COVID-19 Results Briefing

Global

March 19, 2022

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

The present status of the epidemic can be divided into four zones. In most countries, transmission continues to decline steadily. In select countries in Western Europe, but not all, a secondary wave of transmission is unfolding due to declines in mask use and social distancing combined with the replacement of BA.1 by BA.2. Experience in Denmark and the Netherlands suggests this secondary wave will be short-lived and the height of the secondary peak will depend on waning of immunity related to the timing of vaccination and recent infections. The third zone is countries where the first Omicron wave is still unfolding, including Vietnam and Cambodia. The fourth zone is the zero-COVID countries where Omicron in a relatively epidemiologically naive population transmits rapidly and, as we have seen in Hong Kong, can have a high death toll in unvaccinated elderly populations.

Global forecasts for the next months are dominated by what happens in China. Lockdown and repeated mass testing worked to break Omicron transmission in Beijing and other cities in February. Whether the current larger Omicron outbreaks can be managed this way in Shanghai, Shenzhen, and other cities should become clear in this week. However, even if these current examples of community transmission can be suppressed, the economic costs to China will be large if zero-COVID is to be maintained. Pfizer has authorized Paxlovid IP waivers for firms in China so that production of antivirals could provide a strategy to avoid the nearly 1 million deaths we expect with a full-scale Chinese Omicron outbreak. Our forecast of a peak epidemic in China in May is highly uncertain, as it depends critically on the Chinese government’s strategy for managing this complex situation.

While expanding vaccination coverage to those countries with insufficient supply, many of which are in sub-Saharan Africa, is a moral imperative, the impact on hospitalization and death in the coming months may be relatively small for three reasons. First, cumulative infection rates in these countries are high, in some settings over 90%; incremental immunity through vaccination will be beneficial but will be much less than vaccination in an immunologically naive population. Second, vaccine hesitancy is very high in sub-Saharan Africa. There is a gap between supply and demand, but this appears to be 30-40 percentage points of the population. Third, satisfying unmet demand for vaccination in some of these health systems, even when supplies are unconstrained due to health system constraints, may further reduce ultimate vaccination rates. Promoting vaccination is the right thing to do so that anyone who wants to be vaccinated can be vaccinated on moral grounds. However, it is equally or even more important to invest in expanding antiviral production and delivery of antivirals to all those at risk, such as the population in all countries over 70. International efforts to promote access and appropriate use of antivirals lags behind the policy attention on vaccination.
Appropriate use of antivirals may also be a more effective way to deal with the emergence of new variants. Given the experience with greatly reduced vaccine efficacy for Omicron as opposed to prior variants, the effectiveness of current vaccines against future new variants is unknown. It appears more likely that the antivirals will remain effective against new variants.

Current situation

- Estimated daily infections in the last week decreased to 9.3 million per day on average compared to 11.6 million the week before (Figure 1.1).
- Estimated daily hospital census in the last week (through March 14) decreased to 332,000 per day on average compared to 364,000 the week before.
- Daily reported cases in the last week increased to 1.8 million per day on average compared to 1.6 million the week before (Figure 2.1).
- Reported deaths due to COVID-19 in the last week decreased to 6,300 per day on average compared to 7,500 the week before (Figure 3.1).
- Total deaths due to COVID-19 in the last week decreased to 11,000 per day on average compared to 14,000 the week before (Figure 3.1). This makes COVID-19 the number three cause of death globally this week (Table 1). Estimated total daily deaths due to COVID-19 in the past week were 1.8 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 23 locations and 22 subnational locations (Figure 4.1).
- The daily rate of total deaths due to COVID-19 is greater than 4 per million in 39 locations and 49 subnational locations (Figure 4.2).
- We estimate that 57% of people globally have been infected at least once as of March 14 (Figure 6.1).
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 46 locations and 58 subnational locations (Figure 7.1).
- The infection-detection rate globally was close to 15% on March 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). Omicron remains dominant in all countries.

Trends in drivers of transmission

- Mobility last week was 11% higher than the pre-COVID-19 baseline (Figure 11.1). Mobility was lower than 30% of baseline in one location and one subnational location.
- As of March 14, in the COVID-19 Trends and Impact Survey, 51% of people self-report that they always wore a mask when leaving their home (Figure 13.1).
- There were 583 diagnostic tests per 100,000 people on March 14 (Figure 15.1).
As of March 14, 81 locations and 134 subnational locations have reached 70% or more of the population who have received at least one vaccine dose, and 57 locations and 101 subnational locations have reached 70% or more of the population who are fully vaccinated (Figure 17.1). 62% of people globally have received at least one vaccine dose, and 55% are fully vaccinated.

Globally, 64.7% 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 29% in Mongolia to 100% in United Arab Emirates (Figure 19.1).

In our current reference scenario, we expect that 4.9 billion people will be vaccinated with at least one dose by July 1 (Figure 20.1). We expect that 59% of the population will be fully vaccinated by July 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 decline until early April and then will rise to 12.6 million by May 22, 2022, driven by the timing of the Omicron surge in China (Figure 22.1).
- Daily estimated infections in the 80% mask use scenario will decline to mid-April and then increase to a peak in late May (Figure 22.1).
Daily estimated infections in the third dose scenario decline and rise to a peak in late May or early June (Figure 22.1).

Cases

- Daily estimated cases in the reference scenario will decline until mid-April and then rise to a peak of 10.5 million by May 31, 2022 (Figure 22.2).
- Daily estimated cases in the 80% mask use scenario will decline until mid-April and then will rise to 7.1 million by June 10, 2022 (Figure 22.2).
- Daily estimated cases in the third dose scenario will decline until mid-April and then will rise to 8.3 million by June 6, 2022 (Figure 22.2).

Deaths

- In our reference scenario, our model projects 7,397,000 cumulative reported deaths due to COVID-19 on July 1. This represents 794,000 additional deaths from March 14 to July 1. Daily reported COVID-19 deaths in the reference scenario will rise to 18,070 by June 20, 2022 (Figure 22.4).
- Under our reference scenario, our model projects 17,700,000 cumulative total deaths due to COVID-19 on July 1. This represents 954,000 additional deaths from March 14 to July 1 (Figure 22.5).
- In our 80% mask use scenario, our model projects 7,109,000 cumulative reported deaths due to COVID-19 on July 1. This represents 506,000 additional deaths from March 14 to July 1. Daily reported COVID-19 deaths in the 80% mask use scenario will rise to 11,490 by July 1, 2022 (Figure 22.4).
- In our third dose scenario, our model projects 7,227,000 cumulative reported deaths due to COVID-19 on July 1. This represents 626,000 additional deaths from March 14 to July 1. Daily reported COVID-19 deaths in the third dose scenario will rise to 14,350 by June 27, 2022 (Figure 22.4).
Model updates

We had previously developed a model in which deaths and the infection-fatality ratio, hospital admissions and the infection-hospitalization ratio, and cases and the infection-detection ratio were all passed into a single run of our ODE system to simultaneously fit past transmission intensity for a given location over time. We have seen improved stability when instead we first derive transmission intensity based on each of the three abovementioned pairs of daily reported epi statistics and estimated ratios in separate SEIR models and then average them.
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

<table>
<thead>
<tr>
<th>Cause name</th>
<th>Weekly deaths</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ischemic heart disease</td>
<td>175,727</td>
<td>1</td>
</tr>
<tr>
<td>Stroke</td>
<td>126,014</td>
<td>2</td>
</tr>
<tr>
<td>COVID-19</td>
<td>79,226</td>
<td>3</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>63,089</td>
<td>4</td>
</tr>
<tr>
<td>Lower respiratory infections</td>
<td>47,946</td>
<td>5</td>
</tr>
<tr>
<td>Tracheal, bronchus, and lung cancer</td>
<td>39,282</td>
<td>6</td>
</tr>
<tr>
<td>Neonatal disorders</td>
<td>36,201</td>
<td>7</td>
</tr>
<tr>
<td>Alzheimer’s disease and other dementias</td>
<td>31,217</td>
<td>8</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>29,830</td>
<td>9</td>
</tr>
<tr>
<td>Diarrheal diseases</td>
<td>29,509</td>
<td>10</td>
</tr>
</tbody>
</table>

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 March 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 March 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 March 14, 2022

Figure 7.1: Mean effective R on March 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 March 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 March 14, 2022. This is estimated as the ratio of COVID-19 deaths to estimated daily COVID-19 infections.
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 March 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 March 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 March 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.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Ancestral</th>
<th>Alpha</th>
<th>Beta</th>
<th>Gamma</th>
<th>Delta</th>
<th>Omicron</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Severe disease</td>
<td>Infection</td>
<td>Severe disease</td>
<td>Infection</td>
<td>Severe disease</td>
<td>Infection</td>
</tr>
<tr>
<td>AstraZeneca</td>
<td>94%</td>
<td>63%</td>
<td>94%</td>
<td>63%</td>
<td>94%</td>
<td>69%</td>
</tr>
<tr>
<td>CanSino</td>
<td>66%</td>
<td>62%</td>
<td>66%</td>
<td>62%</td>
<td>64%</td>
<td>61%</td>
</tr>
<tr>
<td>CoronaVac</td>
<td>50%</td>
<td>47%</td>
<td>50%</td>
<td>47%</td>
<td>49%</td>
<td>46%</td>
</tr>
<tr>
<td>Covaxin</td>
<td>78%</td>
<td>73%</td>
<td>78%</td>
<td>73%</td>
<td>76%</td>
<td>72%</td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td>86%</td>
<td>72%</td>
<td>86%</td>
<td>72%</td>
<td>76%</td>
<td>64%</td>
</tr>
<tr>
<td>Moderna</td>
<td>97%</td>
<td>92%</td>
<td>97%</td>
<td>92%</td>
<td>97%</td>
<td>91%</td>
</tr>
<tr>
<td>Novavax</td>
<td>89%</td>
<td>83%</td>
<td>89%</td>
<td>83%</td>
<td>86%</td>
<td>82%</td>
</tr>
<tr>
<td>Pfizer/BioNTech</td>
<td>95%</td>
<td>86%</td>
<td>95%</td>
<td>86%</td>
<td>95%</td>
<td>84%</td>
</tr>
<tr>
<td>Sinopharm</td>
<td>73%</td>
<td>68%</td>
<td>73%</td>
<td>68%</td>
<td>71%</td>
<td>67%</td>
</tr>
<tr>
<td>Sputnik-V</td>
<td>92%</td>
<td>86%</td>
<td>92%</td>
<td>86%</td>
<td>89%</td>
<td>85%</td>
</tr>
<tr>
<td>Other vaccines</td>
<td>75%</td>
<td>70%</td>
<td>75%</td>
<td>70%</td>
<td>73%</td>
<td>69%</td>
</tr>
<tr>
<td>Other vaccines (mRNA)</td>
<td>91%</td>
<td>86%</td>
<td>91%</td>
<td>86%</td>
<td>88%</td>
<td>85%</td>
</tr>
</tbody>
</table>
Percent of the population having received at least one dose (17.1) and fully vaccinated against SARS-CoV-2 (17.2) by March 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 July 01, 2022 for three scenarios

Figure 22.2: Daily COVID-19 reported cases until July 01, 2022 for three scenarios
Figure 22.3: Daily COVID-19 hospital census until July 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
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.