COVID-19 Results Briefing
Spain

November 18, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 in Spain. The model was run on November 16, 2021, with data through November 15, 2021.

Current situation

- Daily infections in the last week increased to 9,800 per day on average compared to 7,500 the week before (Figure 1.1). Daily hospital census in the last week (through November 15) increased to 2,300 per day on average compared to 2,100 the week before.
- Daily reported cases in the last week increased to 3,700 per day on average compared to 2,700 the week before (Figure 2.1).
- Reported deaths due to COVID-19 in the last week increased to 22 per day on average compared to 18 the week before (Figure 3.1).
- Total deaths due to COVID-19 in the last week increased to 38 per day on average compared to 31 the week before (Figure 3.1). This makes COVID-19 the number 9 cause of death in Spain this week (Table 1). Estimated total daily deaths due to COVID-19 in the past week 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 4.1).
- No locations had daily total COVID-19 death rates greater than 4 per million (Figure 4.2).
- We estimate that 24% of people in Spain have been infected as of November 15 (Figure 6.1).
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 17 locations. (Figure 7.1).
- The infection-detection rate in Spain was close to 61% on November 15 (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 (Figure 9.1). We estimate that the Beta variant is circulating in 1 autonomous community, that the Delta variant is circulating in 19 autonomous communities, and that the Gamma variant is circulating in 2 autonomous communities in the region.

Trends in drivers of transmission

- Mobility last week was 12% lower than the pre-COVID-19 baseline (Figure 11.1). Mobility was near baseline (within 10%) in Aragon, Asturias, Balearic Islands, Canary Islands, Castile and León, Catalonia, Extremadura, Galicia, Melilla, and Valencian Community. Mobility was lower than 30% of baseline in no locations.
- As of November 15, in the COVID-19 Trends and Impact Survey, 67% of people self-report that they always wore a mask when leaving their home compared to 67% last week (Figure 13.1).
- There were 191 diagnostic tests per 100,000 people on November 15 (Figure 15.1).
- As of November 15, 18 autonomous communities have reached 70% or more of the population who have received at least one vaccine dose and 18 autonomous communities have reached 70% or more of the population who are fully vaccinated (Figure 17.1).
- In our current reference scenario, we expect that 36.3 million people will be vaccinated with at least one dose by March 1 (Figure 20.1). We expect that 81% of the population will be fully vaccinated by March 1.
- Based on the estimate of the population that have been infected with COVID-19 and vaccinated to date, combined with assumptions on protection against infection with the Delta variant provided by either natural infection, vaccination or both, we estimate that 55% of the region is immune to the Delta variant. In our current reference scenario, we expect that by March 1, 62% of people will be immune to the Delta variant (Figure 21.1). These two calculations do not take into account waning of natural or vaccine-derived immunity.
Projections

- In our reference scenario, which represents what we think is most likely to happen, our model projects 109,000 cumulative reported deaths due to COVID-19 on March 1. This represents 13,000 additional deaths from November 15 to March 1. Daily reported deaths will rise to 210 by February 17, 2022 (Figure 22.1).

- Under our reference scenario, our model projects 179,000 cumulative total deaths due to COVID-19 on March 1. This represents 22,000 additional deaths from November 15 to March 1 (Figure 22.1).

- If universal mask coverage (95%) were attained in the next week, our model projects 5,700 fewer cumulative reported deaths compared to the reference scenario on March 1.

- Under our worse scenario, our model projects 144,000 cumulative reported deaths on March 1, an additional 35,000 deaths compared to our reference scenario. Daily reported deaths in the worse scenario will rise to 1,080 by January 27, 2022 (Figure 22.1).

- Daily infections in the reference scenario will rise to 40,240 by January 25, 2022 (Figure 22.3). Daily infections in the worse scenario will rise to 215,750 by January 4, 2022 (Figure 22.3).

- Daily cases in the reference scenario will rise to 21,550 by February 8, 2022 (Figure 22.4). Daily cases in the worse scenario will rise to 116,510 by January 15, 2022 (Figure 22.4).

- Daily hospital census in the reference scenario will rise to 20,730 by February 10, 2022 (Figure 22.5). Daily hospital census in the worse scenario will rise to 105,650 by January 20, 2022 (Figure 22.5).

- Figure 23.1 compares our reference scenario forecasts to other publicly archived models. Forecasts are widely divergent.

- At some point from November through March 1, 0 countries will have high or extreme stress on hospital beds (Figure 24.1). At some point from November through March 1, 0 countries will have high or extreme stress on ICU capacity (Figure 25.1).
Model updates

No model updates.
**Figure 1.1.** Daily COVID-19 hospital census and infections

![Daily COVID-19 hospital census and infections](chart1)

**Figure 2.1.** Reported daily COVID-19 cases, moving average

![Reported daily COVID-19 cases, moving average](chart2)
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>1,031</td>
<td>1</td>
</tr>
<tr>
<td>Stroke</td>
<td>713</td>
<td>2</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>601</td>
<td>3</td>
</tr>
<tr>
<td>Alzheimer’s disease and other dementias</td>
<td>562</td>
<td>4</td>
</tr>
<tr>
<td>Tracheal, bronchus, and lung cancer</td>
<td>472</td>
<td>5</td>
</tr>
<tr>
<td>Colon and rectum cancer</td>
<td>385</td>
<td>6</td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td>282</td>
<td>7</td>
</tr>
<tr>
<td>Lower respiratory infections</td>
<td>273</td>
<td>8</td>
</tr>
<tr>
<td>COVID-19</td>
<td>266</td>
<td>9</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>195</td>
<td>10</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 November 15, 2021

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 November 15, 2021

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 November 15, 2021

Figure 7.1. Mean effective R on November 4, 2021. 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 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 November 15, 2021

**Figure 9.1 Estimated percent Alpha variant**

**Figure 9.2 Estimated percent Beta variant**
Figure 9.3 Estimated percent Delta variant

Figure 9.4 Estimated percent Gamma variant
Figure 10.1. Infection-fatality rate on November 15, 2021. This is estimated as the ratio of COVID-19 deaths to estimated daily COVID-19 infections.
## Critical drivers

### Table 2. Current mandate implementation

<table>
<thead>
<tr>
<th>Andalucia</th>
<th>Aragon</th>
<th>Asturias</th>
<th>Balearic Islands</th>
<th>Basque Country</th>
<th>Canary Islands</th>
<th>Cantabria</th>
<th>Castile and León</th>
<th>Castilla–La Mancha</th>
<th>Catalonia</th>
<th>Ceuta</th>
<th>Community of Madrid</th>
<th>Extremadura</th>
<th>Galicia</th>
<th>La Rioja</th>
<th>Melilla</th>
<th>Murcia</th>
<th>Navarre</th>
<th>Valencian Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary school closure</td>
<td>Secondary school closure</td>
<td>Higher school closure</td>
<td>Borders closed to any non-resident</td>
<td>Borders closed to all non-residents</td>
<td>Individual movements restricted</td>
<td>Curfew for businesses</td>
<td>Individual curfew</td>
<td>Gathering limit: 6 indoor, 10 outdoor</td>
<td>Gathering limit: 25 indoor, 50 outdoor</td>
<td>Gathering limit: 100 indoor, 250 outdoor</td>
<td>Restaurants closed</td>
<td>Bars closed</td>
<td>Restaurants / bars closed</td>
<td>Gyms, pools, other leisure closed</td>
<td>Non-essential retail closed</td>
<td>Non-essential workplaces closed</td>
<td>Stay home order</td>
<td>Stay home fine</td>
</tr>
<tr>
<td>mandate in place</td>
<td>mandate in place</td>
<td>mandate in place</td>
<td>(imposed this week)</td>
<td>(updated from previous reporting)</td>
<td>mandate in place</td>
<td>mandate in place</td>
<td>(updated from previous reporting)</td>
<td>mandate in place</td>
<td>(updated from previous reporting)</td>
<td>mandate in place</td>
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<td>mandate in place</td>
<td>mandate in place</td>
<td>mandate in place</td>
<td>mandate in place</td>
</tr>
</tbody>
</table>

[Source: covid19.healthdata.org, Institute for Health Metrics and Evaluation]
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 November 15, 2021
**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 November 15, 2021
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 November 15, 2021
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: ancestral and Alpha</th>
<th>Efficacy at preventing infection: ancestral and Alpha</th>
<th>Efficacy at preventing disease: Beta, Delta, &amp; Gamma</th>
<th>Efficacy at preventing infection: Beta, Delta, &amp; Gamma</th>
</tr>
</thead>
<tbody>
<tr>
<td>AstraZeneca</td>
<td>90%</td>
<td>52%</td>
<td>85%</td>
<td>49%</td>
</tr>
<tr>
<td>CoronaVac</td>
<td>50%</td>
<td>44%</td>
<td>43%</td>
<td>38%</td>
</tr>
<tr>
<td>Covaxin</td>
<td>78%</td>
<td>69%</td>
<td>68%</td>
<td>60%</td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td>86%</td>
<td>72%</td>
<td>60%</td>
<td>56%</td>
</tr>
<tr>
<td>Moderna</td>
<td>94%</td>
<td>89%</td>
<td>94%</td>
<td>80%</td>
</tr>
<tr>
<td>Novavax</td>
<td>89%</td>
<td>79%</td>
<td>79%</td>
<td>69%</td>
</tr>
<tr>
<td>Pfizer/BioNTech</td>
<td>94%</td>
<td>86%</td>
<td>85%</td>
<td>78%</td>
</tr>
<tr>
<td>Sinopharm</td>
<td>73%</td>
<td>65%</td>
<td>63%</td>
<td>56%</td>
</tr>
<tr>
<td>Sputnik-V</td>
<td>92%</td>
<td>81%</td>
<td>80%</td>
<td>70%</td>
</tr>
<tr>
<td>Tianjin</td>
<td>66%</td>
<td>58%</td>
<td>57%</td>
<td>50%</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>65%</td>
<td>57%</td>
</tr>
<tr>
<td>Other vaccines</td>
<td>91%</td>
<td>86%</td>
<td>85%</td>
<td>78%</td>
</tr>
<tr>
<td>(mRNA)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Percent of the population having received at least one dose (17.1) and fully vaccinated against SARS-CoV-2 (17.2) by November 15, 2021

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
Spain

**Figure 20.1.** Percent of people who receive at least one dose of a COVID-19 vaccine and those who are fully vaccinated

![Graph showing percent of population vaccinated over time](graph1)

**Figure 21.1.** Percentage of people who are immune to non-escape variants and the percentage of people who are immune to escape variants

![Graph showing immune status over time](graph2)
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 7 days.
- Mobility increases as vaccine coverage increases.
- 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 reference scenario assumes that mandates are re-imposed when daily deaths reach 15 per million.
- Variants Alpha, Beta, Gamma, and Delta continue to spread regionally and globally from locations with sufficient transmission.

The worse scenario modifies the reference scenario assumption in four ways:

- 100% of vaccinated individuals stop using masks.
- Mobility increases in all locations to 25% above the pre-pandemic winter baseline, irrespective of vaccine coverage.
- Governments are more reluctant to re-impose social distancing mandates, waiting until the daily death rate reaches 15 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 reference scenario assumes that mandates are re-imposed when daily deaths reach 38 per million. In either case, we assume social distancing mandates remain in effect for 6 weeks.
- Variants Alpha, Beta, Gamma, and Delta spread between locations twice as fast when compared with our reference scenario.

The universal masks scenario makes all the same assumptions as the reference scenario but assumes all locations reach 95% mask use within 7 days.
Daily COVID-19 deaths until March 01, 2022 for three scenarios

Figure 22.1 Reported daily COVID-19 deaths per 100,000

Figure 22.2 Total daily COVID-19 deaths per 100,000
Figure 22.3. Daily COVID-19 infections until March 01, 2022 for three scenarios

Figure 22.4. Daily COVID-19 reported cases until March 01, 2022 for three scenarios
Figure 22.5. Daily COVID-19 hospital census until March 01, 2022 for three scenarios
Figure 23.1. 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, last model update in brackets: Delphi from the Massachusetts Institute of Technology (Delphi) [November 17, 2021], Imperial College London (Imperial) [November 3, 2021], the SI-KJalpha model from the University of Southern California (SIKJalpha) [November 17, 2021]. Daily deaths from other modeling groups are smoothed to remove inconsistencies with rounding. Regional values are aggregates from available locations in that region.
Figure 24.1. 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 25.1. 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.
To download our most recent results, visit our Data downloads page.