COVID-19 Results Briefing

Global

November 3, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 globally. The model was run on November 2, 2021, with data through November 1, 2021.

Daily cases and deaths that had been declining since mid-September are increasing slightly. These global trends mask a clearer reversal underway in many parts of Europe and North America where declining Delta surges have reversed or stagnated. Transmission has stopped declining and is flat in many regions of the world. Trends appear to be driven by possibly three factors converging: winter seasonality in the Northern Hemisphere, declining protective behaviors such as mask use or avoiding close contact, and waning vaccine-derived immunity in locations that began vaccinating more than six months ago. Our reference forecasts suggest that at the global level, daily infections and reported cases will peak in early to mid-January. More importantly, the magnitude of the peak should be much smaller than the previous waves of COVID-19. Our reference forecast does not, however, explicitly take into account the evidence on waning vaccine-derived immunity. By six months after the second dose, protection against infection is likely markedly reduced. In the Northern Hemisphere, particularly North America and Western Europe, this suggests that waning immunity may coincide with winter seasonality, leading to more infection than estimated here. This pattern may be counteracted by use of boosters and the extension of vaccination to children ages 5-11. The three biggest uncertainties for the trajectory of the next few months are: 1) how quickly does immunity acquired through previous infection wane; 2) what happens to vaccine-derived immunity for hospitalization and death after six months; and 3) will new variants with increased transmissibility or considerable immune escape emerge? For planners, given many trajectories are credible, efforts should focus on preparing health systems in the Northern Hemisphere for the likely double impact of flu and COVID-19; in high-resource settings, continued expansion of vaccine coverage and the use of boosters in at-risk populations; expanded vaccine donations to increase vaccine coverage in Africa and other supply-constrained locations; promotion of seasonal mask use or mask use where transmission is increasing.

Current situation

- Estimated daily infections in the last week increased slightly to 3,064,000 per day on average compared to 3,044,000 the week before (Figure 1.1).
- Estimated daily hospital census in the last week (through November 1) stayed essentially the same at 561,000 per day on average compared to 558,000 the week before.
- Daily reported cases in the last week increased to 435,400 per day on average compared to 421,500 the week before (Figure 2.1).
Reported deaths due to COVID-19 in the last week increased to 7,600 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 slightly to 13,400 per day on average compared to 13,500 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 1.8 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 28 countries (Figure 4.1). Nearly all of these locations are in North America or Europe.

The daily rate of total deaths due to COVID-19 is greater than 4 per million in 49 countries (Figure 4.2).

We estimate that 40% of people globally have been infected as of November 1 (Figure 6.1).

Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 204 locations (Figure 7.1). Transmission is increasing in many regions of the world including in parts of the Southern Hemisphere.

The infection-detection rate globally was close to 15% on November 1 (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 (Figure 9). The Delta variant remains dominant in nearly all countries of the world.

Trends in drivers of transmission

Mobility last week was 1% higher than the pre-COVID-19 baseline (Figure 11.1). Mobility was near baseline (within 10%) in 139 locations. Mobility was lower than 30% of baseline in Laos, Latvia, Myanmar, Sri Lanka, and Vietnam.

As of November 1, 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 152 diagnostic tests per 100,000 people on November 1 (Figure 15.1).

As of November 1, 49 locations have reached 70% or more of the population who have received at least one vaccine dose, and 27 locations have reached 70% or more of the population who are fully vaccinated (Figure 17.1). The lowest levels of first-dose vaccine coverage are seen in Africa and Eastern Europe and Central Asia.

Globally, 75.4% 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 31% in Botswana to 100% in United Arab Emirates (Figure 19.1).
In our current reference scenario, we expect that 4.5 billion people will be vaccinated with at least one dose by March 1 (Figure 20.1). We expect that 52% of the population will be fully vaccinated by March 1.

Based on the estimate of the population that have been infected with COVID-19 and vaccinated to date, combined with assumptions on protection against infection with the Delta variant provided by either natural infection, vaccination, or both, we estimate that 46% of the region is immune to the Delta variant. In our current reference scenario, we expect that by March 1, 54% of people will be immune to the Delta variant (Figure 21.1). These two calculations do not take into account waning of natural or vaccine-derived immunity.

Projections

- In our reference scenario, which represents what we think is most likely to happen, our model projects 6,293,000 cumulative reported deaths due to COVID-19 on March 1. This represents 875,000 additional deaths from November 1 to March 1. Daily reported deaths will rise to over 8,250 by mid-November and then decline slowly, remaining over 6,000 per day through March 1 (Figure 22.1).

- Under our reference scenario, our model projects 13,788,000 cumulative total deaths due to COVID-19 on March 1. This represents 1,869,000 additional deaths from November 1 to March 1 (Figure 22.1).

- If universal mask coverage (95%) were attained in the next week, our model projects 372,000 fewer cumulative reported deaths compared to the reference scenario on March 1.

- Under our worse scenario, our model projects 7,319,000 cumulative reported deaths on March 1, an additional 1,026,000 deaths compared to our reference scenario. Daily reported deaths in the worse scenario will rise to 25,610 by January 20, 2022 (Figure 22.1).

- Daily infections in the reference scenario will rise to 3.6 million by January 1, 2022, and then slowly decline (Figure 22.3). Daily infections in the worse scenario will rise to 10.9 million by December 31, 2021 (Figure 22.3).

- Daily cases in the reference scenario will rise to 625,000 by mid-January (Figure 22.4). Daily cases in the worse scenario will rise to 2.3 million by early January (Figure 22.4).

- Daily hospital census in the reference scenario will rise to 578,400 by November 15, 2021 (Figure 22.5). Daily hospital census in the worse scenario will rise to 2,076,030 by January 17, 2022 (Figure 22.5).
Model updates
No model updates.
Figure 1.1. Daily COVID-19 hospital census and infections

![Graph showing daily hospital census and infections from January 20 to November 2021.]

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

![Graph showing reported daily COVID-19 cases from February 2020 to December 2021.]

covid19.healthdata.org Institute for Health Metrics and Evaluation
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>93,997</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 November 1, 2021

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 November 1, 2021

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 November 1, 2021

**Figure 7.1.** Mean effective R on October 21, 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 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 November 1, 2021

**Figure 9.1 Estimated percent Alpha variant**

**Figure 9.2 Estimated percent Beta variant**
Figure 9.3 Estimated percent Delta variant

Figure 9.4 Estimated percent Gamma variant
Figure 10.1. Infection-fatality rate on November 1, 2021. This is estimated as the ratio of COVID-19 deaths to estimated daily COVID-19 infections.
Critical drivers

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 November 1, 2021.
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 November 1, 2021
**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 November 1, 2021
Table 3. Estimates of vaccine efficacy for specific vaccines used in the model at preventing disease and infection. The SEIR model uses variant-specific estimates of vaccine efficacy at preventing symptomatic disease and at preventing 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>Efficacy at preventing disease: ancestral and Alpha</th>
<th>Efficacy at preventing infection: ancestral and Alpha</th>
<th>Efficacy at preventing disease: Beta, Delta, &amp; Gamma</th>
<th>Efficacy at preventing infection: Beta, Delta, &amp; Gamma</th>
</tr>
</thead>
<tbody>
<tr>
<td>AstraZeneca</td>
<td>90%</td>
<td>52%</td>
<td>85%</td>
<td>49%</td>
</tr>
<tr>
<td>CoronaVac</td>
<td>50%</td>
<td>44%</td>
<td>43%</td>
<td>38%</td>
</tr>
<tr>
<td>Covaxin</td>
<td>78%</td>
<td>69%</td>
<td>68%</td>
<td>60%</td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td>86%</td>
<td>72%</td>
<td>60%</td>
<td>56%</td>
</tr>
<tr>
<td>Moderna</td>
<td>94%</td>
<td>89%</td>
<td>94%</td>
<td>80%</td>
</tr>
<tr>
<td>Novavax</td>
<td>89%</td>
<td>79%</td>
<td>79%</td>
<td>69%</td>
</tr>
<tr>
<td>Pfizer/BioNTech</td>
<td>94%</td>
<td>86%</td>
<td>85%</td>
<td>78%</td>
</tr>
<tr>
<td>Sinopharm</td>
<td>73%</td>
<td>65%</td>
<td>63%</td>
<td>56%</td>
</tr>
<tr>
<td>Sputnik-V</td>
<td>92%</td>
<td>81%</td>
<td>80%</td>
<td>70%</td>
</tr>
<tr>
<td>Tianjin</td>
<td>66%</td>
<td>58%</td>
<td>57%</td>
<td>50%</td>
</tr>
<tr>
<td>CanSino</td>
<td>75%</td>
<td>66%</td>
<td>65%</td>
<td>57%</td>
</tr>
<tr>
<td>Other vaccines</td>
<td>91%</td>
<td>86%</td>
<td>85%</td>
<td>78%</td>
</tr>
<tr>
<td>Other vaccines (mRNA)</td>
<td>75%</td>
<td>66%</td>
<td>65%</td>
<td>57%</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 November 1, 2021

**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 over time](image)

**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 vaccine acceptance by country](image)
**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.** Percentage of people who are immune to non-escape variants and the percentage of people who are immune to escape variants
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 7 days.
- Mobility increases as vaccine coverage increases.
- Governments adapt their response by re-imposing social distancing mandates for 6 weeks whenever daily deaths reach 8 per million, unless a location has already spent at least 7 of the last 14 days with daily deaths above this rate, and not yet re-imposed social distancing mandates. In this case, the reference scenario assumes that mandates are re-imposed when daily deaths reach 15 per million.
- Variants Alpha, Beta, Gamma, and Delta continue to spread regionally and globally from locations with sufficient transmission.

The **worse scenario** modifies the reference scenario assumption in four ways:

- 100% of vaccinated individuals stop using masks.
- Mobility increases in all locations to 25% above the pre-pandemic winter baseline, irrespective of vaccine coverage.
- Governments are more reluctant to re-impose social distancing mandates, waiting until the daily death rate reaches 15 per million, unless a location has already spent at least 7 of the last 14 days with daily deaths above this rate, and not yet re-imposed social distancing mandates. In this case, the reference scenario assumes that mandates are re-imposed when daily deaths reach 38 per million. In either case, we assume social distancing mandates remain in effect for 6 weeks.
- Variants Alpha, Beta, Gamma, and Delta spread between locations twice as fast when compared with our reference scenario.

The **universal masks scenario** makes all the same assumptions as the reference scenario but assumes all locations reach 95% mask use within 7 days.
Daily COVID-19 deaths until March 01, 2022 for three scenarios

Figure 22.1 Reported daily COVID-19 deaths per 100,000

Figure 22.2 Total daily COVID-19 deaths per 100,000
Figure 22.3. Daily COVID-19 infections until March 01, 2022 for three scenarios

Figure 22.4. Daily COVID-19 reported cases until March 01, 2022 for three scenarios
Figure 22.5. Daily COVID-19 hospital census until March 01, 2022 for three scenarios
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.