COVID-19 Results Briefing

The African Region

September 15, 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 September 14, 2021, with data through September 13, 2021.

Key indicators including estimated daily infections, reported cases, hospitalizations, and reported deaths continued to decline in the African Region this week; however, trends at the sub-regional level vary. While almost all countries in southern Africa have recorded steady decreases in cases and deaths following implementation of strict public health measures, 14 countries in Central, West, and East Africa have an effective R greater than 1, indicating we should expect continued transmission in these locations. Despite overall declining trends, the risk of resurgence remains due to high mobility, diminished mask use, and persistently unequal access to vaccines leading to very low levels of vaccination in the region. By January 1, we expect only 7% of the population in the African Region to be fully vaccinated, thus concerted global efforts to improve access to vaccines for the region are essential. In our reference scenario, which we extended to January 1 this week, we expect the declining trend in cases and deaths to continue through mid-October and then reverse and begin climbing steadily through January 1. We project 49,000 additional lives will be lost between September 13 and January 1, with 188,000 cumulative reported deaths on January 1. If universal mask use could be achieved, our model projects 29,000 fewer cumulative reported deaths compared to the reference scenario on January 1. Our reference scenarios may be optimistic for two reasons. First, we do not yet take into account waning immunity. There is emerging evidence from post-vaccination studies in England, the US, and Israel and from the long-term follow-up of the Pfizer and Moderna trials that vaccine-derived immunity wanes for preventing infection. This week, some evidence (studies from Israel in the New England Journal of Medicine and a Public Health England report) is also emerging that vaccine-derived immunity for hospitalization and death may also wane, albeit at a slower rate. We plan to revise our model to incorporate this evidence on waning immunity over the next weeks. Countries should seek to report data on cases, hospitalizations, and deaths by vaccination status so that more evidence can emerge on waning immunity. Second, our model does not take into account the potential emergence of a new variant with increased transmissibility or immune escape. Particularly in locations with a large percentage of susceptible individuals, the emergence of new variants is an ongoing risk to monitor closely. Some analysts have raised concern about the Mu variant, but there is not yet any population-level data to suggest this will lead to new surges. Strategies to manage this phase of the pandemic include 1) expanding vaccine coverage by addressing global inequities and vaccine hesitancy; 2) promoting behaviors including mask use and adherence to social distancing measures, particularly as students return to school; 3) implementing other non-pharmaceutical interventions including appropriate mandates in response to rising transmission; and 4) adequate testing to track ongoing transmission, including genetic sequencing to identify new variants as they emerge and provide an early warning for future surges.
Current situation

• Daily infections in the last week decreased to 427,400 per day on average compared to 428,100 the week before (Figure 1). Daily hospital census in the last week (through September 13) decreased to 68,200 per day on average compared to 80,900 the week before.

• Daily reported cases in the last week decreased to 13,500 per day on average compared to 15,600 the week before (Figure 2).

• Reported deaths due to COVID-19 in the last week decreased to 360 per day on average compared to 430 the week before (Figure 3).

• Excess deaths due to COVID-19 in the last week decreased to 1,100 per day on average compared to 1,300 the week before (Figure 3). This makes COVID-19 the number 8 cause of death in the African Region this week (Table 1). Estimated excess daily deaths due to COVID-19 in the past week were 2.9 times larger than the reported number of deaths.

• No locations had daily reported COVID-19 death rates greater than 4 per million (Figure 4).

• The daily rate of excess deaths due to COVID-19 is greater than 4 per million in Eswatini, Liberia, Sao Tome and Principe, and South Africa (Figure 4).

• We estimate that 20% of people in the African Region have been infected as of September 13 (Figure 6).

• Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 14 countries (Figure 7).

• The infection-detection rate in the African Region was close to 3% on September 13 (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 41 countries, and that the Gamma variant is circulating in eight countries.

Trends in drivers of transmission

• Mobility last week was 17% higher than the pre-COVID-19 baseline (Figure 11). Mobility was near baseline (within 10%) in 43 countries. Mobility was lower than 30% of baseline in no locations.

• As of September 13, in the COVID-19 Trends and Impact Survey, 49% of people self-report that they always wore a mask when leaving their home compared to 50% last week (Figure 13).

• There were 18 diagnostic tests per 100,000 people on September 13 (Figure 15).
As of September 13, no countries have 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 African Region, 59.8% of adults say they would accept or would probably accept a vaccine for COVID-19. This is down by 0.4 percentage points from last week. The proportion of the population who are open to receiving a COVID-19 vaccine ranges from 30% in Botswana to 75% in Ghana (Figure 19).

In our current reference scenario, we expect that 174.8 million people, 16% of the population, will be vaccinated with at least one dose by January 1 (Figure 20). We expect 7% of the population to be fully vaccinated by January 1.

In our current reference scenario, we expect that by January 1, 38% of people will be immune to non-escape variants and 32% 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 188,000 cumulative reported deaths due to COVID-19 on January 1. This represents 49,000 additional deaths from September 13 to January 1. Daily reported deaths will decline to 260 by October 16, 2021, and begin rising again through January 1 (Figure 22).

- Under our reference scenario, our model projects 565,000 cumulative excess deaths due to COVID-19 on January 1. This represents 163,000 additional deaths from September 13 to January 1 (Figure 22).

- If universal mask coverage (95%) were attained in the next week, our model projects 29,000 fewer cumulative reported deaths compared to the reference scenario on January 1.

- Under our worse scenario, our model projects 204,000 cumulative reported deaths on January 1, an additional 16,000 deaths compared to our reference scenario. Daily reported deaths in the worse scenario will decline to 270 by October 7, 2021, and begin rising again through January 1 (Figure 22).

- Daily infections in the reference scenario will rise to 2,011,420 by December 24, 2021 (Figure 23). Daily infections in the worse scenario will rise to 2,500,340 by December 13, 2021 (Figure 23).

- Daily cases in the reference scenario will decline to 12,050 by September 25, 2021 (Figure 24). Daily cases in the worse scenario will rise to 59,640 by December 21, 2021 (Figure 24).

- Daily hospital census in the reference scenario will decline to 56,100 by October 4, 2021 (Figure 25). Daily hospital census in the worse scenario will decline to 57,570 by September 29, 2021 (Figure 25).

- Figure 26 compares our reference scenario forecasts to other publicly archived models. Forecasts are widely divergent.
At some point from September through January 1, 28 countries will have high or extreme stress on hospital beds (Figure 27). At some point from September through January 1, 43 countries will have high or extreme stress on intensive care unit (ICU) capacity (Figure 28).
Model updates

No model updates
**Figure 1.** Daily COVID-19 hospital census and infections

![Daily COVID-19 hospital census and infections](image)

- **Daily hospital census**
- **Daily infections**

**Figure 2.** Reported daily COVID-19 cases, moving average

![Reported daily COVID-19 cases, moving average](image)

- **Daily cases**
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>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>COVID-19</td>
<td>7,358</td>
<td>8</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>7,097</td>
<td>9</td>
</tr>
<tr>
<td>Congenital birth defects</td>
<td>3,721</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 September 13, 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 September 13, 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 September 13, 2021

**Figure 7.** Mean effective R on September 2, 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 September 13, 2021

A. Estimated percent Alpha variant

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

D. Estimated percent Gamma variant
**Figure 10.** Infection-fatality rate on September 13, 2021. This is estimated as the ratio of COVID-19 deaths to estimated daily COVID-19 infections.
### Critical drivers

Table 2. Current mandate implementation

<table>
<thead>
<tr>
<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>Curfew for businesses</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</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>Mask mandate</th>
<th>Mask mandate fine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mauritania</td>
<td>Mauritius</td>
<td>Mozambique</td>
<td>Namibia</td>
<td>Sao Tome and Principe</td>
<td>Senegal</td>
<td>Seychelles</td>
<td>Sierra Leone</td>
<td>South Africa</td>
<td>South Sudan</td>
<td>Togo</td>
<td>Uganda</td>
<td>United Republic of Tanzania</td>
<td>Zambia</td>
<td>Zimbabwe</td>
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</tr>
</tbody>
</table>

**Legend:**
- Mandate in place
- Mandate in place (imposed this week)
- Mandate in place (updated from previous reporting)
- No mandate
- No mandate (lifted this week)
- No mandate (updated from previous reporting)
**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 September 13, 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 September 13, 2021
Figure 15. Trend in COVID-19 diagnostic tests per 100,000 people

Figure 16. COVID-19 diagnostic tests per 100,000 people on September 13, 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 infection: 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>90%</td>
<td>52%</td>
<td>85%</td>
<td>49%</td>
</tr>
<tr>
<td>CoronaVac</td>
<td>50%</td>
<td>44%</td>
<td>43%</td>
<td>38%</td>
</tr>
<tr>
<td>Covaxin</td>
<td>78%</td>
<td>69%</td>
<td>68%</td>
<td>60%</td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td>86%</td>
<td>72%</td>
<td>60%</td>
<td>56%</td>
</tr>
<tr>
<td>Moderna</td>
<td>94%</td>
<td>89%</td>
<td>94%</td>
<td>80%</td>
</tr>
<tr>
<td>Novavax</td>
<td>89%</td>
<td>79%</td>
<td>79%</td>
<td>69%</td>
</tr>
<tr>
<td>Pfizer/BioNTech</td>
<td>94%</td>
<td>86%</td>
<td>85%</td>
<td>78%</td>
</tr>
<tr>
<td>Sinopharm</td>
<td>73%</td>
<td>65%</td>
<td>63%</td>
<td>56%</td>
</tr>
<tr>
<td>Sputnik-V</td>
<td>92%</td>
<td>81%</td>
<td>80%</td>
<td>70%</td>
</tr>
<tr>
<td>Tianjin</td>
<td>66%</td>
<td>58%</td>
<td>57%</td>
<td>50%</td>
</tr>
<tr>
<td>CanSino</td>
<td>75%</td>
<td>66%</td>
<td>65%</td>
<td>57%</td>
</tr>
<tr>
<td>Other vaccines</td>
<td>91%</td>
<td>86%</td>
<td>85%</td>
<td>78%</td>
</tr>
<tr>
<td>Other vaccines (mRNA)</td>
<td>91%</td>
<td>86%</td>
<td>85%</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 September 13, 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 January 01, 2022 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 January 01, 2022 for three scenarios

**Figure 24.** Daily COVID-19 reported cases until January 01, 2022 for three scenarios
**Figure 25.** Daily COVID-19 hospital census until January 01, 2022 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.