COVID-19 Results Briefing

Global

February 24, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 globally. The model was run on February 24, 2021, with data through February 22, 2021.

Over the last five weeks, daily cases and deaths have declined more in percentage terms than at any point in the pandemic to date. The declines are occurring despite the increasing prevalence of new variants B.1.1.7, B.1.351, and P1. While global daily numbers are declining, transmission is increasing in some locations in Brazil, some countries in Africa, and many parts of Central and Eastern Europe. It appears the critical driver of the global trends is declining Northern Hemisphere seasonality along with vaccine scale-up in some of these countries. The spread of new variants with increased transmission potential and, in the case of B.1.351 and P1, possibly reduced natural- and vaccine-derived immunity, may slow or even reverse these trends. Even in our worse scenario with declining mask use in the vaccinated and some rebound mobility, we do not expect that the trend in global deaths will reverse prior to June 1. However, in our worse scenario, infections and detected cases stay high and increases are possible in a number of countries. The assessment of the spread of the new variants is highly uncertain due to limited sequencing of isolates in most countries. The most likely outcome is continued progress until June 1, but given the potential for new variants, governments should take measures to maintain mask use, slow the return to pre-COVID-19 mobility levels, and wherever possible, increase vaccination rates.

Current situation

- Daily reported cases in the last week decreased to 342,000 per day on average compared to 395,300 the week before (Figure 1).
- Daily deaths in the last week decreased to 11,150 per day on average compared to 12,420 the week before (Figure 2). This makes COVID-19 the number 3 cause of death globally this week (Table 1).
- The daily death rate is greater than 4 per million in 31 countries (Figure 3). These countries are mostly in the Northern Hemisphere, along with Peru, many states in Brazil, and Botswana.
- We estimated that 10% of people globally have been infected as of February 22 (Figure 4). Locations with more than 25% infected are concentrated in Latin America, some US states, southern Africa, and some states of India.
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 42 countries (Figure 5).
- Globally, less than 25% of infections are detected (Figure 6).
Trends in drivers of transmission

- Mobility last week was 19% lower than the pre-COVID-19 baseline (Figure 7). Mobility was near baseline (within 10%) in 44 countries. Mobility was lower than 30% of baseline in 44 countries.

- As of February 22, we estimated that 64% of people always wore a mask when leaving their home, the same as last week (Figure 9). Mask use was lower than 50% in 38 countries. These countries are mostly in Africa as well as Northern Europe and Australasia.

- There were 100 diagnostic tests per 100,000 people on February 22 (Figure 11).

- Globally, 70.1% of people say they would accept or would probably accept a vaccine for COVID-19. The fraction of the population who are open to receiving a COVID-19 vaccine ranges from 33% in Armenia to 92% in Hidalgo, Mexico (Figure 14).

- In our current reference scenario, we expect that 2.1 billion will be vaccinated by June 1 (Figure 15).

Projections

- In our reference scenario, which represents what we think is most likely to happen, our model projects 3,670,000 cumulative deaths on June 1, 2021. This represents 774,000 additional deaths from February 22 to June 1 (Figure 16). Daily deaths are expected to decline steadily between now and June 1 (Figure 17).

- By June 1, 2021, we project that 235,300 lives will be saved by the projected vaccine rollout.

- If universal mask coverage (95%) were attained in the next week, our model projects 159,000 fewer cumulative deaths compared to the reference scenario on June 1, 2021 (Figure 16).

- Under our worse scenario, our model projects 3,786,000 cumulative deaths on June 1, 2021 (Figure 16). This represents 116,000 more deaths compared to the reference scenario.

- Daily infections are expected to drop below 2 million per day in the reference scenario by mid-March and reach 1.5 million a day by June 1. In the worse scenario, more rapid new variant spread and lower mask use keep daily infections above 2 million per day through until June 1.
Model updates

In this week’s model, we have made five updates. First, new blood bank seroprevalence data from South Africa has strengthened the evidence that the age-standardized infection-fatality ratio (IFR) is much lower in sub-Saharan Africa than previously estimated. Surveys in Kenya and Nigeria had supported this idea, but the more extensive data from South Africa have led us to revise the IFR for all countries in sub-Saharan Africa. This change revised upwards our estimates of the percentage of the population that has been infected in this region. Second, the third round Indian Council of Medical Research serosurvey found a higher level of seroprevalence at the national level than we have been estimating. In this week’s analysis of past levels of infection, we have put more emphasis on this new round of survey data in estimating state-specific IFRs, which in turn is leading to higher estimates of cumulative infection. Third, the winter storm and electricity outages in Texas have had a noticeable impact on case, hospitalization, and death reporting. We have excluded data after the storm from the analysis. Fourth, we have continued to revise our variant scale-up estimates for the past and forecasts for future scale-up. For the past, for countries in Southern Africa without sufficient numbers of isolates sequenced, we have revised the likely start data for B.1.351 based on the scale-up of cases observed in these countries. A similar approach has been taken for Ghana. Newly available sequence data have led to revisions of the timing of the introduction of B.1.1.7, B.1.351, and P1 in select locations. The maps below show our estimates of the prevalence of each variant this week by location. Fifth, we made two changes to the worse scenario. Rather than assuming immediate introduction of new variants B.1.351 or P1 in all locations, we have assumed that the variant spreads to adjacent locations in 21 days, including across national borders. We have also assumed that mask use in those who have been vaccinated will begin declining one month after completed vaccination (rather than the reference scenario that assumes mask will begin declining three months after completed vaccination).
Current situation

Figure 1. Reported daily COVID-19 cases

Table 1. Ranking of 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>78,049</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. Reported daily COVID-19 deaths and smoothed trend estimate.
Figure 3. Daily COVID-19 death rate per 1 million on February 22, 2021

Figure 4. Estimated percent infected with COVID-19 on February 22, 2021
**Figure 5.** Mean effective R on February 11, 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 6. 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 to detection rate (IDR) can exceed 100% at particular points in time.
Critical drivers

Figure 7. Trend in mobility as measured through smartphone app use compared to January 2020 baseline

Figure 8. Mobility level as measured through smartphone app use compared to January 2020 baseline (percent)
Figure 9. Trend in the proportion of the population reporting always wearing a mask when leaving home.

Figure 10. Proportion of the population reporting always wearing a mask when leaving home on February 22, 2021.
**Figure 11.** Trend in COVID-19 diagnostic tests per 100,000 people

**Figure 12.** COVID-19 diagnostic tests per 100,000 people on February 22, 2021
Figure 13. Increase in the risk of death due to pneumonia on February 1 compared to August 1.
**Figure 14.** This figure shows the estimated proportion of the adult (18+) population that is open to receiving a COVID-19 vaccine based on Facebook survey responses (yes and yes, probably).

![Map of the world with color coding representing the percentage of the adult population open to receiving a COVID-19 vaccine.](image)

**Figure 15.** The 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.

![Graph showing the number of people receiving vaccines over time, with lines representing reference and rapid rollout scenarios.](image)

Solid lines represent the total vaccine doses, dashed lines represent effective vaccination.
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 UK.
- 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 P1 begin to spread within 3 weeks in adjacent locations that do not already have B.1.351 or P1 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 16. Cumulative COVID-19 deaths until June 01, 2021 for three scenarios.

Figure 17. Daily COVID-19 deaths until June 01, 2021 for three scenarios,
Figure 18. Daily COVID-19 infections until June 01, 2021 for three scenarios.
More information

Data sources:
Mask use data sources include PREMISE; Facebook Global symptom survey (This research is based on survey results from University of Maryland Social Data Science Center) and the Facebook United States symptom survey (in collaboration with Carnegie Mellon University); Kaiser Family Foundation; YouGov COVID-19 Behaviour Tracker survey.

Vaccine hesitancy data are from the COVID-19 Beliefs, Behaviors, and Norms Study, a survey conducted on Facebook by the Massachusetts Institute of Technology (https://covidsurvey.mit.edu/).

Data on vaccine candidates, stages of development, manufacturing capacity, and pre-purchasing agreements are primarily from Linksbridge and supplemented by Duke University.

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.