COVID-19 Results Briefing

Global

July 14, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 globally. The model was run on July 13, 2021, with data through July 12, 2021.

The global epidemic is driven largely by the spread of the Delta variant. Major surges in countries that previously had managed the epidemic with comparatively low rates of transmission in Southeast Asia now have major surges including Indonesia, Malaysia, Thailand, Cambodia, and Vietnam. The Delta variant is driving surges in many, but not all, countries in sub-Saharan Africa including Malawi, Mozambique, Zimbabwe, Nigeria, and Senegal and smaller surges in many other countries. Some of these surges have peaked already such as in Uganda, Zambia, and Rwanda. In Europe, some countries have major surges including the United Kingdom, Spain, Greece, Cyprus, and the Netherlands, while others have only small increases or continued declines. In Mexico and the US, most states are increasing. In the US, the increases are related to the Delta variant combined with nearly complete removal of social distancing mandates and crashing mask use. Sequence data are sparse for Mexico, but it is likely that the Delta variant is driving the increases there as well. Although the death toll is still high in much of South America, transmission has largely turned and is declining. In South Asia, Bangladesh continues to have a huge surge while Pakistan is beginning to increase. Indian reported cases are staying steady, although late reporting of deaths in some states is clouding the analysis of trends. Where and when the Delta variant will cause surges and how large the surges will be is a function of how the fraction of the population previously infected with COVID-19, the rate of vaccination (particularly with the more effective mRNA vaccines), and the behavioral response to surges (including mask wearing and avoiding high-risk social interactions). By November 1, we forecast 41% of the world’s population will have received at least one dose of vaccine. Given the efficacy of the various vaccines, and dropout between first and second doses, we expect 30% of the global population to have functional vaccine-derived immunity.

From a low of nearly 4.5 million global infections in early June, we are back to 6 million infections. In the worse scenario, global infections remain largely around 6 million a day through to November 1. In the reference scenario, they decline to 3 million by October and then begin increasing again. COVID-19 is not over. We expect very substantial mortality in the months ahead. Given strong seasonality, it is likely that infections, cases, hospitalizations, and deaths will increase more in the winter. Strategies to manage the global pandemic need to focus on delivering as much effective vaccine to those most in need around the world. It will also require use of mask mandates and social distancing mandates in settings where there are rapid increases in severe cases and deaths.

Current situation

- Daily reported cases in the last week (through July 12) increased to 429,300 per day on average compared to 391,000 the week before (Figure 1).
• Reported deaths due to COVID-19 in the last week decreased to 7,300 per day on average compared to 7,500 the week before (Figure 2).

• Excess deaths due to COVID-19 in the last week increased to 19,100 per day on average compared to 18,500 the week before (Figure 2). This makes COVID-19 the number 2 cause of death globally this week (Table 1). Estimated excess daily deaths due to COVID-19 were 2.1 times larger than the reported number of deaths.

• The daily reported COVID-19 death rate is greater than 4 per million in 13 countries (Figure 3). These countries came from two regions: South America and Southern Africa and two countries: Tunisia and the Russian Federation.

• The daily rate of excess death due to COVID-19 is greater than 4 per million in 37 countries (Figure 3).

• We estimated that 31% of people globally have been infected as of July 12 (Figure 5).

• Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 96 countries (Figure 6). Notable areas of increasing transmission include much of Mexico and the US, the majority of countries in Africa, much of Europe, Southeast Asia, and Australia. Notably transmission is beginning to decline in most of South America.

• The infection-detection rate globally was close to 8% on July 12 (Figure 7).

• Based on the GISAID and various national databases, combined with our variant spread model, we estimate the current prevalence of variants of concern (Figure 8). We estimate that B.1.351 is circulating in 45 countries, that B.1.617 is circulating in 101 countries, and that P.1 is circulating in 25 countries.

Trends in drivers of transmission

• Mobility last week was 15% lower than the pre-COVID-19 baseline (Figure 10). Mobility was near baseline (within 10%) in 120 countries. Mobility was lower than 30% of baseline in 17 countries.

• As of July 12, in the COVID-19 Trends and Impact Survey, 60% of people self-report that they always wore a mask when leaving their home compared to 60% last week (Figure 12).

• There were 134 diagnostic tests per 100,000 people on July 12 (Figure 14).

• Globally, 71.8% of people say they would accept or would probably accept a vaccine for COVID-19. The fraction of the adult population who are open to receiving a COVID-19 vaccine ranges from 25% in Mali to over 95% in United Arab Emirates (Figure 18).

• In our current reference scenario, we expect that 3.2 billion people will be vaccinated with at least one dose by November 1 (Figure 19). Of the global adult population, we expect more than 40% will have functional vaccine-derived immunity by November 1.
Projections

• In our reference scenario, which represents what we think is most likely to happen, our model projects 4,765,000 cumulative reported deaths due to COVID-19 on November 1. This represents 703,000 additional deaths from July 12 to November 1. Daily reported deaths will rise to nearly 9,000 in mid-August and then decline until November 1 (Figure 20).

• Under our reference scenario, our model projects 10,438,000 cumulative excess deaths due to COVID-19 on November 1.

• If universal mask coverage (95%) were attained in the next week, our model projects 207,000 fewer cumulative reported deaths compared to the reference scenario on November 1.

• Under our worse scenario, our model projects 5,071,000 cumulative reported deaths on November 1, an additional 306,000 deaths compared to our reference scenario. Daily reported deaths in the worse scenario will rise to 10,320 by late August and then decline slowly beginning in October (Figure 20).

• By November 1, we project that 347,500 lives will be saved by the projected vaccine rollout. This does not includes lives saved through vaccination that has already been delivered.

• Daily infections in the reference scenario will rise to 6.0 million by late July (Figure 25). Daily infections in the worse scenario will rise to 6.9 million by the beginning of August and then remain above 6 million through until November 1 (Figure 25).

Model updates

No model updates.
Projections

Figure 1. Reported daily COVID-19 cases

Table 1. Ranking of excess 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>COVID-19</td>
<td>133,981</td>
<td>2</td>
</tr>
<tr>
<td>Stroke</td>
<td>126,014</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 2. Smoothed trend estimate of reported daily COVID-19 deaths (blue) and excess daily deaths due to COVID-19 (orange).
Figure 3. Daily COVID-19 death rate per 1 million on July 12, 2021

A. Daily reported COVID-19 death rate per 1 million

B. Daily excess COVID-19 death rate per 1 million

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Figure 4. Cumulative COVID-19 deaths per 100,000 on July 12, 2021

A. Reported cumulative COVID-19 deaths per 100,000

B. Excess cumulative COVID-19 deaths per 100,000
Figure 5. Estimated percent of the population infected with COVID-19 on July 12, 2021

Figure 6. Mean effective R on July 1, 2021. 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. Effective R less than 1 means that transmission should decline, all other things being held the same.
Figure 7. 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.
Figure 8. Estimated percent of circulating SARS-CoV-2 for primary variant families on July 12, 2021.

A. Estimated percent B.1.1.7 variant

B. Estimated percent B.1.351 variant
C. Estimated percent B.1.617 variant

D. Estimated percent P.1 variant
Figure 9. Infection-fatality ratio on July 12, 2021
Critical drivers

Figure 10. Trend in mobility as measured through smartphone app use compared to January 2020 baseline

Figure 11. Mobility level as measured through smartphone app use compared to January 2020 baseline (percent) on July 12, 2021
Figure 12. Trend in the proportion of the population reporting always wearing a mask when leaving home.

Figure 13. Proportion of the population reporting always wearing a mask when leaving home on July 12, 2021.
**Figure 14.** Trend in COVID-19 diagnostic tests per 100,000 people

**Figure 15.** COVID-19 diagnostic tests per 100,000 people on July 12, 2021
Figure 16. Increase in the risk of death due to pneumonia on February 1 compared to August 1
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: D614G &amp; B.1.1.7</th>
<th>Efficacy at preventing infection: D614G &amp; B.1.1.7</th>
<th>Efficacy at preventing disease: B.1.351, B.1.617, &amp; P.1</th>
<th>Efficacy at preventing infection: B.1.351, B.1.617, &amp; P.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>AstraZeneca</td>
<td>74%</td>
<td>52%</td>
<td>53%</td>
<td>47%</td>
</tr>
<tr>
<td>CoronaVac</td>
<td>50%</td>
<td>44%</td>
<td>40%</td>
<td>35%</td>
</tr>
<tr>
<td>Covaxin</td>
<td>78%</td>
<td>69%</td>
<td>62%</td>
<td>55%</td>
</tr>
<tr>
<td>Janssen</td>
<td>72%</td>
<td>72%</td>
<td>64%</td>
<td>56%</td>
</tr>
<tr>
<td>Moderna</td>
<td>94%</td>
<td>89%</td>
<td>83%</td>
<td>79%</td>
</tr>
<tr>
<td>Novavax</td>
<td>89%</td>
<td>79%</td>
<td>73%</td>
<td>64%</td>
</tr>
<tr>
<td>Pfizer/BioNTech</td>
<td>91%</td>
<td>86%</td>
<td>81%</td>
<td>77%</td>
</tr>
<tr>
<td>Sinopharm</td>
<td>73%</td>
<td>65%</td>
<td>47%</td>
<td>41%</td>
</tr>
<tr>
<td>Sputnik-V</td>
<td>92%</td>
<td>81%</td>
<td>73%</td>
<td>65%</td>
</tr>
<tr>
<td>Tianjin</td>
<td>66%</td>
<td>58%</td>
<td>53%</td>
<td>47%</td>
</tr>
<tr>
<td>CanSino</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other vaccines</td>
<td>75%</td>
<td>66%</td>
<td>60%</td>
<td>53%</td>
</tr>
<tr>
<td>Other vaccines (mRNA)</td>
<td></td>
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</tbody>
</table>
Figure 17. Trend in the estimated proportion of the adult (18+) population that have been vaccinated or would probably or definitely receive the COVID-19 vaccine if available.

Figure 18. This figure shows the estimated proportion of the adult (18+) population that has been vaccinated or would probably or definitely receive the COVID-19 vaccine if available.
Figure 19. Number of people who receive any vaccine and those who are effectively vaccinated and protected against disease, accounting for efficacy, loss to follow up for two-dose vaccines, partial immunity after one dose, and immunity after two doses.
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.
- 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 scenario assumes that mandates are re-imposed when daily deaths reach 15 per million.
- Variants B.1.1.7 (first identified in the UK), B.1.351 (first identified in South Africa), and P1 (first identified in Brazil) continue to spread from locations with (a) more than 5 sequenced variants, and (b) reports of community transmission, to adjacent locations following the speed of variant scale-up observed in the regions of the United Kingdom.
- In one-quarter of those vaccinated, mobility increases toward pre-COVID-19 levels.

The worse scenario modifies the reference scenario assumptions in three ways:

- First, it assumes that variants B.1.351 or P.1 begin to spread within three weeks in adjacent locations that do not already have B.1.351 or P.1 community transmission.
- Second, it assumes that all those vaccinated increase their mobility toward pre-COVID-19 levels.
- Third, it assumes that among those vaccinated, mask use starts to decline exponentially one month after completed vaccination.

The universal masks scenario makes all the same assumptions as the reference scenario but also assumes 95% of the population wear masks in public in every location.
**Figure 20.** Daily COVID-19 deaths until November 01, 2021 for three scenarios

**A. Reported daily COVID-19 death per 100,000**

**B. Excess daily COVID-19 deaths per 100,000**
Figure 21. Daily COVID-19 infections until November 01, 2021 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.