Africa's resilience in the face of Covid-19 pandemic: Let's talk about it!

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Emmanuel Arakpogun[1, *]; Ziad Elsahn[1]; Karla Simone Prime[1]; Paolo Gerli[1]; Femi Olan[1]

[1]Newcastle Business School, Northumbria University, Newcastle upon Tyne, United Kingdom

[*]Corresponding Author:
Dr. Emmanuel Arakpogun
Newcastle Business School, Northumbria University
City Campus East 1, Newcastle Upon Tyne
NE1 8ST, United Kingdom
Tel: +44 (0) 191 227 3336
Email: e.arakpogun@northumbria.ac.uk

Abstract

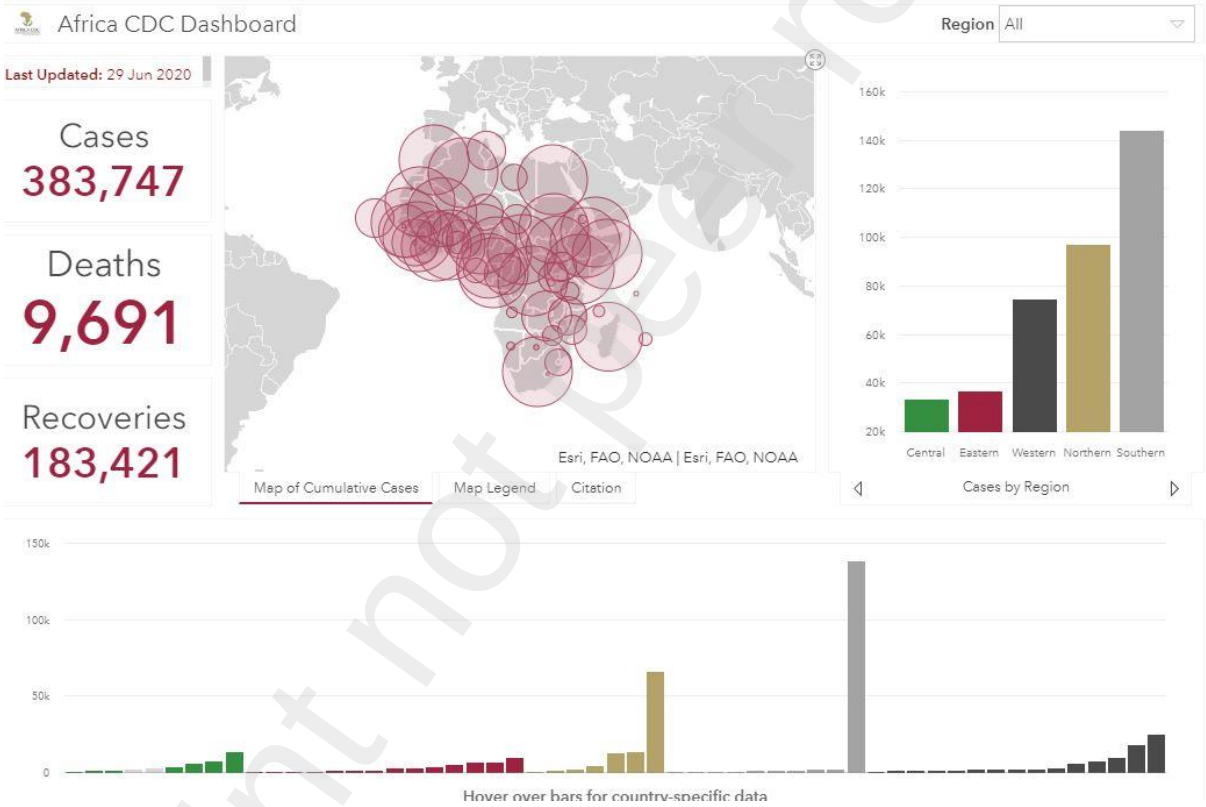
Following the initial outbreak of Covid-19, the United Nations and other established bodies and public figures predicated 'tens' of millions of deaths across Africa due to their weak healthcare systems and critical infrastructure. So far, it appears that Africa is leveraging on local innovations and the resilience gained from dealing with previous outbreaks of infectious diseases such as Ebola to manage the impact of Covid-19 to defile early predictions and the surprise of the rest of the world. Yet, very little is being said about this. This research note thus set out to talk about this by outlining the local initiates, which is helping African countries build resilience and mitigate the impact of Covid-19 and the poor healthcare systems in the continent.

Keywords: Africa, Blended approach; Covid-19; Digital divide, Local innovations; Pandemic

Main text

As Covid-19 contagion continued across the world with epicentres moving from Asia (especially from Wuhan in China) to Europe (e.g., Italy and Spain) and North America (especially in the US), Africa has become the 'last' frontier with Egypt recording the continent's first in February 14, 2020. While African countries have implemented lockdown measures similar to other parts of the world in the initial phase of the contagion, a series of local innovations have also been deployed to mitigate the impact of Covid-19 (see Figure 1 for the latest data on Covid-19 in Africa) vis-à-vis the poor healthcare systems and critical infrastructure in Africa.

Figure 1: Covid-19 data in Africa as of June 29, 2020



Source: Africa CDC (2020)

Accordingly, African countries have largely drawn from their past infectious diseases' experiences and repurposed existing infrastructure to deal with Covid-19. Take **Senegal** for instance. Our case analysis indicates that while Senegal has a meagre health budget compared to any advanced country, it has a wealth of experience in dealing with the outbreak of infectious diseases such as Dengue Fever, HIV AIDS and Ebola. Accordingly, Senegal has repurposed existing laboratories and engineered a $1 Covid-19 testing kit to do what even developed countries could not do – testing everyone in the country regardless of whether they have Covid-

19 symptoms or not (Al Jazeera, 2020). The availability of such testing has helped the government to ramp up their test, tract and trace strategy and bring Covid-19 contagion under control. Anyone with Covid-19 symptoms is then administered Chloroquine, the antimalaria drug popularly used across West Africa, as a therapeutic for recovery. Furthermore, with as few as 50 ventilators for a country of over 15 million people, Engineers in Senegal have resorted to the use of 3D technology to build more ventilators, which cost $60 compared to $16,000 for imported ones. While the scourge of Covid-19 continues across the world, Senegal's ability to draw lessons from previous infectious disease has been a 'game-changer' with the country recording some of the lowest cases and death rates globally – around 2,600 and 30 respectively as at May 20, 2020. Accordingly, the country has the largest Covid-19 recovery rate in Africa and the third globally.

When it comes to limiting Covid-19 contagion, effective communication and clear information is one of the key success factors (Dearden, 2020). Drawing on its experience in dealing with Ebola[1], **Sierra Leone** has reactivated its Mammy Queens – a group of local female community chiefs - to disseminate Covid-19 information and demonstrate practices like handwashing using local languages at community meetings (Whitelaw & Von Villa, 2020). Sierra Leone has combined Mammy Queens with traditional communication media like 'town criers', religious leaders and radio to localise and disseminate vital Convid-19 information.

Speaking of town criers, **Chad** is among the African countries that have used this traditional medium of communication in their fight against Covid-19. The use of town criers (including troubadours) has been a critical instrument in Chad's fight against Covid-19 given that over 70% of its inhabitants live in rural areas with high levels of digital divides (Arakpogun et al., 2017). Accordingly, a large proportion of the population is excluded from mobile and fixed technology with the consequence of missing out on critical Covid-19 information. To mitigate this, the government is working with the International Organization for Migration to partner with town criers, who are considered as 'information custodians' in rural communities, in disseminating key Covid-19 information at local levels to limit the contagion. For example, a town crier in Baga-Sola, a town in western Chad, with a long caftan robe chanted in Kanebou dialect that:

> *Coronavirus is a dangerous disease. We heard that the pandemic affected the world but us. Today, the disease is here. We have to have good hygiene habits and wash our hands, not greet each other, and if you go to the toilet, wash your hands with soap… If you're home,*

[1] See Huber, Finelli and Stevens (2018) for analysis of EBV in West Africa.

make sure to show the good habits to your kids. Before and after eating, wash your hands with soap. (UN, 2020).

Since Covid-19 contagion, around 500 cases have been confirmed with 10 deaths as at May 20, 2020 (Africa CDC, 2020).

In **Ghana**, 'Veronica Bucket' - a repurposed dustbin-like plastic receptacle with a tap and wastewater collecting-bowl (see Figure 2) - is placed across public places in cities and villages to facilitate handwashing in the absence of tap water to help mitigate Covid-19 contagion (Pilling, 2020). This local invention was engineered by Veronica Bekoe, a public health official from Ghana, used during the 2014 Ebola outbreak and now being adopted by other west African countries where running water is largely lacking.

Figure 2: The Veronica Bucket

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Ghana is also using drones built by Zipline to quickly conduct testing by collecting samples from over 1,000 rural health facilities for testing in laboratories located in major cities like Accra and Kumasi (Reuters, 2020). A Zipline drone can carry over 50 samples and make a round trip of 100 Km, saving commuting timing on rural roads that are largely not motorable. With over 160,000 tests as of May 15, 2020, Ghana is the second-highest testing African country behind South Africa (Giles & Mwai, 2020). Zipline is also in operation in Rwanda,

where drones are being deployed for facilitating testing and Covid-19 announcements as shown in Figure 3.

Figure 3: Innovative use of drones to fight Covid-19 in Africa

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Elsewhere in **Nigeria,** the National Institute for Pharmaceutical Research and Development (NIPRD) rallied the country's existing Ebola outbreak stakeholders and spearheaded a national effort to engineer local solutions to essentials like facemasks, hand sanitisers, ventilators and personal protective equipment (PPE) (Channels Television, 2020b). Such proactive measures were useful to averting shortages and mitigating the disruptions seen in advanced countries in Europe and North America, which struggled to provide essentials like PPE for their health systems due to increase in global demand and disruption in supply chains. Following its Covid-19 index case on February 27, 2020, there were concerns that Nigeria was lagging other African countries in testing. For example, as of April 19, 2020, Nigeria had conducted a meagre 7,000 test compared to over 50,000 in Egypt, Ghana and South Africa in the same period (Arbiterz, 2020). As the government continues to covert hospitals and clinics into testing centres, a group of Nigerian doctors (called Flying Doctors) invented reusable stationery and mobile testing booths (see Figure 4) to complement the efforts of government (Channels Television, 2020a).

Figure 4: Flying Doctors' zero contact Covid-19 testing booths

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Flying Doctors argue that the testing booths do not only help the government to ramp up testing, but they also improve the safety of health workers given the safe distance created between testers and patients. Furthermore, the booths also provide better comfort and concentration for health workers who have complained about the unease of using traditional PPE and their disposition to heat. In addition to this, Nigeria CDC has also repurposed the throughput machines that were used for HIV AIDS to handle 3,000 Covid-19 sample in one attempt. With these local innovations, Nigeria is now targeting 2 million tests in three months as they look to 'bring' the test to local communities across the country (Channels Television, 2020a). The country has also repurposed its Ebola screening infrastructure and procedures as early as February 2020 to screen air passengers coming into the country for Covid-19.

Apart from having 3.4 hospital bed per 1,000 persons, **Mauritius** was quick to implement stringent lockdown measures and travel restrictions to curtail the spread of Covid-19 except for repatriation flights (Jeeneea & Sukon, 2020; Okereke & Nielsen, 2020). The screening of airline passengers began as early as January 22, 2020, with the isolation of people with high temperatures on the one hand and quarantining people from highly infection countries on the other hand (Jeeneea & Sukon, 2020). This was followed by a persistent media campaign by the government to raise awareness for Covid-19 symptoms and transmission. The government then embarked on a test, track and trace exercise to isolate those who have encountered identified infected patients. Mauritius tested over 100,000 people, an equivalent

of around 10 of its total population in two weeks (Okereke & Nielsen, 2020). A combination of these measures has helped Mauritius to reduce Covid-19 transmission by 80% (Jeeneea & Sukon, 2020).

Following its Ebola strategy, the **Ugandan** government were quick to introduce travel restrictions and repurpose their infectious disease screening systems into combating Covid-19 contagion (Okereke & Nielsen, 2020). Given the chronic lack of electricity across Africa, local innovators in Uganda are collaborating with other African countries like Kenya, Tanzania, Rwanda and South Africa as well as the Grand Challenges Canada (GCC) to engineer affordable solar-powered oxygen device called SPO2 to help the country deal with Covid-19 (EurekAlert, 2020; Pilling, 2020). SPO2 is a critical element of Uganda's fight against Covid-19 particularly for supporting the health system in rural areas with off-grid electricity (EurekAlert, 2020). Accordingly, a combination of acting quickly with localised inventions like SPO2 has seen Uganda having 26 cases with zero deaths as at May 20, 2020 (Africa CDC, 2020).

Similar level of ingenuity has also occurred in neighbouring **Kenya**. The shortage of PPE has been widely publicised as a global problem for Covid-19. To deal with this, a textile factory in located in Kitui, a county that is 180km east of Nairobi, was repurposed into making surgical mask at a fast pace that saw the production of 30,000 pieces of facemask per day (Bearak, 2020). The pace at which this factory switched to making such vital PPE at short notice is impressive given that not only does Kenya reply on PPE imports from China, over 50% of the 400 workers in the factory are women with no formal education who were retrained in one week (Bearak, 2020). Following government directives of the compulsory use of facemask in the public, textile factories across Kenya are now switching their production lines into making millions of reusable masks, which is not only good for the environment but also promotes affordability for people who cannot afford to buy single-use (Soi, 2020).

Rwanda was another African country that quickly responded to Convid-19 by setting up a pandemic committee as early as January 2020 and trained 500 health workers, including laboratory technicians for testing (Okereke & Nielsen, 2020). As with Uganda and Kenya, local inventors in Rwanda have also collaborated with GCC to set up a virtual care and patient platform called WelTel to remotely connect with public health systems, patients and vulnerable people to combat Covid-19 (EurekAlert, 2020). WelTel provides public health officials with the platform to triage, monitor and support Covid-19 patients and provide in-home care for

those on self-quarantine. The platform has become the "backbone" of Rwanda's Covid-19 test, track and trace strategy (EurekAlert, 2020).

The dire situation with the lack of respiratory equipment in **Somalia** has seen an improvement following the invention of a homemade respirator by Mohamad Adawe, a Somalian engineer (Euronews, 2020). Previously, medical personnel in Somalia have largely assisted the breathing of patients by manually squeezing the airbag of respiratory devices, which brings them in close contact with the infected and, in turn, increase the risk of disease transmission. However, the invention of Mohamad is seen as a game-changer in the country's fight against Covid-19 contagion as highlighted by Dr Hussein Abdi-Aziz Abdulkadir, the medical director of Somalia Syrian Hospital:

In the past, you always had to use your hands to squeeze the airbag of the device, to clear the airway of the patient. But now Mohamed Adawe has automated the device to help patients clear their airway and help with breathing at a time when there is an urgent need for this (Euronews, 2020).

This automated respirator will help to save the lives of both health experts and patients – allow doctors to keep a safe distance to reduce Covid-19 contagion and help the breathing of patients with critical conditions.

On a macro-level, the Africa Centre for Disease Control and Prevention, which was formed in 2017, has been instrumental in implementing a continent coordinated approach via engaging governments and public health workers across Africa with videoconferencing to learn and share experiences and drive a wider effort to test, trace and treat infected persons (Pilling, 2020). The North Star Alliance East Africa have created a network of semi-mobile facilities called Blue Box where shipping containers have been repurposed as mobile clinics positioned along major transport routes across six sub-Saharan African countries, including Kenya (EurekAlert, 2020). Blue Bus is now playing a critical role in helping countries across Africa to mitigate the impact of Covid-19 particularly when it comes to minimising transmission rate among those who are difficult to track, trace and hard-to-reach like trucker drivers, sex workers and rural dwellers.

Overall, in addition to having a youthful population – an age group less susceptible to Covid-19 fatality – African countries have drawn from their previous indelible infectious disease experience, localised infrastructure and early decisive actions like travel restrictions to largely pursue a prevention strategy given their existing weak health systems. A combination of these responses has helped the continent to mitigate the projected alarming Covid-19

outcomes in terms of infection and death rates (UNECA, 2020). Although some may argue that the reason why Africa countries have recorded fewer Covid-19 cases is due to their limited testing capacity (Pilling, 2020). While this may true in certain cases, such argument is also at odds with some countries like Ghana, Mauritius, Senegal and South Africa where testing have been ramped up (Okereke & Nielsen, 2020).

Moreover, if the low rate of Covid-19 infections are down to inadequate testing, hospitalisation and deaths rate would have increased markedly (Okereke & Nielsen, 2020). In an age of social media and other forms of technology, one could also argue that there is hardly any African government that could hide such information. Therefore, the resilience shown so far across Africa should not be underestimated. That said, there are obvious rooms for improvement as the continent begins to ease lockdowns and move into the second phase, particularly when it comes to ramping up testing and setting up a robust contact-tracing epidemiological strategy. To achieve this, African governments need to adopt a blended epidemiological approach as their focal point – one that combines technology with existing local innovations and governments' responses (see Arakpogun et al., 2020).

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