COVID-19 Results Briefing

The European Union

July 28, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 in the European Union. 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 EU member states, with the exception of Poland and Latvia. Transmission in the Netherlands increased and has now declined. 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 to some extent in Portugal and Spain, which suggests that death rates may increase, but with a longer lag. Our reference scenario projects that reported daily deaths will increase steadily to over 1,000 per day by November 1. Despite efforts to vaccinate, and 26% of the EU with a previous infection, we estimate that only 40% of the population in the region is currently immune to the Delta variant infection. The abrupt declines in reported cases in 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 77,200 per day on average compared to 58,000 the week before (Figure 1).
- Reported deaths due to COVID-19 in the last week increased to 120 per day on average compared to 110 the week before (Figure 2).
- Excess deaths due to COVID-19 in the last week increased to 210 per day on average compared to 200 the week before (Figure 2). This makes COVID-19 the number 18 cause of death in the European Union this week (Table 1). Estimated excess daily deaths due to COVID-19 were 1.7 times larger than the reported number of deaths.
No locations had daily reported COVID-19 death rates greater than 4 per million (Figure 3).

No locations had daily excess death rates greater than 4 per million (Figure 3).

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

Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in all countries, with the exception of Poland and Latvia (Figure 6).

The infection-detection rate in the European Union was close to 58% 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 the Delta variant is the dominant variant throughout the EU.

**Trends in drivers of transmission**

- Ireland revised its border closures; otherwise, mandates remained largely unchanged over the last week. Few member states have limitations on businesses, but many have some form of gathering restrictions and the majority have mask mandates (Table 2).

- Mobility last week was 4% lower than the pre-COVID-19 baseline (Figure 10). Mobility was near baseline (within 10%) in 19 countries. Mobility was lower than 30% of baseline in no locations.

- As of July 26, in the COVID-19 Trends and Impact Survey, 45% of people self-report that they always wore a mask when leaving their home (Figure 12).

- There were 323 diagnostic tests per 100,000 people on July 26 (Figure 14).

- In the European Union, 73.5% 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 39% in Bulgaria to 89% in Spain (Figure 18).

- In our current reference scenario, we expect that 406 million people in the EU will be vaccinated by November 1 (Figure 19).

- Based on estimated vaccine effectiveness against the Delta variant in preventing infection and cross-variant immunity from past infection, we estimate that 40% of the EU is immune to the Delta variant. This is expected to rise to 52% by November 1 due to increasing vaccination and ongoing Delta variant infection (Figure 20).
Projections

• In our **reference scenario**, which represents what we think is most likely to happen, our model projects 821,000 cumulative reported deaths due to COVID-19 on November 1. This represents 72,000 additional deaths from July 26 to November 1. Daily reported deaths will rise to nearly 1,200 by November 1, 2021 (Figure 21).

• Under our **reference scenario**, our model projects 1,412,000 cumulative excess deaths due to COVID-19 on November 1. This represents 109,000 additional deaths from July 26 to November 1 (Figure 21).

• If **universal mask coverage (95%)** were attained in the next week, our model projects 42,000 fewer cumulative reported deaths compared to the reference scenario on November 1.

• Under our **worse scenario**, our model projects 890,000 cumulative reported deaths on November 1, an additional 69,000 deaths compared to our reference scenario. Daily reported deaths in the worse scenario will rise to 2,350 by October 9, 2021 (Figure 21).

• Daily infections in the reference scenario will rise to over 400,000 by early October and stay at that level until November 1. In the worse scenario, they rise to near 900,000 by mid-September and then decline (Figure 22).

• By November 1, we project that 35,300 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. Forecasted trends and levels are widely divergent across models. Some models have daily deaths peaking in mid-August and then declining, and the Imperial model has daily deaths increasing modestly until mid-September and then declining. The USC and IHME models have steadily rising daily deaths until November 1.

• At some point from July through November 1, 12 countries will have high or extreme stress on hospital beds (Figure 24). At some point from July through November 1, 17 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

![Graph showing reported daily COVID-19 cases, moving average.](image)

**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>18,714</td>
<td>1</td>
</tr>
<tr>
<td>Stroke</td>
<td>10,303</td>
<td>2</td>
</tr>
<tr>
<td>Tracheal, bronchus, and lung cancer</td>
<td>6,216</td>
<td>3</td>
</tr>
<tr>
<td>Alzheimer’s disease and other dementias</td>
<td>5,827</td>
<td>4</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>4,608</td>
<td>5</td>
</tr>
<tr>
<td>Colon and rectum cancer</td>
<td>4,100</td>
<td>6</td>
</tr>
<tr>
<td>Lower respiratory infections</td>
<td>3,503</td>
<td>7</td>
</tr>
<tr>
<td>Hypertensive heart disease</td>
<td>2,797</td>
<td>8</td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td>2,430</td>
<td>9</td>
</tr>
<tr>
<td>Breast cancer</td>
<td>2,213</td>
<td>10</td>
</tr>
<tr>
<td>COVID-19</td>
<td>1,450</td>
<td>18</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
**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

![Line chart showing the trend in the proportion of the population reporting always wearing a mask when leaving home across Europe from March 2020 to July 2021.](chart)

**Figure 13.** Proportion of the population reporting always wearing a mask when leaving home on July 26, 2021

![Map of Europe showing the proportion of the population reporting always wearing a mask when leaving home on July 26, 2021.](map)
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</td>
<td>91%</td>
<td>86%</td>
<td>81%</td>
<td>77%</td>
</tr>
<tr>
<td>(mRNA)</td>
<td></td>
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**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.

- **At least one dose**
- **Effectively vaccinated**

**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
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.