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FEATURE

Covid-19: Why Africa's pandemic is different

Africa's initially slow burn pandemic puzzled scientists. **Meera Senthilingam** examines the factors at play, and explores the impact of the new variants

Meera Senthilingam *freelance journalist*

"Inequity" is a word firmly attached to Africa, and not just in the pandemic. Inequity in resources, funding, and infrastructure means that diseases—malaria, tuberculosis, HIV, and intestinal worms, among others—persist in Africa long after other regions overcame them.

It comes as no surprise, then, that when covid-19 struck the scenario was similar, with treatments and vaccines rolled out largely in high income settings. While many parts of the world are now reopening enabled by coronavirus vaccines, Africa is facing a continued, possibly exponential, rise in deaths as new waves of infection with new variants of covid-19 strike an unvaccinated population.

"The spread of the delta variant has been a game changer in 2021," says Ann Fortin, incident manager at the World Health Organization regional office for Africa. The variant's increased transmissibility means someone with delta could infect almost twice as many people as someone with the original SARS-CoV-2 virus. This will lead to more hospitalisations, given that 20% of those infected develop severe or critical disease, Fortin says.

When combined with limited access to treatments, weak health systems, limited testing capacities, and low vaccine coverage, this paints a dire picture for the continent.

"Oxygen is one of the most essential medicines for saving patients with covid-19," says Fortin, "Then systemic corticosteroids to manage the strong immune response. Interleukin-6 receptor blockers are another class of drugs targeting the immune system." Although these are lifesaving drugs, they remain inaccessible and unaffordable for most of the world, particularly Africa.

This is on top of tens of other frequent public health emergencies, Fortin adds, such as plague, monkeypox, and cholera. "Africa still has over 100 public health events a year, which makes it one every three days."

Some experts say, however, that the continent's ongoing public health emergencies are among the reasons why Africa has kept largely ahead of the pandemic curve, with case numbers and deaths much lower than in other parts of the world. "Countries were very soon able to switch some of this preparedness and address it to covid-19," said Matshidiso Moeti, regional director for Africa at WHO, at an August press conference.

But many believe the reasons Africa has seen such a different epidemic are much deeper—and understanding them is crucial to fighting the new waves.

Why Africa is Africa

Until 2021, the whole of the African continent recorded less than two million covid-19 cases, while the Americas had more than 36 million and Europe had almost 38 million. Africa also had fewer than 45 000 deaths, while the Americas had more than 900 000.¹

Global health experts were puzzled by the reprieve, although several theories abound. Analysis from the Pew Research Center shows that 94% of the African population is below the age of 60 with a median age of 20 years, meaning the overwhelming majority are at low risk of severe disease and death from covid-19.²

World Bank figures from 2020³ show that 58% of people in sub-Saharan Africa live in rural locations (in Malawi and Rwanda it's as high as 83%) and warmer climates and a cultural tendency to mix outdoors more than indoors may also have played a part in reduced infections.

But further research is needed, says Fortin. "We cannot pinpoint exactly why Africa is Africa," she says.

Moeti said that the region's constant outbreaks of infectious disease had in some way prepared it for covid. "Countries were very soon able to switch some of this preparedness and address it to covid-19."

Fortin agrees. "One of the advantages that we saw at the beginning of the pandemic in Africa, generally, was that we were in a state of preparedness in many countries around what was then going on with the Ebola outbreak in the Democratic Republic of the Congo," she said, pointing also to Chad, which in response to the growing pandemic closed its borders in March, before it registered a single case of covid-19.

Third wave

During the first wave in 2020, cases reached a peak of around 20 000 per day.⁴ But in 2021 numbers rose above that peak from mid June and stayed above it until September, reaching a peak of more than 38 000 as the delta variant took hold. Deaths followed a similar pattern, peaking at 1400 a day, leading to case fatality rates higher than the global average at the time.

Fortin says new infections during the third wave grew at a rate of 2.8% daily compared with 1.2% during the ascending phase of the second wave. “This means that cases double every 24 days during the growth phase of the third wave compared to 58 days in the second wave.”

All four of WHO’s variants of concern are now present on the continent, with delta in at least 40 countries. Continued lockdowns are not an option for many of the economies that enforced them in 2020, and as time has worn on, adherence to social distancing and other public health measures such as mask wearing have become lax. For many, vaccines are nowhere in sight: as of 10 October, just 2.5% of doses of the 6.4 billion administered globally have been in Africa.

“You need a biomedical intervention—the vaccines, monoclonal antibodies,” says Nicaise Ndembi, chief scientific adviser to Africa CDC. “What we have been doing so far is preventive health and social measures. Masking, sanitiser, those are the preventive health and social measures ... but rollout of the vaccine is going to be the game changer.”

Inter-African vaccine inequity

A slow drip of pledged donations of vaccine from wealthier countries continues, with an influx of shipments arriving in the final quarter of 2021. As of 13 October, less than 5% of the African population (some 68 million people) has been fully vaccinated with two doses and just 15 of the 54 African countries achieved the WHO target of vaccinating 10% of their population by the end of September.⁵

Within the continent there is further inequity: some countries brokered their own bilateral deals for vaccines and sit at the top of the table in terms of vaccine coverage, with 17% of the population fully vaccinated in South Africa and 55% in Morocco (as of 13 October.) Many countries have set a target of 70–80% vaccine coverage to reach herd immunity, but the African CDC has set the bar lower: just 60% for all African countries by the end of 2022, with an initial (it says more realistic) target of 35% by the end of this year. Even this is looking unlikely, however.

Covax, the worldwide initiative aimed at equitable access to covid-19 vaccines, has even lower targets for this year of just 20% coverage to reach the most vulnerable, while WHO has set 40% by the end of the year.

Ndembi told *The BMJ* that even these low targets might just about be enough to prevent a catastrophic spread. He says the African CDC target (60%) was originally calculated on the basis that 5–10% of the population will have antibodies to SARS-CoV-2, which, combined with at least 60% vaccine coverage, would be enough for herd immunity. But variants like delta are moving the goalposts, he adds.

“At the time we set that target, the R_0 (measure of transmissibility of the virus) was between 2 and 3,” Ndembi says, “With this delta variant ... we are close to 5 or 6. So it means that target has to be revised upward, if we really want to reach that herd immunity.”

Vaccine hesitancy

The low incidence of covid-19, as well as misinformation from some key influencers (including the former president of Tanzania) have led to vaccine scepticism in African nations.

Data published in February by the Africa CDC and London School of Hygiene and Tropical Medicine show that around one in three people surveyed in the DRC would not get a coronavirus vaccine.⁶ The figure was similar in Gabon and Senegal, but in Ethiopia and Niger fewer than one in 10 stated they would not get a coronavirus vaccine.

African solutions for African problems

The problem, Ndembi says, is that Africa imported 99% of its vaccines, even before covid. Now some nations are looking to ramp up manufacturing of covid vaccines (and other new vaccines) by repurposing existing manufacturing plants. “Now is the point to really strengthen that,” he said.

South Africa is leading the charge. It has borne the brunt of Africa’s pandemic, with more than 2.9 million cases and over 88 000 deaths, as infection was aided by greater population movement and occasionally civil unrest. The country not only brokered its own deals for coronavirus vaccines, but also leveraged the use of clinical trials (notably the Sisonke trial of the Johnson and Johnson vaccine) to vaccinate health workers before national supplies arrived.

It has even struck deals to manufacture the vaccines within its borders.⁷ South African pharmaceutical company Aspen Pharmaceuticals is now producing the Johnson and Johnson coronavirus vaccine, though this is largely a “fill and finish” operation, still reliant on the supply of raw commodities produced outside the country. “We’re all just still going to be dependent on that flow,” says Linda-Gail Bekker, director of the Desmond Tutu HIV centre, adding that this can lead to anxiety that supplies may run out. From October Aspen will manufacture vaccines solely for Africa.

Bekker, who co-leads the Sisonke trial, says the country’s moves can be attributed not just to its experience with covid, but also with HIV, South Africa having the highest HIV infection rate in the world. “We were able to run large clinical trials [of covid vaccines] here because we got on the back of the HIV experience,” she says. “There’s no doubt that has given us a leg up.”

South Africa is also home to the Biovac Institute, a public-private partnership between the South African government and a consortium of health partners, which has a remit to develop affordable and quality vaccines for Africa and the developing world. In June the institute announced it would form part of a consortium including WHO and the Africa CDC to establish a COVID mRNA vaccine technology transfer hub,⁸ with a letter of intent published soon after by Pfizer-BioNTech, naming Biovac to manufacture its covid-19 vaccine for distribution within the African Union.⁹

Ndembi hopes what is happening in South Africa is the first of many vaccine manufacturing developments on the continent. By next year, he says, countries including Senegal¹⁰ and Rwanda will have the ability to produce at least one element or ingredient needed for vaccine manufacturing, such as enzymes, and reports suggest BioNTech is considering mRNA vaccine production in both countries.¹¹ Egypt is also planning end-to-end production, Ndembi said.

Algeria is already producing Russia’s Sputnik V vaccine and the Chinese Coronavac (SinoVac) vaccine. With more countries being able to contribute in some way to vaccine production, “this will significantly close the gap in vaccine inequity,” says Ndembi.

Genomic surveillance

But, as Bekker says, “The longer you take to reach [vaccine] coverage, the more variants will come along and trip things up.” Resources are therefore being ramped up for greater monitoring of variants across the continent.

Key to this has been Africa’s first regional sequencing laboratory network dedicated to SARS-CoV-2, which has been open since September 2020. Consisting of 12 specialised and regional laboratories providing data analysis and sequencing of coronavirus

samples, it is essential for most African countries that cannot afford such technology, says Nicksy Gumede-Moeletsi, senior virologist at the WHO regional office for Africa.

Most important, she believes, is the recognition that genetic sequencing now has in the eyes of governments and leaders, and their appreciation of the role it plays in controlling infectious disease epidemics, something Africa has been ahead of the curve on in the pandemic.

Before the pandemic, “genomic surveillance was very much associated with research. It was never a priority associated with any public health issue of concern taking place at that point in time,” says Gumede-Moeletsi. She says the continent is now moving forward with genomic surveillance with the buy-in of governments and an emphasis on long term sustainability of the network. “So they know when they are talking about public health issues, surveillance should be part and parcel.”

“Africa knows how to respond to health emergencies,” says Fortin, adding that besides pushing for technology transfer and local production of vaccines, health officials are also very aware of the need to ensure domestic supply of personal protective equipment, treatments, and diagnostics.

It’s a model that needs to be rolled out to other parts of Africa and not just for this pandemic, says Ndembu. “We need to build on this current pandemic, our health system and infrastructure, and be prepared for the future pandemics,” he says, “African solutions for African problems.”

Competing interests: I have read and understood the *BMJ* policy on declaration of interests and have no relevant interests to declare.

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