COVID-19 Results Briefing
The South-East Asia Region
September 1, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 in the South-East Asia Region. The model was run on August 31, 2021, with data through August 30, 2021.

Across the South-East Asia Region, cases and deaths continued to decline, as transmission appears to have peaked in most countries. However, the situation in the region remains fragile due to low vaccination rates, low cross-variant immunity, high mobility, and decreasing mask use. In Sri Lanka and Timor-Leste, estimated effective R remained above 1, indicating transmission is increasing within these countries and daily death projections are expected to continue to climb over the coming weeks. As more educational institutions resume in-person learning, mitigation measures to control transmission are essential in schools with largely unvaccinated children. As of August 30, we estimate that 54% of the regional population has already been infected with COVID-19 and only 11% of the population is fully vaccinated, meaning many individuals will remain susceptible to infection through December 1. Our reference scenario projects 62% of individuals will be immune to escape variants by December 1 and the regional reported death toll will reach 761,000 cumulative deaths by that time, representing an additional 120,000 lives lost due to COVID-19. As countries like Thailand and India are reportedly discussing shifting policy goals from controlling transmission to harm reduction (e.g., reducing hospitalizations and deaths), the regional trajectory appears to be heading toward an endemic phase. Our projections indicate that a harm reduction strategy is prudent as eliminating transmission will be difficult for the following reasons: (i) vaccine hesitancy, (ii) waning natural and vaccine-derived immunity, (iii) diminishing adherence to social distancing and mask use advisories, and (iv) the potential emergence of new variants. Long-term harm reduction requires high levels of vaccination in at-risk populations (e.g., those over 60 years old and those with comorbidities). Additionally, seasonal and surge-related mask use can be highly effective in minimizing the scale of potential future winter or variant-driven waves of infections. Our model projects that 18,000 lives could be saved by December 1 if mask use increased to 95% of the population. In countries where vaccine supply chains are constrained or in populations where vaccine hesitancy remains high, managing the epidemic may require ongoing efforts at transmission control through social distancing mandates and mask mandates until vaccination rates in at-risk groups can reach higher levels.

Current situation

- Daily infections in the last week decreased to 998,700 per day on average compared to 1,164,000 the week before (Figure 1). Daily hospital census in the last week (through August 30) decreased to 297,800 per day on average compared to 350,200 the week before.

- Daily reported cases in the last week decreased to 82,600 per day on average compared to 85,500 the week before (Figure 2).
• Reported deaths due to COVID-19 in the last week decreased to 2,000 per day on average compared to 2,400 the week before (Figure 3).

• Excess deaths due to COVID-19 in the last week decreased to 4,900 per day on average compared to 6,000 the week before (Figure 3). This makes COVID-19 the number 2 cause of death in the South-East Asia Region this week (Table 1). Estimated excess daily deaths due to COVID-19 were 2.4 times larger than the reported number of deaths.

• The daily reported COVID-19 death rate is greater than 4 per million in Sri Lanka and Thailand (Figure 4).

• The daily rate of excess deaths due to COVID-19 is greater than 4 per million in Indonesia, Myanmar, Sri Lanka, Thailand, and Timor-Leste (Figure 4).

• We estimate that 54% of people in the South-East Asia Region have been infected as of August 30 (Figure 6).

• Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in two countries – Sri Lanka and Timor-Leste – and several states within India (Figure 7).

• The infection-detection rate in the South-East Asia Region was close to 7% on August 30 (Figure 8).

• 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). We estimate that the Beta variant is circulating in 1 country, that the Delta variant is circulating in all 11 countries, and that the Gamma variant is circulating in no countries.

Trends in drivers of transmission

• Mobility last week was 20% lower than the pre-COVID-19 baseline (Figure 11). Mobility was near baseline (within 10%) in Bangladesh, Bhutan, and Nepal. Mobility was lower than 30% of baseline in Maldives, Myanmar, Sri Lanka, Thailand, and Timor-Leste.

• As of August 30, in the COVID-19 Trends and Impact Survey, 70% of people self-report that they always wore a mask when leaving their home (Figure 13).

• There were 115 diagnostic tests per 100,000 people on August 30 (Figure 15).

• As of August 30, one country – Bhutan – has reached 70% or more of the population who have received at least one vaccine dose and no countries have reached 70% or more of the population who are fully vaccinated (Figure 17).

• In the South-East Asia Region, 80.9% of people say they would accept or would probably accept a vaccine for COVID-19. This is down by 0.2 percentage points from last week. The proportion of the population who are open to receiving a COVID-19 vaccine ranges from 60% in Maldives to 95% in Sri Lanka (Figure 19).
In our current reference scenario, we expect that 964.3 million people will be vaccinated with at least one dose by December 1 (Figure 20).

In our current reference scenario, we expect that by December 1, 67% of people will be immune to non-escape variants and 62% of people will be immune to escape variants (Figure 21).

**Projections**

- In our **reference scenario**, which represents what we think is most likely to happen, our model projects 761,000 cumulative reported deaths due to COVID-19 on December 1. This represents 120,000 additional deaths from August 30 to December 1. Daily reported deaths will decline to 1,050 by October 25, 2021, after which daily deaths will increase slowly through December 1 (Figure 22).

- Under our **reference scenario**, our model projects 2,068,000 cumulative excess deaths due to COVID-19 on December 1. This represents 259,000 additional deaths from August 30 to December 1 (Figure 22).

- If **universal mask coverage (95%)** were attained in the next week, our model projects 18,000 fewer cumulative reported deaths compared to the reference scenario on December 1.

- Under our **worse scenario**, our model projects 905,000 cumulative reported deaths on December 1, an additional 144,000 deaths compared to our reference scenario. Daily reported deaths in the **worse scenario** will rise to 4,630 by November 17, 2021, after which daily deaths will decline through December 1 (Figure 22).

- Daily infections in the **reference scenario** will decline to 533,920 by October 18, 2021 (Figure 23). Daily infections in the **worse scenario** will rise to 2,505,270 by November 15, 2021 (Figure 23).

- Daily cases in the **reference scenario** will decline to 47,710 by October 11, 2021 (Figure 24). Daily cases in the **worse scenario** will rise to 221,570 by November 4, 2021 (Figure 24).

- Daily hospital census in the **reference scenario** will decline to 102,690 by November 8, 2021 (Figure 25). Daily hospital census in the **worse scenario** will rise to 457,800 by November 26, 2021 (Figure 25).

- Figure 26 compares our reference scenario forecasts to other publicly archived models. Forecasts are widely divergent.

- At some point from August through December 1, seven countries will have high or extreme stress on hospital beds (Figure 27). At some point from August through December 1, eight countries will have high or extreme stress on intensive care unit (ICU) capacity (Figure 28).
Model updates

For 22 US states, we have observed poor temporal concordance over recent weeks when comparing (a) deaths, hospitalizations, and cases to (b) seroprevalence surveys after performing assay-specific corrections for sero-reversion. To improve this, we changed the assumptions in the model as to which assay was used in those particular states – from one with substantial declines in sensitivity over time to one with more robust long-term sensitivity – which resulted in a smaller adjustment for these data, and thus lower estimates of seroprevalence. The below are examples from Florida. The top figure shows the previous approach; the lower figure shows the new approach. Squares are reported, circles are post-correction.
Figure 1. Daily COVID-19 hospital census and infections

Figure 2. 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>Ischemic heart disease</td>
<td>39,868</td>
<td>1</td>
</tr>
<tr>
<td>COVID-19</td>
<td>34,232</td>
<td>2</td>
</tr>
<tr>
<td>Stroke</td>
<td>27,102</td>
<td>3</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>21,984</td>
<td>4</td>
</tr>
<tr>
<td>Diarrheal diseases</td>
<td>14,328</td>
<td>5</td>
</tr>
<tr>
<td>Lower respiratory infections</td>
<td>11,327</td>
<td>6</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>10,815</td>
<td>7</td>
</tr>
<tr>
<td>Neonatal disorders</td>
<td>10,504</td>
<td>8</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>9,152</td>
<td>9</td>
</tr>
<tr>
<td>Cirrhosis and other chronic liver diseases</td>
<td>8,514</td>
<td>10</td>
</tr>
</tbody>
</table>

Figure 3. Smoothed trend estimate of reported daily COVID-19 deaths (blue) and excess daily deaths due to COVID-19 (orange)
**Figure 4.** Daily COVID-19 death rate per 1 million on August 30, 2021

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

**B. Daily excess COVID-19 death rate per 1 million**
Figure 5. Cumulative COVID-19 deaths per 100,000 on August 30, 2021

A. Reported cumulative COVID-19 deaths per 100,000

B. Excess cumulative COVID-19 deaths per 100,000
Figure 6. Estimated percent of the population infected with COVID-19 on August 30, 2021

Figure 7. Mean effective R on August 19, 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. 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 9. Estimated percent of circulating SARS-CoV-2 for primary variant families on August 30, 2021

A. Estimated percent Alpha variant

B. Estimated percent Beta variant
C. Estimated percent Delta variant

![Map of South-East Asia Region showing estimated percent Delta variant](image)

D. Estimated percent Gamma variant

![Map of South-East Asia Region showing estimated percent Gamma variant](image)
Figure 10. Infection-fatality rate on August 30, 2021. This is estimated as the ratio of COVID-19 deaths to estimated daily COVID-19 infections.
### Critical drivers

**Table 2. Current mandate implementation**

| Country                  | Primary school closure | Secondary school closure | Higher school closure | Borders closed to any non-resident | Borders closed to all non-residents | Individual movements restricted | Curfew for businesses | Individual curfew | Gathering limit: 6 indoor, 10 outdoor | Gathering limit: 10 indoor, 25 outdoor | Gathering limit: 25 indoor, 50 outdoor | Gathering limit: 50 indoor, 100 outdoor | Gathering limit: 100 indoor, 250 outdoor | Restaurants closed | Bars closed | Restaurants / bars closed only | Restaurants / bars curbside only | Gyms, pools, other leisure closed | Non-essential retail closed | Non-essential workplaces closed | Stay home order | Stay home fine | Mask mandate | Mask mandate fine |
|--------------------------|------------------------|--------------------------|-----------------------|-----------------------------------|------------------------------------|----------------------------------|----------------------|------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------|----------------|-----------------------------|-----------------------------|--------------------------|-----------------------------|--------------------------|----------------|----------------|-------------------|
| Bangladesh               |                        |                          |                       |                                   |                                    |                                  |                     |                 |                                        |                                        |                                        |                                        |                                        |                |                |                             |                             |                         |                             |              |                |                |                    |
| Bhutan                  |                        |                          |                       |                                   |                                    |                                  |                     |                 |                                        |                                        |                                        |                                        |                                        |                |                |                             |                             |                         |                             |              |                |                |                    |
| Democratic People's Republic of Korea |                        |                          |                       |                                   |                                    |                                  |                     |                 |                                        |                                        |                                        |                                        |                                        |                |                |                             |                             |                         |                             |              |                |                |                    |
| India                   |                        |                          |                       |                                   |                                    |                                  |                     |                 |                                        |                                        |                                        |                                        |                                        |                |                |                             |                             |                         |                             |              |                |                |                    |
| Indonesia               |                        |                          |                       |                                   |                                    |                                  |                     |                 |                                        |                                        |                                        |                                        |                                        |                |                |                             |                             |                         |                             |              |                |                |                    |
| Maldives                |                        |                          |                       |                                   |                                    |                                  |                     |                 |                                        |                                        |                                        |                                        |                                        |                |                |                             |                             |                         |                             |              |                |                |                    |
| Myanmar                 |                        |                          |                       |                                   |                                    |                                  |                     |                 |                                        |                                        |                                        |                                        |                                        |                |                |                             |                             |                         |                             |              |                |                |                    |
| Nepal                   |                        |                          |                       |                                   |                                    |                                  |                     |                 |                                        |                                        |                                        |                                        |                                        |                |                |                             |                             |                         |                             |              |                |                |                    |
| Sri Lanka               |                        |                          |                       |                                   |                                    |                                  |                     |                 |                                        |                                        |                                        |                                        |                                        |                |                |                             |                             |                         |                             |              |                |                |                    |
| Thailand                |                        |                          |                       |                                   |                                    |                                  |                     |                 |                                        |                                        |                                        |                                        |                                        |                |                |                             |                             |                         |                             |              |                |                |                    |
| Timor-Leste             |                        |                          |                       |                                   |                                    |                                  |                     |                 |                                        |                                        |                                        |                                        |                                        |                |                |                             |                             |                         |                             |              |                |                |                    |

*Not all locations are measured at the subnational level.*
Figure 11. Trend in mobility as measured through smartphone app use, compared to January 2020 baseline

Figure 12. Mobility level as measured through smartphone app use, compared to January 2020 baseline (percent) on August 30, 2021
Figure 13. Trend in the proportion of the population reporting always wearing a mask when leaving home.

Figure 14. Proportion of the population reporting always wearing a mask when leaving home on August 30, 2021.
Figure 15. Trend in COVID-19 diagnostic tests per 100,000 people

Figure 16. COVID-19 diagnostic tests per 100,000 people on August 30, 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 disease: Beta, Delta, &amp; Gamma</th>
<th>Efficacy at preventing infection: Beta, Delta, &amp; Gamma</th>
</tr>
</thead>
<tbody>
<tr>
<td>AstraZeneca</td>
<td>85%</td>
<td>83%</td>
<td>57%</td>
</tr>
<tr>
<td>CoronaVac</td>
<td>50%</td>
<td>43%</td>
<td>38%</td>
</tr>
<tr>
<td>Covaxin</td>
<td>78%</td>
<td>68%</td>
<td>60%</td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td>86%</td>
<td>85%</td>
<td>56%</td>
</tr>
<tr>
<td>Moderna</td>
<td>94%</td>
<td>93%</td>
<td>80%</td>
</tr>
<tr>
<td>Novavax</td>
<td>89%</td>
<td>79%</td>
<td>69%</td>
</tr>
<tr>
<td>Pfizer/BioNTech</td>
<td>92%</td>
<td>86%</td>
<td>78%</td>
</tr>
<tr>
<td>Sinopharm</td>
<td>73%</td>
<td>63%</td>
<td>56%</td>
</tr>
<tr>
<td>Sputnik-V</td>
<td>92%</td>
<td>81%</td>
<td>70%</td>
</tr>
<tr>
<td>Tianjin</td>
<td>66%</td>
<td>57%</td>
<td>50%</td>
</tr>
<tr>
<td>CanSino Other</td>
<td>75%</td>
<td>65%</td>
<td>57%</td>
</tr>
<tr>
<td>Other vaccines</td>
<td>91%</td>
<td>86%</td>
<td>78%</td>
</tr>
<tr>
<td>Other vaccines</td>
<td>75%</td>
<td>66%</td>
<td>57%</td>
</tr>
<tr>
<td>(mRNA)</td>
<td>91%</td>
<td>86%</td>
<td>78%</td>
</tr>
</tbody>
</table>
Figure 17. Percent of the population (A) having received at least one dose and (B) fully vaccinated against SARS-CoV-2 by August 30, 2021

A. Percent of the population having received one dose of a COVID-19 vaccine

B. Percent of the population fully vaccinated against SARS-CoV-2
Figure 18. 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 19. 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 20.** Percent of people who receive at least one dose of a COVID-19 vaccine and those who are fully vaccinated.

**Figure 21.** 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. 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.
Figure 22. Daily COVID-19 deaths until December 01, 2021 for three scenarios

A. Reported daily COVID-19 deaths per 100,000

B. Excess daily COVID-19 deaths per 100,000
Figure 23. Daily COVID-19 infections until December 01, 2021 for three scenarios

Figure 24. Daily COVID-19 reported cases until December 01, 2021 for three scenarios
Figure 25. Daily COVID-19 hospital census until December 01, 2021 for three scenarios

Figure 26. 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 27. 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 28. 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.