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What can we learn from Africa's experience of Covid?



▲ The race against Covid: children run past a mural featuring the coronavirus in the Kibera settlement in Nairobi, Kenya. The country's total death toll stands at just over 1,800. Photograph: Brian Inganga/AP

As [Africa](#) emerges from its second wave of Covid-19, one thing is clear: having officially clocked up more than 3.8m cases and more than 100,000 deaths, it hasn't been spared. But the death toll is still lower than experts predicted when the first cases were reported in Egypt just over a year ago. The relative youth of African populations compared with those in the global north - while a major contributing factor - may not entirely explain the discrepancy. So what is really going on in [Africa](#), and what does that continent's experience of Covid-19 teach us about the disease and ourselves?

"If anyone had told me one year ago that we would have 100,000 deaths from a new infection by now, I would not have believed them," says John Nkengasong, the Cameroonian virologist who directs the Africa Centres for Disease Control and Prevention (CDC) in Addis Ababa, Ethiopia. Incidentally, he deplores the shocking [normalisation of death](#) that this pandemic has driven: "One hundred thousand deaths is a lot of deaths," he says.

It's also an underestimate. Under-reporting is happening all over the world, but the fragility of many African health systems and relative inaccessibility of tests - of which more than 35m have been carried out since the pandemic began, in a population of 1.2 billion - are exacerbating the problem there. A study soon to be **published in the *British Medical Journal***, which involved postmortem PCR testing of 364 bodies at a university hospital morgue in the Zambian capital, Lusaka, showed that one in five were infected with the virus. Most had died before reaching hospital, without being tested.

Christine Jamet, the Geneva-based director of operations for the medical charity Médecins Sans Frontières (MSF), says that it will take time to establish the full impact of the African epidemics, but the idea that the continent has had a mild brush with Covid-19 is wrong. Many African countries put measures in place at the same time as Europe last spring, before they had reported any cases - and flattened the initial curve far more effectively as a result - but they have been hit hard by the second wave. In the current hotspots, which include Eswatini, Malawi and Mozambique, “the hospitals are overrun,” Jamet says. “We have put tents up beside them to care for patients who wouldn’t otherwise have beds.” The situation has been aggravated by a shortage of oxygen - one reason, Nkengasong says, why the average case fatality rate (CFR) across Africa has recently overtaken the global average of 2.2%. It now stands at 2.6%.



▲ Fresh plots at a Johannesburg cemetery. The South African variant has been linked to reinfections and reduces the effectiveness of vaccines. Photograph: Jérôme Delay/AP

The CFR is itself a blunt instrument, since a “case” is harder to define - and with regard to managing the pandemic, less informative - than an infection, whether that infection produces symptoms or not. But testing is not good enough across Africa for the more useful infection fatality rate to be calculated. And yet, even accounting for under-reporting, Nkengasong believes that death is visible enough in African communities that he can say with confidence that overall, the disease has been less lethal there than in other regions. Along with his scientific colleagues on the Africa Task Force for Novel **Coronavirus** (Afcor), he agrees that this paradox can be explained mainly by the youth of African populations - the median age is 18 - and the relatively low prevalence of comorbidities including obesity and diabetes, especially among the poorest.

It's hard to discern cause and effect in messy epidemiological data, especially when such data is scarce, but there is now substantial evidence supporting the idea that the most powerful predictors of Covid-19 mortality are age and comorbidities - something African experts say their local experiences confirm. The immunologist Hechmi Louzir, who directs the Pasteur Institute in Tunis, says that Tunisia - which was **widely praised** for its handling of the first wave, but has been less successful second time around - accounts for less than 1% of Africa's population, but 6% of its reported Covid-19 cases to date. With a median age of 33, Tunisia has one of the oldest populations in Africa.

In South Africa, meanwhile, the government's chief adviser on the pandemic, the epidemiologist **Salim Abdool Karim**, points to surveys conducted by the National Institute for Communicable Diseases that indicate white people are dying at higher rates than black people - the opposite of the situation in the UK and US. South Africa's white population is older than its black one, on average. But within a given age group, Karim says, black people are slightly more likely to die than white people - an effect that is probably due to black people coming forward later for treatment. That in turn is probably related to access to healthcare, since white South Africans are more likely to pay for private care. Though the quality of care is roughly the same in the public and private systems, Karim says, it might be harder to get seen at a public clinic. The greater risk of overcrowding there might also act as a deterrent. (There may also be a tradeoff in operation, Jamet says, with richer, older white people offsetting their greater vulnerability to Covid-19, to some extent, by seeking treatment earlier.)



▲ A teacher reads temperatures at a school in Lusaka, Zambia. Research suggests the nation's death toll may be under-reported tenfold. Photograph: Xinhua/Rex/Shutterstock

Many other theories have been proposed for what researchers have called “[the African paradox](#). The most controversial is probably that [poverty protects](#): the idea being that people living in crowded settings such as townships, where social distancing is harder to achieve, may have been more exposed to coronaviruses related to the one that causes Covid-19 - including four that cause the common cold - and acquired some immunity to Covid-19 as a result. There is [some evidence for such cross-protection](#), but the theory hasn’t stood the test of time. “If it was that these four coronaviruses protected you, we would see it in the slums of Mumbai and the favelas of Brazil, but we don’t,” says Karim. Infection with original variants of the Covid-19 virus [doesn’t even necessarily protect](#) against the new variant first described in South Africa, he says.

The Texas-based wound care nurse Linda Benskin [has made the case](#) that high levels of vitamin D - which is made mainly in the skin when it is exposed to UVB radiation in sunlight - is protecting Africans against Covid-19, and on those grounds more than 200 scientists and medics [signed an open letter](#) in December, urging governments to act to boost vitamin D levels in other populations. The World Health Organization (WHO) remains unconvinced, however, and has placed suggestions that vitamin D supplements effectively treat Covid-19 (it doesn’t mention prevention) on its “[Mythbusters](#)” page. There, the idea rubs shoulders with the theories that hot, humid climates and antimalarial drugs related to hydroxychloroquine are protective - both unsupported, according to the WHO.

Then there is the category of theory for which the jury is still out - that Africans’ genetic background may be playing a role, for example by influencing the prevalence of the ACE-2 receptor that the virus uses to break into human cells, or that African immune systems have been primed to fend off the virus, either by [other kinds of vaccines](#) or by [high levels of infection](#) with parasitic worms.

Though it’s once again hard to demonstrate, most experts do seem disposed to agree that experience with other serious infectious diseases including Ebola - of which there are active outbreaks in the [Democratic Republic of the Congo](#) and [Guinea](#) - prepared African populations to deal with Covid-19. “The government succeeded in quickly creating consensus on measures that were, a priori, drastic and unpopular,” says Amadou Sall, who heads up the Pasteur Institute in Dakar, Senegal, of that country’s swift response to the first wave. “Contact tracing in countries like [the UK] is a theory,” says Nkengasong. “In our countries it’s a reality.” Jamet highlights the flipside of that: MSF’s skills have been in demand across Europe, she says, where “expertise in epidemic management has been completely lost”.

For now, then, the African paradox persists. “We don’t have an explanation for why the impact has been lower,” says Karim. “It remains for me an unanswered question.” Nkengasong says that answers may not be forthcoming for years, and until then most theories remain on the table. One early prediction has already been disproved, however: that many Africans whose immune systems were weakened by HIV/Aids infection would die of Covid-19. Thankfully it didn’t happen, says Karim, for a reason that, in hindsight, appears obvious. The two diseases don’t affect the same age groups, since HIV is mainly a disease of the young in Africa. There is, however, [some evidence](#) that when those infected with HIV do catch Covid-19, their Covid-19 can be more severe.



▲ John Nkengasong, the director of the Africa Centres for Disease Control and Prevention, is hoping 60% of Africans will be vaccinated by the end of 2022. Photograph: Michael Tewelde/AFP via Getty Images

Ghana received the first African shipment of Covid-19 vaccine from the Covax initiative this week - 600,000 doses of the Oxford/AstraZeneca jab. Vaccine programmes are getting under way on the continent, amid confusion caused by a lack of data on the prevalence of new variants in many countries (from the data there is, it looks as if the variant first described in the UK is spreading in west Africa, while the one first described in [South Africa](#) is spreading northwards from there), and a lack of data on how the various vaccines perform against those variants. The Africa CDC is trying to address the first problem by boosting sequencing efforts - it aims to have sequenced 50,000 viral genomes by December, up from around 7,000 now - and the second by gathering data on hospitalisations and deaths as the distribution of vaccines proceeds.

Nkengasong's goal is that 35% of Africans, mainly city-dwellers, should be vaccinated by the end of this year, and 60% by the end of 2022. That way, he says, it should be possible to reduce the continental epidemic to localised outbreaks, which can then be stamped out by public health campaigns - with the ultimate aim of ridding Africa of Covid-19 within five years.

When he first proposed the 60% goal, he says, he was told by some beyond Africa that 20% was more realistic - the proportion of every population that is considered vulnerable to Covid-19. "But if you just vaccinate 20%, you remain a continent of Covid for ever," he says. That's because in Africa the disease is spread by the young, who are not considered vulnerable and who tend to experience mild or no symptoms, but often live in multigenerational households.

Paradox or not, Nkengasong says, Africa can't afford Covid-19. And speed is of the essence, where vaccination is concerned, because if it doesn't happen quickly then immune escape will render the vaccines increasingly ineffective and elimination will move beyond the continent's grasp. That's the main reason why he and his Afcor colleagues condemn vaccine nationalism - both inside and outside Africa. The other reason is that in this hyperconnected world, Africa-with-Covid is bad for everyone. As Karim likes to repeat, "No one is safe until everyone is safe."