COVID-19 Results Briefing

The African Region

June 9, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 in the WHO African Region. The model was run on June 9, 2021, with data through June 7, 2021.

The situation in the African Region continues to worsen – reported daily cases increased by 25% this week, from 7,100 per day on average to 8,900 per day. Daily deaths increased to 500 per day, compared to 470 last week, and we estimate that total daily COVID-19 deaths were 2.9 times larger than the reported number of deaths. Winter in southern Africa and the circulation of escape variants (primarily B.1.351, estimated to be circulating in 41 countries, and B.1.617, detected in over a dozen countries but not yet at the level of community transmission) coupled with the slow pace of vaccination will continue to drive spikes in cases and deaths. Sustained increases in reported cases in South Africa as well as sharp rises in the Democratic Republic of the Congo, Liberia, Namibia, Uganda, and Zambia are of particular concern. Diminished vigilance and relaxation of mandates further heightens the likelihood of surges and poses a real threat to health systems. In our reference scenario, we project 420,000 cumulative deaths on October 1, an additional 163,000 lives lost from June 7 to October 1, and we expect daily deaths to peak at 2,190 on July 14. Universal mask usage could save 53,000 lives. To manage this phase of the pandemic, countries should prioritize improving mask usage, bolstering vaccine confidence, considering targeted acquisition of vaccines with higher efficacy against prevailing variants of concern, and implementing appropriate social distancing mandates in response to rising transmission. Improvements to vaccine equity and distribution must also continue to mitigate surges in the coming months.

Current situation

- Daily reported cases in the last week increased to 8,900 per day on average compared to 7,100 the week before (Figure 1).
- Daily deaths in the last week increased to 500 per day on average compared to 470 the week before (Figure 2). Estimated total daily COVID-19 deaths were 2.9 times larger than the reported number of deaths. This makes COVID-19 the number 11 cause of death in the African Region this week (Table 1).
- The daily death rate is greater than 4 per million in Namibia and Seychelles (Figure 3).
- We estimated that 22% of people in the African Region have been infected as of June 7 (Figure 5).
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 33 countries (Figure 6).
- The infection-detection rate in the African Region was close to 2% on June 7 (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 primary circulating variants are escape variants (B.1.351, B.1.617, or P.1). We estimate that B.1.351 is circulating in 41 countries, B.1.617 is circulating in no countries, and P.1 or P.3 is circulating in no countries in the region.

Trends in drivers of transmission

- **Mobility last week was 1% lower than the pre-COVID-19 baseline (Figure 10).** Mobility was near baseline (within 10%) in 41 countries. Mobility was lower than 30% of baseline in Cabo Verde and Seychelles.

- **As of June 7, in Global COVID-19 Symptom Surveys and US COVID-19 Symptom Surveys, 48% of people self-report that they always wore a mask when leaving their home, unchanged from last week (Figure 12).** Mask use was lower than 50% in Algeria, Burkina Faso, Burundi, Cameroon, Central African Republic, Congo, Côte d’Ivoire, Democratic Republic of the Congo, Gambia, Mali, Mauritania, Nigeria, São Tomé and Príncipe, Tanzania, and Togo.

- **There were 18 diagnostic tests per 100,000 people on June 7 (Figure 14).**

- **In the African Region, 58.1% of people say they would accept or would probably accept a vaccine for COVID-19.** This is up by 1.1 percentage points from last week. The fraction of the population who are open to receiving a COVID-19 vaccine ranges from 39% in Cameroon to 71% in Guinea (Figure 18).

- **In our current reference scenario, we expect that 94.8 million people will be vaccinated by October 1 (Figure 19).**

Projections

- **In our reference scenario,** which represents what we think is most likely to happen, our model projects 420,000 cumulative deaths on October 1. This represents 163,000 additional deaths from June 7 to October 1 (Figure 20). Daily deaths will peak at 2,190 on July 14, 2021 (Figure 21).

- **If universal mask coverage (95%)** were attained in the next week, our model projects 53,000 fewer cumulative deaths compared to the reference scenario on October 1 (Figure 20).

- **Under our worse scenario,** our model projects 425,000 cumulative deaths on October 1, an additional 5,100 deaths compared to our reference scenario (Figure 20). Daily deaths in the worse scenario will peak at 2,150 on July 14, 2021 (Figure 21).

- **By October 1, we project that 15,400 lives will be saved by the projected vaccine rollout.** This does not include lives saved through vaccination that has already been delivered.

- **Daily infections in the reference scenario will rise to 499,900 by October 1, 2021.** Under the worse scenario, daily infections will rise to 563,400 by October 1, 2021 (Figure 22).
• Figure 23 compares our reference scenario forecasts to other publicly archived models. Forecasts are widely divergent.

• At some point from June through October 1, 32 countries will have high or extreme stress on hospital beds (Figure 24). At some point from June through October 1, 45 countries will have high or extreme stress on ICU capacity (Figure 25).
Model updates

We have updated our variant spread estimation model to more carefully account for simultaneous invasion of multiple variants of concern. Where available, we use data on the number of sequences by variant in a sequential ordinal modeling framework to decompose, by week, the expected fraction of all transmission that is attributable to each variant. We currently ignore very small sample sizes and only consider variants for which there are at least 200 sequences, if they are the only variant of concern, or 100 sequences if there are two variants of concern co-circulating. The current variants we consider are B.1.1.7, B.1.351, P.1, B.1.617.1, and B.1.617.2. These estimates are then used to identify timings of variant invasions, which is then used within the SEIR model.
Figure 1. Reported daily COVID-19 cases

![Graph showing reported daily COVID-19 cases](image)

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>Neonatal disorders</td>
<td>14,422</td>
<td>1</td>
</tr>
<tr>
<td>Lower respiratory infections</td>
<td>12,732</td>
<td>2</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>12,224</td>
<td>3</td>
</tr>
<tr>
<td>Malaria</td>
<td>11,351</td>
<td>4</td>
</tr>
<tr>
<td>Diarrheal diseases</td>
<td>11,088</td>
<td>5</td>
</tr>
<tr>
<td>Ischemic heart disease</td>
<td>8,306</td>
<td>6</td>
</tr>
<tr>
<td>Stroke</td>
<td>8,063</td>
<td>7</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>7,097</td>
<td>8</td>
</tr>
<tr>
<td>Congenital birth defects</td>
<td>3,721</td>
<td>9</td>
</tr>
<tr>
<td>Cirrhosis and other chronic liver diseases</td>
<td>3,615</td>
<td>10</td>
</tr>
<tr>
<td>COVID-19</td>
<td>3,523</td>
<td>11</td>
</tr>
</tbody>
</table>
Figure 2. Smoothed trend estimate of reported daily COVID-19 deaths (blue) and total daily COVID-19 deaths (orange).
Figure 3. Daily COVID-19 death rate per 1 million on June 7, 2021

Figure 4. Cumulative COVID-19 deaths per 100,000 on June 7, 2021
Figure 5. Estimated percent of the population infected with COVID-19 on June 7, 2021

Figure 6. Mean effective R on May 27, 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 June 7, 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 June 7, 2021

- < 0.2%
- 0.2% to 0.39%
- 0.4% to 0.59%
- 0.6% to 0.79%
- 0.8% to 0.99%
- > 1%
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 June 7, 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 June 7, 2021
**Figure 14.** Trend in COVID-19 diagnostic tests per 100,000 people

**Figure 15.** COVID-19 diagnostic tests per 100,000 people on June 7, 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>35%</td>
<td>31%</td>
</tr>
<tr>
<td>CoronaVac</td>
<td>50%</td>
<td>44%</td>
<td>32%</td>
<td>28%</td>
</tr>
<tr>
<td>Covaxin</td>
<td>78%</td>
<td>69%</td>
<td>50%</td>
<td>44%</td>
</tr>
<tr>
<td>Janssen</td>
<td>72%</td>
<td>72%</td>
<td>64%</td>
<td>57%</td>
</tr>
<tr>
<td>Moderna</td>
<td>94%</td>
<td>89%</td>
<td>89%</td>
<td>85%</td>
</tr>
<tr>
<td>Novavax</td>
<td>89%</td>
<td>79%</td>
<td>49%</td>
<td>43%</td>
</tr>
<tr>
<td>Pfizer/BioNTech</td>
<td>91%</td>
<td>86%</td>
<td>86%</td>
<td>82%</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>59%</td>
<td>52%</td>
</tr>
<tr>
<td>Tianjin</td>
<td>66%</td>
<td>58%</td>
<td>42%</td>
<td>37%</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>57%</td>
<td>50%</td>
</tr>
<tr>
<td>Other vaccines (mRNA)</td>
<td>91%</td>
<td>86%</td>
<td>86%</td>
<td>82%</td>
</tr>
</tbody>
</table>
**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.
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.
- 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 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.
- 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 20. Cumulative COVID-19 deaths until October 01, 2021 for three scenarios

Figure 21. Daily COVID-19 deaths until October 01, 2021 for three scenarios
Figure 22. Daily COVID-19 infections until October 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 Global COVID-19 Symptom Survey (this research is based on survey results from University of Maryland Social Data Science Center with Facebook’s support) and the US COVID-19 Symptom Survey (this research is based on survey results from Carnegie Mellon University’s Delphi Research Group with Facebook’s support). 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.