COVID-19 Results Briefing

Indonesia

July 28, 2021

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

Current situation

Cases and deaths are rapidly rising in Indonesia. The rapid spread of the Delta variant, combined with low masking, high mobility, and low vaccination levels, has led to this surge. We estimate that effective R was 1.2 on July 15, indicating a rise in cases in the coming weeks. In our reference scenario, which represents what we think is most likely to happen, our model projects about 225,000 cumulative reported deaths due to COVID-19 on November 1. This represents about 141,000 additional deaths from July 26 to November 1. Daily reported deaths will rise to about 2,570 by August 17, 2021.

Masks are an effective means to reduce transmission as the vaccination campaign is rolled out. If universal mask coverage (95%) were attained in the next week, our model projects about 25,000 fewer cumulative reported deaths compared to the reference scenario on November 1.

The main strategies to manage the epidemic in this phase remain the same: 1) addressing hesitancy and increasing vaccination levels; 2) implementation of vaccination mandates by employers and schools; 3) re-imposition of mask mandates; 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.

- Daily reported cases in the last week (through July 26) increased to about 60,300 per day on average compared to about 49,300 the week before (Figure 1).

- Reported deaths due to COVID-19 in the last week increased to about 1,400 per day on average compared to about 1,000 the week before (Figure 2).

- Excess deaths due to COVID-19 in the last week increased to about 3,700 per day on average compared to about 2,800 the week before (Figure 2). This makes COVID-19 the number 1 cause of death in Indonesia this week (Table 1). Estimated excess daily deaths due to COVID-19 were 2.7 times larger than the reported number of deaths.

- The daily reported COVID-19 death rate is greater than 4 per million in Indonesia (Figure 3).

- The daily rate of excess deaths due to COVID-19 is greater than 4 per million (Figure 3).
We estimated that 28% of people in Indonesia have been infected as of July 26 (Figure 5).

Effective R, computed using cases, hospitalizations, and deaths, was 1.2 on July 15 (Figure 6).

The infection-detection rate in Indonesia was close to 7% 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.1.617 is circulating in Indonesia.

Trends in drivers of transmission

Mobility last week was 36% lower than the pre-COVID-19 baseline (Figure 10).

As of July 26, in the COVID-19 Trends and Impact Survey, 77% of people self-report that they always wore a mask when leaving their home, unchanged from last week (Figure 12).

There were 34 diagnostic tests per 100,000 people on July 26 (Figure 14).

In Indonesia, 71.2% of people say they would accept or would probably accept a vaccine for COVID-19. This is down by 0.7 percentage points from last week. The fraction of the population who are open to receiving a COVID-19 vaccine ranges from 71% in Indonesia to 89% in Thailand (Figure 18).

In our current reference scenario, we expect that about 104 million people will be vaccinated by November 1 (Figure 19).

In our current reference scenario, we expect that by November 1, 52% of people will be immune to non-escape variants and 48% of people will be immune to escape variants (Figure 20).

Projections

In our reference scenario, which represents what we think is most likely to happen, our model projects about 225,000 cumulative reported deaths due to COVID-19 on November 1. This represents about 141,000 additional deaths from July 26 to November 1. Daily reported deaths will rise to 2,570 by August 17, 2021 (Figure 21).

Under our reference scenario, our model projects about 604,000 cumulative excess deaths due to COVID-19 on November 1. This represents about 378,000 additional deaths from July 26 to November 1. Daily excess deaths due to COVID-19 will rise to about 6,890 by August 17, 2021 (Figure 21).

If universal mask coverage (95%) were attained in the next week, our model projects about 25,000 fewer cumulative reported deaths compared to the reference scenario on November 1.
If universal mask coverage (95%) were attained in the next week, our model projects about 68,000 fewer cumulative excess deaths due to COVID-19 compared to the reference scenario on November 1.

Under our worse scenario, our model projects about 243,000 cumulative reported deaths on November 1, an additional about 18,000 deaths compared to our reference scenario. Daily reported deaths in the worse scenario will rise to about 2,810 by August 18, 2021 (Figure 21).

Under our worse scenario, our model projects about 650,000 cumulative excess deaths due to COVID-19 on November 1, about an additional 46,000 deaths compared to our reference scenario. Daily excess deaths due to COVID-19 in the worse scenario will rise to 7,520 by August 18, 2021 (Figure 21).

Daily infections in the reference scenario will decline to about 95,780 on November 1, 2021 (Figure 22). Daily infections in the worse scenario will decline to about 113,190 on November 1, 2021 (Figure 22).

By November 1, we project that about 40,400 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. Forecasts are widely divergent.

At some point from July through November 1, Indonesia will have high or extreme stress on its hospital beds and on intensive care unit (ICU) capacity (Figures 24 and 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](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>
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<tbody>
<tr>
<td>COVID-19</td>
<td>25,792</td>
<td>1</td>
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<tr>
<td>Stroke</td>
<td>6,372</td>
<td>2</td>
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<td>Ischemic heart disease</td>
<td>4,718</td>
<td>3</td>
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<td>Diabetes mellitus</td>
<td>2,045</td>
<td>4</td>
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<tr>
<td>Cirrhosis and other chronic liver diseases</td>
<td>1,705</td>
<td>5</td>
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<td>Tuberculosis</td>
<td>1,472</td>
<td>6</td>
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<td>Chronic obstructive pulmonary disease</td>
<td>1,379</td>
<td>7</td>
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<tr>
<td>Diarrheal diseases</td>
<td>1,146</td>
<td>8</td>
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<td>Hypertensive heart disease</td>
<td>973</td>
<td>9</td>
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<tr>
<td>Tracheal, bronchus, and lung cancer</td>
<td>951</td>
<td>10</td>
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</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**

<table>
<thead>
<tr>
<th>Country</th>
<th>Primary school closure</th>
<th>Secondary school closure</th>
<th>Higher school closure</th>
<th>Borders closed to any non-resident</th>
<th>Borders closed to all non-residents</th>
<th>Individual movements restricted</th>
<th>Individual curfew</th>
<th>Gathering limit: 6 indoor, 10 outdoor</th>
<th>Gathering limit: 10 indoor, 25 outdoor</th>
<th>Gathering limit: 25 indoor, 50 outdoor</th>
<th>Gathering limit: 50 indoor, 100 outdoor</th>
<th>Gathering limit: 100 indoor, 250 outdoor</th>
<th>Restaurants closed</th>
<th>Bars closed</th>
<th>Restaurants / bars closed only</th>
<th>Restaurants / bars curbside only</th>
<th>Gyms, pools, other leisure closed</th>
<th>Non-essential retail closed</th>
<th>Non-essential workplaces closed</th>
<th>Stay home order</th>
<th>Stay home fine</th>
<th>Stay home fine</th>
<th>Mask mandate</th>
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*Not all locations are measured at the subnational level.*

Source: covid19.healthdata.org
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

![Graph showing the trend in COVID-19 diagnostic tests per 100,000 people from February 20 to August 21, with Indonesia, Myanmar, Thailand, Bangladesh, and India depicted.]

**Figure 15.** COVID-19 diagnostic tests per 100,000 people on July 26, 2021

![Map showing the distribution of COVID-19 diagnostic tests in the region, with color codes indicating the number of tests per 100,000 population.]
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>
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</thead>
<tbody>
<tr>
<td>AstraZeneca</td>
<td>74%</td>
<td>52%</td>
<td>53%</td>
<td>47%</td>
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<tr>
<td>CoronaVac</td>
<td>50%</td>
<td>44%</td>
<td>40%</td>
<td>35%</td>
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<tr>
<td>Covaxin</td>
<td>78%</td>
<td>69%</td>
<td>62%</td>
<td>55%</td>
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<tr>
<td>Janssen</td>
<td>72%</td>
<td>72%</td>
<td>64%</td>
<td>56%</td>
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<tr>
<td>Moderna</td>
<td>94%</td>
<td>89%</td>
<td>83%</td>
<td>79%</td>
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<tr>
<td>Novavax</td>
<td>89%</td>
<td>79%</td>
<td>73%</td>
<td>64%</td>
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<td>Pfizer/BioNTech</td>
<td>91%</td>
<td>86%</td>
<td>81%</td>
<td>77%</td>
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<tr>
<td>Sinopharm</td>
<td>73%</td>
<td>65%</td>
<td>47%</td>
<td>41%</td>
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<tr>
<td>Sputnik-V</td>
<td>92%</td>
<td>81%</td>
<td>73%</td>
<td>65%</td>
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<td>Tianjin</td>
<td>66%</td>
<td>58%</td>
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<td>CanSino</td>
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<td>Other vaccines</td>
<td>75%</td>
<td>66%</td>
<td>60%</td>
<td>53%</td>
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<tr>
<td>Other vaccines (mRNA)</td>
<td>91%</td>
<td>86%</td>
<td>81%</td>
<td>77%</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.

![Graph showing number of people who receive any vaccine and effectively vaccinated, with dates ranging from Dec 20 to Nov 21.](image)

**Figure 20.** Percentage of people who are immune to non-escape variants and the percentage of people who are immune to escape variants.

![Graph showing percent immune to non-escape and escape variants, with dates ranging from Feb 20 to Dec 21.](image)
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*. 

![All hospital beds chart](chart)
**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*. 

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*Intensive care unit beds*
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.