COVID-19 Results Briefing

India

January 21, 2022

This document contains summary information on the latest projections from the IHME model on COVID-19 in India. The model was run on January 20, 2022, with data through January 18, 2022.

India had a dramatic rise in COVID-19 cases and deaths in April and May 2021. The cases peaked around mid-May and the deaths in late May, after which there was a decreasing trend until the recent explosion of the Omicron variant of the virus. The daily cases increased last week by 89% and daily deaths by 75% compared with the week before. Persistent measures are needed to bolster the health system to deal with such surges of COVID-19 and rapidly increase the pace of vaccination including boosters, as well as sustain effective face mask use and control social mixing through appropriate restrictions. IHME's reference scenario forecasts 3.1 million total deaths due to COVID-19 in India by May 1, 2022. An important component for successful control of COVID-19 in India over the next few months is timely reporting of genomic sequencing of an adequate number of samples of the virus from across the country, and assessing the efficacy of the available vaccines against the variants of the virus.

Current situation

- Estimated daily infections in the last week decreased to 35,052,900 per day on average compared to 35,096,500 the week before (Figure 1.1). Daily hospital census in the last week (through January 18) increased to 350,700 per day on average compared to 138,300 the week before.

- Daily reported cases in the last week increased to 268,400 per day on average compared to 141,700 the week before (Figure 2.1).

- Reported deaths due to COVID-19 in the last week increased to 210 per day on average compared to 120 the week before (Figure 3.1).

- The estimated total deaths due to COVID-19 in the last week increased to 1,300 per day on average compared to 710 the week before (Figure 3.1). This makes COVID-19 the number 5 cause of death in India this week (Table 1). Estimated total daily deaths due to COVID-19 in the past week were 6.2 times larger than the reported number of deaths.

- No locations had daily reported COVID-19 death rates greater than 4 per million (Figure 4.1).

- The daily rate of total COVID-19 deaths is greater than 4 per million in Delhi (Figure 4.2).

- We estimate that 83% of people in India have been infected at least once as of January 18 (Figure 6.1).

- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 27 states and union territories (Figure 7.1).

- The infection-detection rate in India was close to 1% on January 18 (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 Omicron variant is circulating in 30 states and union territories, the Delta variant is circulating in 28 states and union territories, and the Gamma variant is circulating in one state or union territory.

Trends in drivers of transmission

- Mobility last week was same as the pre-COVID-19 baseline (Figure 11.1). Mobility was lower than 30% of baseline in no locations (Figure 12.1).

- There were 103 diagnostic tests per 100,000 people on January 18 (Figure 15.1).

- As of January 18, 13 states and union territories have reached 70% or more of the population who have received at least one vaccine dose, and 5 states and union territories have reached 70% or more of the population who are fully vaccinated (Figure 17.1). 63% of people in India have received at least one vaccine dose and 47% are fully vaccinated.

- In India, 91% 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. The proportion of the population who are open to receiving a COVID-19 vaccine ranges from 80% in Mizoram to 100% in Dadra and Nagar Haveli and Daman and Diu (Figure 19.1).

- In our current reference scenario, we expect that 939.9 million people will be vaccinated with at least one dose by May 1 (Figure 20.1). We expect that 60% of the population will be fully vaccinated by May 1.

Projections

Infections

- Daily estimated infections in the **reference scenario**, which represents what we think is most likely to happen, will decline to 41,240 on May 1, 2022 (Figure 21.1).

- Daily estimated infections in the **80% mask coverage scenario** will decline to 48,560 on May 1, 2022 (Figure 21.1).

- Daily estimated infections in the **third dose scenario** will decline to 27,910 on May 1, 2022 (Figure 21.1).

Deaths

- In our **reference scenario**, our model projects 503,000 cumulative reported deaths due to COVID-19 on May 1. This represents 19,000 additional deaths from January 18 to May 1. Daily reported COVID-19 deaths in the **reference scenario** will rise to 650 by January 30, 2022 (Figure 21.4).

- Under our **reference scenario**, our model projects 3,063,000 cumulative total deaths due to COVID-19 on May 1. This represents 131,000 additional deaths from January 18 to May 1 (Figure 24.2).

- In our **80% mask coverage scenario**, our model projects 502,000 cumulative reported deaths due to COVID-19 on May 1. This represents 18,000 additional deaths from January 18 to May 1. Daily reported COVID-19 deaths in the **80% mask coverage scenario** will rise to 650 by January 30, 2022 (Figure 21.4).

- In our **third dose scenario**, our model projects 501,000 cumulative reported deaths due to COVID-19 on May 1. This represents 17,000 additional deaths from January 18 to May 1. Daily reported COVID-19 deaths in the **third dose scenario** will rise to 610 by January 28, 2022 (Figure 21.4).

- Figure 22.1 compares our reference scenario forecasts to other publicly archived models. Forecasts are widely divergent.
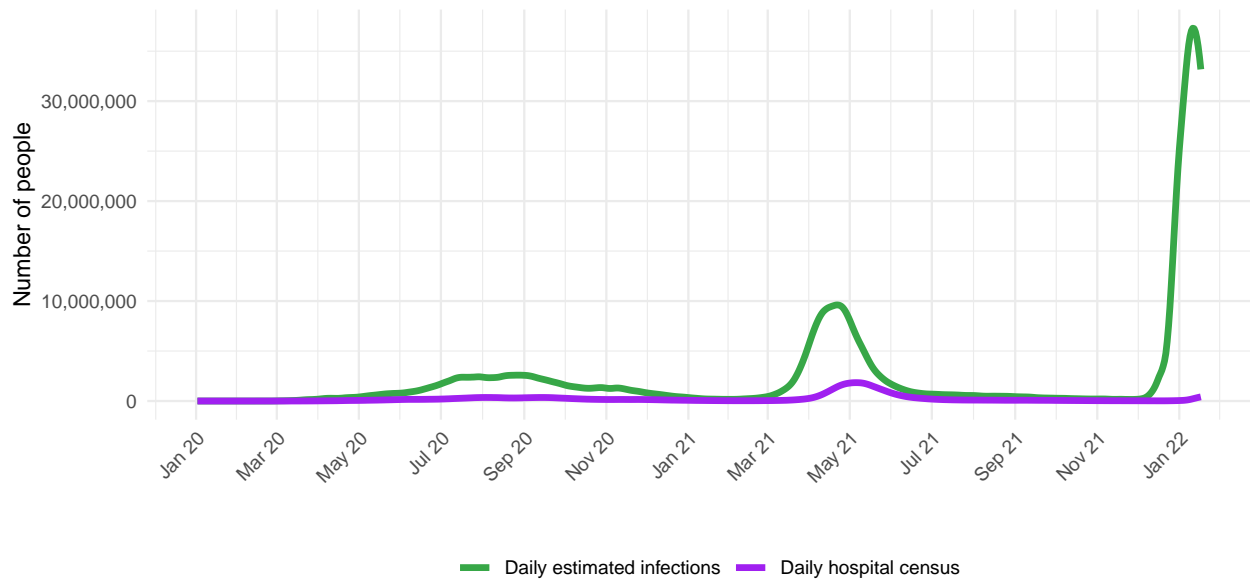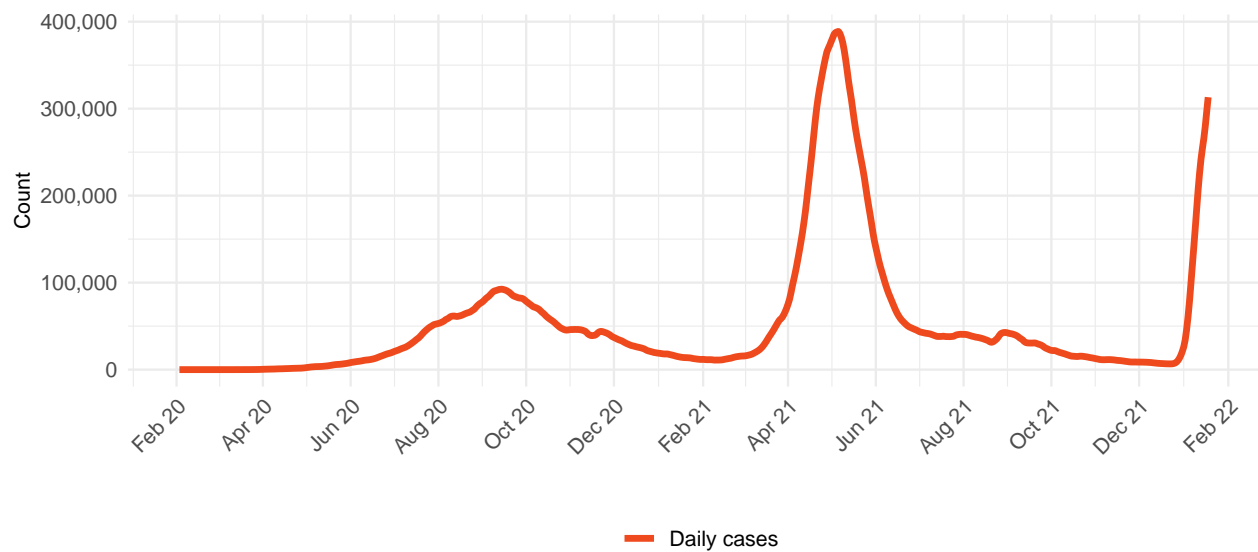
Model updates

No model updates.

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

Daily estimated infections ▬ Daily hospital census

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

Daily cases

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
Ischemic heart disease	29,214	1
Chronic obstructive pulmonary disease	17,278	2
Stroke	13,444	3
Diarrheal diseases	12,160	4
COVID-19	9,239	5
Neonatal disorders	8,423	6
Lower respiratory infections	8,340	7
Tuberculosis	8,128	8
Diabetes mellitus	5,252	9
Cirrhosis and other chronic liver diseases	5,193	10

Figure 3.1. Smoothed trend estimate of reported daily COVID-19 deaths (blue) and total daily deaths due to COVID-19 (orange)
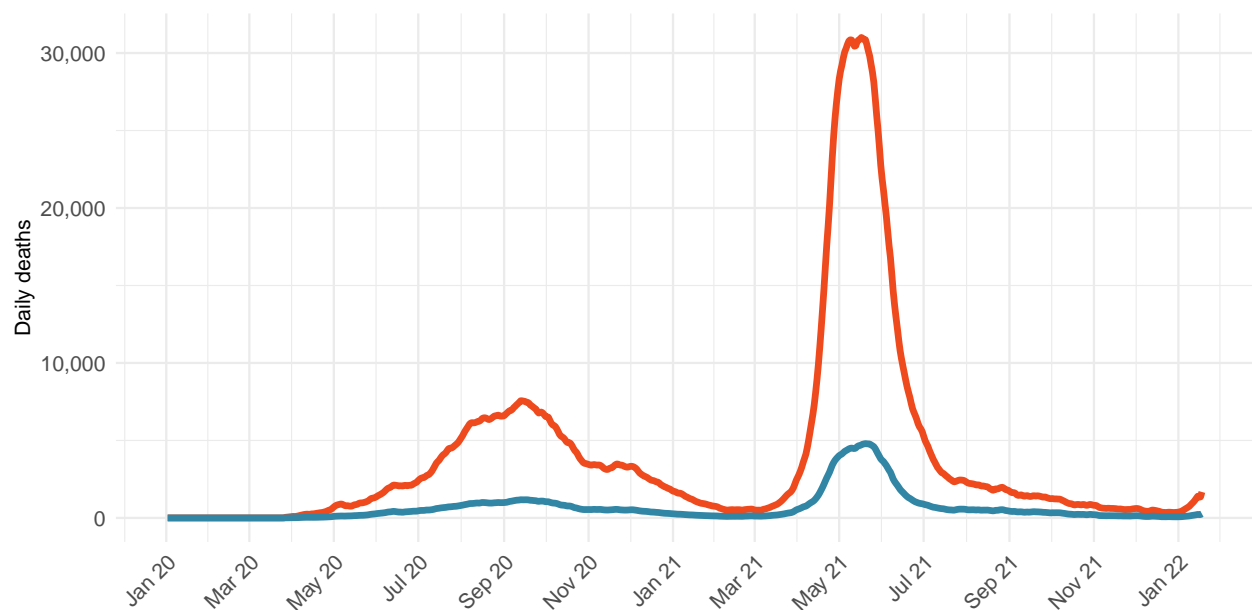
Daily COVID-19 death rate per 1 million on January 18, 2022

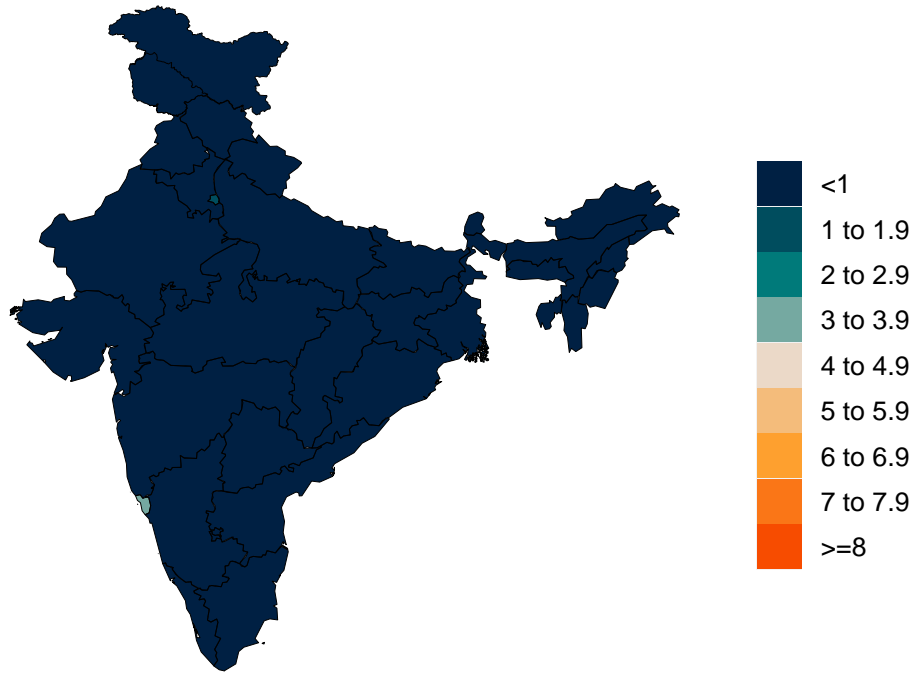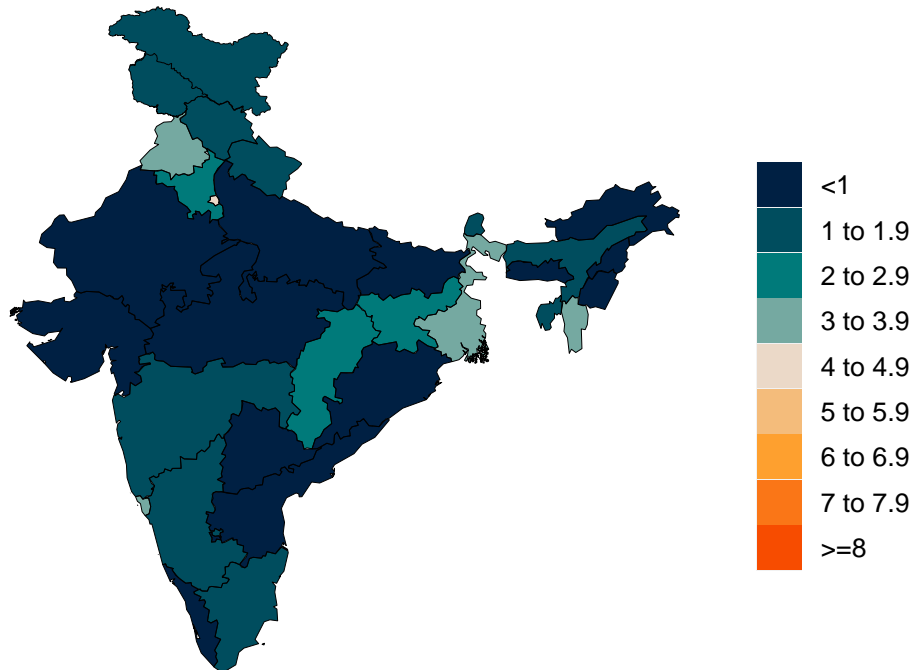**Figure 4.1 Daily reported COVID-19 death rate per 1 million**

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

Cumulative COVID-19 deaths per 100,000 on January 18, 2022

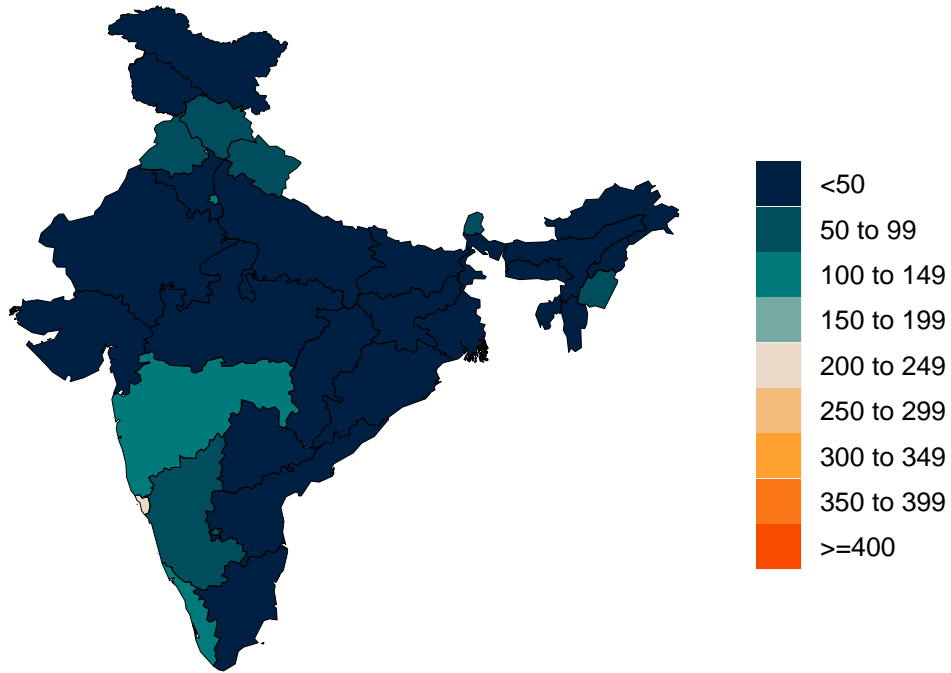**Figure 5.1 Reported cumulative COVID-19 deaths per 100,000**

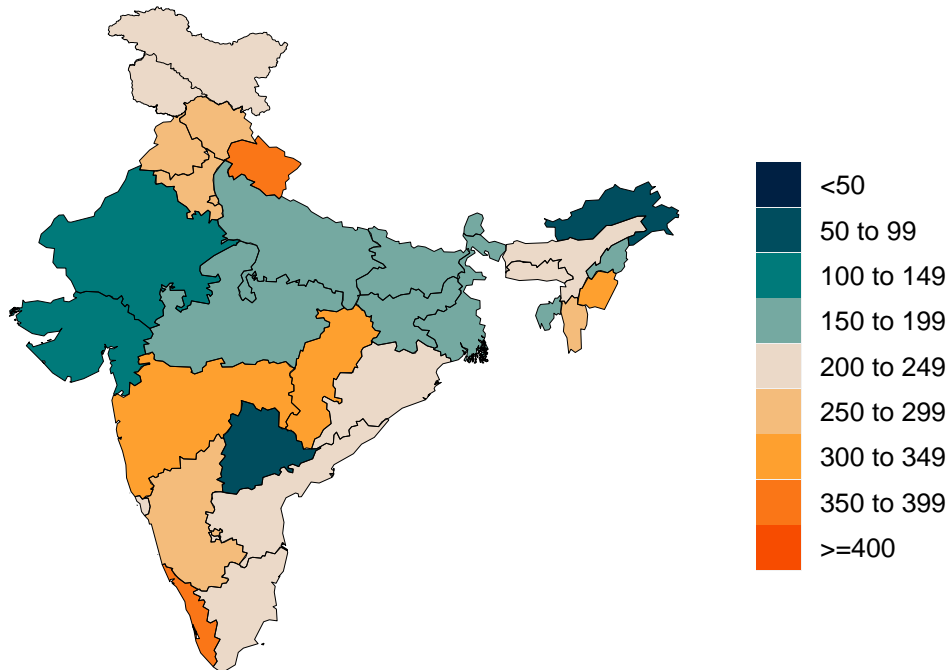**Figure 5.2 Total cumulative COVID-19 deaths per 100,000**

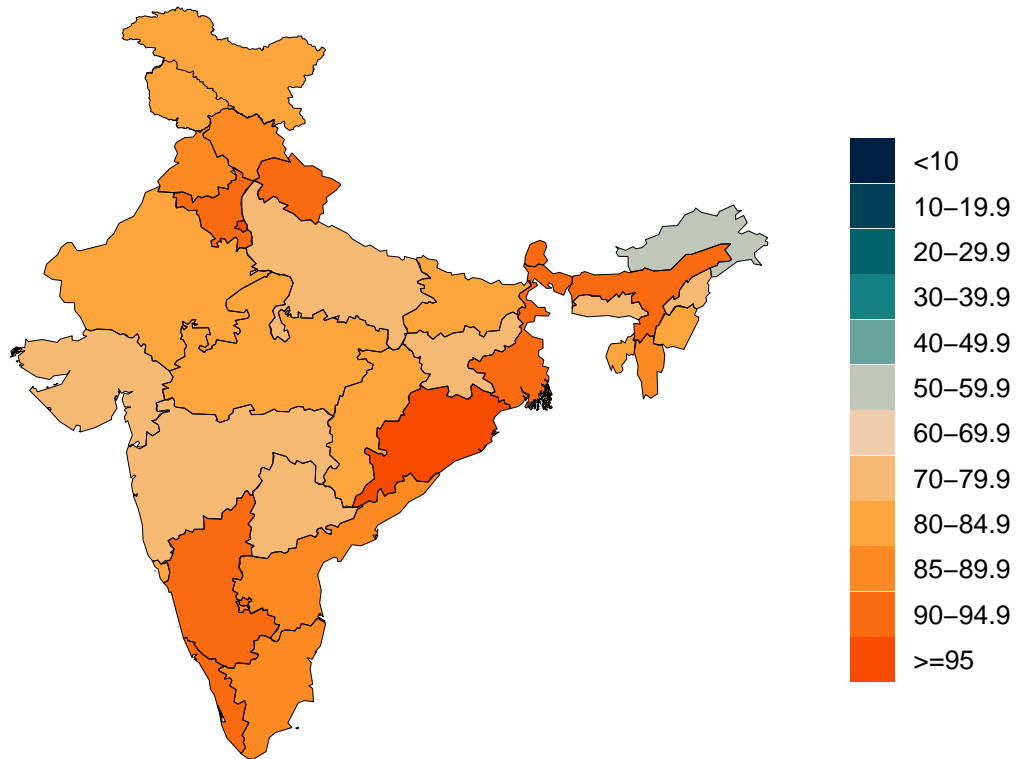**Figure 6.1.** Estimated percent of the population infected with COVID-19 on January 18, 2022

Figure 7.1. Mean effective R on January 7, 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.
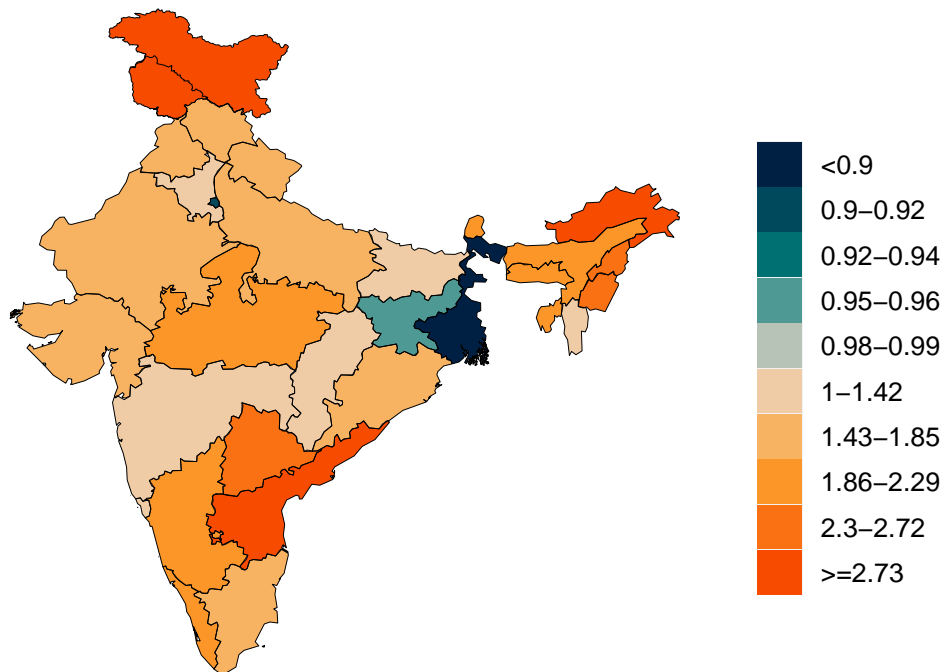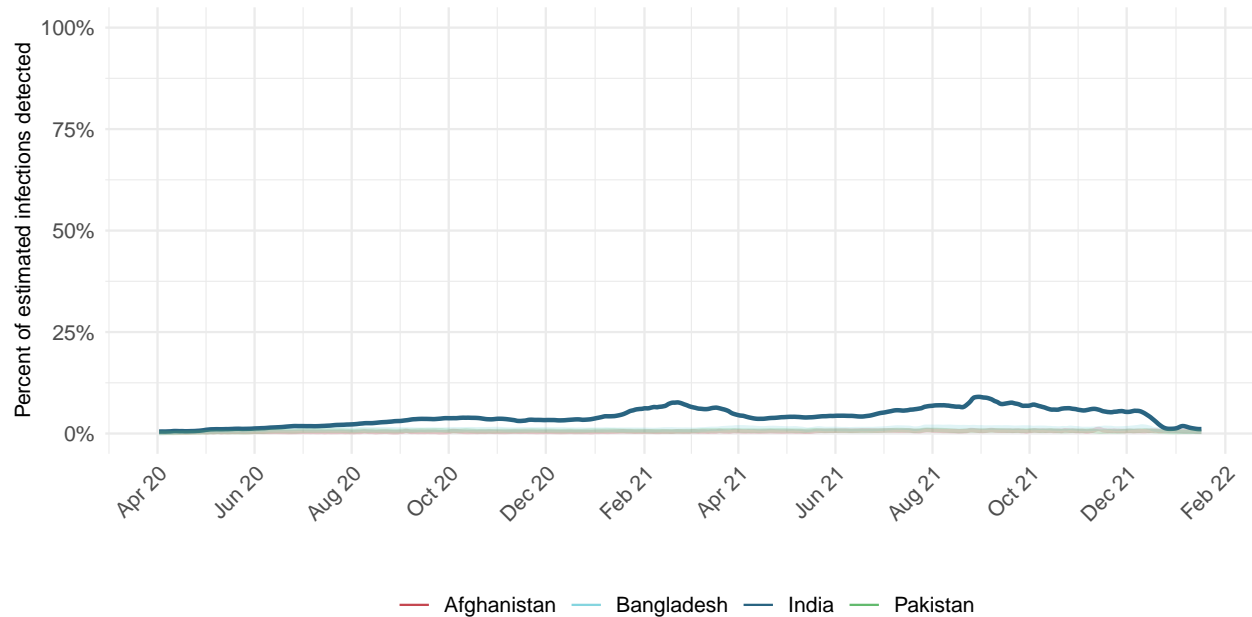
Figure 8.1. Percent of estimated COVID-19 infections detected. This is estimated as the ratio of reported daily COVID-19 cases to estimated daily COVID-19 infections based on the SEIR disease transmission model. Due to measurement errors in cases and testing rates, the infection-detection rate can exceed 100% at particular points in time.

Estimated percent of circulating SARS-CoV-2 for primary variant families on January 18, 2022

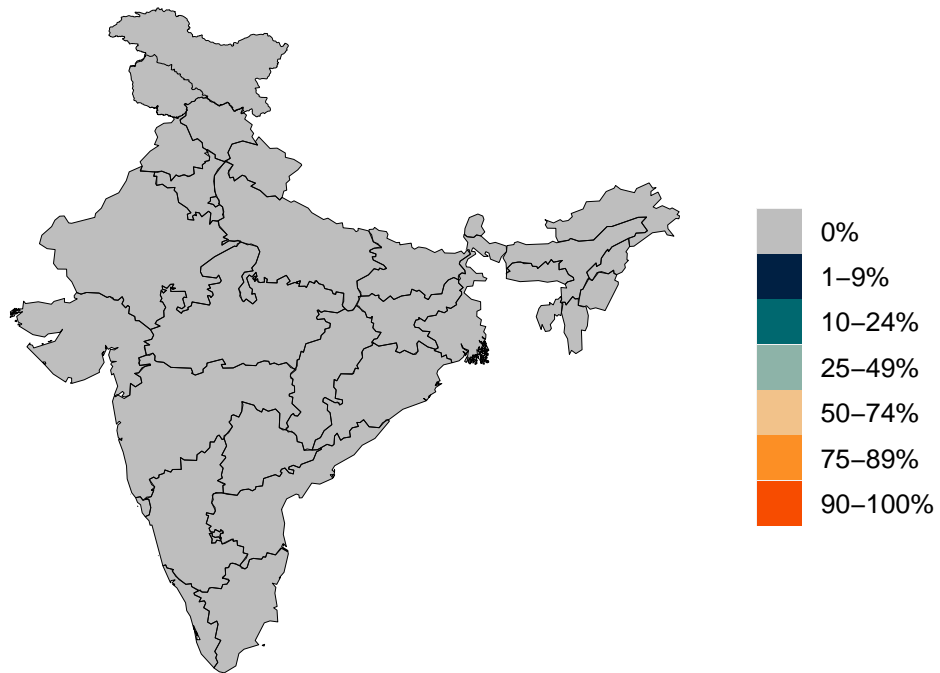**Figure 9.1 Estimated percent of new infections that are Alpha variant**

	0%
	1–9%
	10–24%
	25–49%
	50–74%
	75–89%
	90–100%

Figure 9.2 Estimated percent of new infections that are Beta variant

	0%
	1–9%
	10–24%
	25–49%
	50–74%
	75–89%
	90–100%
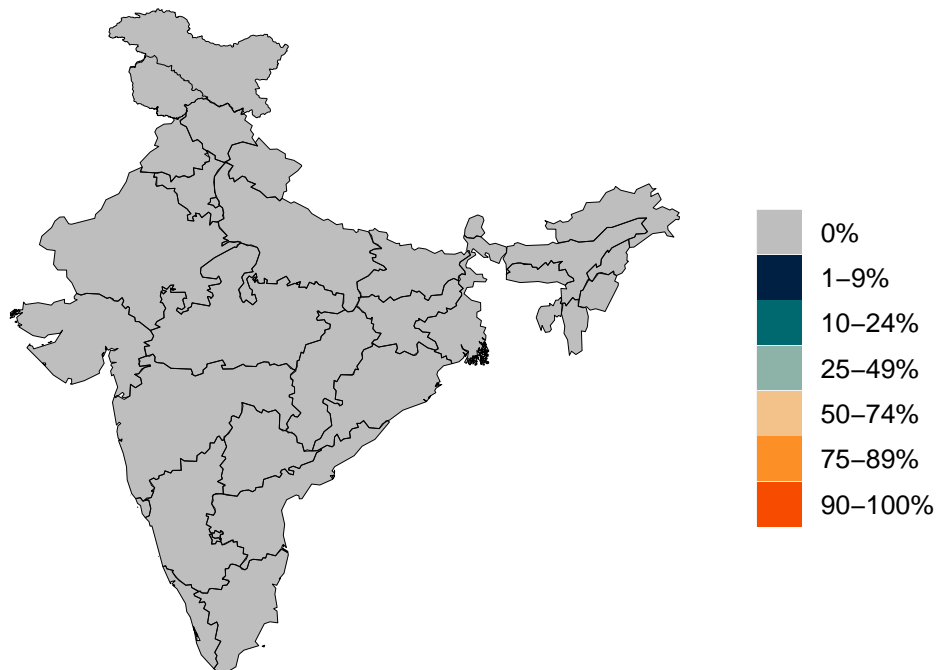
Figure 9.3 Estimated percent of new infections that are Delta variant

⬜	0%
⬛	1–9%
🟦	10–24%
🟩	25–49%
🟧	50–74%
🟧	75–89%
🟥	90–100%
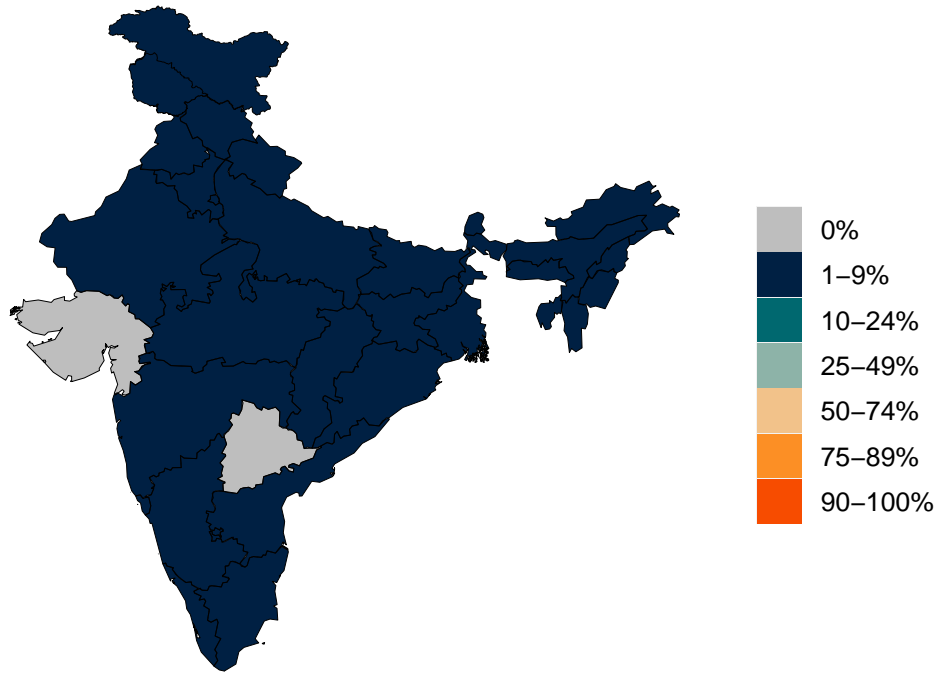
Figure 9.4 Estimated percent of new infections that are Gamma variant

⬜	0%
⬛	1–9%
🟦	10–24%
🟩	25–49%
🟧	50–74%
🟧	75–89%
🟥	90–100%
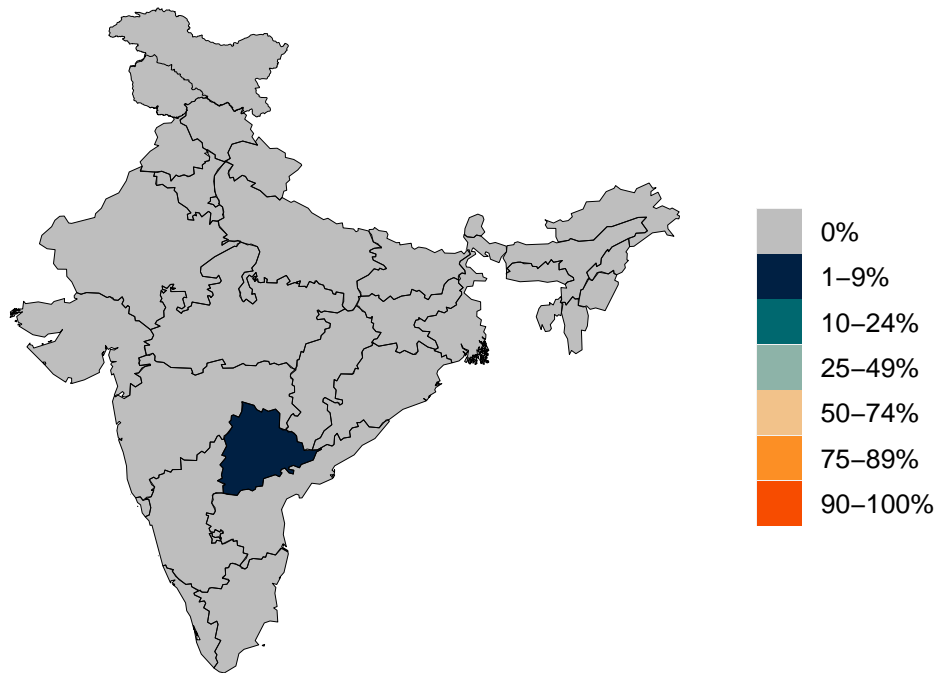
Figure 9.5 Estimated percent of new infections that are Omicron variant

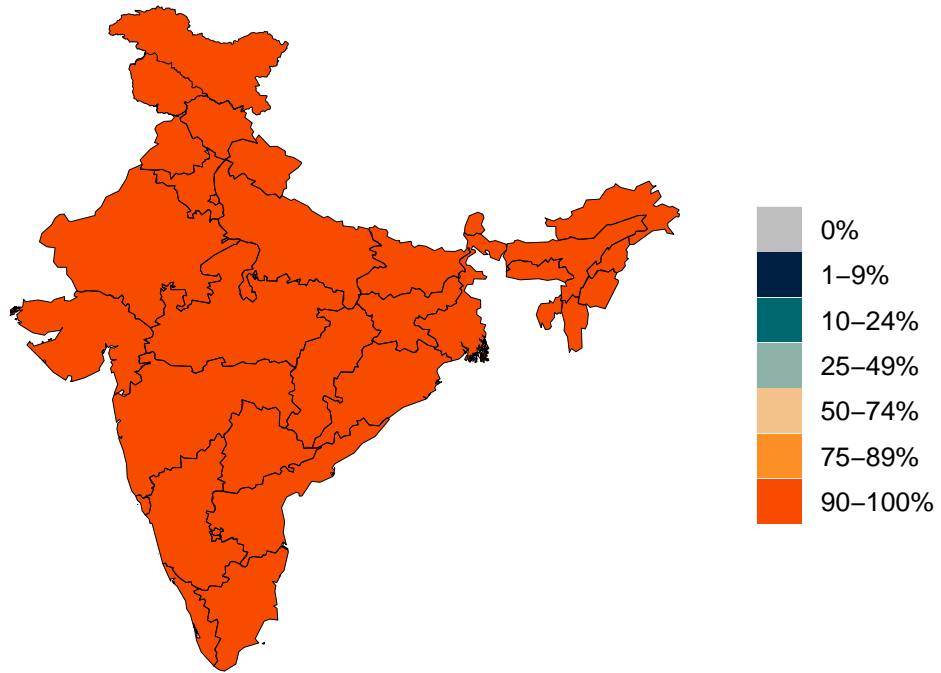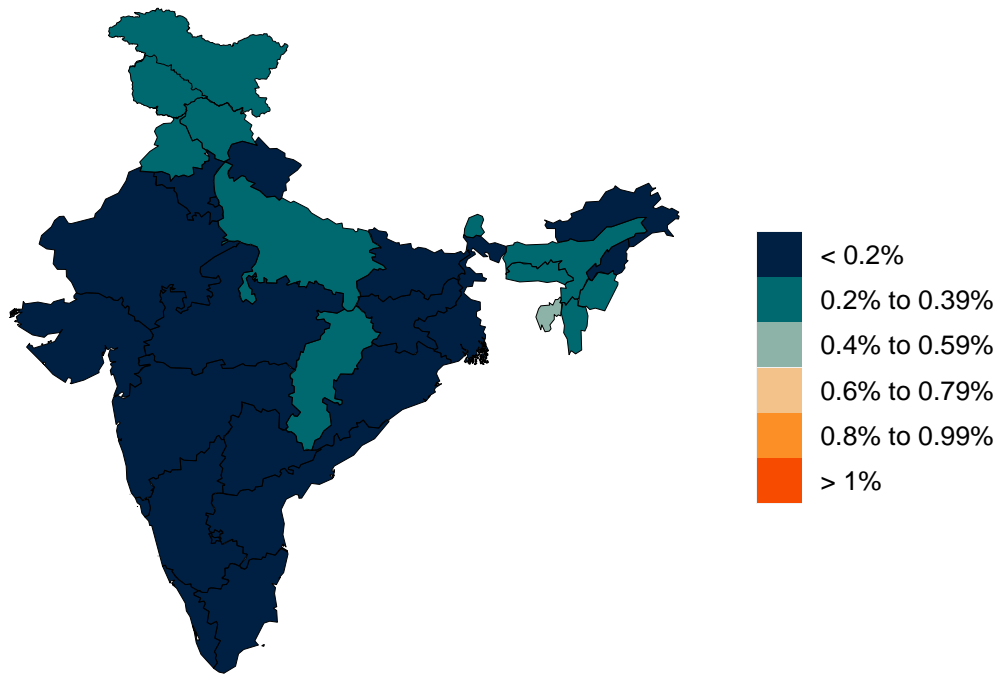|	
	0%
	1–9%
	10–24%
	25–49%
	50–74%
	75–89%
	90–100%

Figure 10.1. Infection-fatality rate on January 18, 2022. This is estimated as the ratio of COVID-19 deaths to estimated daily COVID-19 infections.

■	< 0.2%
■	0.2% to 0.39%
■	0.4% to 0.59%
■	0.6% to 0.79%
■	0.8% to 0.99%
■	> 1%

Critical drivers

Table 2. Current mandate implementation

Column headers (left to right):
- 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

Row labels (top to bottom):
- Andhra Pradesh
- Arunachal Pradesh
- Assam
- Bihar
- Chhattisgarh
- Dadra and Nagar Haveli and Daman and Diu
- Delhi
- Goa
- Gujarat
- Haryana
- Himachal Pradesh
- Jammu & Kashmir and Ladakh
- Jharkhand
- Karnataka
- Kerala
- Madhya Pradesh
- Maharashtra
- Manipur
- Meghalaya
- Mizoram
- Nagaland
- Odisha
- Punjab
- Rajasthan
- Sikkim
- Tamil Nadu
- Telangana
- Tripura
- Uttar Pradesh
- Uttarakhand
- West Bengal

Legend:
- Mandate in place
- Mandate in place (imposed this week)
- Mandate in place (updated from previous reporting)
- No mandate
- No mandate (lifted this week)
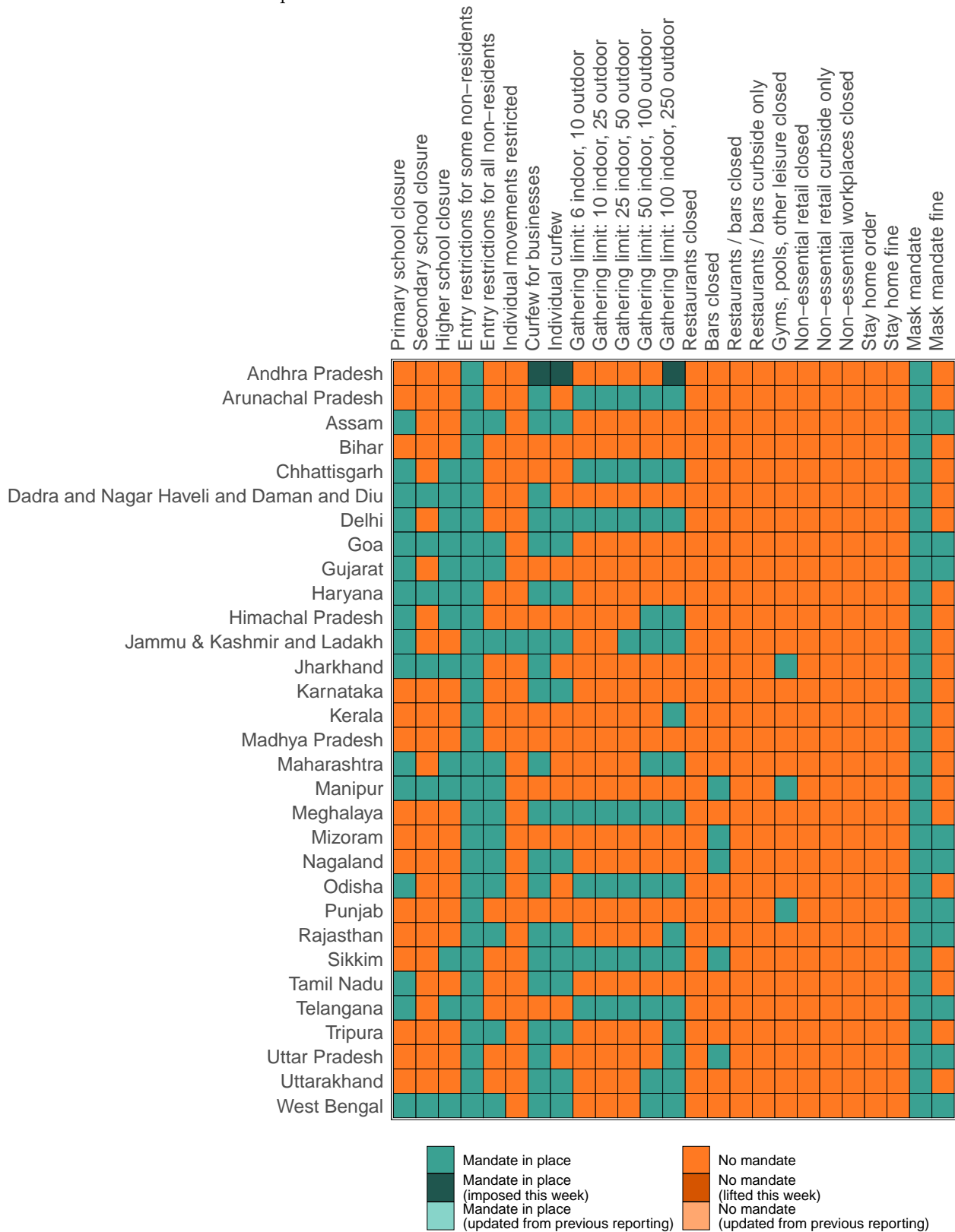- No mandate (updated from previous reporting)

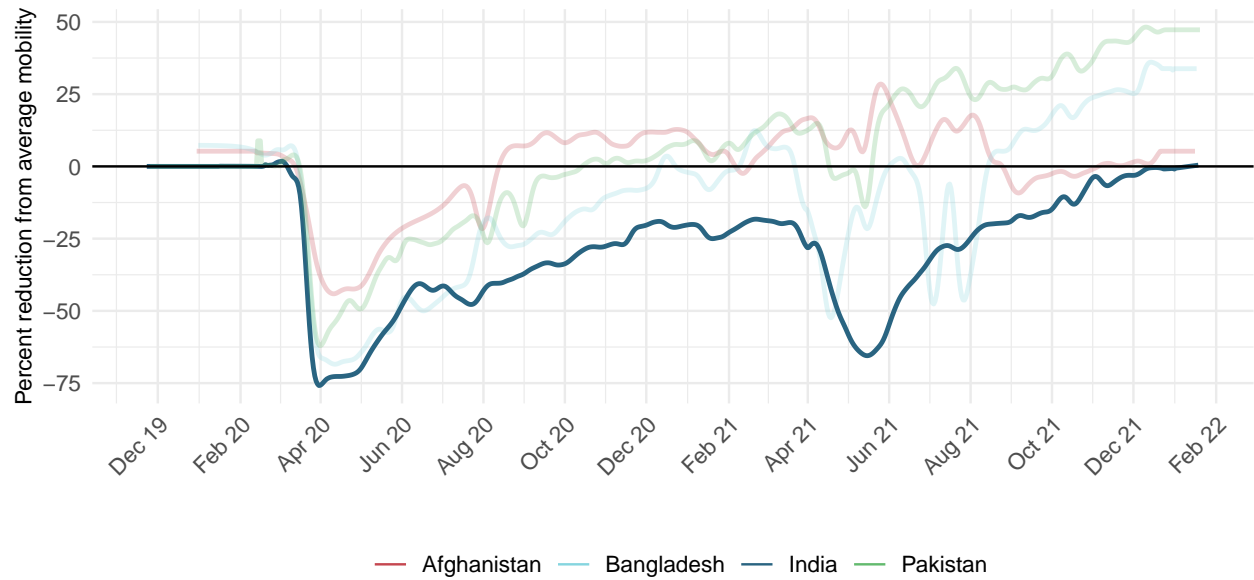**Figure 11.1.** Trend in mobility as measured through smartphone app use, compared to January 2020 baseline

Figure 12.1. Mobility level as measured through smartphone app use, compared to January 2020 baseline (percent) on January 18, 2022
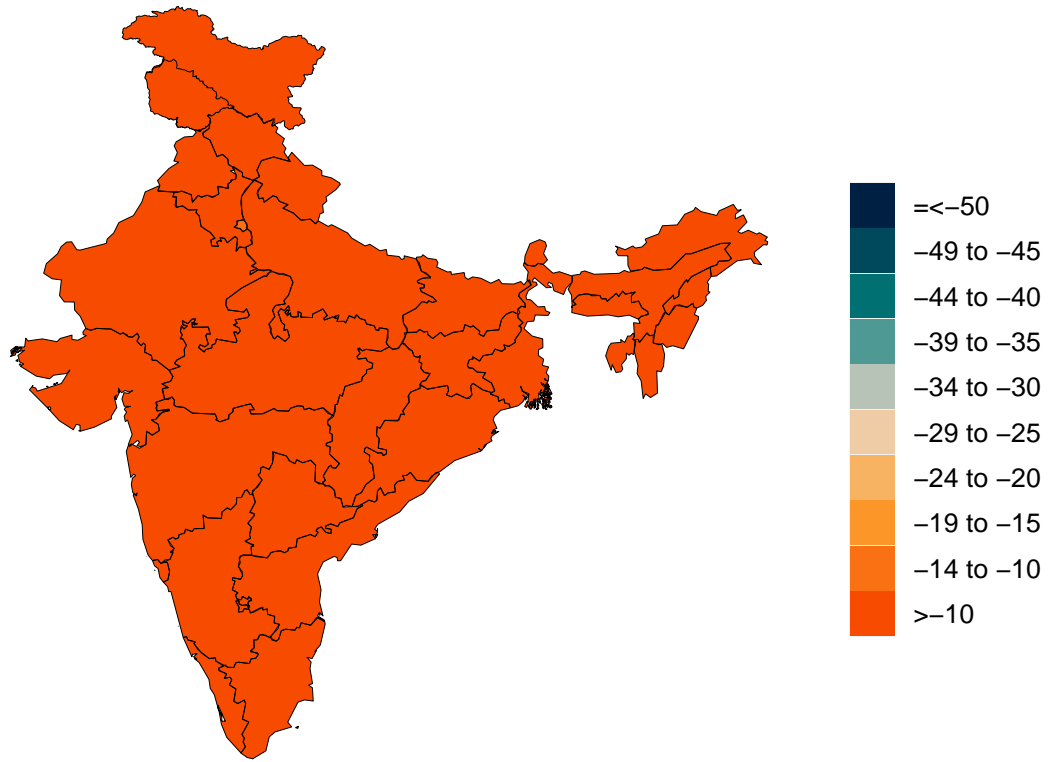
Figure 13.1. Trend in the proportion of the population reporting always wearing a mask when leaving home
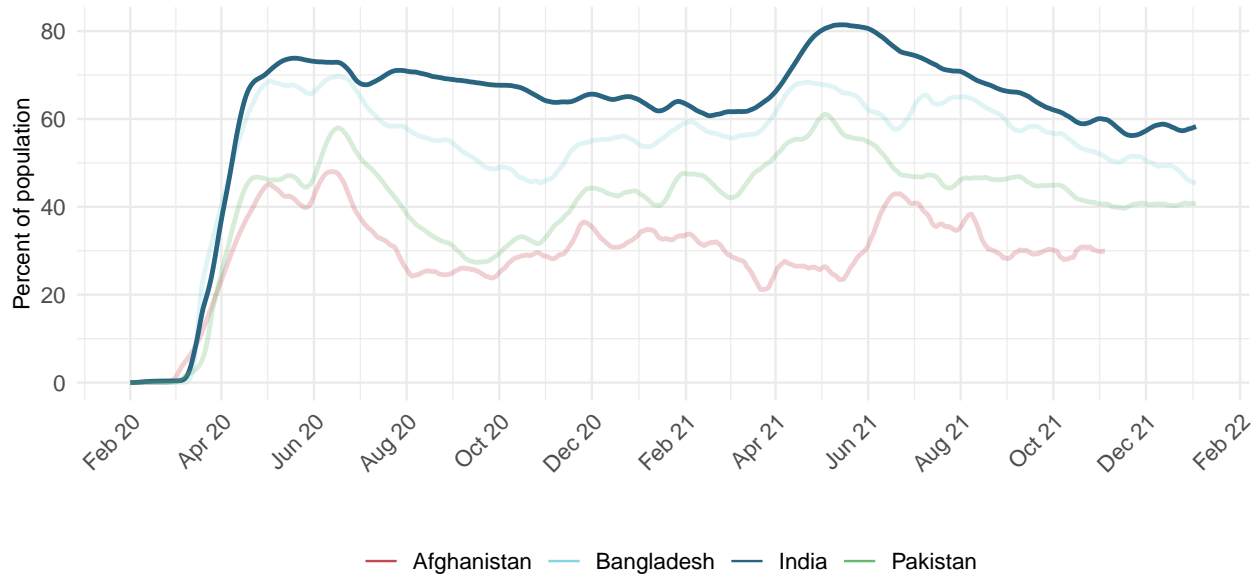

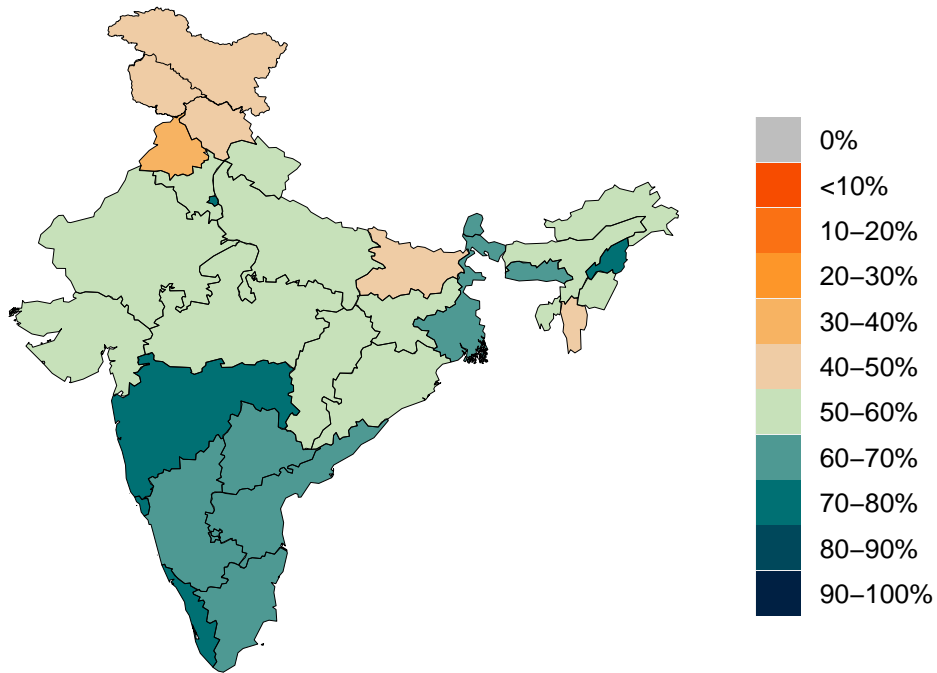**Figure 14.1.** Proportion of the population reporting always wearing a mask when leaving home on January 18, 2022

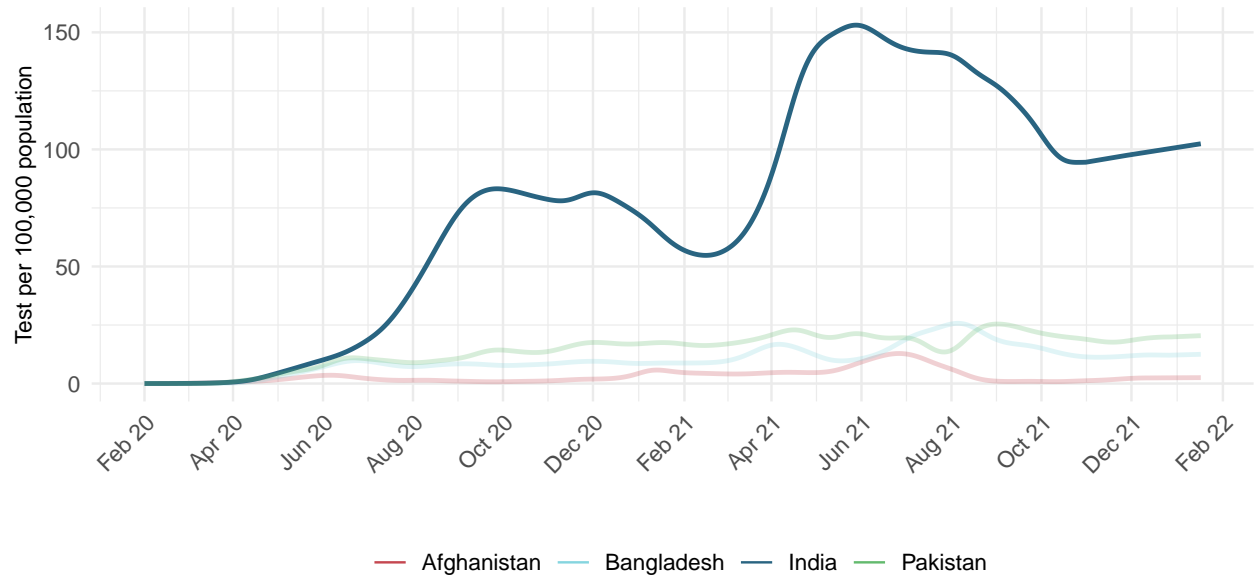**Figure 15.1.** Trend in COVID-19 diagnostic tests per 100,000 people

Figure 16.1. COVID-19 diagnostic tests per 100,000 people on January 18, 2022
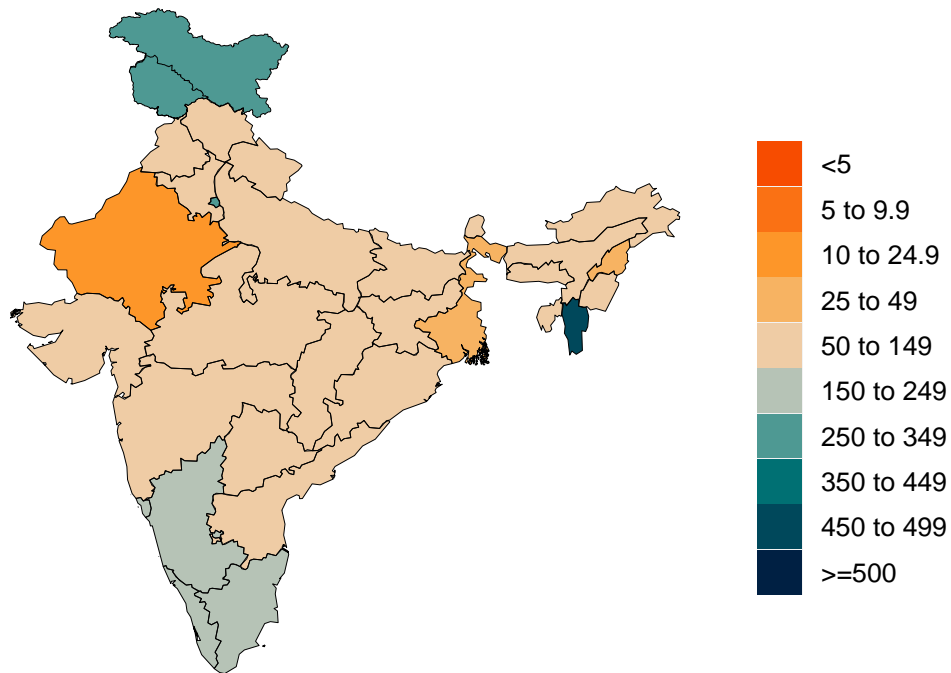
Table 3. Estimates of vaccine effectiveness for specific vaccines used in the model at preventing severe disease and infection. We use data from clinical trials directly, where available, and make estimates otherwise. More information can be found on our website.

| | Effectiveness at preventing | | | | | | | | | | | |
| | Ancestral | | Alpha | | Beta | | Gamma | | Delta | | Omicron | |
Vaccine	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 January 18, 2022

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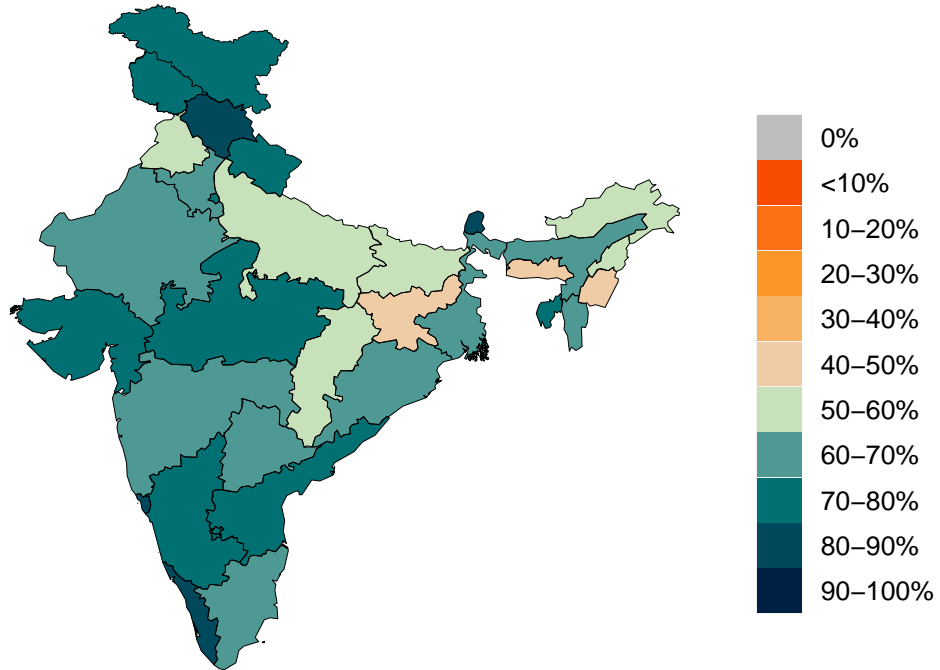

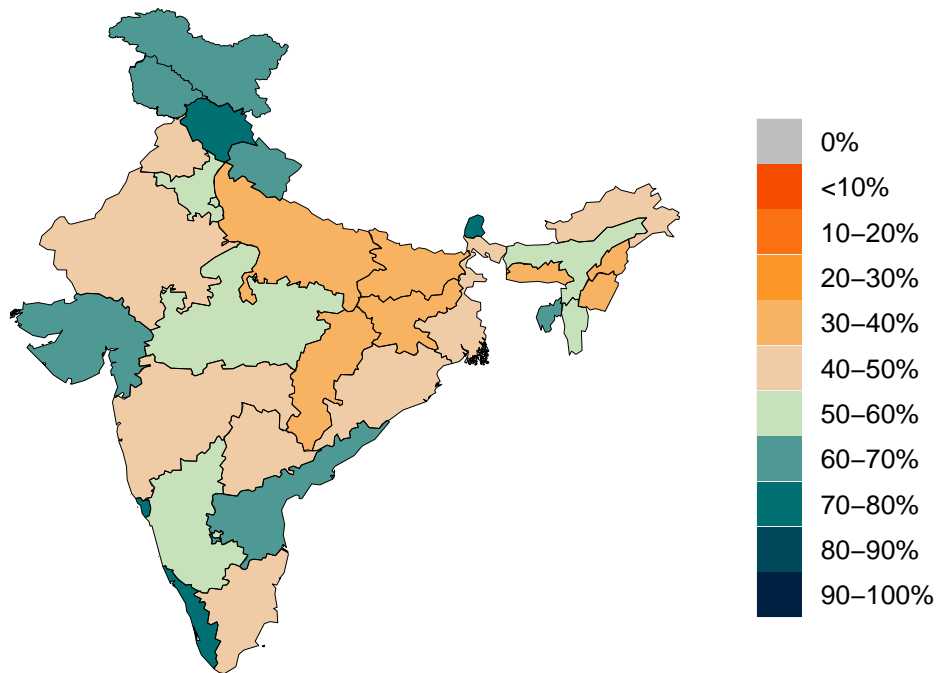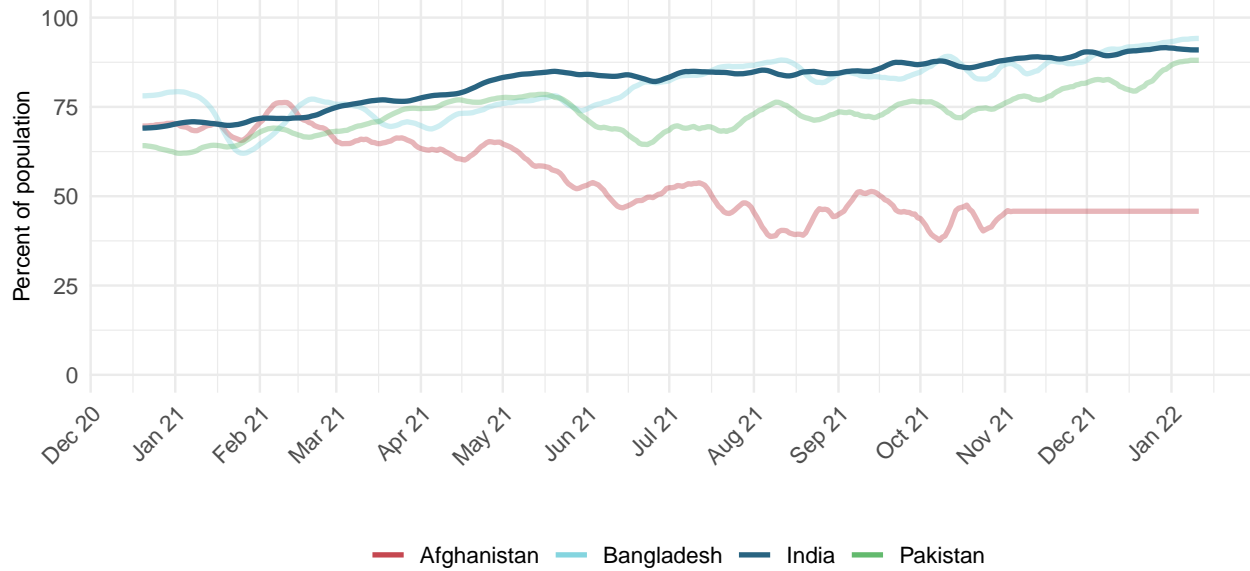**Figure 17.2 Percent of the population fully vaccinated against SARS-CoV-2**

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.
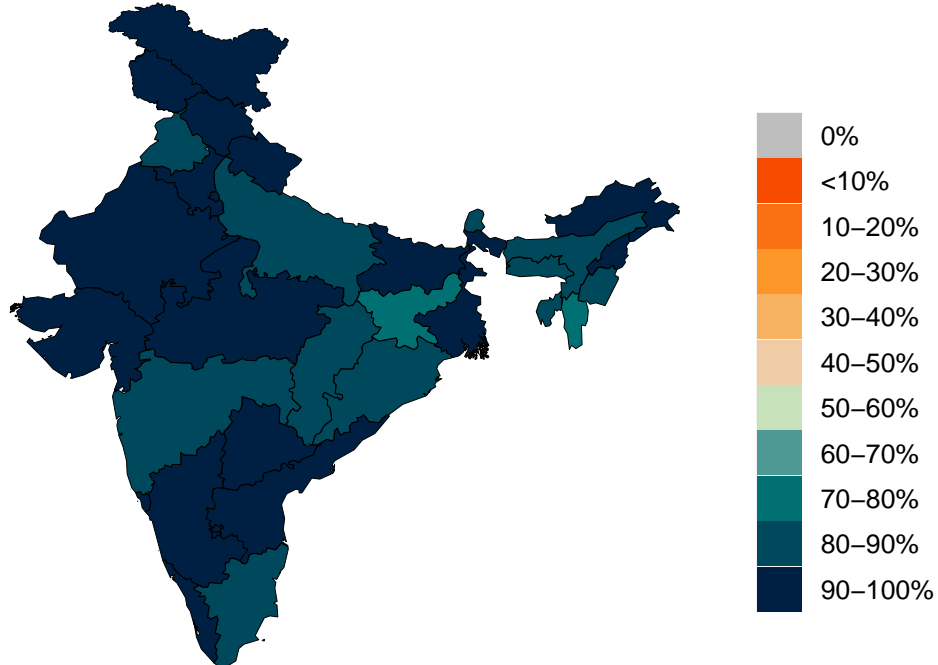

Figure 19.1. Estimated proportion of the population that is 12 years and older that has been vaccinated or would probably or definitely receive the COVID-19 vaccine if available. Note that vaccine acceptance is calculated using survey data from the 18+ population.

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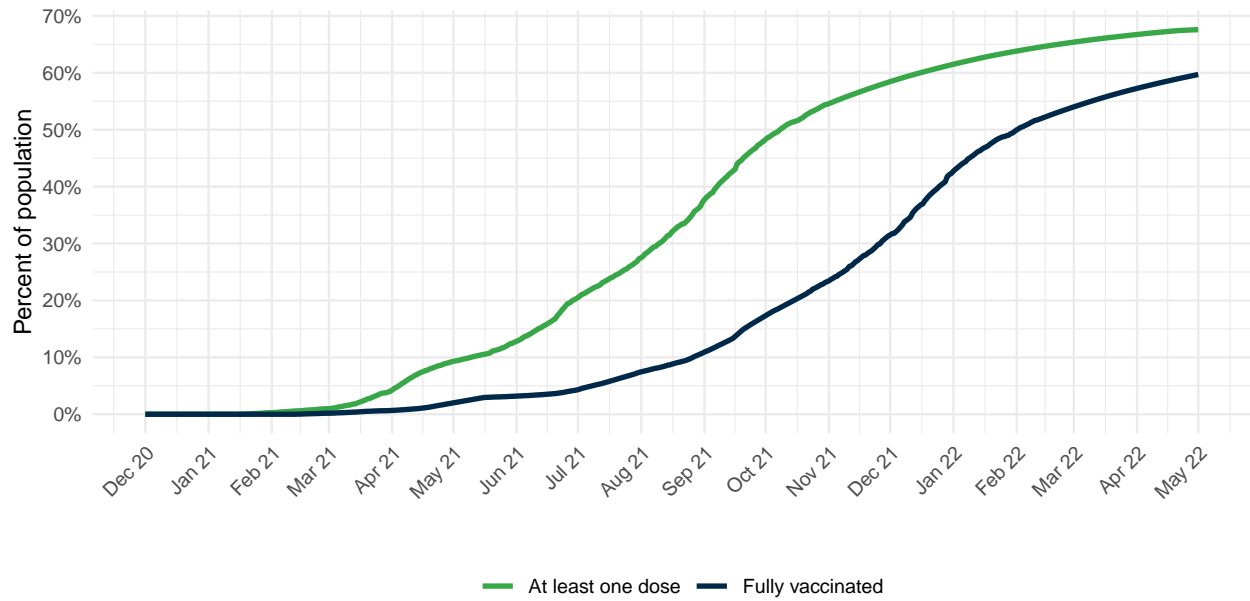
Projections and scenarios

We produce 3 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 7 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 6 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 7 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 6 months.
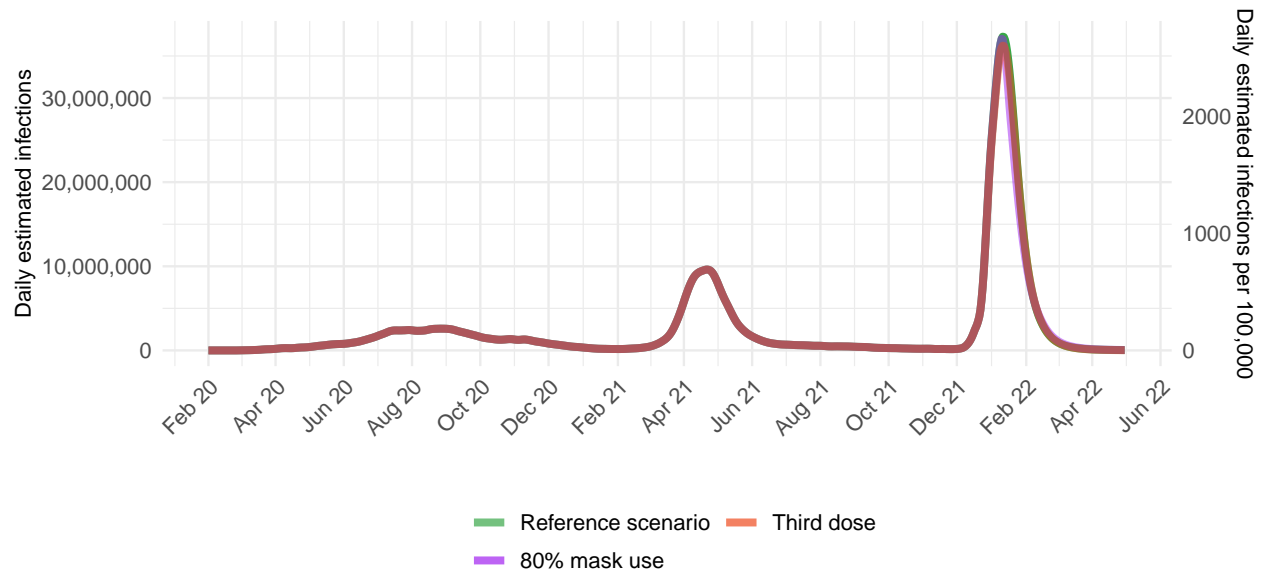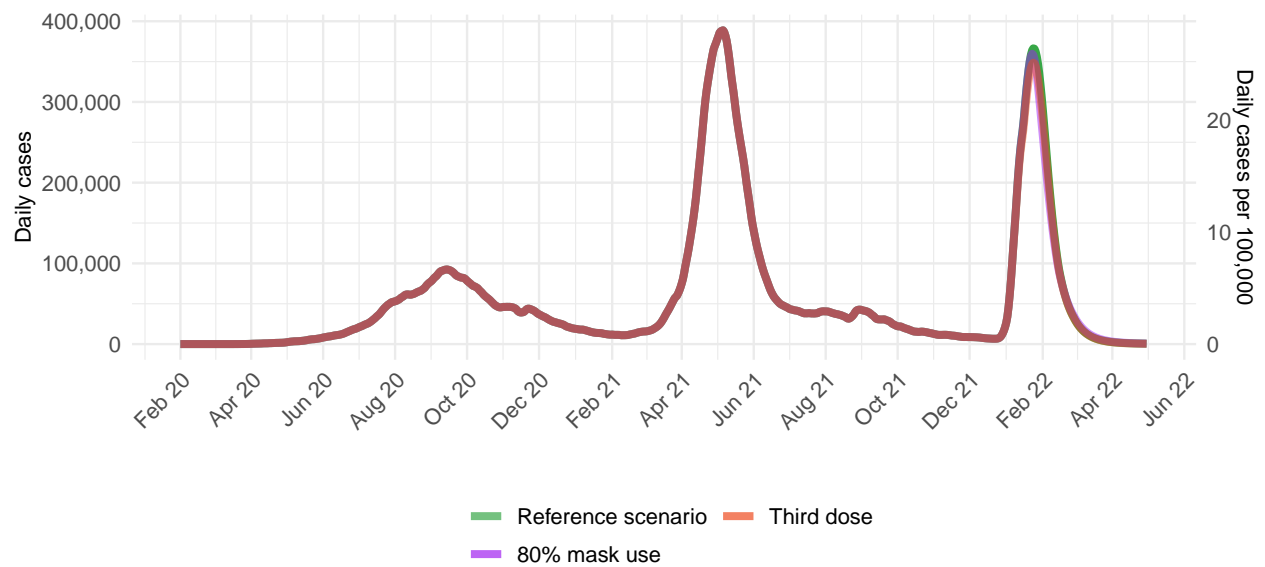
Figure 21.1. Daily COVID-19 infections until May 01, 2022 for 3 scenarios

Reference scenario — Third dose

80% mask use

Figure 21.2. Daily COVID-19 reported cases until May 01, 2022 for 3 scenarios

Reference scenario — Third dose

80% mask use

Figure 21.3. Daily COVID-19 hospital census until May 01, 2022 for 3 scenarios

Reference scenario — Third dose
80% mask use
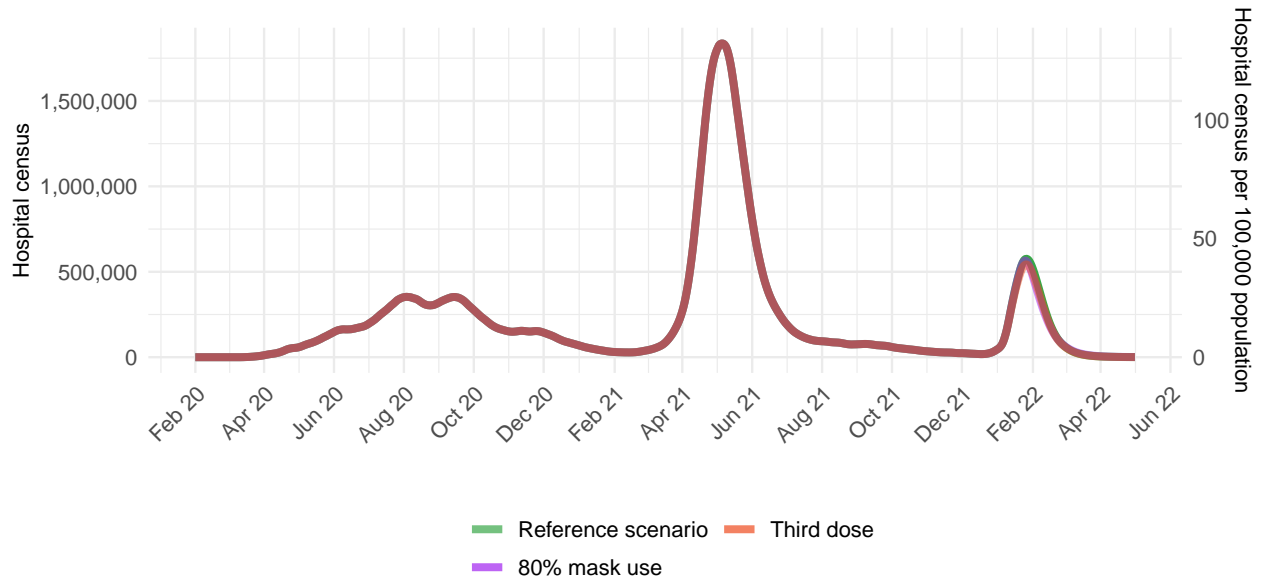
Figure 21.4 Reported daily COVID-19 deaths per 100,000

Reference scenario — Third dose
80% mask use
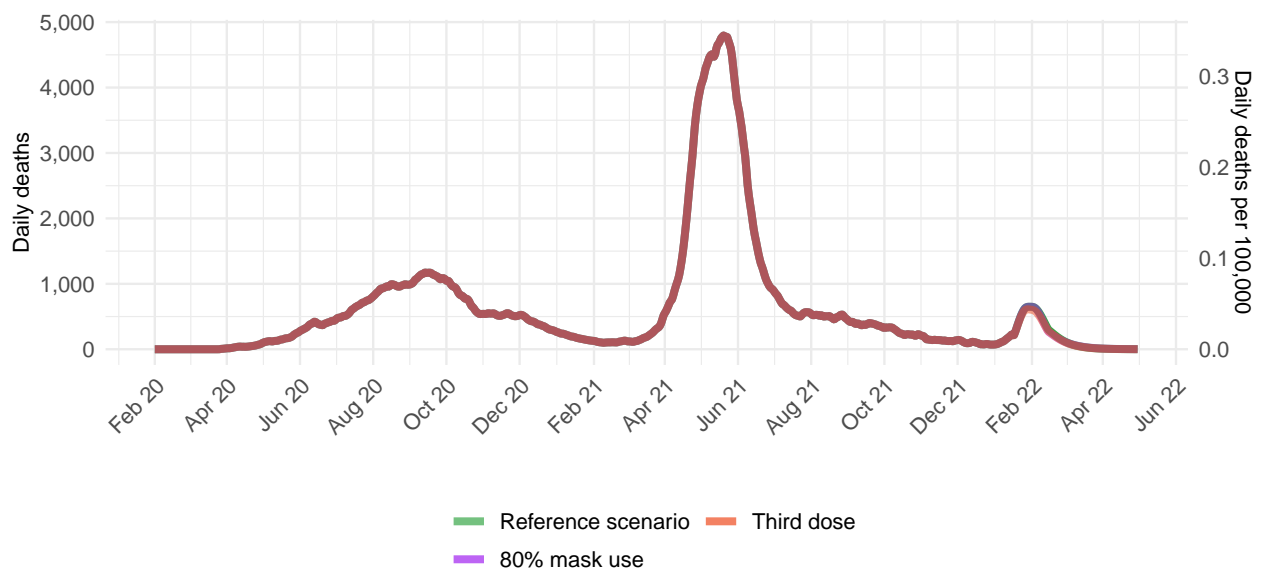
Figure 21.5 Total daily COVID-19 deaths per 100,000

Legend:
- Reference scenario
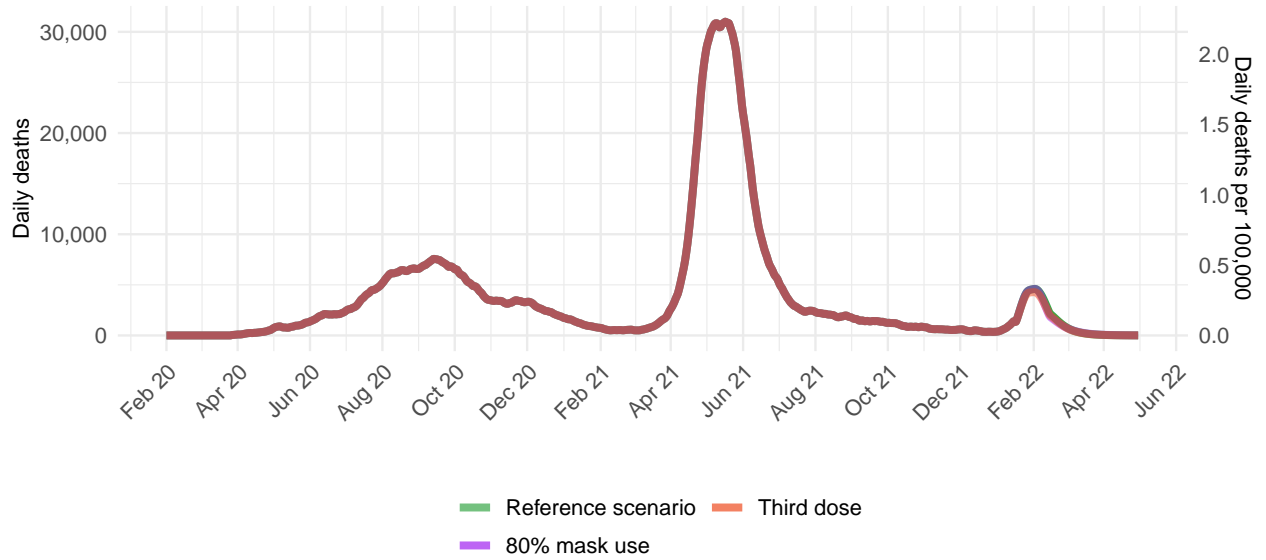- Third dose
- 80% mask use

Figure 22.1. 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) [January 21, 2022], Imperial College London (Imperial) [January 2, 2022], the SI-KJalpha model from the University of Southern California (SIKJalpha) [January 20, 2022]. Daily deaths from other modeling groups are smoothed to remove inconsistencies with rounding. Regional values are aggregates from available locations in that region.
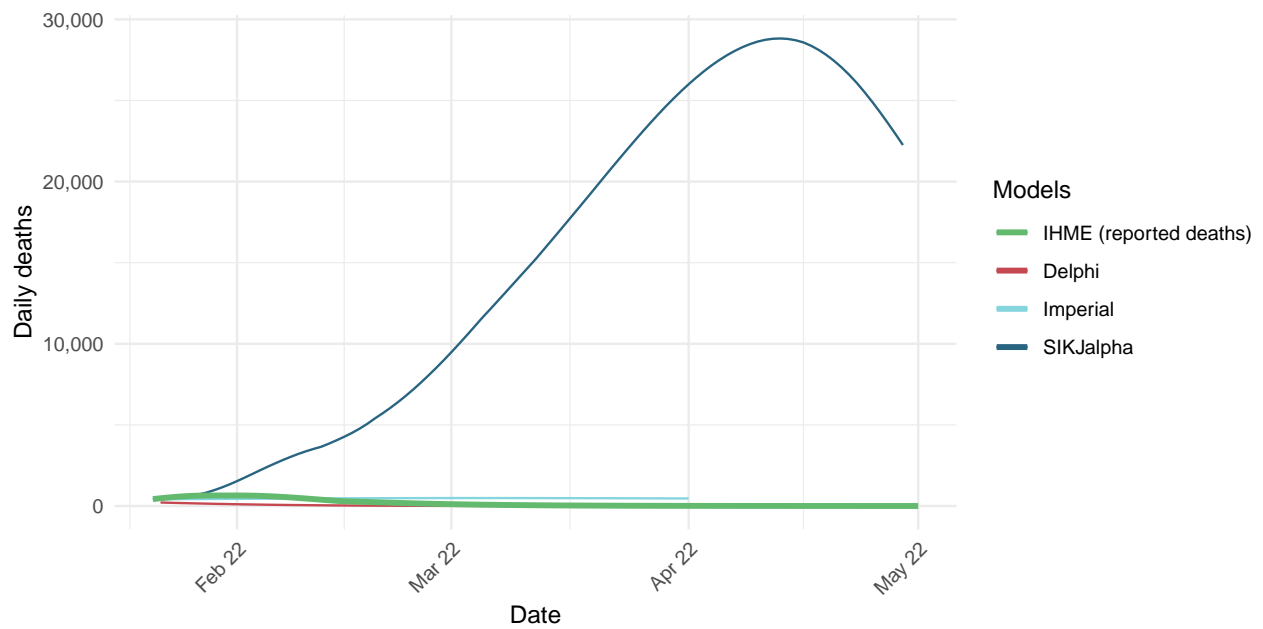
More information

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.