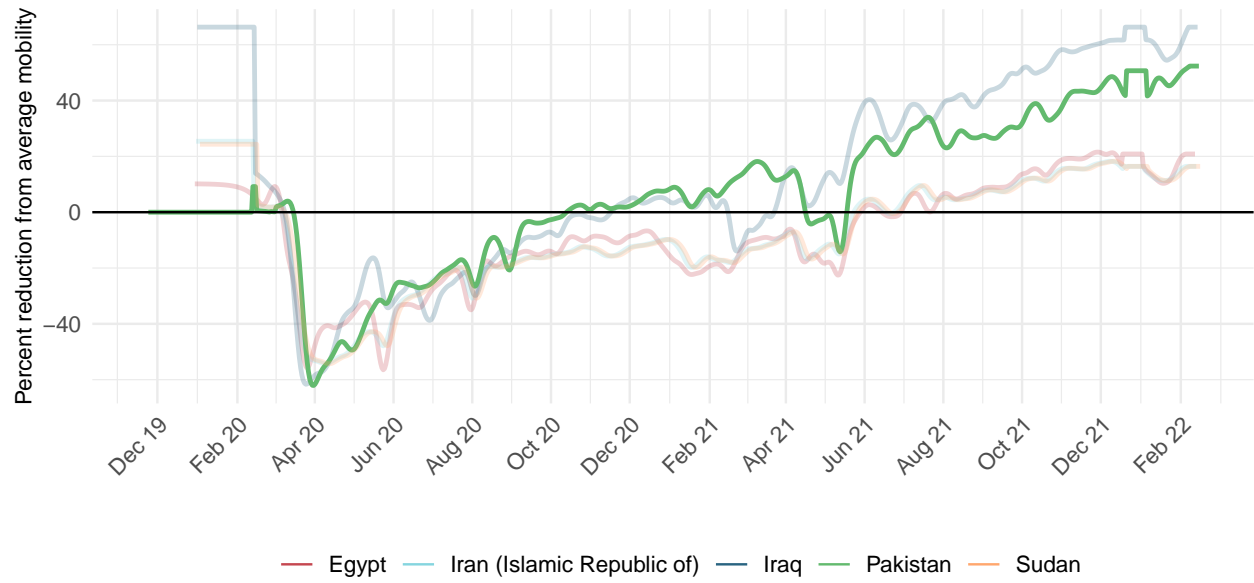


Figure 12.1: Mobility level as measured through smartphone app use, compared to January 2020 baseline (percent) on February 14, 2022

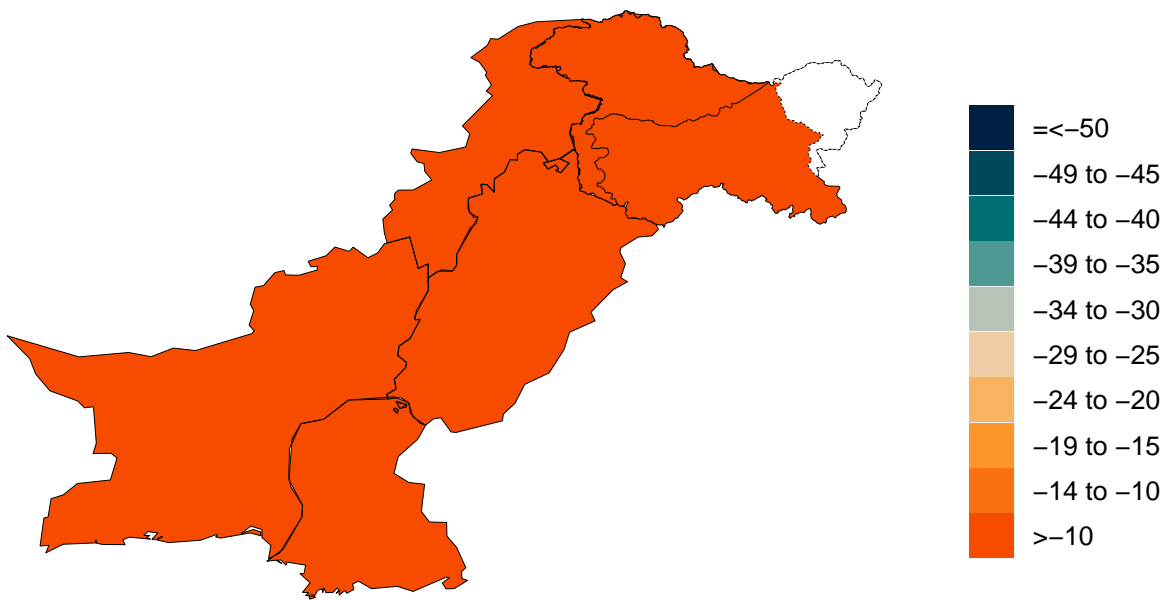


Figure 13.1: Trend in the proportion of the population reporting always wearing a mask when leaving home

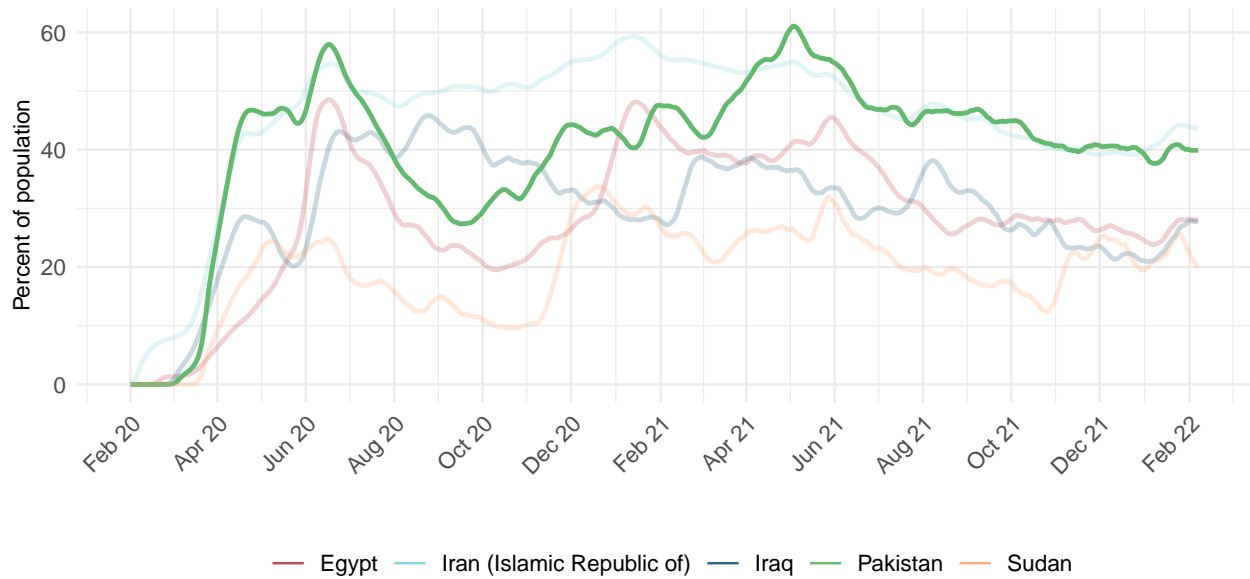


Figure 14.1: Proportion of the population reporting always wearing a mask when leaving home on February 14, 2022

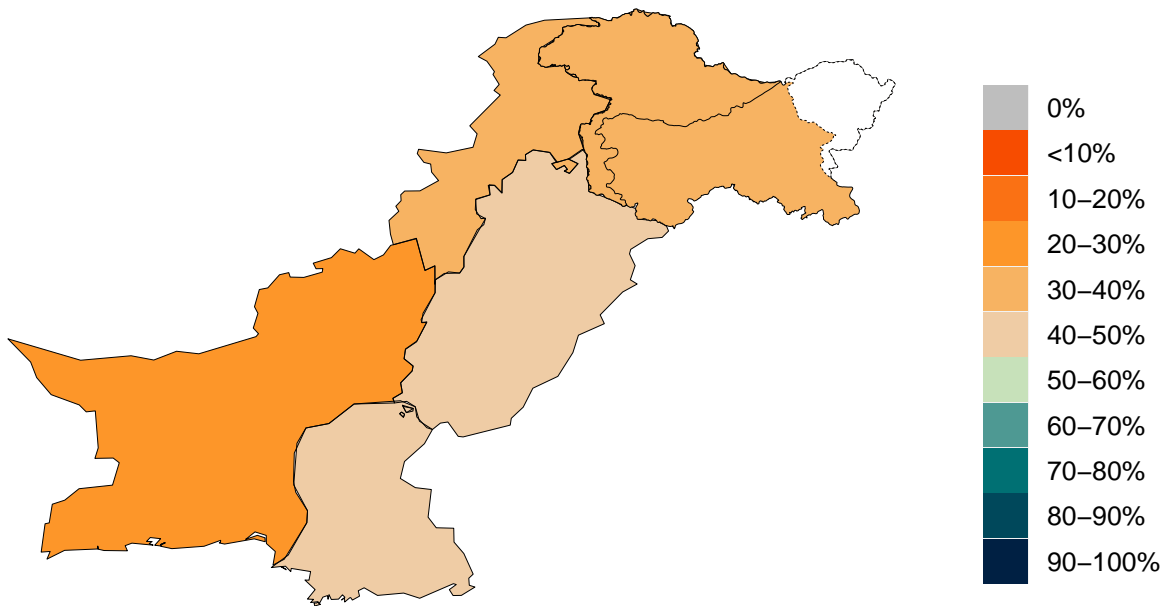


Figure 15.1: Trend in COVID-19 diagnostic tests per 100,000 people

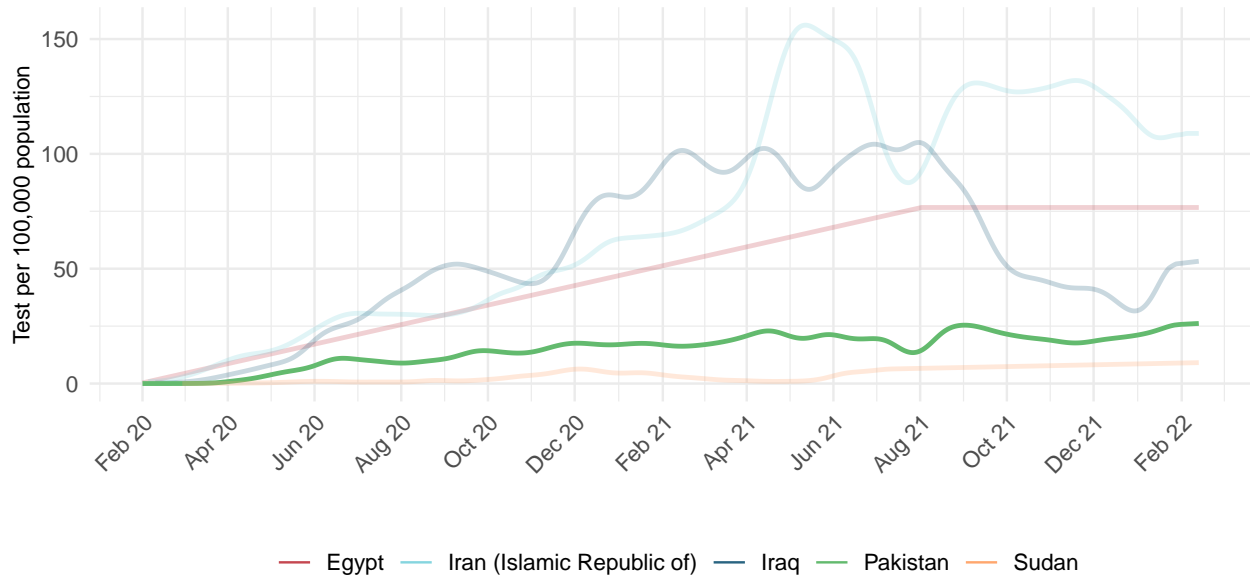


Figure 16.1: COVID-19 diagnostic tests per 100,000 people on February 14, 2022

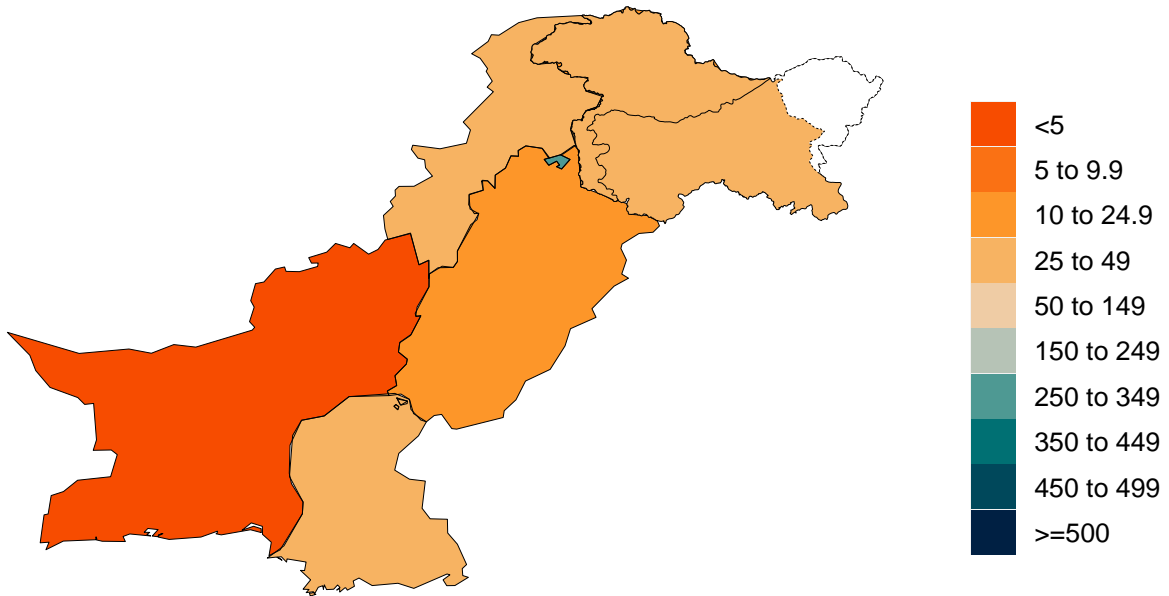


Table 3: Estimates of vaccine effectiveness for specific vaccines used in the model at preventing severe disease and infection. We use data from clinical trials directly, where available, and make estimates otherwise. More information can be found on our [website](#).

Vaccine	Effectiveness at preventing											
	Ancestral		Alpha		Beta		Gamma		Delta		Omicron	
	Severe disease	Infection	Severe disease	Infection	Severe disease	Infection	Severe disease	Infection	Severe disease	Infection	Severe disease	Infection
AstraZeneca	94%	63%	94%	63%	94%	69%	94%	69%	94%	69%	71%	36%
CanSino	66%	62%	66%	62%	64%	61%	64%	61%	64%	61%	48%	32%
CoronaVac	50%	47%	50%	47%	49%	46%	49%	46%	49%	46%	37%	24%
Covaxin	78%	73%	78%	73%	76%	72%	76%	72%	76%	72%	57%	38%
Johnson & Johnson	86%	72%	86%	72%	76%	64%	76%	64%	76%	64%	57%	33%
Moderna	97%	92%	97%	92%	97%	91%	97%	91%	97%	91%	73%	48%
Novavax	89%	83%	89%	83%	86%	82%	86%	82%	86%	82%	65%	43%
Pfizer/BioNTech	95%	86%	95%	86%	95%	84%	95%	84%	95%	84%	72%	44%
Sinopharm	73%	68%	73%	68%	71%	67%	71%	67%	71%	67%	53%	35%
Sputnik-V	92%	86%	92%	86%	89%	85%	89%	85%	89%	85%	67%	44%
Other vaccines	75%	70%	75%	70%	73%	69%	73%	69%	73%	69%	55%	36%
Other vaccines (mRNA)	91%	86%	91%	86%	88%	85%	88%	85%	88%	85%	67%	45%

Percent of the population having received at least one dose (17.1) and fully vaccinated against SARS-CoV-2 (17.2) by February 14, 2022

Figure 17.1: Percent of the population having received one dose of a COVID-19 vaccine

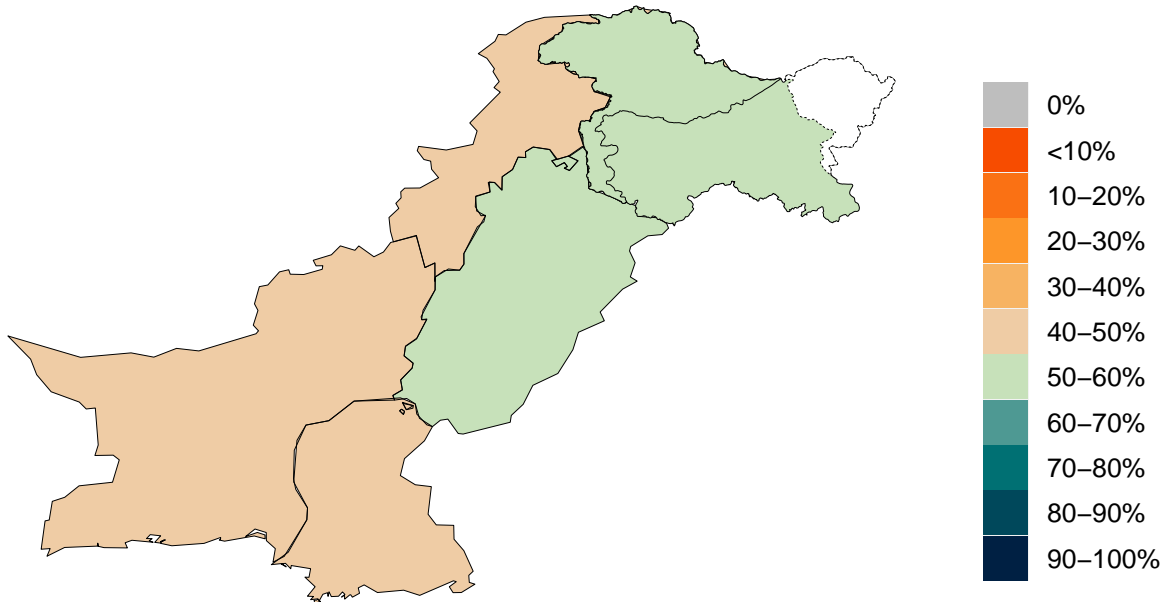


Figure 17.2: Percent of the population fully vaccinated against SARS-CoV-2

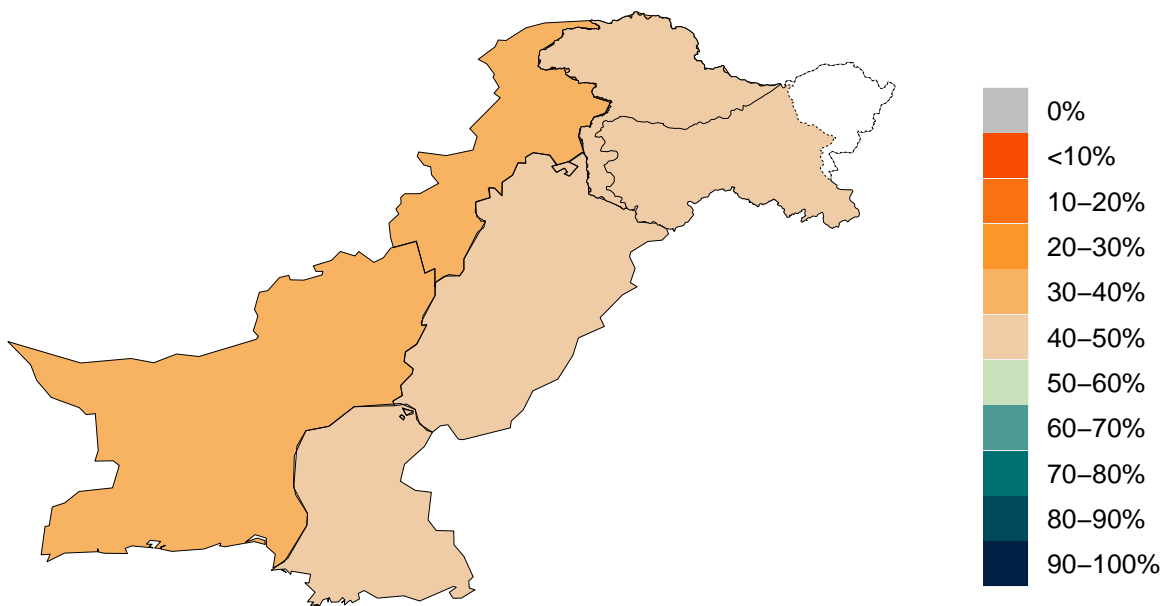


Figure 18.1: Trend in the estimated proportion of the population that is 12 years and older that has been vaccinated or would probably or definitely receive the COVID-19 vaccine if available. Note that vaccine acceptance is calculated using survey data from the 18+ population.

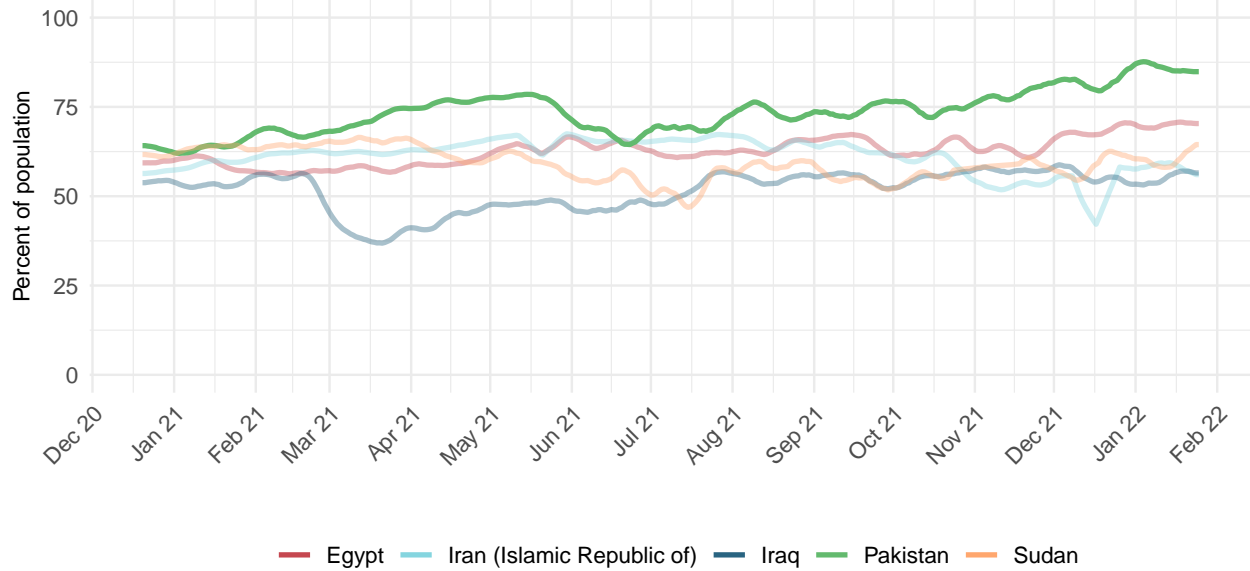


Figure 19.1: Estimated proportion of the population that is 12 years and older that has been vaccinated or would probably or definitely receive the COVID-19 vaccine if available. Note that vaccine acceptance is calculated using survey data from the 18+ population.

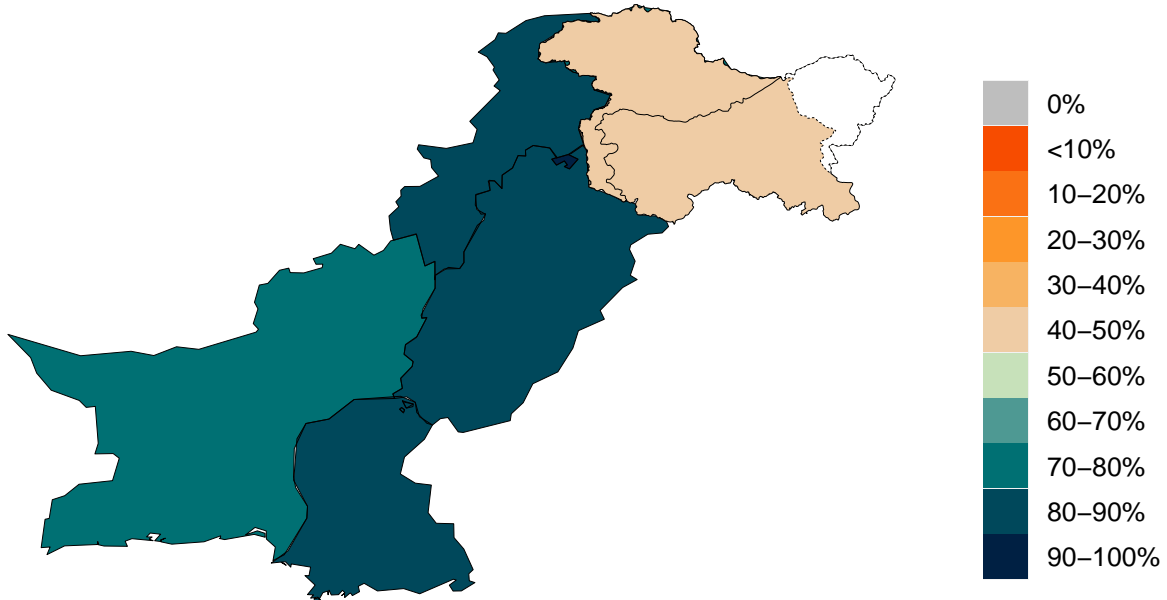


Figure 20.1: Percent of people who receive at least one dose of a COVID-19 vaccine and those who are fully vaccinated

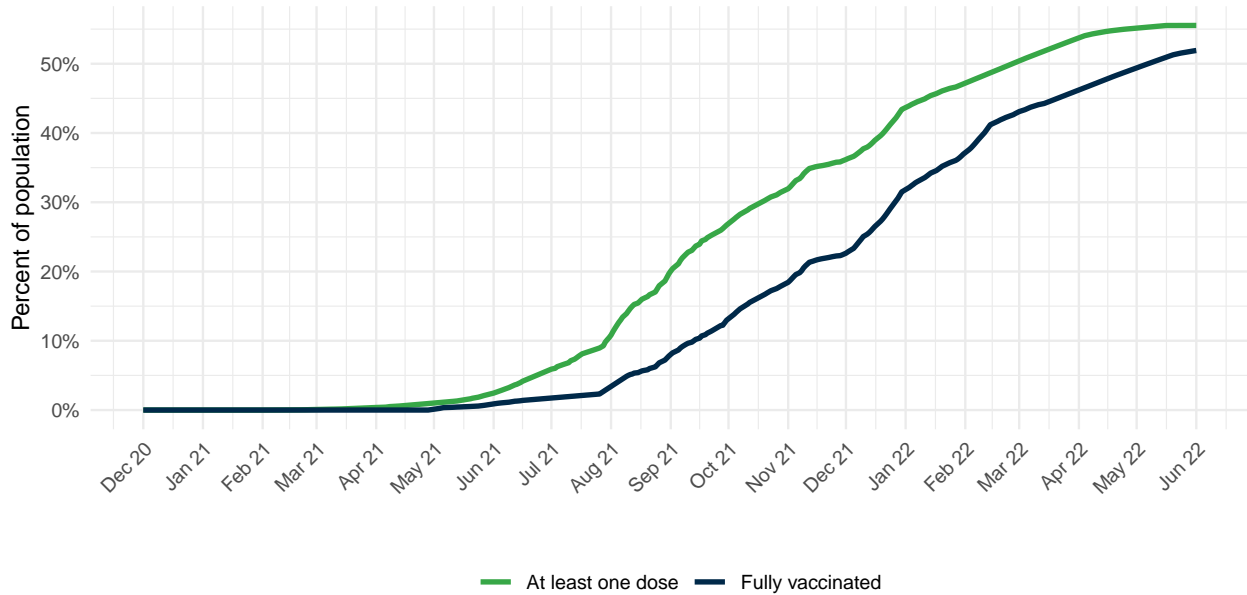
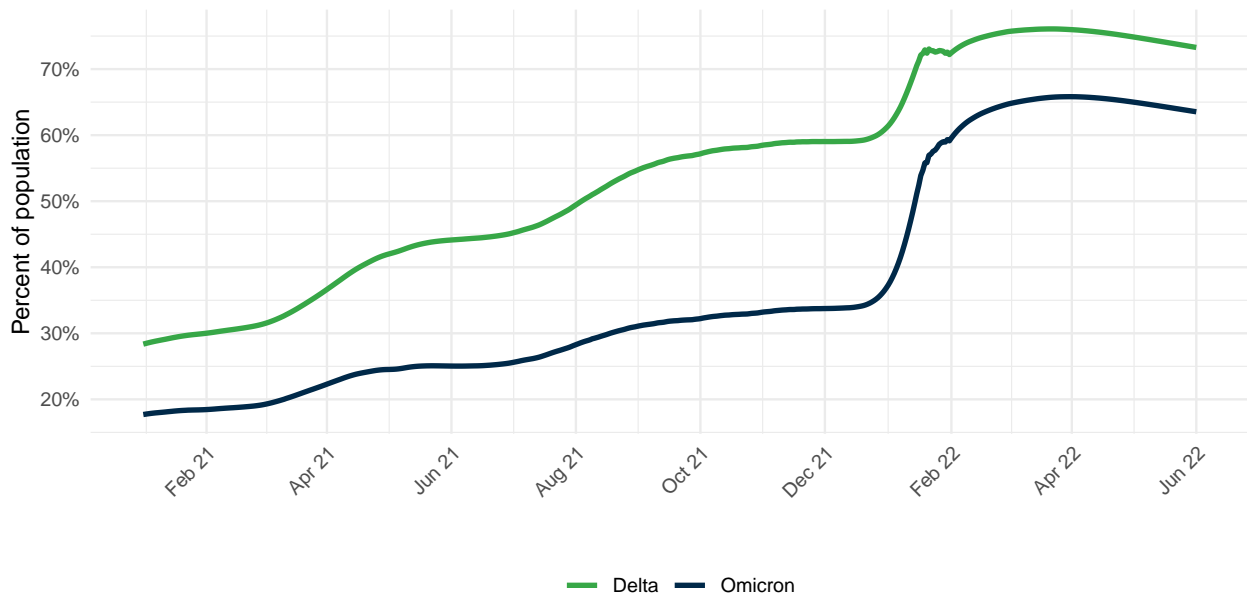


Figure 21.1: Percent of people who are immune to Delta or Omicron. Immunity is based on protection due to prior vaccination and infection(s). Moreover, variant-specific immunity is also based on variant-variant specific protection.



Projections and scenarios

Figure 22.1: Daily COVID-19 infections until June 01, 2022 for three scenarios

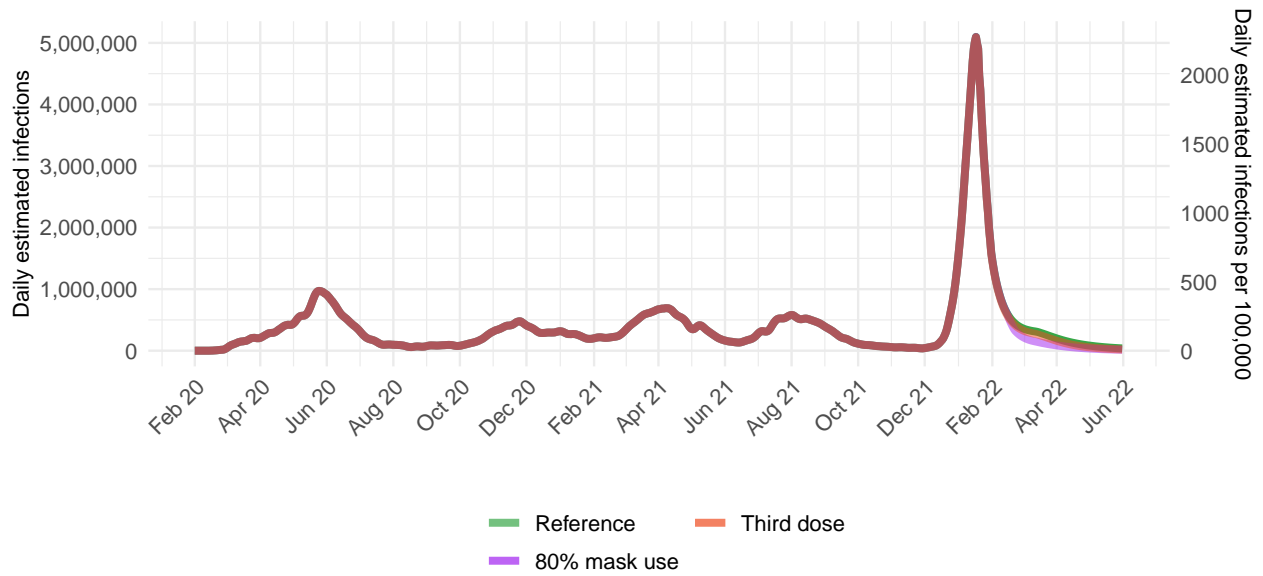


Figure 22.2: Daily COVID-19 reported cases until June 01, 2022 for three scenarios

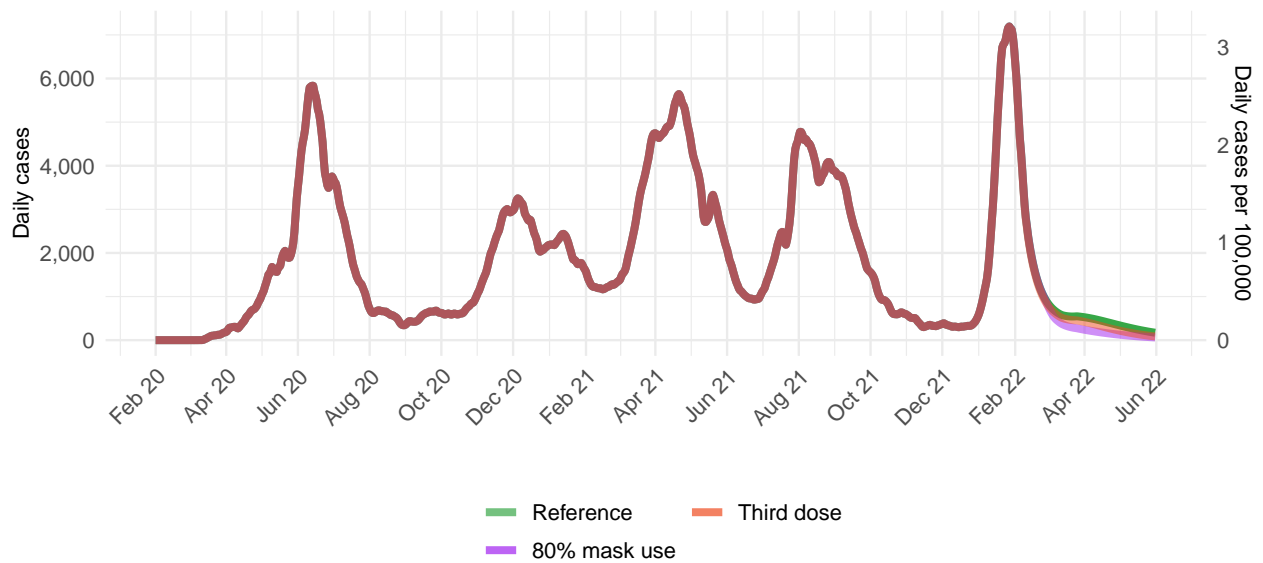


Figure 22.3: Daily COVID-19 hospital census until June 01, 2022 for three scenarios

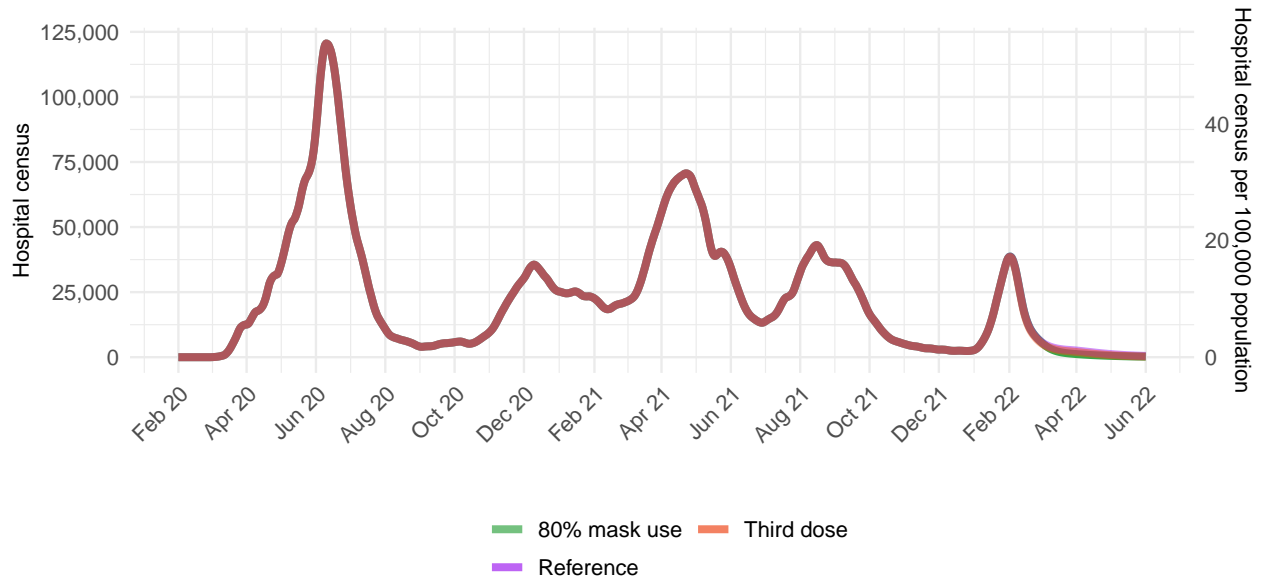


Figure 22.4: Reported daily COVID-19 deaths per 100,000

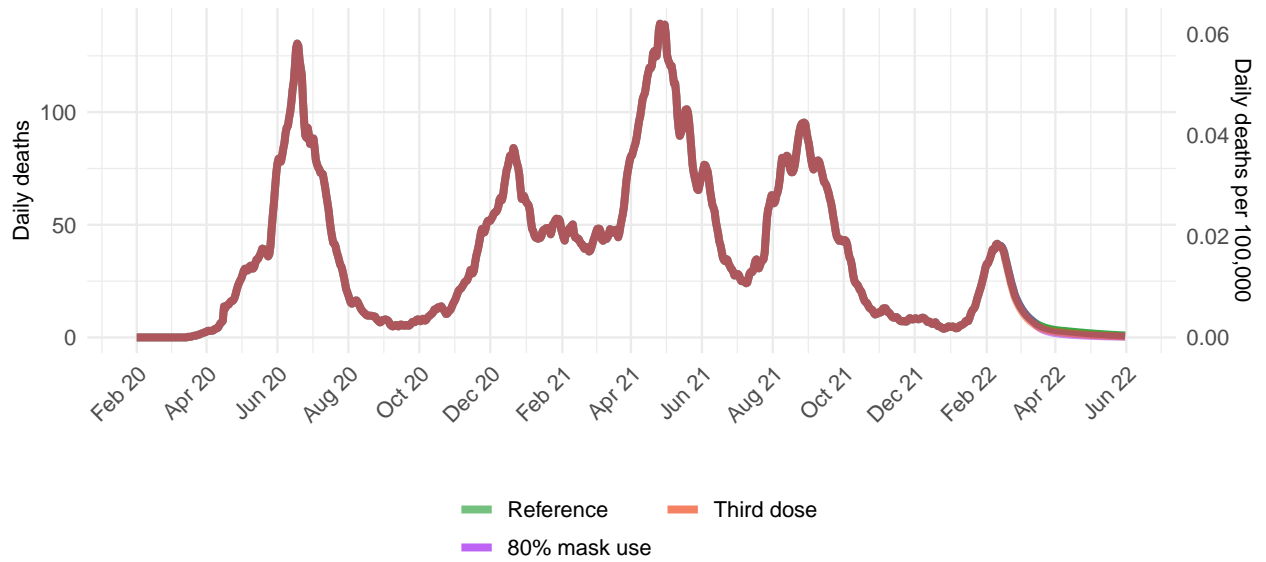


Figure 22.5: Total daily COVID-19 deaths per 100,000

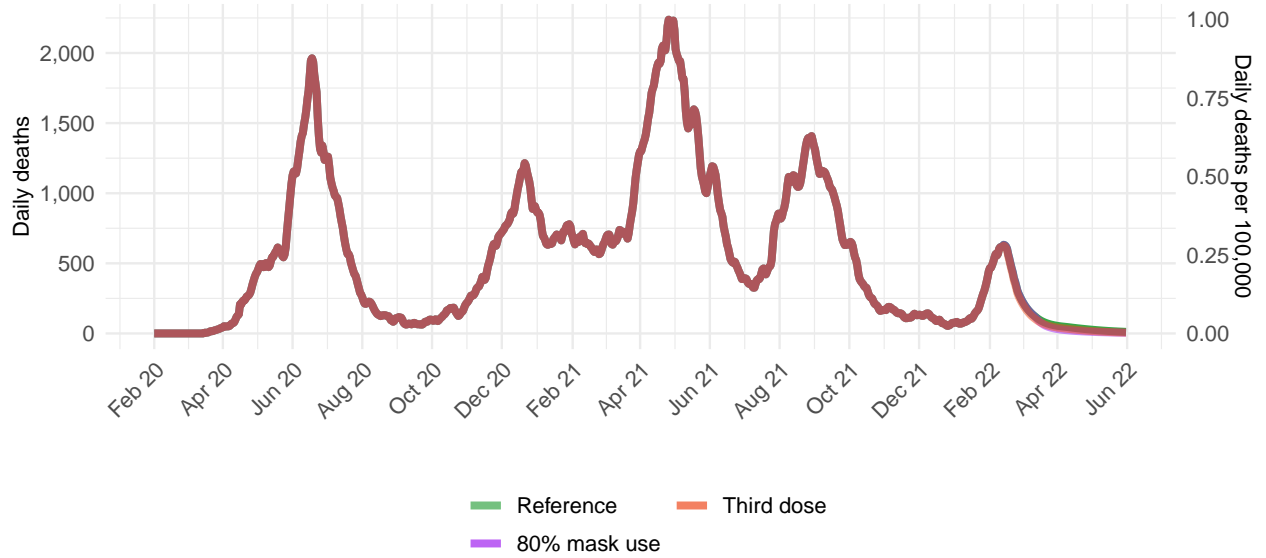


Figure 23.1: Comparison of reference model projections with other COVID modeling groups. For this comparison, we are including projections of daily COVID-19 deaths from other modeling groups when available, last model update in brackets: Delphi from the Massachusetts Institute of Technology ([Delphi](#)) [February 17, 2022], Imperial College London ([Imperial](#)) [January 2, 2022], the SI-KJalpha model from the University of Southern California ([SIKJalpha](#)) [February 17, 2022]. Daily deaths from other modeling groups are smoothed to remove inconsistencies with rounding. Regional values are aggregates from available locations in that region.

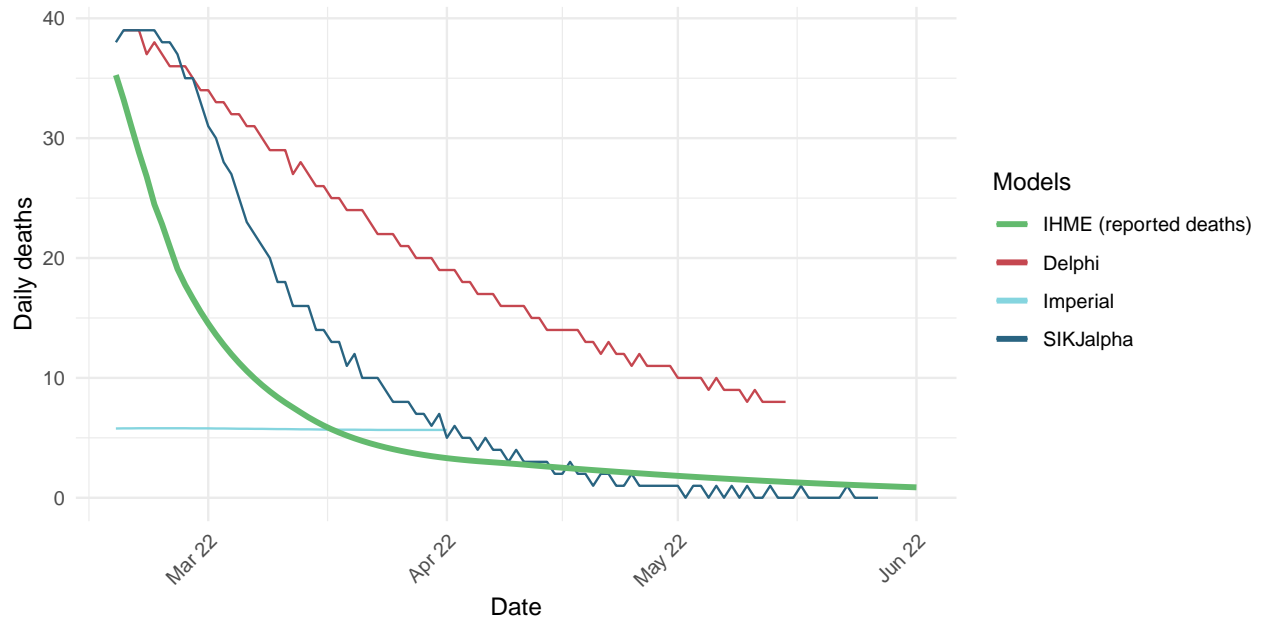


Figure 24.1: The estimated inpatient hospital usage is shown over time. The percent of hospital beds occupied by COVID-19 patients is color-coded based on observed quantiles of the maximum proportion of beds occupied by COVID-19 patients. Less than 5% is considered *low stress*, 5-9% is considered *moderate stress*, 10-19% is considered *high stress*, and 20% or greater is considered *extreme stress*.

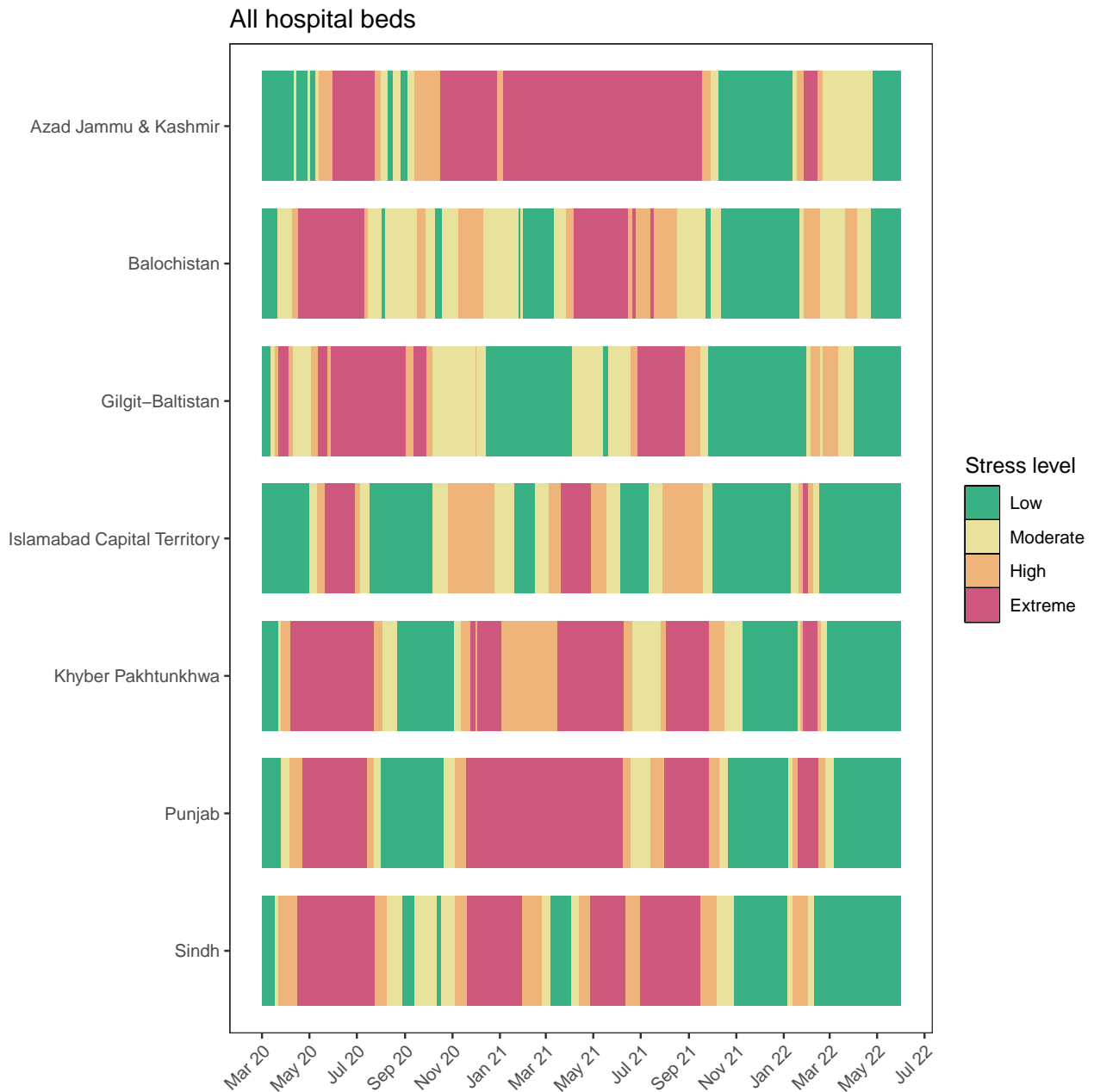
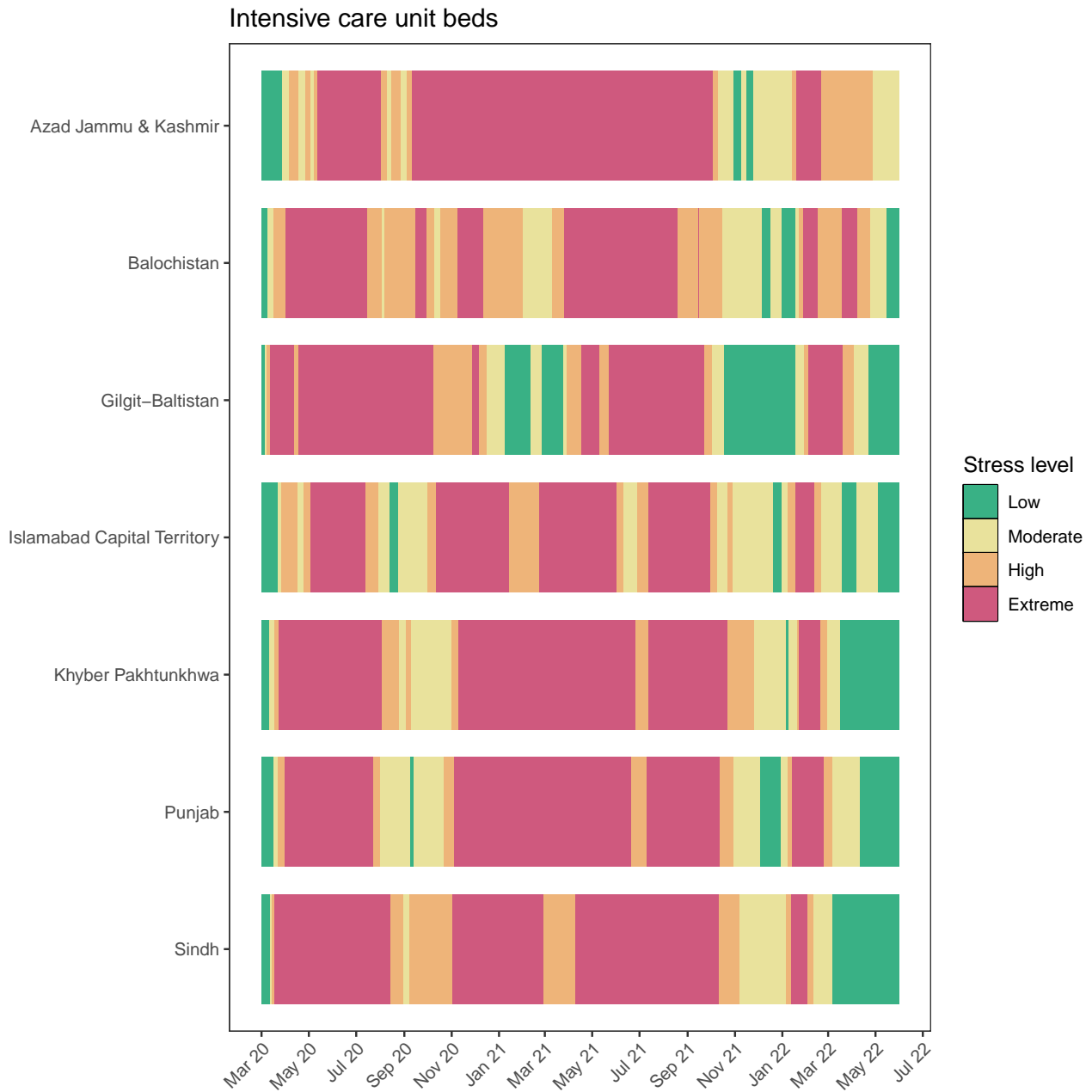


Figure 25.1: The estimated intensive care unit (ICU) usage is shown over time. The percent of ICU beds occupied by COVID-19 patients is color-coded based on observed quantiles of the maximum proportion of ICU beds occupied by COVID-19 patients. Less than 10% is considered *low stress*, 10-29% is considered *moderate stress*, 30-59% is considered *high stress*, and 60% or greater is considered *extreme stress*.



More information

Data sources:

Mask use and vaccine confidence data are from the [The Delphi Group at Carnegie Mellon University and University of Maryland COVID-19 Trends and Impact Surveys](#), in partnership with Facebook. Mask use data are also from [Premise](#), the Kaiser Family Foundation, and the [YouGov COVID-19 Behaviour Tracker](#) survey.

Genetic sequence and metadata are primarily from the GISAID Initiative. Further details available on the COVID-19 model [FAQ page](#).

A note of thanks:

We wish to warmly acknowledge the support of [these](#) and others who have made our COVID-19 estimation efforts possible.

More information:

For all COVID-19 resources at IHME, visit <http://www.healthdata.org/covid>.

To download our most recent results, visit our [Data downloads page](#).

Questions? Requests? Feedback? Please contact us at <https://www.healthdata.org/covid/contact-us>.