

African science steps up to COVID challenge

As the coronavirus spreads across Africa, launching a pandemic that the World Health Organization (WHO) warns [could “smolder” for years](#), the continent’s institutions and scientists are stepping up their efforts to keep the disease under control.

Low-cost ventilators, COVID-19 test kits, 3D-printed personal protective equipment and artificial intelligence platforms are just some of the innovative tools that African scientists have developed as they call for a coordinated strategy to address a health care crisis that [could cause 190,000 deaths](#) on the continent.

Promising projects across Africa

In Senegal, biomedical research organization Pasteur Institute has collaborated with a British firm to develop \$1 COVID-19 home diagnostic test kits that can give results in 10 minutes. Validation trials are currently ongoing for the test kits and the developers say they could be available as early as June across Africa and beyond. When scaled up, these low-cost tests could help address concerns that the figures on the rate of coronavirus spread in Africa do not paint a true picture because of limited testing capabilities.

In Ghana, the nation’s foremost science-focused university, the Kwame Nkrumah University of Science and Technology (KNUST), has developed Rapid Diagnostic Tests (RDT) for COVID-19 that can produce results in 15-20 minutes, instead of the 48 hours the country’s current testing method takes. A [statement on the university’s website](#) says the test detects antibodies produced by the body to fight off the coronavirus infection about seven days after infection even in patients who are asymptomatic. The developers say they are awaiting approval from Ghana’s Food and Drugs Authority so they can be mass-produced for use.

In Uganda, auto firm Kiira Motors Corporation and the Makerere School of Public Health [have developed a low-cost ventilator](#) that can be used to support critically ill COVID-19 patients who need help to breathe. They are producing the first batch of 40 ventilators for use. A [New York Times report last month](#) claimed there are fewer than 2,000 ventilators across 41 African countries. By comparison, there were some 160,000 ventilators in the US before the pandemic and the country is [expected to receive another 200,000](#) before the end of this year.

Inventions like that in Uganda could help scale up availability of ventilators for more people on the continent in case they become critically ill from COVID-19. Scientists at the University of Makerere have also developed [an inexpensive COVID-19 test kit](#) that can deliver results quickly, offering hope for a “homegrown solution” to sub-Saharan Africa’s testing needs.

In Nigeria, health startup Wellvis Health has developed the COVID-19 Triage Tool, an online platform that allows users to self-assess their chances of having the coronavirus. Those at high risk are then put in touch with a medical professional for further direction.

In Tunisia, the National Institute of Applied Sciences and Technology (INSAT) has [developed an artificial intelligence platform](#)

that analyses lung X-ray images uploaded over the internet and detects whether an individual has COVID-19 or not. The innovation – which has funding support from the German government's international development organization GIZ, the Italian Society of Medical Radiology and tech giant IBM – is awaiting approval from Tunisia's Ministry of Health before it can be used in healthcare facilities.

In Kenya, [3D printing](#) firm Ultra Red Technologies and other 3D printers [have begun designing and printing](#) relatively low-cost 3D personal protective equipment, plastic face shields and prototypes for ventilators using open source prototypes developed in Sweden.

Similarly, the South African artificial intelligence firm Robots Can Think and WomeninAI South Africa, both of which are led by tech entrepreneur Natalie Raphil, are [using 3D printers](#) to design and produce about 100 masks daily for use in hospitals in the capital Johannesburg. Also in South Africa, [Praekelt.org](#) has created a COVID-19 health alert WhatsApp-based platform [to help counter misinformation](#) about the disease by providing automated responses to frequently asked questions about the virus. Some 3.5 million people used the platform within its first ten days and the WHO [is now partnering with the firm to create](#) similar platforms across the world in different languages.

In Ethiopia, the 18-year-old natural science student Ezedine Kamil [has developed 30 separate COVID-19 related inventions](#). Thirteen of those have now been patented but a lack of funding is hampering scaling efforts. Kamil's products include low-cost ventilators, warning devices that prompt people against touching their faces and a contactless electrical soap dispenser. In his community Welkite, a rural town 160 kilometers from the Ethiopian capital Addis Ababa, a local university has produced 50 of his dispensers and distributed them to various public places including hospitals.

"Mass production requires a big investment. It is beyond my capacity to start it alone. It requires a major capital injection. And the biggest problem in this country is that inventors who want to work on their own initiative never get financial support from the government," [Kamil told Germany's DW](#).

The WHO regional office for Africa has also been working to encourage innovations to help fight the virus. The office last month organized a virtual 'hackathon' which brought together 100 leading innovators from across sub-Saharan Africa to come up with creative solutions to combat COVID-19. The group that won the competition developed [a screening tool concept](#) with the capability to map COVID-19 test cases and do classify the results according to their level of risk. The team led by Ghanaian biomedical engineer Laud Basing won a cash prize of \$10,000 to scale up their idea.

"As COVID-19 spreads rapidly across Africa, raising concerns about the strain on already fragile health systems, it has become clear that solutions in the response require action beyond the health sector. Innovation can play a critical role in that regard. It should be part of our DNA going forward," Dr Moredreck Chibi, the WHO regional innovation advisor who facilitated the event, [explained in a statement from WHO Africa](#).

African scientists are calling on governments and other stakeholders to take necessary steps to adequately support such technological innovations across the continent to help fight the disease. Three University of Cape Town scientists wrote an [opinion piece on the institution's website stressing](#) the "urgent need for national regulatory bodies to develop and deploy dedicated fast-tracking mechanisms to support

these kind of technologies.”

“Now more than ever, a strong motivation has been made for the need to increase research funding to strengthen responses by African scientists. And research should be fast-tracked. Some changes should be made to facilitate this,” the scientists Salome Maswime, Collet Dandara and Sudesh Sivarasu wrote.

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