COVID-19 Results Briefing

Global

May 5, 2022

This document contains summary information on the latest projections from the IHME model on COVID-19 globally. The model was run on May 5, 2022, with data through May 3, 2022.

At the global level, COVID deaths are at the lowest level since April 2020. The global trend is dominated by events in East Asia. Taiwan is undergoing a huge Omicron surge. China continues to pursue a zero-COVID strategy through multiple strict lockdowns with marked reductions in mobility throughout most of the country. Secondary Omicron waves in many parts of Europe and Canada have largely peaked or are peaking. Some US states are entering a period of rising transmission most likely linked to behavioral relaxation. South Africa has an increase in transmission associated with the BA.4 and BA.5 subvariants and perhaps waning immunity.

Our reference scenario suggests that transmission should peak and decline in May, with China continuing to hold off widespread transmission through aggressive lockdowns. If China were to stop the strict lockdowns, the explosive epidemic underway in Taiwan is indicative of what we believe would happen in China. The question in China is the trade-off between the economic consequences of strict lockdowns versus avoiding a widespread Omicron wave, especially given comparatively low vaccination rates in the population over 80. China does not appear to be deploying more effective vaccines or scaling up Paxlovid production and access, leaving few options other than strict lockdowns for the moment.

Our comparatively optimistic outlook for the next four months in the reference scenario factors in waning vaccine-derived and infection-acquired immunity. But it does not take into account the possibility that the BA.4 and BA.5 subvariants in South Africa have a major reduction in cross-variant immunity with BA.1 and BA.2. If this turns out to be the case, a tertiary Omicron wave could spread to many countries. If the evidence on cross-variant immunity clarifies, we will incorporate this into our future releases.

Based on vaccination rates and reported willingness to get vaccinated, we estimate that 3.1% of the world population are willing to be vaccinated but have not yet been vaccinated. This 3.1% is heavily concentrated in sub-Saharan Africa. Among the 3.1% who want to be vaccinated, it is likely that three-quarters have some immunity through prior infection. In our reference scenario, we expect the fraction of the world’s population that will be fully vaccinated to increase in the next four months by 3 percentage points.

Given the potential for a new variant that is more transmissible and more severe than Omicron to emerge at any time, and given that vaccination rates are unlikely to increase much, the main strategies for managing risks of new variants are three. First, continued surveillance even as interest in the pandemic fades in some policy circles. Identifying new variants and whether they have increased severity or not will be critical to titrating the policy response.
Second, the world needs greater focus on expanding production and access to Paxlovid and other antivirals as they become available. The randomized clinical trials suggest that Paxlovid can dramatically reduce the infection-fatality rate; increased access globally can greatly reduce the future risk of harm of new variants. Third, if and when a new, more transmissible variant that is more severe than Omicron emerges, policies to encourage mask use as appropriate will be important.

**Current situation**

- Estimated daily infections in the last week increased to 6.6 million per day on average compared to 6.1 million the week before (Figure 1.1).
- Estimated daily hospital census in the last week (through May 3) decreased to 183,000 per day on average compared to 189,000 the week before.
- Daily reported cases in the last week decreased to 589,000 per day on average compared to 688,000 the week before (Figure 2.1).
- Reported deaths due to COVID-19 in the last week decreased to 2,300 per day on average compared to 2,700 the week before (Figure 3.1).
- Total deaths due to COVID-19 in the last week decreased to 3,600 per day on average compared to 4,200 the week before (Figure 3.1). This makes COVID-19 the number 12 cause of death globally this week (Table 1). Estimated total daily deaths due to COVID-19 in the past week were 1.6 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 five locations and eight subnational locations (Figure 4.1).
- The daily rate of total deaths due to COVID-19 is greater than 4 per million in 12 locations and 30 subnational locations (Figure 4.2).
- We estimate that 66% of people globally have been infected at least once as of May 2 (Figure 6.1).
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 64 locations and 116 subnational locations, with increases in transmission in much of South America (Figure 7.1).
- The infection-detection rate globally was close to 10% on May 2 (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 the dominant variant globally.

**Trends in drivers of transmission**

- Mobility last week was 4% higher than the pre-COVID-19 baseline (Figure 11.1). Mobility was lower than 15% of baseline in 12 locations and 22 subnational locations (Figure 12.1).
• As of May 1, in the COVID-19 Trends and Impact Survey, 42% of people self-reported that they always wore a mask when leaving their home (Figure 13.1).

• There were 478 diagnostic tests per 100,000 people on May 2 (Figure 15.1).

• As of May 2, 84 locations and 167 subnational locations have reached 70% or more of the population who have received at least one vaccine dose, and 66 locations and 135 subnational locations have reached 70% or more of the population who are fully vaccinated (Figures 17.1 and 17.2). 66% of people globally have received at least one vaccine dose, and 59% are fully vaccinated.

• Globally, 82.4% of the population that is 12 years and older say they would accept a vaccine for COVID-19 (Figure 18.1). 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 13% in Turkmenistan to 100% in Tripura, India (Figure 19.1).

• As of April 25, 2022, 3.1% of the population globally say they would accept a vaccine for COVID-19 but have not yet been vaccinated.

• In our current reference scenario, we expect that 5.2 billion people will be vaccinated with at least one dose by September 1 (Figure 21.1). We expect that 62% of the population will be fully vaccinated by September 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 will decline to 2.7 million by August 20, 2022 (Figure 23.1).

• Daily estimated infections in the 80% mask use scenario will decline to 1.0 million by July 13, 2022 (Figure 23.1).

• Daily estimated infections in the third dose scenario will decline to 2.6 million by August 21, 2022 (Figure 23.1).

Cases

• Daily estimated cases in the reference scenario will decline to 120,000 by September 1, 2022 (Figure 23.2).

• Daily estimated cases in the 80% mask use scenario will decline to 43,000 by September 1, 2022 (Figure 23.2).

• Daily estimated cases in the third dose scenario will decline to 114,000 by September 1, 2022 (Figure 23.2).

Deaths

• In our reference scenario, our model projects 6,966,000 cumulative reported deaths due to COVID-19 on September 1. This represents 145,000 additional deaths from May 2 to September 1. Daily reported COVID-19 deaths in the reference scenario will decline to 680 by September 1, 2022 (Figure 23.4).

• Under our reference scenario, our model projects 17,393,000 cumulative total deaths due to COVID-19 on September 1. This represents 278,000 additional deaths from May 2 to September 1 (Figure 23.5).

• In our 80% mask use scenario, our model projects 6,921,000 cumulative reported deaths due to COVID-19 on September 1. This represents 100,000 additional deaths from May 2 to September 1. Daily reported COVID-19 deaths in the 80% mask use scenario will decline to 280 by September 1, 2022 (Figure 23.4).

• In our third dose scenario, our model projects 6,964,000 cumulative reported deaths due to COVID-19 on September 1. This represents 142,000 additional deaths from May 2 to September 1. Daily reported COVID-19 deaths in the third dose scenario will decline to 650 by September 1, 2022 (Figure 23.4).
Model updates

No model updates.
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>Chronic obstructive pulmonary disease</td>
<td>63,089</td>
<td>3</td>
</tr>
<tr>
<td>Lower respiratory infections</td>
<td>47,946</td>
<td>4</td>
</tr>
<tr>
<td>Tracheal, bronchus, and lung cancer</td>
<td>39,282</td>
<td>5</td>
</tr>
<tr>
<td>Neonatal disorders</td>
<td>36,201</td>
<td>6</td>
</tr>
<tr>
<td>Alzheimer’s disease and other dementias</td>
<td>31,217</td>
<td>7</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>29,830</td>
<td>8</td>
</tr>
<tr>
<td>Diarrheal diseases</td>
<td>29,509</td>
<td>9</td>
</tr>
<tr>
<td>Cirrhosis and other chronic liver diseases</td>
<td>28,308</td>
<td>10</td>
</tr>
<tr>
<td>COVID-19</td>
<td>25,516</td>
<td>12</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 May 2, 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 May 2, 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 May 2, 2022

Figure 7.1: Mean effective R on April 21, 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 May 2, 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 May 2, 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 May 2, 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 May 2, 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 May 2, 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 Severe disease</th>
<th>Ancestral Infection</th>
<th>Alpha Severe disease</th>
<th>Alpha Infection</th>
<th>Beta Severe disease</th>
<th>Beta Infection</th>
<th>Gamma Severe disease</th>
<th>Gamma Infection</th>
<th>Delta Severe disease</th>
<th>Delta Infection</th>
<th>Omicron Severe disease</th>
<th>Omicron Infection</th>
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<tbody>
<tr>
<td>AstraZeneca</td>
<td>94%</td>
<td>63%</td>
<td>94%</td>
<td>63%</td>
<td>94%</td>
<td>69%</td>
<td>94%</td>
<td>69%</td>
<td>94%</td>
<td>69%</td>
<td>71%</td>
<td>36%</td>
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<tr>
<td>CanSino</td>
<td>66%</td>
<td>62%</td>
<td>66%</td>
<td>62%</td>
<td>64%</td>
<td>61%</td>
<td>64%</td>
<td>61%</td>
<td>64%</td>
<td>61%</td>
<td>48%</td>
<td>32%</td>
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<tr>
<td>CoronaVac</td>
<td>50%</td>
<td>47%</td>
<td>50%</td>
<td>47%</td>
<td>49%</td>
<td>46%</td>
<td>49%</td>
<td>46%</td>
<td>49%</td>
<td>46%</td>
<td>37%</td>
<td>24%</td>
</tr>
<tr>
<td>Covaxin</td>
<td>78%</td>
<td>73%</td>
<td>78%</td>
<td>73%</td>
<td>76%</td>
<td>72%</td>
<td>76%</td>
<td>72%</td>
<td>76%</td>
<td>72%</td>
<td>57%</td>
<td>38%</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>
<td>76%</td>
<td>64%</td>
<td>76%</td>
<td>64%</td>
<td>57%</td>
<td>33%</td>
</tr>
<tr>
<td>Moderna</td>
<td>97%</td>
<td>92%</td>
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<td>92%</td>
<td>97%</td>
<td>91%</td>
<td>97%</td>
<td>91%</td>
<td>97%</td>
<td>91%</td>
<td>73%</td>
<td>48%</td>
</tr>
<tr>
<td>Novavax</td>
<td>89%</td>
<td>83%</td>
<td>89%</td>
<td>83%</td>
<td>86%</td>
<td>82%</td>
<td>86%</td>
<td>82%</td>
<td>86%</td>
<td>82%</td>
<td>65%</td>
<td>43%</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>
<td>95%</td>
<td>84%</td>
<td>95%</td>
<td>84%</td>
<td>72%</td>
<td>44%</td>
</tr>
<tr>
<td>Sinopharm</td>
<td>73%</td>
<td>68%</td>
<td>73%</td>
<td>68%</td>
<td>71%</td>
<td>67%</td>
<td>71%</td>
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<td>71%</td>
<td>67%</td>
<td>53%</td>
<td>35%</td>
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<tr>
<td>Sputnik-V</td>
<td>92%</td>
<td>86%</td>
<td>92%</td>
<td>86%</td>
<td>89%</td>
<td>85%</td>
<td>89%</td>
<td>85%</td>
<td>89%</td>
<td>85%</td>
<td>67%</td>
<td>44%</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>
<td>73%</td>
<td>69%</td>
<td>73%</td>
<td>69%</td>
<td>55%</td>
<td>36%</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>
<td>88%</td>
<td>85%</td>
<td>88%</td>
<td>85%</td>
<td>67%</td>
<td>45%</td>
</tr>
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</table>
Percent of the population having received at least one dose (17.1) and fully vaccinated against SARS-CoV-2 (17.2) by May 2, 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 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 definitely receive the COVID-19 vaccine if available. Note that vaccine acceptance is calculated using survey data from the 18+ population.
Figure 20.1: Estimated proportion of the total population that is not vaccinated but willing to be vaccinated as of April 25, 2022
Figure 21.1: Percent of people who receive at least one dose of a COVID-19 vaccine and those who are fully vaccinated

Figure 22.1: 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 23.1: Daily COVID-19 infections until September 01, 2022 for three scenarios

Figure 23.2: Daily COVID-19 reported cases until September 01, 2022 for three scenarios
Figure 23.3: Daily COVID-19 hospital census until September 01, 2022 for three scenarios
Figure 23.4: Reported daily COVID-19 deaths per 100,000
Figure 23.5: 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.