COVID-19 Results Briefing

The European Region

July 28, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 in the WHO European Region. The model was run on July 27, 2021, with data through July 26, 2021.

Driven by the spread of the Delta variant, transmission has been increasing in nearly all countries in the region. The increase in cases has been dramatically larger for reported cases than for reported deaths. The disconnect between infections and deaths has been attributed to higher vaccine effectiveness for severe disease and death than for infection, higher rates of vaccination in older age groups with higher infection-fatality rates, and greater transmission in younger age groups due to higher rates of contact. Deaths have been increasing in Central Asia, the Russian Federation, and, to a lesser extent, in Portugal, Spain, and Scotland, which suggests that death rates may increase but with a longer lag. Our reference scenario suggests that reported daily deaths will increase steadily to 2,000 a day by November 1. Despite efforts to vaccinate, and 42% of the region with a previous infection, we estimate that only 45% of the population in the region is currently immune to the Delta variant infection. The abrupt declines in reported cases in the United Kingdom and the Netherlands after rapid increases without notable changes in mask use or mobility raise the possibility that levels of immunity, at least temporarily, were high enough in those countries, combined with some behavioral modification, to bring down transmission. However, given recent evidence from Israel on waning vaccine effectiveness in preventing infection, our reference scenario may be optimistic. The main strategies to manage the epidemic in this phase include: 1) community outreach and messaging to increase vaccination in local communities with high vaccine hesitancy; 2) implementation of vaccination mandates by employers and schools; 3) re-imposition of mask mandates for all in settings of rapid increases in transmission; 4) reporting of cases, hospitalizations, and deaths by vaccination status and time since vaccination to help assess vaccine effectiveness and how it changes over time; and 5) long-term planning of resources for the likely heavy demand for hospitalization due to COVID-19 and flu in the winter.

Current situation

- Daily reported cases in the last week (through July 26) increased to 170,400 per day on average compared to 146,500 the week before (Figure 1).

- Reported deaths due to COVID-19 in the last week remained constant at 1,100 per day (Figure 2).

- Excess deaths due to COVID-19 in the last week increased to 7,200 per day on average compared to 6,900 the week before (Figure 2). This makes COVID-19 the number 1 cause of death in the European Region this week (Table 1). Estimated excess daily deaths due to COVID-19 were 2.5 times larger than the reported number of deaths.
• The daily reported COVID-19 death rate is greater than 4 per million in Georgia, Kazakhstan, and the Russian Federation (Figure 3).

• The daily rate of excess deaths due to COVID-19 is greater than 4 per million in Belarus, Georgia, Kazakhstan, Kyrgyzstan, the Russian Federation, and Uzbekistan (Figure 3).

• **We estimated that 42% of people in the European Region have been infected as of July 26** (Figure 5).

• Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in nearly all countries, with the notable exceptions of the Netherlands, the UK, the Russian Federation, and Poland (Figure 6).

• The infection-detection rate in the European Region was close to 17% on July 26 (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 4 countries, that B.1.617 is circulating in 48 countries, and that P.1 is circulating in 8 countries.

**Trends in drivers of transmission**

• Mask mandates remain in place in all but 12 countries in the region. A limited number of countries have many business restrictions in place, but some form of gathering restrictions remain more widely in place (Table 2).

• Mobility last week was 5% lower than the pre-COVID-19 baseline (Figure 10). Mobility was near baseline (within 10%) in 33 countries. Mobility was lower than 30% of baseline in no locations.

• As of July 26, in the COVID-19 Trends and Impact Survey, 47% of people self-report that they always wore a mask when leaving their home (Figure 12).

• There were 374 diagnostic tests per 100,000 people on July 26 (Figure 14).

• **In the European Region, 66.7% of people say they would accept or would probably accept a vaccine for COVID-19.** The fraction of the population open to receiving a COVID-19 vaccine ranges from 34% in Republic of Moldova to 89% in Spain (Figure 18).

• In our current reference scenario, we expect that 633 million people, just over 50% of the adult population in the region, will be vaccinated by November 1 (Figure 19).

• Taking into account estimated effectiveness of each vaccine against the Delta variant and estimated immunity provided by prior infection, we estimate that currently 45% of the population is immune to the Delta variant. Through increases in vaccination and ongoing Delta transmission, this is forecasted to increase to 58% of people being immune to the Delta variant by November 1 (Figure 20).
Projections

- In our **reference scenario**, which represents what we think is most likely to happen, our model projects 1,395,000 cumulative reported deaths due to COVID-19 on November 1. This represents 155,000 additional deaths from July 26 to November 1. Daily reported deaths will rise to 2,000 on November 1, 2021 (Figure 21).

- Under our **reference scenario**, our model projects 3,657,000 cumulative excess deaths due to COVID-19 on November 1. This represents 500,000 additional deaths from July 26 to November 1 (Figure 21).

- If **universal mask coverage (95%)** were attained in the next week, our model projects 75,000 fewer cumulative reported deaths compared to the reference scenario on November 1.

- Under our **worse scenario**, our model projects 1,518,000 cumulative reported deaths on November 1, an additional 123,000 deaths compared to our reference scenario (Figure 21).

- Daily infections in the reference scenario will rise to 1 million by early September and stay at that level until November 1 (Figure 22). Daily infections in the worse scenario rise to 2.2 million by early September (Figure 22).

- By November 1, we project that 84,300 lives will be saved by the projected vaccine rollout. This does not include lives saved through vaccination that has already been delivered.

- Figure 23 compares our reference scenario forecasts to other publicly archived models. Models have highly divergent estimates of the trends in deaths. Many models forecast peaks in mid-August and then declines.

- At some point from July through November 1, 31 countries will have high or extreme stress on hospital beds (Figure 24). At some point from July through November 1, 39 countries will have high or extreme stress on intensive care unit (ICU) capacity (Figure 25).
Model updates

Our projections of SARS-CoV-2 infections and COVID-19 deaths in the worse scenario were updated to account for the possibility that population mobility may continue to increase, irrespective of vaccine coverage or infection levels. Specifically, a new mobility scenario was formulated in which all locations exhibit an 8-week linear increase in mobility to the regional maximum mobility level observed between the period 1/1/2020 and the last day of data. Furthermore, the new projections of mobility for the worse scenario assume that population mobility will remain elevated until COVID-19 mortality reaches a minimum of 15 deaths per million, at which point a location may re-impose all social distancing mandates for a period of six weeks, causing mobility to rapidly decline.
Figure 1. Reported daily COVID-19 cases, moving average

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>COVID-19</td>
<td>50,188</td>
<td>1</td>
</tr>
<tr>
<td>Ischemic heart disease</td>
<td>44,253</td>
<td>2</td>
</tr>
<tr>
<td>Stroke</td>
<td>22,622</td>
<td>3</td>
</tr>
<tr>
<td>Tracheal, bronchus, and lung cancer</td>
<td>8,918</td>
<td>4</td>
</tr>
<tr>
<td>Alzheimer’s disease and other dementias</td>
<td>8,022</td>
<td>5</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>6,719</td>
<td>6</td>
</tr>
<tr>
<td>Colon and rectum cancer</td>
<td>5,881</td>
<td>7</td>
</tr>
<tr>
<td>Lower respiratory infections</td>
<td>5,254</td>
<td>8</td>
</tr>
<tr>
<td>Cirrhosis and other chronic liver diseases</td>
<td>4,290</td>
<td>9</td>
</tr>
<tr>
<td>Hypertensive heart disease</td>
<td>3,949</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 26, 2021

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

B. Daily excess COVID-19 death rate per 1 million
Figure 4. Cumulative COVID-19 deaths per 100,000 on July 26, 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 26, 2021.

**Figure 6.** Mean effective R on July 15, 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 26, 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 26, 2021
### Critical drivers

#### Table 2. Current mandate implementation

|------------------------|--------------------------|-----------------------|-----------------------------------|------------------------------------|-------------------------------------|-------------------------------|----------------------|------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------|-----------------------------|-----------------------------|-------------------------|-------------------|------------------|------------------|-------------------|
| Albania                | Andorra                  | Armenia               | Azerbaijan                         | Belarus                             | Belgium                             | Bulgaria                      | Croatia              | Cyprus                      | Czechia                      | Denmark                      | Estonia                      | Finland                      | Georgia                      | Germany                      | Greece                      | Hungary                      | Iceland                      | Ireland                      | Israel                      | Italy                      | Kazakhstan                      | Kyrgyzstan                      | Latvia                      | Lithuania                      | Luxembourg                      | Malta                      | Monaco                      | Montenegro                      | Netherlands                      | North Macedonia                      | Norway                      | Poland                      | Portugal                      | Republic of Moldova                      | Romania                      | Russian Federation                      | San Marino                      | Serbia                      | Slovakia                      | Slovenia                      | Spain                      | Sweden                      | Switzerland                      | Tajikistan                      | Turkey                      | Ukraine                      | United Kingdom                      | Uzbekistan                      | *Not all locations are measured at the subnational level.*

*No mandate (lifted this week)*

*No mandate (updated from previous reporting)*

*Mandate imposed (imposed this week)*

*Mandate imposed in some subnational locations (imposed this week)*

*Mandate imposed in some subnational locations (updated from previous reporting)*

Mandate in place
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 26, 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 26, 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 26, 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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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>91%</td>
<td>86%</td>
<td>81%</td>
<td>77%</td>
</tr>
</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.

**Figure 20.** 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.
- 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.

The worse scenario modifies the reference scenario assumptions in two 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.

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 21. 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 22. Daily COVID-19 infections until November 01, 2021 for three scenarios

[Graph showing daily infections and infections per 100,000 from January 20 to November 21, with three scenarios: Reference, Universal mask use, Worse.]

Figure 23. Comparison of reference model projections with other COVID modeling groups. For this comparison, we are including projections of daily COVID-19 deaths from other modeling groups when available: Delphi from the Massachusetts Institute of Technology (Delphi), Imperial College London (Imperial), The Los Alamos National Laboratory (LANL), and the SI-KJalpha model from the University of Southern California (SIKJalpha). Daily deaths from other modeling groups are smoothed to remove inconsistencies with rounding. Regional values are aggregates from available locations in that region.
Figure 24. 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 25. 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.