COVID-19 Results Briefing

The African Region

March 17, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 in the African Region. The model was run on March 17, 2021, with data through March 15, 2021.

Daily reported cases increased this week, driven in part by the spread of the B.1.351 and B.1.117 variants, while daily deaths decreased. Effective R is above 1 in 24 countries, indicating transmission is increasing throughout much of the continent. Mobility remains very high and on average is 9% lower than the pre-COVID-19 baseline; only Cabo Verde and Senegal had mobility levels less than 30% of the pre-COVID-19 baseline. In our reference scenario, our model projects 90,000 cumulative deaths in the African Region by July 1, representing an additional 16,000 lives lost between March 15 and July 1. If mask usage could be increased from the current estimated 50% of people reporting always wearing a mask to 95%, 7,000 lives could be saved. The main strategies that should be pursued to manage this phase of the epidemic include 1) accelerating vaccine coverage, bolstering vaccine confidence, and considering targeted acquisition of vaccines with higher efficacy against prevailing variants of concern, and 2) strengthening public health messaging to encourage increased mask use and avoidance of high transmission risk settings, coupled with appropriate social distancing mandates.

Current situation

- Daily reported cases in the last week increased to 7,200 per day on average compared to 6,900 the week before (Figure 1).
- Daily deaths in the last week decreased to 180 per day on average compared to 190 the week before (Figure 2). This makes COVID-19 the number 24 cause of death in the African Region this week (Table 1).
- No locations had daily death rates greater than 4 per million (Figure 3).
- We estimated that 10% of people in the African Region have been infected as of March 15 (Figure 4).
- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 24 countries (Figure 5).

Trends in drivers of transmission

- Mobility last week was 9% lower than the pre-COVID-19 baseline (Figure 9). Mobility was near baseline (within 10%) in 13 countries. Mobility was lower than 30% of baseline in Cabo Verde and Senegal.
• As of March 15, we estimated that 50% of people always wore a mask when leaving their home, unchanged from last week (Figure 11). Mask use was lower than 50% in Algeria, Burkina Faso, Cameroon, Central African Republic, Congo, Côte d’Ivoire, Democratic Republic of the Congo, Ethiopia, Gambia, Mauritania, Nigeria, São Tomé and Príncipe, South Sudan, Tanzania, Togo, and Zambia.

• There were 14 diagnostic tests per 100,000 people on March 15 (Figure 13).

• In the African Region, 62.5% of people say they would accept or would probably accept a vaccine for COVID-19. The fraction of the population who are open to receiving a COVID-19 vaccine ranges from 37% in Democratic Republic of the Congo to 79% in Mauritius (Figure 16).

• In our current reference scenario, we expect that 182.82 million will be vaccinated by July 1 (Figure 17).

Projections

• If universal mask coverage (95%) were attained in the next week, our model projects 7,000 fewer cumulative deaths compared to the reference scenario on July 1, 2021 (Figure 18).

• Under our worse scenario, our model projects 93,000 cumulative deaths on July 1, 2021 (Figure 18).

• In our reference scenario, which represents what we think is most likely to happen, our model projects 90,000 cumulative deaths on July 1, 2021. This represents 16,000 additional deaths from March 15 to July 1 (Figure 18). Daily deaths are expected to decline steadily until July 1 (Figure 19).

• By July 1, we project that 2,400 lives will be saved by the projected vaccine rollout.

• Figure 21 compares our reference scenario forecasts to other publicly archived models. Forecasts are widely divergent.

• At some point from March through July 1, 32 countries will have high or extreme stress on hospital beds (Figure 24). At some point from March through July 1, 38 countries will have high or extreme stress on ICU capacity (Figure 23).
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>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>1,244</td>
<td>24</td>
</tr>
</tbody>
</table>
Figure 2. Reported daily COVID-19 deaths
Figure 3. Daily COVID-19 death rate per 1 million on March 15, 2021

Figure 4. Estimated percent of the population infected with COVID-19 on March 15, 2021
Figure 5. Mean effective R on March 04, 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 March 15, 2021.

A. Percent B.1.1.7 variant

B. Percent B.1.351 variant

C. Percent P1 variant
Figure 8. Infection fatality ratio on March 15, 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
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 March 15, 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 March 15, 2021.
**Figure 13.** Trend in COVID-19 diagnostic tests per 100,000 people

**Figure 14.** COVID-19 diagnostic tests per 100,000 people on March 12, 2021
**Figure 15.** Increase in the risk of death due to pneumonia on February 1 2020 compared to August 1 2020

![Map of Africa showing risk of death due to pneumonia](image)

**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>74%</td>
<td>52%</td>
<td>10%</td>
<td>7%</td>
</tr>
<tr>
<td>CanSinoBio</td>
<td>66%</td>
<td>57%</td>
<td>50%</td>
<td>44%</td>
</tr>
<tr>
<td>CoronaVac</td>
<td>50%</td>
<td>43%</td>
<td>38%</td>
<td>33%</td>
</tr>
<tr>
<td>Janssen (Johnson &amp; Johnson)</td>
<td>72%</td>
<td>72%</td>
<td>64%</td>
<td>56%</td>
</tr>
<tr>
<td>Moderna</td>
<td>94%</td>
<td>85%</td>
<td>72%</td>
<td>62%</td>
</tr>
<tr>
<td>Novavax</td>
<td>89%</td>
<td>77%</td>
<td>49%</td>
<td>43%</td>
</tr>
<tr>
<td>Pfizer/BioNTech</td>
<td>95%</td>
<td>86%</td>
<td>72%</td>
<td>63%</td>
</tr>
<tr>
<td>Sinopharm</td>
<td>73%</td>
<td>63%</td>
<td>56%</td>
<td>48%</td>
</tr>
<tr>
<td>Sputnik V</td>
<td>92%</td>
<td>80%</td>
<td>70%</td>
<td>61%</td>
</tr>
<tr>
<td>Other mRNA vaccines</td>
<td>95%</td>
<td>83%</td>
<td>72%</td>
<td>63%</td>
</tr>
<tr>
<td>All other vaccines</td>
<td>75%</td>
<td>65%</td>
<td>57%</td>
<td>50%</td>
</tr>
</tbody>
</table>
Figure 16. This figure shows the estimated proportion of the adult (18+) population that is open to receiving a COVID-19 vaccine based on Facebook survey responses (yes and yes, probably).

Figure 17. 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 18. Cumulative COVID-19 deaths until July 01, 2021 for three scenarios

Figure 19. Daily COVID-19 deaths until July 01, 2021 for three scenarios
Figure 20. Daily COVID-19 infections until July 01, 2021 for three scenarios
Figure 21. 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.bsggateway.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 22. 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 23. 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/).

Data on vaccine candidates, stages of development, manufacturing capacity, and pre-purchasing agreements are primarily from Linksbridge and supplemented by Duke University.

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.