COVID-19 Results Briefing

Global

January 8, 2022

This document contains summary information on the latest projections from the IHME model on COVID-19 globally. The model was run on January 7, 2022, with data through January 3, 2022.

Omicron is likely to have spread to nearly all countries by now. Exponential increases in daily cases are now reported in Canada, in 44 US states, four states in Mexico, Panama, and many countries in South America. Because of a data hack to the Brazilian COVID-19 databases, up-to-date information is not available for Brazil, but most neighboring countries have surges. In Europe, exponential increases have been reported in most countries; so far only two states in Germany have these increases. Central Asia and some countries in Eastern Europe have not yet begun the increase in reported cases. In South Asia, exponential increases have begun in several states in India, but not yet in Nepal and Bangladesh. In Southeast Asia, only the Philippines has begun the rapid increase. So far, Japan and Korea have not started the rapid increase either. Most countries in sub-Saharan Africa are rapidly increasing, and some, such as South Africa, have peaked and are declining. Given the rapid spread and short period from introduction to exponential increases in reported cases, we expect nearly all countries will have an Omicron wave within the month of January.

Our analysis suggests that there will be unprecedented levels of infection, reaching over 80 million infections a day by mid-January. We expect 50% of the world will be infected in the next 8 weeks. Data, however, from South Africa, the United Kingdom, and the US suggest that Omicron is substantially less severe than Delta: the fraction with asymptomatic infection has likely increased from 40% to 80%–90%; the fraction of detected cases that end up requiring hospitalization is down by 50%; and among those hospitalized, the death rate is further reduced by 80%–90%. Taking all these together, the infection-fatality rate for Omicron compared to Delta is 98% lower. The larger fraction asymptomatic means that the massive surge in infections will lead to a smaller but still unprecedented increase in reported cases, reaching as high as 8 million cases per day late in January. Hospitalizations will increase, and in some this increase will lead to higher levels of hospitalization than in previous surges, including the Delta wave and the Northern Hemisphere winter surge last year. However, extremely high levels of infection in many communities means that as many as 50% of these hospitalizations will be incidental admissions, namely individuals admitted for other reasons who happen to test positive for COVID-19. Given much lower infection-fatality rates, despite the massive increase in infections, global deaths should increase slightly to a peak in early February and then decline.

Our alternative policy scenarios, including more rapid scale-up of boosters to all who have been previously vaccinated, increasing mask use to 80%, and vaccinating the partially hesitant, have a small impact on the trajectory over the next 4 months. The intervention with the largest impact is increasing mask use to 80%; this impact is greatest in those countries that have not yet started their Omicron surges. In previous waves, the control strategy has been to control infection and thus reduce hospitalization and death. Given that
there is little prospect of controlling infection once the surge has begun, strategies in those countries need to focus on reducing harm in the vulnerable and minimizing health system, school, and economic disruption. The number of people who will be admitted with COVID-19 to hospital is expected to increase substantially, but a substantial fraction of this increase is due to incidental COVID-19. But hospitals are likely to be under stress due to health care workers who have tested positive and need to quarantine. Given the massive numbers of infections in the community, testing and quarantining asymptomatic individuals may not be helpful. There appears to be no prospect for controlling transmission and considerable prospect for disruption of schools and essential services due to screening. Countries may need to consider revisions to their testing and quarantine strategies.

Considerable uncertainty remains about the future course of the Omicron wave. First, the infection-detection rate may decline even more than we have estimated if testing capacity in countries is overwhelmed. This would reduce the reported case rates below the peak of 8 million that have been forecasted per day. Second, hospital admission screening will substantially impact the reported COVID-19 admissions. If some hospitals run out of testing capacity and do not screen all admissions, then the incidental COVID-19 admission rate may also decline. Third, a critical factor in understanding the trajectory of Omicron is the fraction of infections that are asymptomatic. Increases or decreases in this fraction asymptomatic have an important impact on the trajectory and severity of the Omicron wave.

For individuals at risk of bad outcomes, particularly the unvaccinated and never infected, the strategies to reduce risk remain: vaccination, including a third dose where appropriate, high-quality mask use, and avoiding crowded indoor settings.
Current situation

- Daily infections in the last week increased to 47.3 million per day on average compared to 25.3 million the week before (Figure 1.1). Infections are now nearly four times higher than the Delta peak in April.

- Daily hospital census in the last week (through January 3) increased to 692,000 per day on average compared to 617,000 the week before.

- Daily reported cases in the last week increased to 1.6 million per day on average compared to 922,000 the week before (Figure 2.1).

- Reported deaths due to COVID-19 in the last week decreased to 6,600 per day on average compared to 7,000 the week before (Figure 3.1).

- Total deaths due to COVID-19 in the last week decreased to 11,100 per day on average compared to 11,400 the week before (Figure 3.1). This makes COVID-19 the number 3 cause of death globally this week (Table 1). Estimated total daily deaths due to COVID-19 in the past week were 1.7 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 countries and no subnational locations (Figure 4.1).

- The daily rate of reported deaths due to COVID-19 is greater than 4 per million in 48 countries and no subnational locations (Figure 4.2).

- We estimate that 44% of people globally have been infected at least once as of January 3 (Figure 6.1).

- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 153 countries and 214 subnational locations (Figure 7.1).

- The infection-detection rate globally was close to 12% on January 3 (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 by now is dominant in nearly all countries.

Trends in drivers of transmission

- Mobility last week was 9% higher than the pre-COVID-19 baseline (Figure 11.1). Mobility was lower than 30% of baseline in two countries and no subnational locations.

- As of January 3, in the COVID-19 Trends and Impact Survey, 55% of people self-report that they always wore a mask when leaving their home (Figure 13.1).

- There were 184 diagnostic tests per 100,000 people on January 3 (Figure 15.1).

- The fraction of the population vaccinated with at least one dose is over 50% in many countries in the Americas, Europe, and Asia. Vaccination rates below 50% are seen in some parts of Eastern Europe and Central Asia and most countries in Africa.
• 62.9% of the global 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 2.2 percentage points from last week. The proportion of the population who are open to receiving a COVID-19 vaccine ranges from 31% in Namibia to 100% in Malaysia and Brunei (Figure 19.1).

Projections

Infections

• Daily estimated infections in the reference scenario, which represents what we think is most likely to happen, will rise to 81.1 million infections by mid-January (Figure 21.1).

• Daily estimated infections in the high severity of Omicron scenario will rise to 81.2 million by mid-January (Figure 21.1).

• Daily estimated infections in the 80% mask coverage scenario will rise to 69.5 million by January 8, 2022 (Figure 21.1).

• Daily estimated infections in the third dose scenario will rise to 78.6 million infections by January 12, 2022 (Figure 21.1).

• Daily estimated infections in the reduced vaccine hesitancy scenario will rise to 78.5 million by January 13, 2022 (Figure 21.1).

Cases

• Daily cases in the reference scenario will rise to 5.6 million by January 23, 2022 (Figure 21.2).

• Daily cases in the high severity of Omicron scenario will rise to 5.6 million by January 23, 2022 (Figure 21.2).

• Daily cases in the 80% mask coverage scenario will rise to 4.9 million by January 19, 2022 (Figure 21.2).

• Daily cases in the third dose scenario will rise to 5.4 million by January 23, 2022 (Figure 21.2).

• Daily cases in the reduced vaccine hesitancy scenario will rise to 5.4 million by January 23, 2022 (Figure 21.2).

Hospitalizations

• Daily hospital census in the reference scenario will rise to 2.1 million by February 1, 2022 (Figure 21.3).

• Daily hospital census in the high severity of Omicron scenario will rise to 3.9 million by February 3, 2022 (Figure 21.3).
Daily hospital census in the 80% mask coverage scenario will rise to 1.8 million by January 29, 2022 (Figure 21.3).

Daily hospital census in the third dose scenario will rise to 2.0 million by February 1, 2022 (Figure 21.3).

Daily hospital census in the reduced vaccine hesitancy scenario will rise to 2.0 million by February 1, 2022 (Figure 21.3).

Deaths

In our reference scenario, our model projects 6,388,000 cumulative reported deaths due to COVID-19 on May 1. This represents 447,000 additional deaths from January 3 to May 1. Daily reported COVID-19 deaths in the reference scenario will rise to 7,860 by January 31, 2022, and then decline (Figure 21.4).

Under our reference scenario, our model projects 13,582,000 cumulative total deaths due to COVID-19 on May 1. This represents 933,000 additional deaths from January 3 to May 1 (Figure 24.2).

In our high severity of Omicron scenario, our model projects 6,536,000 cumulative reported deaths due to COVID-19 on May 1. This represents 595,000 additional deaths from January 3 to May 1. Daily reported COVID-19 deaths in the high severity of Omicron scenario will rise to 9,990 by February 3, 2022 (Figure 21.4).

In our 80% mask coverage scenario, our model projects 6,342,000 cumulative reported deaths due to COVID-19 on May 1. This represents 401,000 additional deaths from January 3 to May 1. Daily reported COVID-19 deaths in the 80% mask coverage scenario will rise to 7,780 by January 28, 2022 (Figure 21.4).

In our third dose scenario, our model projects 6,335,000 cumulative reported deaths due to COVID-19 on May 1. This represents 402,000 additional deaths from January 3 to May 1. Daily reported COVID-19 deaths in the third dose scenario will rise to 7,330 by January 29, 2022 (Figure 21.4).

In our reduced vaccine hesitancy scenario, our model projects 6,334,000 cumulative reported deaths due to COVID-19 on May 1. This represents 401,000 additional deaths from January 3 to May 1. Daily reported COVID-19 deaths in the reduced vaccine hesitancy scenario will rise to 7,250 by January 29, 2022 (Figure 21.4).

At some point from January through May 1, 37 countries will have high or extreme stress on hospital beds (Figure 23.1). At some point from January through May 1, 49 countries will have high or extreme stress on intensive care unit (ICU) capacity (Figure 24.1).
Model updates

In this week’s update, we have made changes to key Omicron parameters based on data from South Africa, the United Kingdom, and the US. First, based on an analysis of the UK Office of National Statistics prevalence of infection surveys, we have revised the range of asymptomatic infection from 90% to 80%-90%. Second, the degree of transmissibility of Omicron compared to ancestral variants was increased from 1.5-2.5 to 2-3. This adjustment was based on matching the scale-up curves for Omicron from the analysis of the GISAID database. Third, the infection-hospitalization rate for Omicron relative to Delta has been increased from a mean of 0.07 to a mean of 0.125 (range 0.0625-0.1875) based on data from the UK, US, and South Africa. Fourth, the infection-hospitalization rate has been decreased from a mean of 0.02 to 0.01875 (range 0.009375-0.028125) based on published studies of the hospital-fatality rate, the case-hospitalization rate, and the fraction asymptomatic. Fifth, based on the timing of Omicron surges, we have adjusted the date of Omicron arrival for a number of countries to match the timing of increases in reported cases, taking into account the lag from introduction to the exponential rise in reported cases. Sixth, in the high-severity scenario, we have used IFR and IHR values that are double the ranges used in the reference scenario.
**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>77,808</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 January 3, 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 3, 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 3, 2022

Figure 7.1. Mean effective R on December 23, 2021. 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 3, 2022

Figure 9.1 Estimated percent of new infections that are Alpha variant

![Alpha variant map]

Figure 9.2 Estimated percent of new infections that are Beta variant

![Beta variant map]
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 January 3, 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 January 3, 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 3, 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 3, 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](https://covid19.healthdata.org).

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Ancstral</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 January 3, 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.

![Graph showing trend in vaccine acceptance](chart18.png)

**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.

![Map showing estimated vaccine acceptance](chart19.png)
Projections and scenarios

We produce five 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 high severity of Omicron scenario modifies the reference scenario assumption in two ways:

- The infection-hospitalization ratio for Omicron is 2.3 times as high as compared to the reference scenario.
- The infection-fatality rate is 4.6 times as high as compared to the reference scenario.

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.

The reduced vaccine hesitancy scenario assumes that those in each location who respond on surveys that they probably will not receive a vaccine are persuaded or mandated to receive a vaccine.
Figure 21.1. Daily COVID-19 infections until May 01, 2022 for five scenarios

Figure 21.2. Daily COVID-19 reported cases until May 01, 2022 for five scenarios
**Figure 21.3.** Daily COVID-19 hospital census until May 01, 2022 for five scenarios

**Figure 21.4** Reported daily COVID-19 deaths per 100,000
Figure 21.5 Total daily COVID-19 deaths per 100,000

- Reference scenario
- High severity of Omicron
- Third dose
- 80% mask use
- Reduced vaccine hesitancy
**Figure 23.1.** 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 24.1. 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.