COVID-19 Results Briefing

The South-East Asia Region

April 15, 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 April 13, 2021, with data through April 12, 2021.

The spring surge continues at an alarming rate across the South-East Asia Region. Daily infections have climbed to record levels, and the current trajectory is likely to bring daily deaths to a peak at more than double the levels observed during the fall peak of 2020. Our reference scenario projects more than 400,000 additional COVID-19 deaths from now until August 1, peaking at a daily death rate of more than 6,000 in early May. This surge is likely driven by escape variants; however, with relatively few genomic sequencing data sources available publicly in South Asia, it is difficult to determine which variant is the main driver. Given high levels of previous infection in some states of India such as Delhi but continued expansion of cases, whatever variant is driving this surge appears likely to be an escape variant, possibly B.1.617. Primary strategies for containing the pandemic remain the same: (i) continue scaling up vaccination campaigns, (ii) increase mask wearing, (iii) reduce mobility, and (iv) institute measures to prevent the gathering of large crowds, which is especially important during Ramadan and the current season of festivals and holiday gatherings.

Current situation

- Daily reported cases in the last week increased to 146,000 per day on average compared to 90,000 the week before (Figure 1).
- Daily deaths in the last week increased to 1,800 per day on average compared to 1,200 the week before (Figure 2). This makes COVID-19 the number 5 cause of death in the South-East Asia Region this week (Table 1).
- No locations had daily death rates greater than 4 per million (Figure 3).
- We estimated that 18% of people in the South-East Asia Region have been infected as of April 12 (Figure 4).
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 35 locations, including five countries and nearly every state and union territory in India (Figure 5).
- The infection detection rate in the South-East Asia Region was close to 9% on April 12 (Figure 6).
Trends in drivers of transmission

- Mobility last week was 23% lower than the pre-COVID-19 baseline (Figure 9). Mobility was near baseline (within 10%) in Bangladesh, Nepal, and Thailand. Mobility was lower than 30% of baseline in the Maldives, Myanmar, and several central and western states in India, including Maharashtra and Madhya Pradesh.

- As of April 12, we estimated that 67% of people always wore a mask when leaving their home (Figure 11). Mask use was lower than 50% in Maldives.

- There were 79 diagnostic tests per 100,000 people on April 12 (Figure 13).

- In the South-East Asia Region, 77.3% of people say they would accept or would probably accept a vaccine for COVID-19. This is up by 0.3 percentage points from last week. The fraction of the population who are open to receiving a COVID-19 vaccine ranges from 36% in Bhutan to 81% in Indonesia (Figure 17).

- In our current reference scenario, we expect that 1.65 billion will be vaccinated by August 1 (Figure 18).

Projections

- In our reference scenario, which represents what we think is most likely to happen, our model projects 812,000 cumulative deaths on August 1, 2021. This represents 407,000 additional deaths from April 12 to August 1 (Figure 19). Daily deaths will peak at 6,160 on May 10, 2021 (Figure 20).

- If universal mask coverage (95%) were attained in the next week, our model projects 104,000 fewer cumulative deaths compared to the reference scenario on August 1, 2021 (Figure 19).

- Under our worse scenario, our model projects 892,000 cumulative deaths on August 1, 2021, an additional 80,000 deaths compared to our reference scenario (Figure 19).

- By August 1, we project that 98,200 lives will be saved by the projected vaccine rollout.

- Figure 22 compares our reference scenario forecasts to other publicly archived models. Forecasts are widely divergent.

- At some point from April through August 1, four countries will have high or extreme stress on hospital beds (Figure 23). At some point from April through August 1, three countries will have high or extreme stress on ICU capacity (Figure 24).
Model updates

There are no major updates in the model this week.
Figure 1. Reported daily COVID-19 cases

Table 1. Ranking of 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>Stroke</td>
<td>27,102</td>
<td>2</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>21,984</td>
<td>3</td>
</tr>
<tr>
<td>Diarrheal diseases</td>
<td>14,328</td>
<td>4</td>
</tr>
<tr>
<td>COVID-19</td>
<td>12,365</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 2. Reported daily COVID-19 deaths and smoothed trend estimate.
Figure 3. Daily COVID-19 death rate per 1 million on April 12, 2021

Figure 4. Estimated percent of the population infected with COVID-19 on April 12, 2021
Figure 5. Mean effective R on April 01, 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 6. 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 to detection rate (IDR) can exceed 100% at particular points in time.*
Figure 7. Percent of circulating SARS-CoV-2 for 3 primary variants on April 12, 2021.

A. Percent B.1.1.7 variant

B. Percent B.1.351 variant

C. Percent P1 variant
Figure 8. Infection fatality ratio on April 12, 2021. This is estimated as the ratio of COVID-19 deaths to infections based on the SEIR disease transmission model.
Critical drivers

Table 2. Current mandate implementation

<table>
<thead>
<tr>
<th>Country</th>
<th>All nonessential businesses closed</th>
<th>Any businesses restricted</th>
<th>Any gatherings restricted</th>
<th>Mask use</th>
<th>School closure</th>
<th>Stay home order</th>
<th>Travel limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>Mandate in place</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>Mandate in place</td>
</tr>
<tr>
<td>Bhutan</td>
<td>Mandate in place</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>Mandate in place</td>
</tr>
<tr>
<td>Democratic People’s Republic of Korea</td>
<td>Mandate in place</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>Mandate in place</td>
</tr>
<tr>
<td>India</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>Mandate in place</td>
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<tr>
<td>Indonesia</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>Mandate in place</td>
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<tr>
<td>Maldives</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>Mandate in place</td>
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<tr>
<td>Myanmar</td>
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<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>Mandate in place</td>
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<tr>
<td>Nepal</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>Mandate in place</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>No mandate</td>
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<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
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<tr>
<td>Thailand</td>
<td>No mandate</td>
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<td>No mandate</td>
<td>No mandate</td>
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<tr>
<td>Timor-Leste</td>
<td>No mandate</td>
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<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
<td>No mandate</td>
</tr>
</tbody>
</table>

*Not all locations are measured at the subnational level.
**Figure 9.** Trend in mobility as measured through smartphone app use compared to January 2020 baseline

**Figure 10.** Mobility level as measured through smartphone app use compared to January 2020 baseline (percent) on April 12, 2021
Figure 11. Trend in the proportion of the population reporting always wearing a mask when leaving home

Figure 12. Proportion of the population reporting always wearing a mask when leaving home on April 12, 2021
Figure 13. Trend in COVID-19 diagnostic tests per 100,000 people

Figure 14. COVID-19 diagnostic tests per 100,000 people on April 09, 2021
Figure 15. Increase in the risk of death due to pneumonia on February 1 2020 compared to August 1 2020.
Table 3. 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 (http://www.healthdata.org/node/8584).

<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 &amp; P.1</th>
<th>Efficacy at preventing infection: B.1.351 &amp; P.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>AstraZeneca</td>
<td>75%</td>
<td>52%</td>
<td>10%</td>
<td>6%</td>
</tr>
<tr>
<td>CoronaVac</td>
<td>50%</td>
<td>43%</td>
<td>38%</td>
<td>25%</td>
</tr>
<tr>
<td>Janssen</td>
<td>72%</td>
<td>72%</td>
<td>64%</td>
<td>42%</td>
</tr>
<tr>
<td>Moderna</td>
<td>94%</td>
<td>85%</td>
<td>72%</td>
<td>47%</td>
</tr>
<tr>
<td>Novavax</td>
<td>89%</td>
<td>77%</td>
<td>49%</td>
<td>32%</td>
</tr>
<tr>
<td>Pfizer/BioNTech</td>
<td>91%</td>
<td>86%</td>
<td>69%</td>
<td>45%</td>
</tr>
<tr>
<td>Sinopharm</td>
<td>73%</td>
<td>63%</td>
<td>56%</td>
<td>36%</td>
</tr>
<tr>
<td>Sputnik-V</td>
<td>92%</td>
<td>80%</td>
<td>70%</td>
<td>45%</td>
</tr>
<tr>
<td>Tianjin</td>
<td>66%</td>
<td>57%</td>
<td>50%</td>
<td>32%</td>
</tr>
<tr>
<td>CanSino</td>
<td>Other vaccines</td>
<td>Other vaccines</td>
<td>Other vaccines</td>
<td>Other vaccines</td>
</tr>
<tr>
<td></td>
<td>75%</td>
<td>65%</td>
<td>57%</td>
<td>37%</td>
</tr>
<tr>
<td></td>
<td>95%</td>
<td>83%</td>
<td>72%</td>
<td>47%</td>
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<tr>
<td></td>
<td>Other vaccines (mRNA)</td>
<td>Other vaccines (mRNA)</td>
<td>Other vaccines (mRNA)</td>
<td>Other vaccines (mRNA)</td>
</tr>
</tbody>
</table>
**Figure 16.** Trend in the estimated proportion of the adult (18+) population that have been vaccinated or is open to receiving a COVID-19 vaccine based on Facebook survey responses (yes and yes, probably).

**Figure 17.** This figure shows the estimated proportion of the adult (18+) population that has been vaccinated or is open to receiving a COVID-19 vaccine based on Facebook survey responses (yes and yes, probably).
Figure 18. The 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.
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 UK.
- In one-quarter of those vaccinated, mobility increases toward pre-COVID-19 levels.

The **worse scenario** modifies the reference scenario assumptions in three ways:

- First, it assumes that variants B.1.351 or P1 begin to spread within 3 weeks in adjacent locations that do not already have B.1.351 or P1 community transmission.
- Second, it assumes that all those vaccinated increase their mobility toward pre-COVID-19 levels.
- Third, it assumes that among those vaccinated, mask use starts to decline exponentially one month after completed vaccination.

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 19. Cumulative COVID-19 deaths until August 01, 2021 for three scenarios

Figure 20. Daily COVID-19 deaths until August 01, 2021 for three scenarios,
Figure 21. Daily COVID-19 infections until August 01, 2021 for three scenarios.
**Figure 22.** 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; https://www.covidanalytics.io/home), Imperial College London (Imperial; https://www.covidsim.org), The Los Alamos National Laboratory (LANL; https://covid-19.bsvgateway.org/), and the SI-KJalpha model from the University of Southern California (SIKJalpha; https://github.com/scc-usc/ReCOVER-COVID-19). Daily deaths from other modeling groups are smoothed to remove inconsistencies with rounding. Regional values are aggregates from available locations in that region.
Figure 23. 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 greater than 20% is considered extreme stress.
Figure 24. 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 greater than 60% is considered extreme stress.
More information

Data sources:

Mask use data sources include Premise: Facebook Global Symptom Survey (This research is based on survey results from University of Maryland Social Data Science Center) and the Facebook United States Symptom Survey (in collaboration with Carnegie Mellon University); Kaiser Family Foundation; YouGov COVID-19 Behaviour Tracker survey.

Vaccine hesitancy data are from the COVID-19 Beliefs, Behaviors, and Norms Study, a survey conducted on Facebook by the Massachusetts Institute of Technology (https://covidsurvey.mit.edu/).

Vaccine hesitancy data are from the Facebook Global Symptom Survey (This research is based on survey results from University of Maryland Social Data Science Center), the Facebook United States Symptom Survey (in collaboration with Carnegie Mellon University), and from the Facebook COVID-19 Beliefs, Behaviors, and Norms Study conducted by the Massachusetts Institute of Technology.

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.