



# **KNOCKING OUT COVID-19** Africa Unites to Fight Pandemic



**Mobile Hospitals  
Offer Extra Support**  
**Outbreak Sparks Innovation**

## **PLUS**

**A Conversation With Dr. John Nkengasong,  
Director of the Africa CDC**

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**ON THE COVER:**

African nations are working to knock out COVID-19 using experience, partnerships and technology.

ADF ILLUSTRATION



Soldiers train to outmaneuver, outsmart and overpower any enemy that threatens the homeland. But what happens when the enemy is invisible? And what if the enemy cannot be defeated by the military alone? A pandemic is this type of unconventional threat. It can't be beaten by a single institution. A virus can bring entire nations to a standstill, and it takes collective action and discipline to make progress against it.

Throughout 2020, Africa grappled with COVID-19. And although most countries have so far avoided the worst-case scenarios, the economic and societal effects of the virus will be felt for years to come.

During the worst months of the pandemic, many African nations relied heavily on the military for support. Soldiers were called on to seal borders, enforce curfews and transport lifesaving medical equipment.

In many cases, African militaries found themselves on the front lines providing treatment.

In Ghana, Senegal and Uganda, defense forces assembled field hospitals intended for peacekeeping missions and used them to treat COVID-19 patients or overflow patients from civilian hospitals. The field hospitals, which were staffed by military doctors, were key in keeping patients from overwhelming other medical facilities.

The Kenya Defence Forces mobilized to "Komesha Corona," or "Stop Corona," by disinfecting public spaces, transporting medicine and food, and setting up a treatment center.

In Nigeria, Air Force researchers and technicians developed an affordable ventilator to help extend the lives of the sickest COVID-19 patients.

The fight is far from over, but security forces have shown that when their country calls, they are ready to step up, no matter the threat. The toughest challenge will be to use the lessons learned from the current pandemic to prepare for the next one.

U.S. Africa Command Staff



South African National Defence Force military health practitioners arrive at Air Force Station Port Elizabeth to help combat COVID-19. AFP/GETTY IMAGES



## Pandemics

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CONTACT US:

U.S. AFRICA COMMAND

Attn: J3/Africa Defense Forum  
Unit 29951  
APO-AE 09751 USA

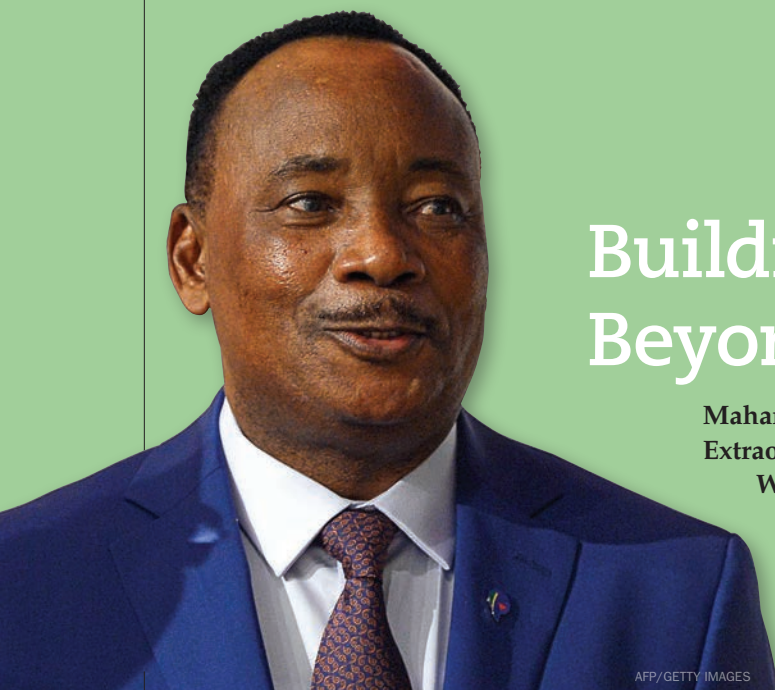
[ADF.Editor@ADF-Magazine.com](mailto:ADF.Editor@ADF-Magazine.com)

HEADQUARTERS  
U.S. AFRICA COMMAND

Attn: J3/Africa Defense Forum  
Geb 3315, Zimmer 53  
Plieninger Strasse 289  
70567 Stuttgart, Germany

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# Building a Future Beyond COVID-19

**Mahamadou Issoufou spoke at the opening of the Extraordinary Session of the Economic Community of West African States (ECOWAS) Authority of Heads of State and Government on April 23, 2020, via videoconference. He was president of the Republic of Niger and chairman of the ECOWAS authority at the time. His speech has been edited to fit this format.**

AFP/GETTY IMAGES



A few months ago, no one could imagine that everything would stop so quickly: work, the

economy, social life. No one could imagine that all land, sea and air borders to all countries of the world would be closed. These measures were not caused by a world war but by a virus, COVID-19. The health crisis it created has human, social and economic consequences, the scale of which we cannot measure.

Already shaken by security challenges, our region, like all other regions of the world, is not spared from this pandemic.

The national responses that we have put in place must be combined into a regional response plan in accordance with the founding principles of our organization, namely:

- Solidarity and collective self-sufficiency.
- Interstate cooperation, harmonization of policies and integration of programs.
- Peaceful settlement of disputes, active cooperation between neighboring countries and promotion of a peaceful environment as a prerequisite for economic development.
- Fair and equitable distribution of the costs and benefits of cooperation and economic integration.

Based on these principles, the pandemic response plan should focus, among other things, on:

- **Health:** the massive production and provision of masks, the wearing of which must be compulsory; the strengthening of the West African Health Organization; the operationalization of the National Institutions of Coordination in charge of disease control and prevention in all member countries; the intensification of the fight against counterfeit medicines in our area; health cooperation at the borders of member countries; and the harmonized management of places of worship.
- **Socioeconomics:** the establishment of a support plan for vulnerable individuals and households allowing access to basic necessities; the adoption of fiscal support measures for businesses in the formal and informal sector; the facilitation of the movement of goods, particularly basic necessities; the cancellation of the debt of the member countries and the countries of our continent.

The various response plans must be extended to include post-pandemic plans. Our region must set up a technical working group to reflect on the socioeconomic

impact and the conditions for post-crisis recovery. This group must come up with a community investment plan that tackles structural constraints for necessary industrialization, an indispensable condition for our economic emergence, notably through:

- Mastery of production factors: energy, transport, and information and communications technology.
- The creation of industrial hubs aimed at transforming the comparative advantages of each country. By way of illustration, we can explore the chocolate, coffee, meat, rice, textile and petrochemical industries.
- Modernization and transformation of agriculture.
- The creation of educational and health centers.
- The creation of regional champions in the fields of finance, logistics and aviation, to name but a few.

We must all share the risks and the benefits of globalization. This is why we must manage our planet with caution. This is why a new paradigm for global governance is needed. Dignity, equality, justice and solidarity are among the values that must be the basis of this governance. I call for these values to be taken into account. I call in particular for the cancellation of the debt of developing countries.



# NAMIBIA REDUCES RHINO POACHING BY 63%



REUTERS

**R**hino poaching fell 63% year-on-year in Namibia due to intensified intelligence operations and tougher sentences and fines for poachers.

Elephant poaching also decreased, with two incidents reported as of August 2020 compared with 13 in 2019, the environment ministry said.

Namibia is home to the second-largest white rhino population in the world after South Africa, according to nonprofit Save the Rhino. Namibia also holds one-third of the world's remaining black rhinos.

Rhino poaching has plagued Southern Africa for decades, especially in neighboring South

Africa and Botswana, leading to anti-poaching programs such as dehorning and strict policing.

Namibia has increased fines for poaching to 25,000,000 Namibian dollars (\$1.43 million) from 200,000, and prison sentences have risen to 25 years from 20.

Rhinos are hunted and killed for their horns to feed rising demand, mostly in Asia, where affluent classes regard them as a status symbol. They also are used in traditional Chinese medicine, despite having no medicinal value.

Romeo Muyanda, spokesman for Namibia's Ministry of Environment, Forestry and Tourism, said rhino poaching had decreased from 46 incidents in 2019 to 17 as of early

August 2020.

Intensified ground and aerial patrols were the main reason.

Collaboration with the public and stiffer sentences for convicted poachers also helped bring about the decline.

"Another factor is the excellent collaboration with law enforcement agencies, such as the Namibian Police, the Namibian Defence Force and the Namibia Central Intelligence," Muyanda said.

The ban on international travel imposed in March 2020 in response to COVID-19 was not a big factor in the poaching decline.

**A black rhino in Etosha National Park in Namibia**  
AFP/GETTY IMAGES



# AU NAMES NEW HEALTH LEADERSHIP PROGRAM FOR KOFI ANNAN

AFRICAN UNION

**T**he African Union has announced a new initiative that will help the continent better meet the health challenges of the future.

The Kofi Annan Global Health Leadership Programme is a new AU effort under the auspices of the Africa Centres for Disease Control and Prevention (Africa CDC). It is named in memory of Kofi Atta Annan, seventh secretary-general of the United Nations (1997-2006), Nobel Peace Prize laureate and founding chair of the Kofi Annan Foundation. Annan worked tirelessly to promote improved health in Africa, particularly with regard to HIV/AIDS. He died in 2018 at age 80.

"In 2014 when the Ebola epidemic struck in West Africa, Kofi Annan publicly called for the establishment of an African institution that would focus on disease prevention and control on the continent," said El Hadj As Sy, chairman of the board of the Kofi Annan Foundation. "Today, Africa CDC, an institution of the African Union, plays a leading role in shaping Africa's response to COVID-19."

The program intends to create public health leadership to harness Africa's human potential. This emerging leadership will help galvanize a new public health order so the continent can meet 21st century challenges.

The program is built on three components:

- **The Public Health Leadership Fellow Programme** will equip emerging and established public health leaders with skills to initiate innovative, bold, visionary and implementable African-owned solutions to address disease threats.
- **The Public Health Scholar Programme** will help place experts within National Public Health Institutes and health ministries to enable strategic leadership, mentorship and policy development.
- **The Public Health Virtual Leadership Academy** will become the continent's leading digital think tank platform to democratize the search for new insights and solutions for African public health needs. It will create the nexus between health threats and economics, finance, technology, gender, security, and human rights.

"Africa is a resilient continent, but we need stronger health systems and institutions that can support communities to become more resilient," said Dr. John Nkengasong, director of the Africa CDC. "The Kofi Annan Global Health Leadership is a visionary program that will help advance the tremendous potential that exists within the public health systems of the continent."

## Togo First to End Sleeping Sickness as Public Health Problem



WORLD HEALTH ORGANIZATION

Togo has received validation from the World Health Organization (WHO) for having eliminated human African trypanosomiasis, or "sleeping sickness," as a public health problem, becoming the first African country to reach this milestone.

Parasites transmitted by tsetse flies cause sleeping sickness, and it is found in about three dozen Sub-Saharan African countries. If left untreated, sleeping sickness is almost always fatal. In 1995, about 25,000 cases were detected, about 300,000 cases were estimated to have gone undetected, and 60 million people were estimated to be at risk of infection. In 2019, fewer than 1,000 cases were found. Togo has not reported any cases in the past 10 years. Early symptoms include fever, headache and joint pain. When the parasites infect the nervous system, confusion, behavior changes, loss of coordination and sleep cycle disruption emerge.

There are two forms of sleeping sickness. The first, due to *trypanosoma brucei gambiense*, is found in 24 West and Central African countries and accounts for more than 98% of cases. The second, *trypanosoma brucei rhodesiense*, is found in 13 East and Southern Africa countries. WHO and its partners are working to eliminate the gambiense form as a public health problem from all endemic countries by 2030. Benin, Burkina Faso, Cameroon, Côte d'Ivoire and Ghana have started the validation process with WHO support.

Togo's achievement comes after more than two decades of sustained political commitment, surveillance and screening. Togolese public health officials put control measures in place in 2000. In 2011, the country established surveillance sites at hospitals in Mango and Tchamba, cities that cover the main risk areas. Health officials have since maintained heightened surveillance in endemic and at-risk areas.

"Togo is a pathfinder in eliminating sleeping sickness," said Dr. Matshidiso Moeti, WHO regional director for Africa. "I congratulate the government and people of Togo for showing the way. I am sure the country's efforts will inspire others to push toward a final eradication of sleeping sickness."



# HISTORY *is Being Written*

**Dr. John Nkengasong, Director of the Africa CDC, Says the COVID-19 Crisis Calls for Bold, Unprecedented Action**

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| ADF STAFF |

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AFRICA CDC  
Centres for Disease Control and Prevention  
Leading Africa's Health



Dr. John Nkengasong,  
director of the Africa  
Centres for Disease Control  
and Prevention REUTERS

*Dr. John Nkengasong, a virologist, has been the director of the Africa Centres for Disease Control and Prevention (Africa CDC) since 2017 and has helped lead the continent's response to Ebola, COVID-19, malaria and other health challenges since that time. He spoke to ADF from his office in Addis Ababa, Ethiopia, in December 2020. His remarks have been edited to fit this format.*

**ADF:** Countries are now preparing to acquire and distribute COVID-19 vaccines. You recently co-authored a piece for *Nature* urging the world not to “let history repeat itself” where African nations find themselves at the back of the line when it comes to acquiring vaccines and lifesaving treatments. How can you ensure this doesn't happen?

**Nkengasong:** Gavi, the Vaccine Alliance, and the Coalition for Epidemic Preparedness Innovations are going to be instrumental in making sure that the initial vaccination is done almost simultaneously as much as possible across the world. It should not occur sequentially where the developed world gets vaccines, then Africa and the developing world get vaccines after that. It's going to be extremely important to highlight the global solidarity and the oneness of the planet that we live on. Otherwise, the narrative will emerge that the rest of the world can wait, and some people will die, whereas people who have the money and resources have access.

So what does this mean? It is now incumbent on COVAX [the World Health Organization effort pushing for global access to the vaccine] to make sure that there are vaccination points within the major capital cities in Africa. That way our citizens have faith in the whole concept of global solidarity and global cooperation to get rid of this virus.

If the process delays until mid-2021 and people see on television that vaccination is happening in

Europe, the United States, China, Russia, and no one has been vaccinated in Africa, then it will be a very unappealing impression.

**ADF:** You have a goal of reaching 60% immunization of the continent's 1.3 billion people in two to three years. Aside from obtaining doses of the vaccine, what will be the biggest challenge in this effort?

**Nkengasong:** It is truly an unprecedented scenario we face. Remember, pandemic means this affects all of us, and this has never happened in the past 100 years. We need to be ambitious, or we will be judged harshly as the leaders of the continent who are here managing this crisis. There will be a next generation that will read the history of this pandemic, and a key question they will ask is: “Did the leaders have a stated, ambitious goal, and were they thinking outside of the box?” The crisis is unprecedented, and we have to have unprecedented strategies to allow us to reach 60%. This target is informed by science, informed by knowledge from other infectious diseases.

So I think the continent and partners need to do everything possible to take that to scale. The world has never vaccinated more than 500 million people in one year. But I think it is reasonable and the right thing to do. The saying is, “The time is always right to do the right thing.” We need to make sure that we mobilize the continent to get rid of this virus by vaccinating more than 60% of the population.



A specialist works in an Ethiopian laboratory amid the COVID-19 pandemic. The Africa CDC hopes that 60% of the continent's population can be vaccinated in two to three years. REUTERS



**ADF:** *With any public health endeavor, education is a major component. In the past, we've seen suspicion and even hostility toward vaccinations. How can you help educate and reassure people about the safety of the vaccine?*

**Nkengasong:** We looked at about 15 countries and saw a range of perception or willingness to accept the vaccine ranging from 60% to 80%. The question is: What can be done about the 20% to 40% of the population who are hesitant? We need to win this population over. We are very encouraged by the level of acceptance we're seeing. In some parts of the developed world, acceptance of the vaccine is as low as 40%. This also points to the fact that we have a lot of work to do to get our population to believe in science, believe in the public health authorities, believe in public health institutions and agencies. They need to believe that leadership will watch their back and only allow safe vaccines to be administered on the continent. The Africa CDC is there just for that. It should be the trusted organization, as well as the World Health Organization, to communicate this information to the population.

**ADF:** *Will the Africa CDC play a role in trying to prevent criminals from bringing fake vaccinations to the market?*

**Nkengasong:** This is why we have insisted on the need for a whole-of-Africa approach to acquiring and distributing vaccines. This means that if a manufacturer approaches any member state, they should make sure that the Africa CDC is at the table to discuss it. We are also putting together a working group of regulatory agencies across the continent so we can speak with one voice. The whole-of-Africa approach calls for us to coordinate our activities as much as possible. If we do this, we can build barriers against and mitigate the potential for some companies to come in and do bilateral deals with countries and give them suboptimal vaccines. That has a tremendous risk of eroding the credibility of vaccines on the whole. Africa must express a strong unity of purpose in the spirit of cooperation and coordination through the Africa CDC, which is a specialized, technical agency of the African Union. This will be critical.

**ADF:** *You recently returned from the Democratic Republic of the Congo (DRC), which has endured disease outbreaks for many years. How have you seen countries use their experience in fighting previous outbreaks to be more prepared to take on COVID-19?*

**Nkengasong:** There are three different layers to this. First of all, there is strong leadership on the continent, rallying around a cause at the level of the heads of state. Remember, the heads of state have met over the years to address the issue of HIV/AIDS and malaria. So, bringing back that level of leadership has been very important. The second is at the programmatic level, with the whole concept of using national public health institutes — most of them were born out of the Ebola crisis in West Africa — and this has been extremely important in coordinating the technical response to this pandemic. Third, at the

more granular level, is the use of community health care workers in contact tracing. South Africa has thousands of community health care workers doing this. Uganda, Rwanda and Nigeria have done it similarly. We at the Africa CDC have supported these countries to [train and deploy] more than 10,000 community health care workers in 23 countries. That was born out of previous experience. It comes from the pains we have gone through in Ebola, where we used the community engagement to support contact tracing, education and isolation. So that has come in really handy.

**ADF:** *One particular innovation by the AU and Africa CDC was the creation of platforms and programs to mutualize resources and leverage buying power among African nations. I'm referring to the African Medical Supplies Platform and the Partnership to Accelerate COVID-19 Testing (PACT). How have you observed cross-continental partnerships grow and deepen as a result of responding to this pandemic?*

**Nkengasong:** This is new territory, and this is born out of a joint continental strategy that we put in place in February 2020. The first cases of COVID-19 were reported in Egypt on February 14, and on February 22 we convened a meeting in Addis Ababa with all the ministers of health. It was the first time we could rally more than 40 ministers of health and agree on a joint continental strategy. It is through that strategy that the platforms and mechanisms have been supported and endorsed. Behind the scenes there has been tremendous work for the acceptance of the platform, working with finance ministers, presenting it to the heads of state, presenting it to foreign ministers. So it may look just like a group of engineers came together and the platform was created, but there was a lot of work that went into it to carry the political leadership.

It was similar with the PACT initiative, as well as the AU COVID-19 Response Fund. Our hope is that, since this is a new territory, we will continue to strengthen them. They are not perfect, but they will grow and we will use them in an adaptive response to COVID-19. Hopefully, after this, we can continue to use those mechanisms to fight other endemic diseases like HIV, TB and malaria.

**ADF:** *One bright spot in the COVID-19 response has been the way it has inspired innovation from individuals, companies and nations, from the use of drones and robots to the creation of apps to help with contact tracing and combating misinformation. What do you think about the innovations that have been made by African inventors and software developers?*

**Nkengasong:** One of the early lessons we've learned is the power of innovation to fast track what has been called the "fourth industrial revolution." Look at the technology platforms, look at the innovations that have come out of it. Before COVID-19, there was no country in Africa investing in developing basic diagnostics. Today, five countries are in that space: Morocco, South Africa, Kenya, Senegal and Nigeria. This is innovation that is happening within the last couple of months. Take personal protective equipment: Companies have been repurposed to manufacture



A South Sudanese health worker speaks during a measles vaccination campaign. The Africa CDC believes public education will be key to dispelling myths and encouraging acceptance of COVID-19 vaccines.

REUTERS

masks and other material. We have seen a lot of that. I remain hopeful that behind every crisis there is a silver lining. As we say, “You don’t waste any crisis” in terms of advancing innovations, and we don’t want to wait until the next crisis before looking to innovation. This should create the space for technological advancement and also the local manufacturing of drugs and vaccines.

**ADF:** *Even as the continent battles COVID-19, other health challenges continue, including malaria, HIV/AIDS, tuberculosis, diarrheal diseases and cardiovascular disease. Are you concerned that the effort to defeat COVID-19 will take away from combating those diseases, either by diverting resources or because people are delaying treatment?*

**Nkengasong:** We are very concerned with that. We know that when pandemics hit, a lot of the deaths are not from the pandemic itself but are due to fact that the pandemic has shifted resources or the supply chain has been disrupted. It’s because of this that deaths are occurring in areas that are not necessarily related to the COVID infection. We are currently working with partners to do detailed analysis to see the impact. Very early on in the joint continental strategy we focused on three things: limiting transmission of COVID, limiting the deaths from COVID and limiting harm. In this case “harm” was defined to mean non-COVID diseases as well as economic harm. So we are conscious of that, and we continue to encourage our partners not to neglect things like immunization programs and programs for HIV, malaria and noncommunicable diseases. If you combine the deaths on

the continent each year between HIV, TB and malaria, it is over 1.2 million people. So that would be a catastrophe if we allow the pandemic to impact those programs.

**ADF:** *As you look to the future, what do you hope will be the next step in the development of the Africa CDC? How do you hope institutions build upon the lessons learned in combating COVID-19 to further develop continental health infrastructure and capacity?*

**Nkengasong:** I believe that, not just the continent, but the world as a whole should step back and take a critical look at our public health security architecture. The Africa CDC should look at the challenges this pandemic has caused us and say, “How do we strengthen it further so we can truly be an empowering, continental organization that can make decisions quickly that are binding to member states?” The whole concept of health security should start at the national level. The Africa CDC can support member states to have their own national public health institutes that can work in a network and coordinate with the Africa CDC so we can guarantee a rapid response. Look at the DRC. How many times have we been to the DRC to fight Ebola? The Africa CDC is only 4 years old, and we’ve been there ever since I took office. If you have a strong national public health institution, then they can be fighting a pandemic locally and it will save us a lot. Look at how much we’ve spent on fighting COVID. If we used just a fraction of that on strengthening our systems, we would be ahead of the curve and save billions of dollars. I think that is where the reflection should be going. □





# A FIGHT ON MANY FRONTS

## SECURITY FORCES ACROSS THE CONTINENT STEP UP TO HELP ENSURE HEALTH DURING COVID-19 PANDEMIC

ADF STAFF

**W**hen the COVID-19 pandemic spread to Malawi in early April 2020, the nation known as the “warm heart of Africa” for the kindness of its citizens faced a potential crisis. The fast-spreading respiratory disease could easily have overwhelmed the low-income country of more than 20 million people.

“COVID-19 could have a disastrously high toll in Malawi,” said Maria Jose Torres Macho, United Nations resident coordinator for Malawi. “Even a fairly low number of cases could overwhelm the health system, cause food shortages and reverse the path of progress the country has been on in recent years.”



By early in 2021, Malawi had seen 7,110 COVID-19 cases and 199 deaths. Although Malawi and its neighbors likely will have to grapple with the pandemic for months to come, the nation's military, the Malawi Defence Force (MDF), has shown that it is ready and willing to help civilians blunt the effects of the virus by rendering various levels of assistance.

"So far, the MDF is enjoying massive public trust and support, not only because of the logistical help that it is providing to the National COVID-19 Response Team, but also because of the professional handling of recent security issues surrounding the general public," said Capt. Wilned Kalizgamangwere Chawinga of the MDF Public Information Office.

When it comes to infectious diseases such as COVID-19, doctors, nurses and public health officials are the ones who fight on the front lines. They don personal protective equipment and risk their lives to save patients from the precarious and often deadly effects of the new virus.

Typically, national militaries and security forces have a different mandate. They are charged with protecting national sovereignty and borders. But they can play a vital role in fighting COVID-19 and other disease outbreaks.

Some help comes in logistics, such as transporting and distributing medical supplies. Other times, national security forces protect medical personnel, who often face danger in the stressful and fraught conditions of a pandemic.

Regardless of the help rendered, Soldiers and security officials all over the continent — from Malawi to Ghana, from Kenya to Lesotho — are doing their part to help civilian health authorities stamp out COVID-19.

## BORDERS AND LOGISTICS

In peacetime, African militaries primarily are concerned with securing national borders and training for deployments and peacekeeping missions. In a crisis such as the COVID-19 pandemic, borders become all the more

crucial. In some regions, informal crossings are frequent and routine. The prospect of such crossings bringing in new virus cases makes the need for enforcement and oversight vital.

Perhaps nowhere in Africa has that been more important than in Lesotho, a small landlocked kingdom surrounded by South African territory. South Africa has had the most COVID-19 cases on the continent.

Many blue-collar workers live in Lesotho and work in South Africa, but they have no official passports. When South Africa locked down, those workers returned to Lesotho at whatever point was convenient to them, said Capt. Nolutkhanyo Ndleleni of the Lesotho Defence Force (LDF).

Lesotho was the last nation on the continent to report a COVID-19 case, doing so on May 13, 2020, months after the virus already had infiltrated other African nations. Lesotho's first case, thought to have originated in the Middle East, was detected about a week after the country started easing initial lockdown measures that began in late March.

The LDF began supporting civilian efforts at the border on April 1, 2020, through Operation Save Life, Ndleleni told *ADF* by email. The ongoing operation has two phases. The first phase had Soldiers patrolling borders to ensure that anyone coming into the country was screened and tested. It also helped enforce the initial government lockdown.

Phase two began after COVID-19 cases were confirmed and the lockdown was lifted. Soldiers helped make sure that civilians adhered to rules on social distancing, mask wearing and gathering sizes. They also helped with contact tracing as cases increased.

"LDF deployed along the borders to prevent illegal crossings and to screen and direct all those who enter the country to established health centers for testing and quarantine," KV Khoabane, LDF legal officer, told *ADF* via email. "Only the LDF could do this duty as it had



MDF personnel help civilians arrange relief items for people affected by COVID-19. MALAWI DEFENCE FORCE



Malawi Defence Force trucks transport citizens affected by COVID-19 from Kamuzu International Airport in Lilongwe. MALAWI DEFENCE FORCE



the bulk of force that was readily available, and our LDF Medical Service was able to give them sufficient briefing or orientation on how to fight the pandemic.”

This work put LDF forces in close contact with Basotho civilians, who helped keep Soldiers informed about unauthorized border crossings. Soldiers then gathered people and transported them to health centers for testing and quarantine. “This benefited LDF and its Soldiers a lot as this was one of the rare opportunities where the Soldiers and civilians had to work together to fight a common enemy,” Khoabane said. “It improved military civil relations and helped the Soldiers to give the society the good side of the Defence Force.”

Soldiers in the MDF also have supported civilian authorities in several ways, perhaps most notably by offering logistical transportation support. Chawinga told *ADF* that the MDF supports civilian responders by ferrying Malawians affected by COVID-19 to testing and quarantine facilities across the country. This includes those who have flown in from elsewhere to Kamuzu International Airport, who are then transported in trucks with large seating capacities on behalf of the National COVID Response Team.

The MDF also worked alongside the Malawi Police Service and the Department of Immigration and Citizenship Services in Operation Pewa. In that operation, troops deployed along Malawi’s borders to control illegal entry and to raise awareness about COVID-19 prevention.

Having Soldiers work on public health projects doesn’t just improve the public’s view of its military. Soldiers also benefit. “During these operations, Soldiers are developing a sense of confidence, experience, trust and patriotism,” Chawinga said. “This personal trust and experience is building healthy careers for Soldiers.”

MDF medical practitioners also have been busy training and preparing troops on how to avoid contracting COVID-19 and how to safely interact with COVID-19 patients, including using proper hygiene, social distancing and wearing masks.

### SECURITY AND CIVIC SUPPORT

It’s no surprise that a pandemic disease outbreak leads to security threats. Health workers’ safety was a constant concern for those addressing the West African Ebola pandemic in 2014-2016. Outbreaks often require government and medical authorities to interact with people in



A military nurse takes a blood sample from a man being tested for COVID-19 at a military hospital in Tunisia's southwestern Gabès governorate.

AFP/GETTY IMAGES



A stream separates the village of Dili-Dili, Lesotho, at left, from South Africa. Because South Africa surrounds Lesotho, there is much informal border crossing, which the LDF monitors as part of its COVID-19 efforts.

LESOTHO DEFENCE FORCE



remote villages who may be unfamiliar with modern health services and susceptible to rumors and misinformation. Extra security measures are all the more important in Sudan after years of war and sanctions weakened the nation's health care system.

In May 2020, Sudanese authorities announced they would establish a police force to protect health facilities and health workers as attacks mounted during the pandemic.

Doctors threatened to strike because of growing security concerns. In April 2020, rioters threatened a hospital in Omdurman, across the river from the capital, Khartoum, after a rumor spread that COVID-19 patients would be treated there, The Associated Press reported.

One day in May, three attacks targeted health workers and a hospital in Khartoum, leading to a suspension of services.

The Ghana Armed Forces (GAF) also has worked with civilian authorities to mitigate the spread of COVID-19 through security measures, among other things. In the spring of 2020, military personnel had been fumigating and cleaning public markets before

a lockdown of the capital, Accra, and Kumasi and surrounding areas, according to the GAF.

Once the lockdown began, the GAF helped enforce it through Operation COVID Safety. This effort deployed naval vessels to prevent illegal entry from the sea. Pilots also flew reconnaissance missions and airlifted medical supplies and samples to aid in virus testing.

In July 2020, a task force composed of the GAF, the Accra Metropolitan Assembly and Zoomlion Ghana Limited, a Ghanaian waste management and sanitation company, began a weeklong public awareness campaign on Accra's sanitation bylaws and COVID-19 protocols in advance of enforcement measures.

Task force members broadcast public messages via loudspeaker to let them know that they must keep their surroundings clean and wear masks to avoid prosecution, according to a Ghana News Agency report.

### THE IMPORTANCE OF EDUCATION

In Kenya, Soldiers have spent a lot of time sanitizing public spaces, including military installations, health facilities and other areas. Members of the Kenya





Kenyan Soldiers serving in the African Union Mission in Somalia teach civilians how to prevent the spread of COVID-19 in Dhobley, Lower Jubba region, in April 2020. AMISOM



LDF personnel clean streets in the capital, Maseru, in September 2020. LESOTHO DEFENCE FORCE

Defence Forces (KDF) also have worked to educate themselves and others.

In September 2020, more than 50 KDF medical practitioners from the three services and the Defence Forces Memorial Hospital spent three days at a COVID-19 medical conference at the International Peace Support Training Centre in Karen, Nairobi. The purpose of the conference was for medical personnel to share their experiences and learn the latest information for managing and controlling infectious diseases.

"It is my sincere hope that among the lessons that KDF medical fraternity has learnt during the recent COVID-19 outbreak include emergency planning, preparation, training, coordination, protective equipment use, containment measures, control and medication," Dr. Ibrahim Mohamed, principal secretary of the Ministry of Defence, said in a news release.

Kenyan Soldiers also are educating civilians as part of the African Union Mission in Somalia. KDF Soldiers serving in the Dhobley region shared COVID-19 prevention measures with Jubaland Security Forces, a state-level paramilitary force based there, and others.

KDF Soldiers taught basic hygiene such as frequent hand-washing, social distancing, wearing of face masks, and how to cough and sneeze in a way that minimizes the virus's spread. The awareness efforts are combined with other work to mentor Somali security forces through joint operations against al-Shabaab.

## TESTING AND OTHER SUPPORT

Testing is one of the best ways to assess and control the spread of COVID-19. The logistical power of

national militaries makes their involvement in testing valuable.

The KDF undertook mass testing of its own personnel to control spread of the disease. In June 2020, the Kenya Navy tested its personnel and their families as part of an effort called Komesha Korona. Workers also tested KDF forces at Defence Headquarters and in barracks across Nairobi. Officers, Soldiers, military families and Defence Ministry civilian staffers have access to testing at various medical centers.

The Tunisian Armed Forces showed the importance of military logistics during the pandemic in April 2020 by flying round trip from Tunis to Hong Kong to pick up medical and sanitary equipment. The 22,000-kilometer, 48-hour trip was the longest the Tunisian Air Force ever has flown, according to the Tunisian news site Webdo.

Tunisia's General Directorate of Military Health in October 2020 also dispatched health teams to Béja and Ghannouch to support local teams that were administering rapid tests.

The KDF has aided civilians in other ways during the pandemic. In October 2020, the KDF airlifted teachers into the Lamu region by helicopter. "Air assets under Operation Amani Boni lifted teachers to Milimani, Mangai, Basuba, and Mararani Primary Schools during the first week of learning post the COVID-19 nationwide closure of schools," according to a KDF statement. "The teachers were happy to resume their duties because the schools had just reopened in January 2020 after 6 years of closure due to insecurity." □



An abstract graphic on the left side of the page features a circular, gear-like structure with various shades of blue and grey. From this central point, a network of thin blue lines extends across the page, resembling a circuit board or data pathways. Several of these lines terminate in arrowheads, pointing towards the right. Some of these lines are thicker and more prominent, creating a sense of flow and direction. The overall aesthetic is technological and futuristic.

# OUTBREAK SPARKS INNOVATION

## Scientists, Entrepreneurs Develop Devices to Ease Pandemic ADF STAFF

**A**s national economies struggle to reopen from pandemic lockdowns, the African Union is looking to homegrown technology to help businesses while tracking the potential for new outbreaks.

One technology is a smartphone app called PanaBIOS. It lets governments monitor people's movement — particularly those who may have tested positive for COVID-19 — and curb large gatherings that might turn into superspreader events.

The widespread use of PanaBIOS is crucial to the AU's planned opening of a continentwide free-trade area in 2021. That project, which will let people and goods move across open borders, will require a way to track the potential spread of COVID-19 and similar diseases.

Koldchain, a Kenyan startup, developed the app, and AfroChampions, a public-private partnership, funded it. It has been tested in Ghana since June 2020. Ghana also ran a small test of PanaBIOS during its elections earlier in 2020.



Quintin the robot began working with COVID-19 patients in the intensive care unit at Tygerberg Hospital in Cape Town, South Africa, shortly after the pandemic struck.

DAMIEN SCHUMANN/  
STELLENBOSCH UNIVERSITY





In Malawi, limited internet access led student Sam Masikini, 23, left, to design an offline education app that works on basic cellphones. UNICEF

From mobile apps to ventilators to drones, African innovators and health professionals are using new technology to gain an upper hand in the COVID-19 fight. Amateurs, some still teenagers, have developed useful devices, equipment and software to cope with the virus. People across the continent have produced a range of innovations:

In **Rwanda**, Wilfred Ndifon, an epidemiological mathematician and director of research at the African Institute for Mathematical Sciences, recognized a scarcity of COVID-19 testing kits and used an algorithm to develop a fast, effective and inexpensive method of batch testing people for the virus.

Ndifon's innovation, which can test up to 100 people simultaneously, has earned global recognition.

"Because [batch] testing allows you to test many people, you can have a clearer picture of your epidemiological data profile," Leon Mutesa, a member of the Rwandan government's COVID-19 task force, told *The Conversation Africa*.

Officials mostly conduct batch testing in Rwandan markets, banks, prisons and other places where large groups gather. "It will also help to identify new infection hot spots to enable a rapid response by public health officials," Mutesa added.

In **South Africa**, robot twins Quintin and Salma have joined the intensive care unit (ICU) at Tygerberg Hospital in Cape Town. The pair provide two-way video conferencing. Imagine an iPad atop a pole with wheels.

The robots let doctors and nurses do virtual rounds with COVID-19 patients without contact, which means saving precious personal protective equipment. Just as important, the robots boost the spirits of patients isolated with the highly contagious disease by connecting them with loved ones. They wheel to the patients' bedsides and connect them with family and friends, sometimes for hours.

The robots joined the Tygerberg ICU after Coenie Koegelenberg, professor of pulmonology at Stellenbosch University's Faculty of Medicine and Health Sciences, looked for ways doctors and nurses could do virtual rounds.

In **Malawi**, Sam Masikini, a 23-year-old information technology student, heard about a UNICEF contest to design a mobile app, so he drew from his own experience attending a rural village school.

"You can have five villages attending one school," he told *ADF*. "A single teacher is teaching 70 students. I knew what had to be done."

# ‘We Can Build Our Youth for the Future’

ADF STAFF

**T**hree young Ethiopian men have teamed up to start the Ewenet Communication Private Limited Company and have introduced Debo, an Android-based contact-tracing cellphone app to track COVID-19 cases.

Addis Alemayehu is founder and general manager. Mikiyas Teshome is a software developer and vice manager/co-founder. Natnael Mahetem is a software developer and co-founder. *ADF* conducted an email interview with the men. The interview has been edited to fit this format.

**ADF:** When did you start Ewenet? What made you decide to start the company?

**EWENET:** Ewenet was established with a heartfelt promise made by the three of us to make a difference, not only in our lives, but also in the lives of many Ethiopians and African youths through technology. We did not start Ewenet because of COVID-19, but we are the first startup company to volunteer to join the effort to stop the spread of the virus in Ethiopia, and still we are working.

We are living in the digital age and information era where technology makes our lives easy or difficult. The way we collect, organize, analyze and interpret data will determine our success, whether we are individuals, companies or government. People prefer that information comes in the best way possible on their fingertips in a cost-effective and efficient way.

**ADF:** Tell us about Debo. What does it do? How does it work?

**EWENET:** Debo is a contact-tracing Android mobile application we developed with the Ethiopian Public Health Institute to stop the spread of COVID-19 in Ethiopia. The application

has an easy user interface. The app uses Bluetooth and can trace anyone who uses it within a 2-meter radius. The two phones exchange codes that are saved in each phone. If someone who uses Debo becomes COVID-19 positive, the contact-tracing team will use his/her phone and can easily access the name of the people who were within 2 meters, contact frequency, sex, age and address.

The user can also register his or her immediate contacts, like family members who live together, as well as close friends and colleagues.

All the functions work offline, and this will avoid data connection costs to users. Debo is working in five languages: Amharic, Afan Oromo, Tigrigna, Somali and English.



Natnael Mahetem, Addis Alemayehu and Mikiyas Teshome

**ADF:** How did you develop Debo? What is your development process like?

**EWENET:** The development of Debo started with engaging the Ethiopian Public Health Institute COVID-19 contact tracing team. Our team and the tracing team tried to identify all the challenges when tracing contacts using the so-called detective method.

We chose the Bluetooth protocol and Android operating system for the first phase of the application. According to a 2018 report, 92.41% of

smartphones in use in Ethiopia were Android devices.

At every stage of development, we tried to engage all higher officials from the Ethiopian Public Health Institute and the Ministry of Health for better output. We also tested the performance of the application on volunteers' phones from the institute. Finally, after a security check made by the Ethiopian Information Network Security Agency, the application launched to the public. We also provided training to more than 250 contact tracers.

**ADF:** What does the future hold for your company?

**EWENET:** Nowadays Africa has started to embrace innovation and science but still has a long way to walk. Some African countries started to support innovation through startups, but this needs a well-developed policy framework with integrated collaboration of all sectors within the economy. Ethiopia is on the verge of developing a policy that will help startups via tax exemption up to five years, and it means a lot.

Ewenet is trying to digitalize the Ethiopian election campaign, and political parties have been encouraged to join the effort.

Now is the time for Africa, and we should embrace African talents and innovations. The important thing that every African startup should learn from us is that your first products should be made for the public voluntarily. Our primary agenda should be social concern, but African governments should also pave the way to digitalization of Africa via youth development. As the former U.S. President Franklin D. Roosevelt said, "We cannot always build the future for our youth, but we can build our youth for the future."





A Malian researcher conducts a COVID-19 test at the University Clinical Research Center of Bamako. Across the continent, COVID-19 has sparked an unprecedented drive for a scientific solution to the pandemic. AFP/GETTY IMAGES

In June 2020, Masikini entered the UNICEF Malawi COVID-19 Youth Challenge, one of four problem-solving competitions in the region the organization sponsors. He designed a mobile app he thinks can help overcome the challenges of educating rural children who, due to COVID-19, might not have access to in-person schooling.

On September 14, 2020, UNICEF Malawi announced Masikini had finished first out of 1,717 participants. He since has worked with experts and mentors in incubation hubs. They have developed the application and anticipate testing it with students and teachers next.

Masikini's winning entry is called Inspire, which helps with e-learning in places with limited internet access and few smartphones and computers. It places Malawi Ministry of Education content on an offline learning platform accessible by basic cellphones.

In **Ethiopia**, three young men and their company, Ewenet Communication, have developed Debo, a contact-tracing mobile phone app. Because people can spread COVID-19 while having no signs of being sick, the infection can spread so fast that it outpaces conventional contact tracing.

With that in mind, Debo uses a Bluetooth "handshake" to communicate with nearby phones. This captures the identity of anyone who comes within 2 meters of the phone's user as part of the contact-tracing

strategy should one of them test positive later.

Ewenet also developed a website to inform people about COVID-19 and a call-center management system to answer the public's questions about the virus through the nation's 8335 phone number.

With an estimated 14 million smartphone users, Ethiopia has leaned heavily on mobile technology in its campaign to prevent the spread of COVID-19. Mobile phones play jingles reminding people to wash their hands and wear face masks. Mobile phone networks carry religious services, letting the faithful worship remotely.

In **Senegal**, students from the Ecole Supérieure Polytechnique have built a multifunctional robot designed to lower the risk of COVID-19 being transmitted from patients to caregivers. The small robot, called "Dr. Car," can measure patients' blood pressure and temperature, reducing direct exposure between patients and medical professionals.

The device is equipped with cameras and is remotely controlled using an app. It also can be used to deliver drugs and food, and doctors can use it to communicate with patients.

The school is considered one of West Africa's finest for engineering and technology. Its 4,000 students come from 28 countries.



Mechanical engineering students from Senegal's Ecole Supérieure Polytechnique work on "Dr. Car," a robot that can measure COVID-19 patients' vital signs. AFP/GETTY IMAGES



Inventors are developing touch-free electronic hand sanitizers, one example of finding homegrown solutions to the spread of COVID-19. AFP/GETTY IMAGES

In **Kenya**, 9-year-old schoolboy Stephen Wamukota invented a wooden hand-washing machine to help curb the spread of COVID-19. Users push a foot pedal to tip a bucket of water to wash their hands, allowing them to avoid touching surfaces.

BBC News listed the hand-washing station as one of the top 10 African innovations to help tackle COVID-19. He later received a request from a local hospital to build another hand-washing station, which he sold for \$33.

In June 2020, he was the youngest of 68 people to receive a presidential award from President Uhuru Kenyatta.

Also in Kenya, mobile money agent Danson Wanjohi has built a wooden device that sanitizes cash notes passed through a slot in the machine. He built the device using a motor, a rubber band and gears. It is designed to sanitize all notes being deposited and withdrawn.

Wanjohi told [Kenya.co.ke](http://Kenya.co.ke) that the next challenge is acquiring financing to roll out mass production of his machine.

"Money is one of the weakest links in curbing the spread of the virus because you have to use money, and you never know where it is from," he said. "Getting corona is free, but catering for treatment is not free."

During a COVID-19 lockdown in **Ghana**, shoemaker Richard Kwarteng and his brother Jude Osei designed a solar-powered hand-washing basin.

They built their device on a deadline and had less than 48 hours to get the building materials before a lockdown went into effect. As CNN reported, their shopping list consisted of a sink, a faucet, a computer motherboard, a solar panel, a sensor and an alarm.

Kwarteng called an electrician friend, Amkwaah Boakye, to handle the wiring before the brothers programmed the device to release soapy water when hands or other items activated a sensor underneath the faucet. After 25 seconds, an alarm indicates hand-washing is complete, and water is released to rinse before

drying, in accordance with the 20-second hand-washing guidance issued by the U.S. Centers for Disease Control and Prevention.

The machine, called SolaWash, can service 150 people before a refill is needed.

The Ghana Standards Authority certified the machine in four days instead of the 21 days normally required. Ghanaian President Nana Akuffu-Addo has endorsed the device.

Engineers in **Tunisia** have created an online platform that scans lung X-rays to determine whether a person could have COVID-19. Although it is not the first such platform, its creators say it is the first to be openly available. Engineers told Agence France-Presse that the platform is 90% reliable in noting the probability of infection.

Teachers and students at the Tunisian engineering and technology institute INSAT have been developing the platform, called COVID-19 Exam Ct/XR images by AI, with German, Italian and American technical support.

Researchers have fed thousands of X-rays of lungs of healthy people and COVID-19 patients into the platform, allowing artificial intelligence to learn to recognize marks of the virus on the lungs. Uploading an X-ray and running the test generates a recognition score, requiring nothing more than an internet connection.

Also in Tunisia, authorities have deployed police robots on the streets of the capital, Tunis, to enforce lockdown rules. The Tunisian-made surveillance robots, called PGuards, approach people walking on the street and ask them why they are out. People have to show their identification and other documents to cameras on the robots.

The four-wheeled PGuards have thermal-imaging cameras and light detection and ranging technology, which works like radar but uses light instead of radio waves. The manufacturer, Enova Robotics, told the BBC that it also is producing a health care robot that can give a preliminary visual diagnosis and measure certain vital signs. □







# AFRICA CONTINUES WAR ON MALARIA

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THE CONTINENT HAS ERADICATED WILD POLIO;  
NOW MALARIA IS IN THE CROSSHAIRS

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ADF STAFF

**I**n the swamplands of central Tanzania is a place called Mosquito City. It has the world's largest captive colony of mosquitoes used for researching the spread of malaria and other mosquito-borne diseases, such as Zika virus and dengue fever. Scientists with the Ifakara Health Institute are working to understand mosquito behavior, such as when they mate. The goal is to learn how to best trap, repel and kill mosquitoes.

"Part of our work here is to innovate and create new tools so we can just keep pace," Fredros Okumu, chief scientist at the institute, said in a video on GatesNotes.

Malaria once was so widespread in the region that it infected 80% of the population. Many babies never reached their first birthdays. In fact, the meaning of the town's name, Ifakara, is "The place people go to die."

But researchers are making progress. Malaria deaths in Tanzania were cut by more than 50% between 2014 and 2019, according to MalariaSpot. Scientists now have an even more ambitious goal: eradication.

"For the mosquitoes that carry malaria, we see no need to continue sharing this beautiful, beautiful planet with them," Okumu said.

## ONE DISEASE ON TOP OF ANOTHER

The spread of COVID-19 has slightly weakened, but not stopped, efforts to eradicate malaria in Africa.

More than 90% of anti-malaria campaigns across



Malawian villagers wait to have their children take part in a test of the world's first malaria vaccine. THE ASSOCIATED PRESS

four continents were on track at the end of 2020. During the year, officials distributed 200 million mosquito nets in 30 countries. They sent antimalarial drugs to 12 countries in and around the Sahel. The RBM Partnership to End Malaria reported that Kenya, Malawi and Ghana had immunized more than 300,000 children against the disease in a pilot program started in 2019.

"This year, under the worst of circumstances, countries have proven they don't need to choose between protecting populations from COVID-19





Two women in a Malawian village talk after having their children participate in a malaria vaccine test program.

THE ASSOCIATED PRESS

or malaria; they can, and should, do both,” said Abdourahmane Diallo, who heads the RBM (formerly Roll Back Malaria) Partnership.

“Despite the unprecedented challenges faced, it is a remarkable achievement that countries and their partners around the world have successfully sustained planned malaria efforts, including distributing record numbers of insecticide-treated nets, and [are] continuing the march to zero malaria — ensuring that communities remain protected from the deadly mosquito bite,” he said, as reported by the partnership.

Health officials have said that the worldwide spread of COVID-19 is affecting the treatment of other illnesses. During the 2014 Ebola outbreak in West Africa, malaria, tuberculosis and HIV/AIDS caused more deaths than Ebola because the epidemic disrupted local health care systems. Health officials have expressed fear that the same could happen with COVID-19.

“We must use COVID-19 as an opportunity to learn lessons to improve collaboration and innovation, as well as set our ambitions higher for achieving zero malaria,” said Peter Sands of the Global Fund to Fight AIDS, Tuberculosis and Malaria, as reported by *The Guardian*.

The World Health Organization (WHO) has advised governments to adapt their malaria campaigns to protect health care workers and people distributing supplies and mosquito nets from COVID-19.

Although COVID-19 has devastated the world’s

economy, malaria remains a potent killer. The WHO says that in 2018 there were 212 million cases of malaria in Africa and 381,000 deaths, which were both lower figures than for 2017. In 2020, it was estimated that for every COVID-19 death in Africa, there were seven to eight malaria fatalities.

In 2018, six countries accounted for more than half of all malaria cases worldwide. A fourth of the world’s cases originated in Nigeria, with 12% in the Democratic Republic of the Congo, 5% in Uganda, and 4% each in Côte d’Ivoire, Mozambique and Niger. Children under 5 years old accounted for two-thirds of all malaria deaths worldwide.

Even amid the COVID-19 pandemic, organizations such as the RBM Partnership, Malaria No More and the Gates Foundation are working not just to limit the number of malaria cases, but to eradicate the disease.

The U.S. Centers for Disease Control and Prevention (CDC) is precise in its language about controlling malaria, as opposed to eliminating it. It says its goal is to reduce malaria transmission to a level where it is no longer a public health problem.

“‘Control’ of malaria differs from ‘elimination’ or eradication of malaria,” the CDC reports. “‘Elimination’ is local or regional in scope. Eradication is ‘global elimination.’ Eradication is not achieved until malaria is gone from the natural world.” The center says that recent increases in resources, political will and commitment have led to discussions of the possibility of malaria elimination and, ultimately, eradication. □

# GROUND ZERO FOR MALARIA



ADF STAFF

**A**frican societies have battled malaria for thousands of years and, despite scientific advances, it continues to be deadly. Here are several reasons why Sub-Saharan Africa is ground zero for malaria:

- Africa's malaria-bearing mosquitoes are highly efficient in transmitting the disease.
- There is a high prevalence in Africa of the deadliest species of the parasite.
- Sub-Saharan Africa's climate is favorable to mosquitoes.
- The countries hardest hit by the disease have low capacity for taking preventive measures.

Antimalarial medication is widely available, which raises the question: Why not give the drugs to people living in countries where the disease is most prevalent? It's not that simple. Recommendations for drugs to prevent malaria differ from country to country because of the various strains of the disease. No antimalarial drug is 100% effective and must be combined with personal protective measures such as mosquito nets. Such drugs also must be taken daily or weekly.

Since vaccinations remain unproven, the best way to stop malaria is by using effective, safe, and tested prevention and control measures. Health officials list six categories of preventive measures: insecticide-treated nets, preventive treatment of malaria in pregnant women, preventive treatment of infants, indoor residual spraying, larval control and mass drug administration.

The first line of defense is effective mosquito netting in sleeping areas, because mosquitoes are most active between dusk and dawn. Better still,



A researcher works in a laboratory at the International Centre of Insect Physiology and Ecology headquarters in Nairobi, Kenya. REUTERS

the CDC says, are **insecticide-treated bed nets**. In communitywide trials in Africa, treated nets reduced malaria-related deaths in children under 5 by 20%.

Insecticides used for treating bed nets kill mosquitoes and other insects. They also repel bugs, reducing the number that enter a house, which also reduces the risk to everyone in the house. In communities where such nets are widely used, mosquito numbers go down, along with the insects' life spans. Health officials say that at least half the people in a community must use treated nets to get such results.

Treated nets have been shown to pose "very low health risks" to humans and other mammals, the CDC says. Until fairly recently, such nets had to be regularly re-treated with insecticides. But several



# AFRICA HAS STOPPED DISEASES BEFORE

ADF STAFF

**O**rganizations around the world are working to wipe malaria from the face of the earth.

There are African precedents in wiping out diseases. In August 2020, the U.S. Centers for Disease Control and Prevention (CDC) announced that Africa was officially polio-free.

“This incredible public health achievement — the interruption of wild poliovirus transmission from every corner of the African region — began 24 years ago with a call-to-action by the late South African President Nelson Mandela,” the CDC reported. “He challenged African heads of state and leaders to mobilize to ‘kick polio out of Africa.’ At the time, 75,000 African children a year were being paralyzed by polio.”

Nigeria was the last country in Africa to be declared free of so-called wild polio, as opposed to polio acquired from the vaccine itself. In August 2019, Nigeria passed three consecutive years without a reported case of wild polio, which opened the door for the official certification process to review data and documents and declare Africa polio-free. As of 2020, Afghanistan and Pakistan are the only two countries where the disease is still classified as endemic.

Africa also is on the verge of eradicating Guinea worm disease, in which a worm larva swallowed in drinking water grows up to 80 centimeters long, tunneling through the host body to emerge from the victims’ feet. In 1986, the United States-based Carter Center assumed leadership of a program to eradicate the disease, which at that time was infecting 3.5 million people annually in 21 countries in Africa and Asia.

The Carter Center has achieved stunning results. It reported a provisional total of 53 cases of Guinea worm disease worldwide in 2019. The disease has proved harder to totally eradicate than expected because of a rise in the infections in animals, primarily dogs in Chad.

“The time to eradicate Guinea worm is now,” Adam Weiss, director of the Carter Center Guinea Worm Eradication Program, told *Outbreak News Today*. “To prevent unnecessary suffering, the remaining endemic countries are going all out with every intervention available.”

companies have developed long-lasting insecticide-treated nets, known as LLINs, that are effective for at least three years, even after repeated washings.

Between 2008 and 2010, health officials distributed 294 million LLINs in Sub-Saharan Africa. The CDC said funding for LLINs gradually increased from 2004, when officials distributed 5.6 million nets, to 2010, when they delivered 145 million nets.

## SYMPTOMS OF MALARIA

### Systemic

- High fever
- Back pain
- Profuse sweating

### Central

- Headaches

### Respiratory

- Dry cough

### Spleen

- Enlargement

### Muscular

- Fatigue
- Aches

### Stomach

- Nausea
- Vomiting
- Abdominal pain

### Skin

- Chills
- Sweating

### Blood

- Bloody stool

ADF ILLUSTRATION

Officials say the economic harm caused by COVID-19 will lead net distributions to plateau or even decline in the coming years. Researchers are working to increase the life spans of treated nets from three to five years. Such five-year nets would save \$3.8 billion over 10 years.

Health officials say that during pregnancy, the mother and the fetus are at risk of malaria. The mother’s natural immunity is reduced. Adverse





A researcher from the International Centre of Insect Physiology and Ecology checks water quality in a Kenyan village. Mosquitoes breed in standing water. REUTERS

effects of malaria during pregnancy include maternal anemia, fetal loss, premature delivery, intrauterine growth retardation and low birth-weight infants.

**Preventive treatment of malaria in pregnant women** includes the use of LLINs, effective pregnancy case management, supplements to prevent anemia and folic acid supplements to reduce birth defects. Children born to mothers with malaria are particularly prone to spinal and brain deformities.

**Preventive treatment for infants** consists of a full therapeutic course of the drug sulfadoxine-pyrimethamine at intervals corresponding to routine vaccination schedules — usually at ages 10 weeks, 14 weeks and 9 months — given to infants at risk of malaria. The drug lowers the risk of anemia and contracting malaria.

**Indoor residual spraying** is coating the walls and other surfaces of a house with an insecticide. The insecticide will kill mosquitoes and other insects that come in contact with these surfaces for several months. The spraying does not prevent mosquitoes from biting. Instead, it usually kills mosquitoes after they have fed and have come to rest on the sprayed surface. To be effective, the spraying must be done in at least 80% of the homes in a community.

**Larval control** requires eliminating any standing water where mosquitoes can breed. Eggs laid in water will hatch into larvae within 24 to 48 hours

and mature to mosquitoes in seven to 10 more days. Just about any standing water will support larvae, so eliminating breeding spots is difficult. Countries throughout Africa have not attempted larval control on a large scale, but in other parts of the world, it has been highly effective.

The CDC says that larval control in Africa may be useful for specific settings such as urban environments or desert fringe areas where puddling water is more predictable.

Large-scale larval control generally requires environmental modifications, such as draining and filling, or the use of larvicides. Biodegradable oil can be sprayed on water, suffocating the larvae and pupae.

In times and places where malaria has reached epidemic proportions or has become particularly lethal, medical workers have used **mass drug administration**, or MDA. Every person living in a defined area is given antimalarial medicine. *P. falciparum*, the most lethal of malarial parasites, has forced communities to use MDA.

The World Health Organization recommends MDA only in extreme circumstances, where the health system is overwhelmed and unable to serve the affected community. In lesser circumstances, where the incidence of malaria is merely high or moderate, MDA has not proved to be practical. □



**HELP  
WHERE  
IT'S  
NEEDED  
MOST**



# MOBILE MILITARY HOSPITALS SUPPORT STRAINED HEALTH SYSTEMS DURING COVID-19 OUTBREAKS

ADF STAFF

**W**hen the first cases of COVID-19 arrived in Senegal, the military jumped into action. In March 2020, the Senegalese Army traveled to Touba, 190 kilometers east of Dakar, and built a mobile field hospital to handle an anticipated rise in COVID-19 cases that threatened to overwhelm the local hospital.

In a matter of days an empty field was transformed into a 14-tent, 690-square-meter compound in which doctors could perform surgery and diagnose and treat hundreds of patients a day. All treatment was offered to the public for free.

It was an unusual mission for unusual times.

“We have a number of missions; we have the mission of providing care to the Army in times of peace, we also have the mission of health in times of crisis or during war,” Col. Abdourahamane Diang, chief of medicine at the Senegalese Army Hospital, told local press. “In times of crisis or war, it necessitates an exceptional approach.”

Touba, a city of 1.5 million, is one of the holiest cities for Sufi Muslims and hosts an annual festival that draws millions of pilgrims. Although the city saw several case spikes throughout the year, Senegal avoided the direst outbreak forecasts, and the Army was credited with playing a key role in treating the public.

“The treatment is free with the only limit being the means we have available,” Diang said. “The consultation is free, the radiological services are free, the laboratory analysis is free. ... We will steadily offer care, and at each step we will evaluate what else is needed.”

## HOSPITAL IN A BOX

Senegal was one of four countries that received United Nations level II field hospitals from the United States. The other countries are Ghana, Rwanda and Uganda. Each country was scheduled to receive two hospitals.

The modular hospitals can be packed into shipping containers and deployed along with troops on peacekeeping missions. They were donated as part of the U.S. African Peacekeeping Rapid Response Program (APRRP), a \$110 million annual effort to help African militaries rapidly intervene in crises on the continent.



A Senegalese Army doctor examines a local resident at a field hospital in Touba. REUTERS



Each of the hospitals is valued at about \$3.5 million.

"It is designed to provide a rapid response to any crisis, whether it be a geopolitical destabilization or a disease outbreak," said Dr. Charles Beadling, a military medicine professor at Uniformed Services University, who helps train people to use the mobile hospitals. "Rather than relying on the international community and the delays in responding to the continent, APRRP provides an on-the-continent rapid-response capability."

Each hospital has 20 beds for inpatient care and is equipped with devices to monitor vital signs. The hospitals have a surgical room, intensive care units and diagnostic imaging tools. Each has water purification, generators and sewage disposal capabilities. It takes one to three days to set them up.

"They are self-sustaining facilities. They have their own generators, they have everything," said U.S. Air Force Maj. Mohamed Diallo, an international health specialist with the Office of the Command Surgeon at U.S. Africa Command (AFRICOM). "They can set it up anywhere and be fully operational without the need to tap into any external source."

Once the hospitals are delivered, AFRICOM provides a multiphase training program on skills including field sanitation, clinical ultrasound, infection control and tactical combat casualty care. "This is not just one-time training," Diallo said. "We train them so they can train their own. We don't just come in and train one group and say we're done. We are institutionalizing each of these programs so they can be used appropriately during deployment."

Although travel has been halted due to the pandemic, trainers from AFRICOM have continued to provide virtual courses on critical care and COVID-19 patient management that incorporates the latest lessons learned from around the world.

In addition to these level II hospitals, the U.S. donated 14 level I field hospitals equipped with negative air pressure systems to stop infected air from leaving treatment rooms. These hospitals have gone to countries such as Angola, Djibouti, Ethiopia, Ghana, Kenya, Morocco, Niger, Nigeria, South Africa and Tunisia. These hospitals typically are being operated by the ministry of health in the recipient country.

**“They are self-sustaining facilities. They have their own generators, they have everything. They can set it up anywhere and be fully operational without the need to tap into any external source.”**

**~ U.S. Air Force Maj. Mohamed Diallo, an international health specialist at U.S. Africa Command**



This U.N. level II mobile treatment facility was assembled in the Uganda Rapid Deployment Capabilities Center in Jinja in 2019 as part of an exercise. U.S. ARMY



Senegalese Army doctors carry protective equipment as they prepare to examine patients exhibiting COVID-19 symptoms at the Army field hospital in Touba. REUTERS



Senegalese Army Dr. Alassane Dia walks toward an isolation tent in a field hospital set up in Touba. REUTERS

## PREPARING FOR THE WORST

The hospitals were never intended for use during a domestic pandemic, but they've proved valuable.

U.S. trainers worked with Soldiers from the Uganda People's Defence Force (UPDF) in May 2019 to practice how to set up and take down the hospitals. The training included a mass casualty exercise to test the UPDF's ability to treat and stabilize wounded Soldiers.

By early 2020, the UPDF had 320 people trained to operate the hospital. That put them in a strong position once COVID-19 struck.

"Our preparations started a long time ago; when the first epidemic broke out in China, we started preparing from then," Brig. Stephen Kusasira, director of medical services in the UPDF, told local media. "Everyone knew it was a matter of time until this thing reaches here."

The UPDF set up the hospital at the Bombo Military Barracks north of the capital, Kampala. And although Uganda experienced a relatively small number of COVID cases and 228 deaths as of mid-December, leaders say the experience of responding to a pandemic has been valuable.

"Tomorrow there could be another emergency that requires the establishment of a mobile hospital," Kusasira said. "So it's a model that we use in the UPDF to have both the static centers but also to develop our mobile capabilities. Should we deploy somewhere, we should be able to move with a hospital or health center or a structure where we can give them health care services."

In Ghana, the Ghanaian Armed Forces (GAF) set up the hospital on the football pitch at the El Wak Stadium in Accra. The tents were arranged to include isolation facilities for the sickest patients and changing rooms in which doctors and nurses could don and later dispose

of personal protective equipment. The hospital handled overflow patients from the nearby 37 Military Hospital.

"The military tends to be low profile, so for some time you haven't heard much about us, but ... we're doing a lot here, and we need the support of the public to keep up with the influx of patients," GAF Col. Thomas Aquinas Gbireh, commanding officer at the hospital, told Citi TV.

One of the biggest needs was personal protective equipment, which was in short supply. In August 2020, the U.S. responded by donating 10,000 N95 face masks, 1,600 hospital gowns, 2,000 liters of liquid sanitizer and other medical goods. Maj. Michael Kummerer, chief of the Office of Security Cooperation at the U.S. Embassy in Ghana, called the donation "a friend lending a helping hand in a time of need."

"We recognize the absolutely critical role that the GAF is playing in Ghana's COVID-19 response, and we're happy to support them in this noble cause," Kummerer said.

Although many parts of Sub-Saharan Africa were not affected as severely by COVID-19 as initially feared, military health professionals said it was an important reminder of the role security forces must play in a national crisis.

"We are preparing for the worst scenario should it happen," Kusasira said.

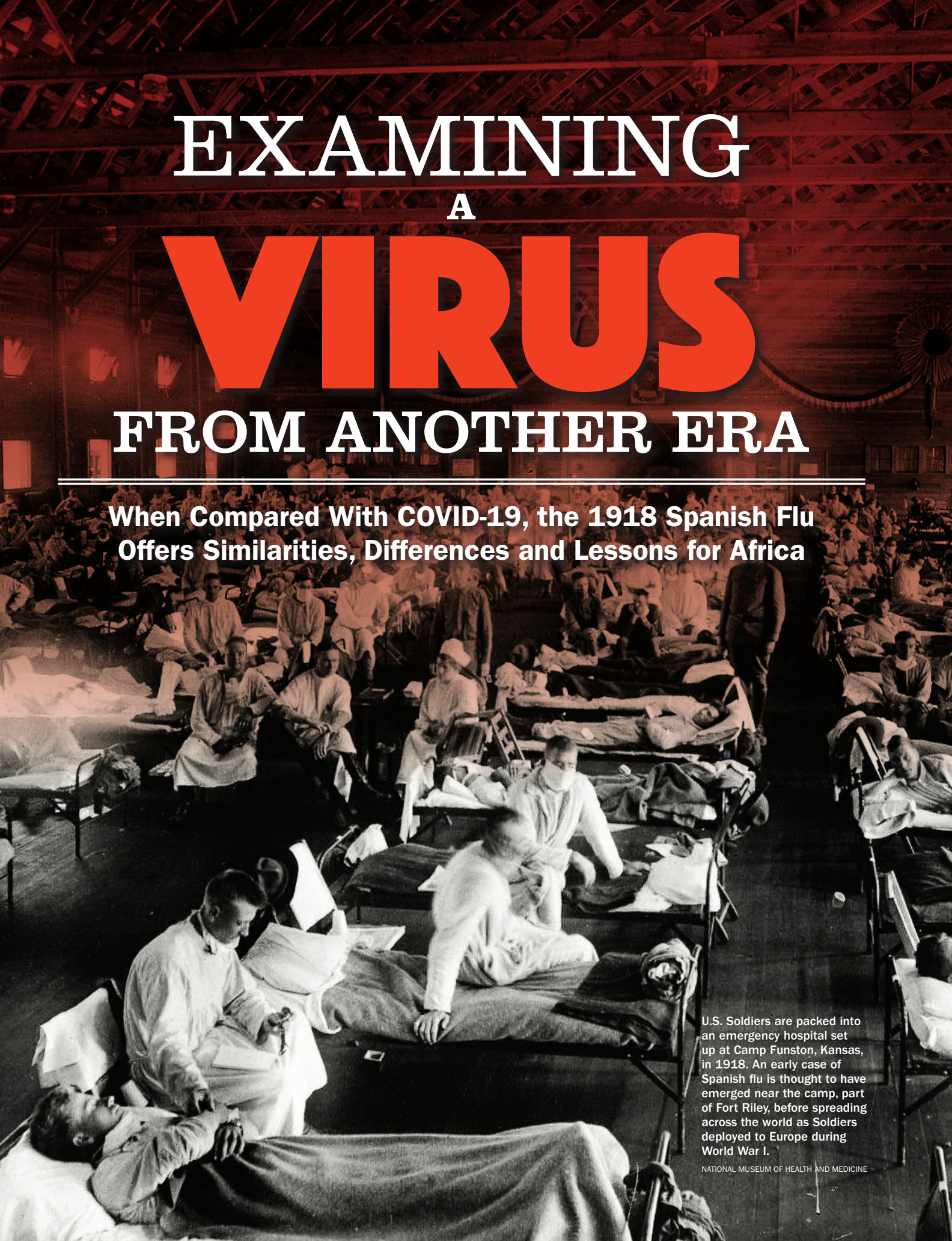
Part of that preparation means strengthening preventive measures so health systems don't get overwhelmed in the future.

"We should not be looking as a country just at treatment centers; we should focus on strengthening the prevention aspects so that we don't have very many people that overwhelm the capacity of the country," Kusasira said. □



# EXAMINING A VIRUS FROM ANOTHER ERA

**When Compared With COVID-19, the 1918 Spanish Flu Offers Similarities, Differences and Lessons for Africa**



U.S. Soldiers are packed into an emergency hospital set up at Camp Funston, Kansas, in 1918. An early case of Spanish flu is thought to have emerged near the camp, part of Fort Riley, before spreading across the world as Soldiers deployed to Europe during World War I.

NATIONAL MUSEUM OF HEALTH AND MEDICINE



**W**hen it comes to pandemic diseases, the African continent has been forged in fire.

History is replete with examples of deadly illnesses originating on the continent and ravaging populations in nation after nation. Some, such as Ebola, rear their heads fiercely in specific regions at different times, killing and terrorizing populations while the world looks on in fear.

Others, such as HIV/AIDS, stubbornly take root in a region and become an endemic health concern for generations, not unlike the ever-present threat of

malaria or yellow fever.

A few, however, emerge elsewhere and march across the globe, infecting Africa from every direction and with methodical, relentless and increasing intensity. COVID-19 is such a disease. And although this coronavirus is new, its similarities to an infectious precursor — the 1918 Spanish flu — are instructive.

Africa has been through a catastrophic, global pandemic before. The question is, what lessons can be learned from a plague that coursed through the continent more than 100 years ago?

## It Began With World War I

The tendrils of the world's "Great War" had spread out from Europe to involve nations across oceans and continents since it began in 1914. By the spring of 1918, the conflict was in its final stages. Even so, troop movements in and out of countries and continents continued on a huge scale by ship and by rail. Scholars and experts agree that the troop movements gave rise to the influenza pandemic's deadly global reach.

"World War I played a significant role in transmitting the virus rapidly and globally," according to the May 2020 Africa Center for Strategic Studies (ACSS) paper, "Lessons from the 1918-1919 Spanish Flu Pandemic in Africa." "Ships transporting some of the 150,000 African troops and 1.4 million laborers providing logistics support to the war in Europe brought the Spanish flu to the seaports of Freetown, Cape Town, and Mombasa."

The Sierra Leonean, South African and Kenyan ports still are major regional economic drivers today. Their importance a century ago to a continent under colonial control cannot be overstated. Each was part of a vast and far-reaching colonial infrastructure that made ingress and egress to the continent's interior simple. Ships went to those ports tightly packed with men fresh from the infectious soil of Europe. Upon disembarking, most boarded train cars to travel deeper into the heart of Sub-Saharan Africa.

With their every breath, cough, handshake and embrace, they unleashed the potential for death.

It's easy to underestimate the power of influenza. Its seasonal resurrection and spread often present newly mutated strains that can bedevil even those who have fought off flu multiple times. Vaccines are available, but none is foolproof. Influenza can cause mild to severe symptoms, from fever and malaise to debilitating pneumonia and respiratory distress. It sickens 3 million to 5 million globally each year, killing between 290,000 and

650,000 through respiratory symptoms, according to the World Health Organization.

There was something different, though, about the 1918 flu.

## An African Killing Ground

The Spanish flu's worldwide death toll has not been matched in the years since, and it was especially lethal in Africa.

Spanish flu infected half a billion people and killed between 20 million and 50 million. With a global population then thought to be about 1.8 billion, that marks a potential worldwide infection rate of up to 28% and a death rate of up to 2.8%. Some estimates put the global death toll at 100 million people.

Africa bore the brunt. "Nearly 2 percent of Africa's population is estimated to have died within 6 months — 2.5 million out of an estimated 130 million," the ACSS paper said. "The Spanish flu tore through communities, in some cases infecting up to 90 percent of the population and generating mortality rates of 15 percent."

South Africa was one of the five-worst-hit nations on Earth, the ACSS stated. The flu also killed 4% of Freetown, Sierra Leone's, population in three weeks. Across the continent, up to 6% of Kenya's population perished within nine months.

Spanish flu was known for being a disease of the young. At its worst, it quickly overwhelmed the infected, causing their bodies to unleash fierce immune reactions that caused quick deaths. Historical anecdotes tell of people who went to bed well, woke up sick and were dead by nightfall.

COVID-19, in contrast, appears to be more dangerous for older people and those with underlying medical conditions. This is notable for a continent in which the median age is just under 20 years old.



## Facts About Spanish Flu

Spanish flu's name is a misnomer. After emerging in Spain, which was neutral in the war and thus not subject to wartime censorship, newspapers freely reported the flu's effects there, including the serious illness of King Alfonso XIII. This led to the impression that Spain had been disproportionately affected by the virus, giving rise to the name "Spanish flu."

Cases of the H1N1 strain of flu virus first were observed in the United States in early 1918 in Haskell County, Kansas, and spread to Camp Funston, a U.S. Army training camp in Kansas. Cases later were

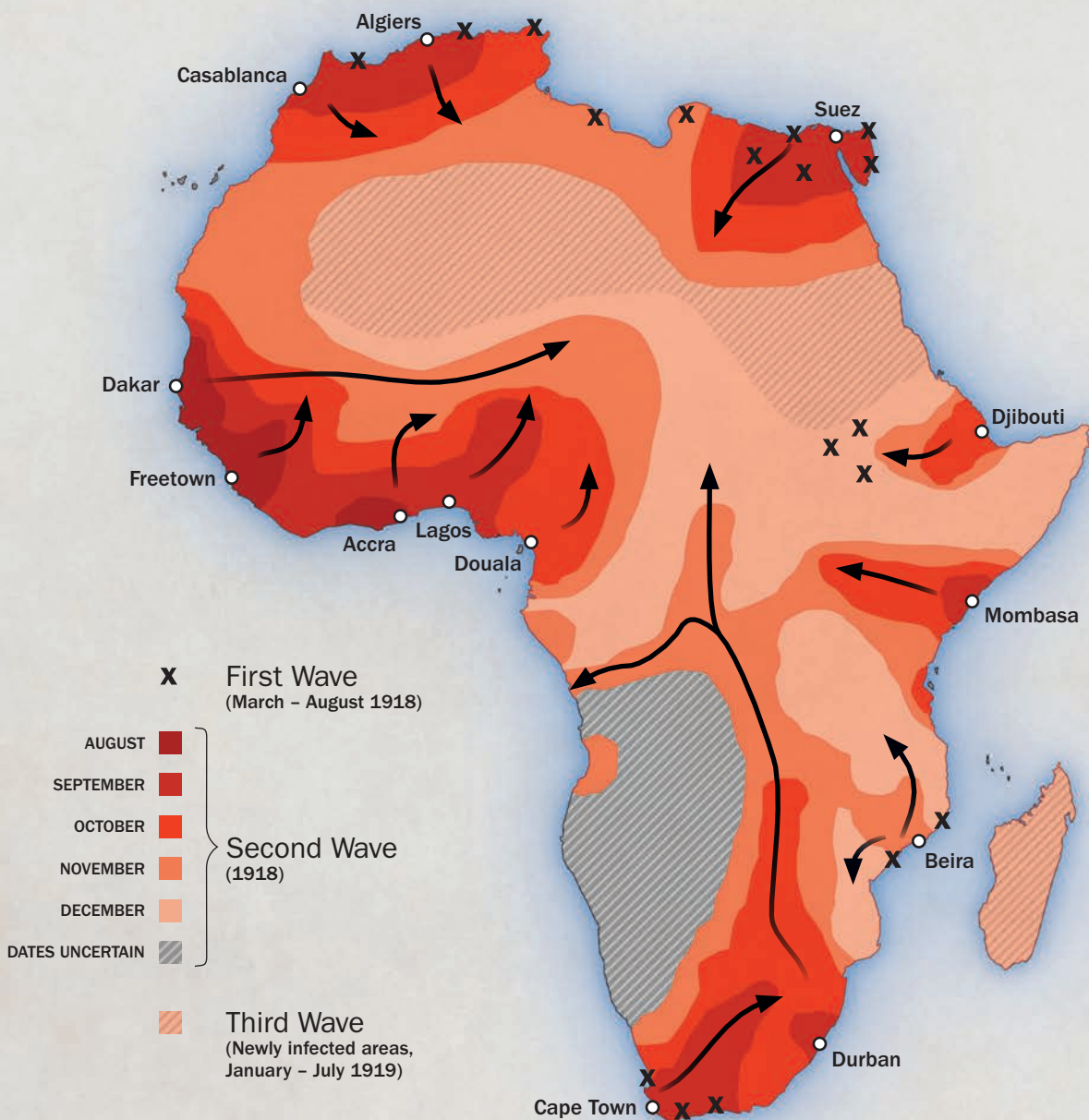
reported in France, Germany and the United Kingdom. It's still not completely clear where the pathogen originated.

The virus spread in Europe among the larger military population, which then brought it to other continents and countries in the waning months of the war.

Global death rates were staggering. The pandemic killed about 5% of India's population and about 8% of Iran's population. The U.S. saw a 30% increase in its death rate for 1918, which decreased life expectancy by about a dozen years.

Sources: Royal Central, Smithsonian magazine and YaleGlobal Online

## The Spread of the Spanish Flu in Africa



Africa Center for Strategic Studies



A hospital train in Allery, France, unloads influenza patients during World War I. The deadly flu spread through Africa once Soldiers returned by ship and boarded trains for the continent's interior.

NATIONAL MUSEUM OF HEALTH AND MEDICINE

## The Flu Came In Waves

The Spanish flu came in three distinct waves. The first hit Africa in the spring of 1918 and lasted through most of the summer. This wave largely spared Sub-Saharan Africa, but it did lead to cases in North Africa, Ethiopia, and parts of East Africa and South Africa.

Then something happened.

As the virus roiled Europe during the waning months of the war, mutations transformed the strain into a deadlier pathogen.

"In late August 1918, military ships departed the English port city of Plymouth carrying troops unknowingly infected with this new, far deadlier strain of Spanish flu," said an article by Dave Roos on History.com. "As these ships arrived in cities like Brest in France, Boston in the United States and Freetown in west Africa, the second wave of the global pandemic began."

It was this second wave that devastated African populations. Because the initial wave did not penetrate the continent's interior, vast Sub-Saharan populations were left without a whit of immunity to the coming onslaught. It was at this time that the three seaports played host to war returnees, and with them, the deadly flu.

A British Royal Navy warship carrying 124 sick crewmen docked in Freetown on August 14, 1918, without a proper quarantine, wrote South African historian Howard Phillips for 1914-1918-online: International Encyclopedia of the First World War. Men traipsed aboard with new loads of coal, and doctors and medics from other ships boarded to assist with those in the sick bay. Within two weeks, Phillips wrote, 70% of Freetown's population had fallen ill.

Freetown's infection spread south when two ships carrying South African Native Labour Corps troops home from Europe stopped at the West African port for coal.

Soon after the ships left, sickness spread onboard. Cape Town authorities hospitalized the sick and sent the other Soldiers to camp for two days, where they were loosely quarantined, Phillips wrote.

"When none showed symptoms of influenza, they were formally demobilized and allowed to embark on trains for their homes all over the country," Phillips wrote.

"The next day, cases of 'Spanish' influenza appeared among the staff of the military camp and the transport unit that had conveyed the troops there, among the hospital staff, and among stevedores and fishermen working in the harbor."

An Indian ship at the third major port, in Mombasa, is thought to have brought the second wave of flu into East Africa.

Soon, demobilized Soldiers, porters, colliers, railway workers, migrants toiling at mines and others began to disperse in hopes of escaping infected workplaces and villages — what Phillips called "the ubiquity of flu-infected men on the move."

"Thus did the influenza virus spread, to a greater or lesser extent, throughout sub-Saharan Africa in the last quarter of 1918," Phillips wrote. "From these three ports — which had become veritable nodes of infection for the

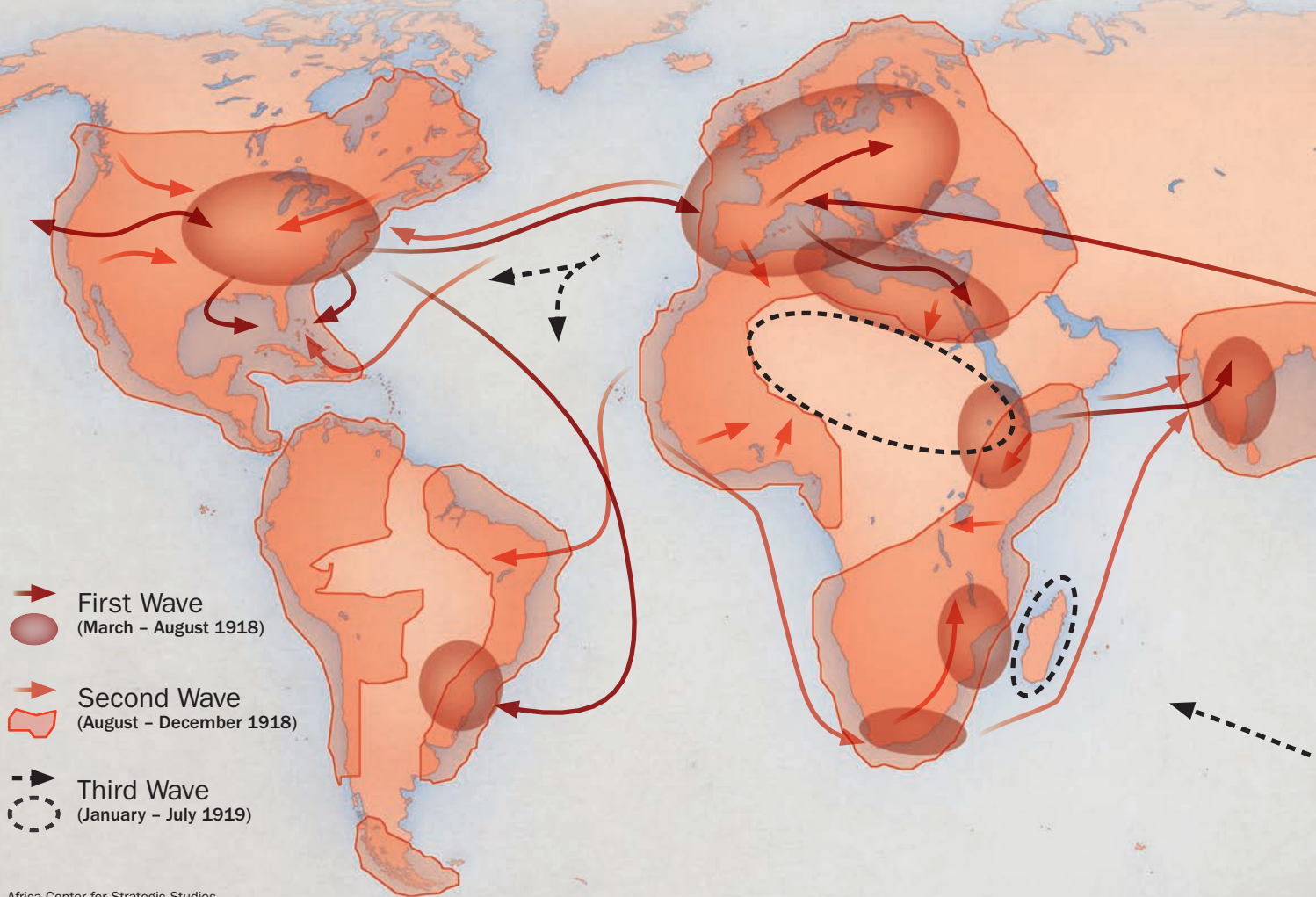
Stickers on a South African bus in Pretoria ensure social distancing on public transport. Ship and rail transport of returning World War I Soldiers spread the 1918 Spanish flu across the continent.

AFP/GETTY IMAGES





## Global Trajectories of the Spanish Flu



continent — the pandemic spread along the coast and far inland, engulfing community after community.”

Just as the deadly second wave began to abate in December, a more moderate third wave arrived. It persisted into the summer of 1919.

However, Mari Webel and Megan Culler Freeman of the University of Pittsburgh caution against ascribing wave-like resurgences to the current COVID-19 pandemic. In an article republished by Smithsonian.com, the two researchers said that differences rooted in the biology of the two viruses make COVID-19 less likely to adhere to influenza’s wave behavior.

Simply put, coronaviruses tend to replicate more efficiently than influenza viruses, decreasing the number of mutations that can lead to seasonal changes. It is precisely because flus do mutate more easily and frequently that people are advised to get flu vaccinations each year.

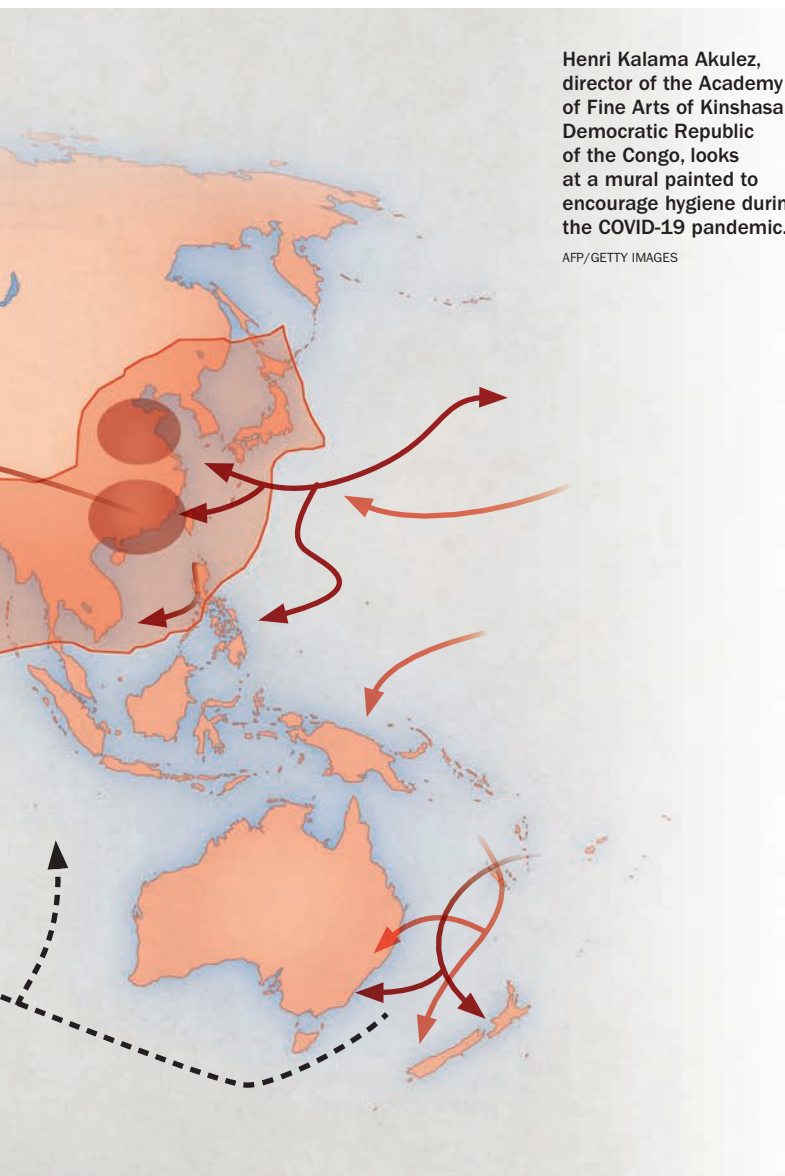
Influenza also tends to arise most often in colder weather, corresponding to winter. COVID-19 already has spread effectively in warm, temperate and colder climates.

“All this means that oscillations in COVID-19 cases are unlikely to come with the predictability that discussions of influenza ‘waves’ in 1918-19 might suggest,” Webel and Freeman wrote. “Rather, as SARS-CoV-2 continues to circulate in nonimmune populations globally, physical distancing and mask-wearing will keep its spread in check and, ideally, keep infection and death rates steady.”

### Modern Lessons From the 1918 Flu

Although the two viruses are biologically distinct, influenza and COVID-19 are similar enough that the same mitigation precautions are effective for both. The ACSS highlights some areas that will require special attention as the COVID-19 fight continues.

**Promote social distancing and sanitation:** Fever, malaise, cough, headache, sore throat and respiratory difficulty all are shared between the two viruses. For that reason alone, people would be well-advised to maintain good personal hygiene with frequent hand-washing, social distancing and mask-wearing, and



Henri Kalama Akulez, director of the Academy of Fine Arts of Kinshasa, Democratic Republic of the Congo, looks at a mural painted to encourage hygiene during the COVID-19 pandemic.

AFP/GETTY IMAGES



**“As SARS-CoV-2 continues to circulate in nonimmune populations globally, physical distancing and mask-wearing will keep its spread in check and, ideally, keep infection and death rates steady.”**

*~ Mari Webel and Megan Culler Freeman,  
University of Pittsburgh*

isolate when feeling sick.

During the 1918 pandemic, closings and bans on large gatherings helped slow the flu’s spread. Zanzibar, an archipelago that is now part of Tanzania, and Nyasaland, a former British protectorate now known as Malawi, were known for quarantines and contact tracing. “The efforts of these two governments were heralded as some of the most comprehensive on the continent,” according to the ACSS paper.

**Monitor food security:** Multiple reports show that food prices have skyrocketed across Africa during the current pandemic. A September 2020 report in *The Guardian* noted that staple food prices had jumped 50% in Sudan due to COVID-19 and other factors. Lockdowns, distancing, weather and existing conflicts all have led to food insecurity. The Famine Early Warning Systems Network shows that some of the most intractable problems are in South Sudan.

Leaders will have to monitor food chains and incentivize farmers while guaranteeing their access to

transportation, storage and food processing. Households will need enough money to shop in local markets.

**Build communication and trust:** When diseases are spreading, whether they be Ebola or COVID-19, authorities must work to build trust within communities to gain access to treat, vaccinate and educate populations about public health. The West African and Congolese Ebola outbreaks underscored the importance of this, and it will be vital going forward as the COVID-19 pandemic continues and new vaccines are used.

Authorities in 1918 used radio and telegraphs effectively to inform medical authorities about incoming ships carrying Spanish flu as well as villagers about medical treatment opportunities.

**Protect health professionals:** Many parts of Africa already have few doctors and nurses to cover large populations. As COVID-19 spreads, facilities and the professionals who staff them must be protected. Some countries such as Kenya, Lesotho, Malawi and Sudan are mobilizing military and security forces to support and protect health professionals. This is one of the most important things that security forces can do during a disease outbreak.

No one can reliably predict when the COVID-19 pandemic will pass, but dealing with it effectively — however long it may last — will require vigilance, cooperation and a commitment to transparency, security and good governance. □



# A Slithering Health Threat

SNAKEBITES MAIM AND KILL THOUSANDS EACH YEAR; TREATING VICTIMS CAN BE COSTLY AND DIFFICULT

ADF STAFF

**H**eads of state are accustomed to welcoming visitors. They entertain foreign officials with frequency, rolling out red carpets and assembling military honor guards adorned in their finest uniforms.

But not all visitors come with an official entourage, much less an invitation. In fact, a couple of unannounced visitors to Liberian President George Weah in 2019 caused quite a stir.

Two black snakes infiltrated Liberia's Ministry of Foreign Affairs building through a grate above and behind the security desk on the ground floor. A video shows one snake, of unknown species, twist and writhe where the ceiling met the wall while a gaggle of onlookers chatted excitedly. Liberia's president has worked in the ministry building since fire destroyed the Executive Mansion in 2006.

Press secretary Smith Toby said at the time that all employees were ordered to stay away for a few days so that the building could be fumigated to get rid of the snakes.

"That building's been there for years now, and [because of] the drainage system, the possibility of having things like snakes crawling in that building was high," Toby told the BBC.

The sight of any snake in a government building had to be scary and unsettling, but no one was hurt and the president safely returned to his office. But for many across the continent, encounters with snakes can have deadly consequences.

## A Hidden Health Problem

Pwagrida Samson, 19, was the first patient of the day at Snakebite Treatment and Research Hospital, Kaltungo, in eastern Nigeria one morning in August 2020. Samson was bitten on the left foot by a carpet viper, a small, venomous snake common to the area.

"I was in the field and walking to go to the toilet, and I stepped on a snake and was bitten," Samson told *PBS NewsHour* through an interpreter. "Now I'm having a lot of pain where the bite is."

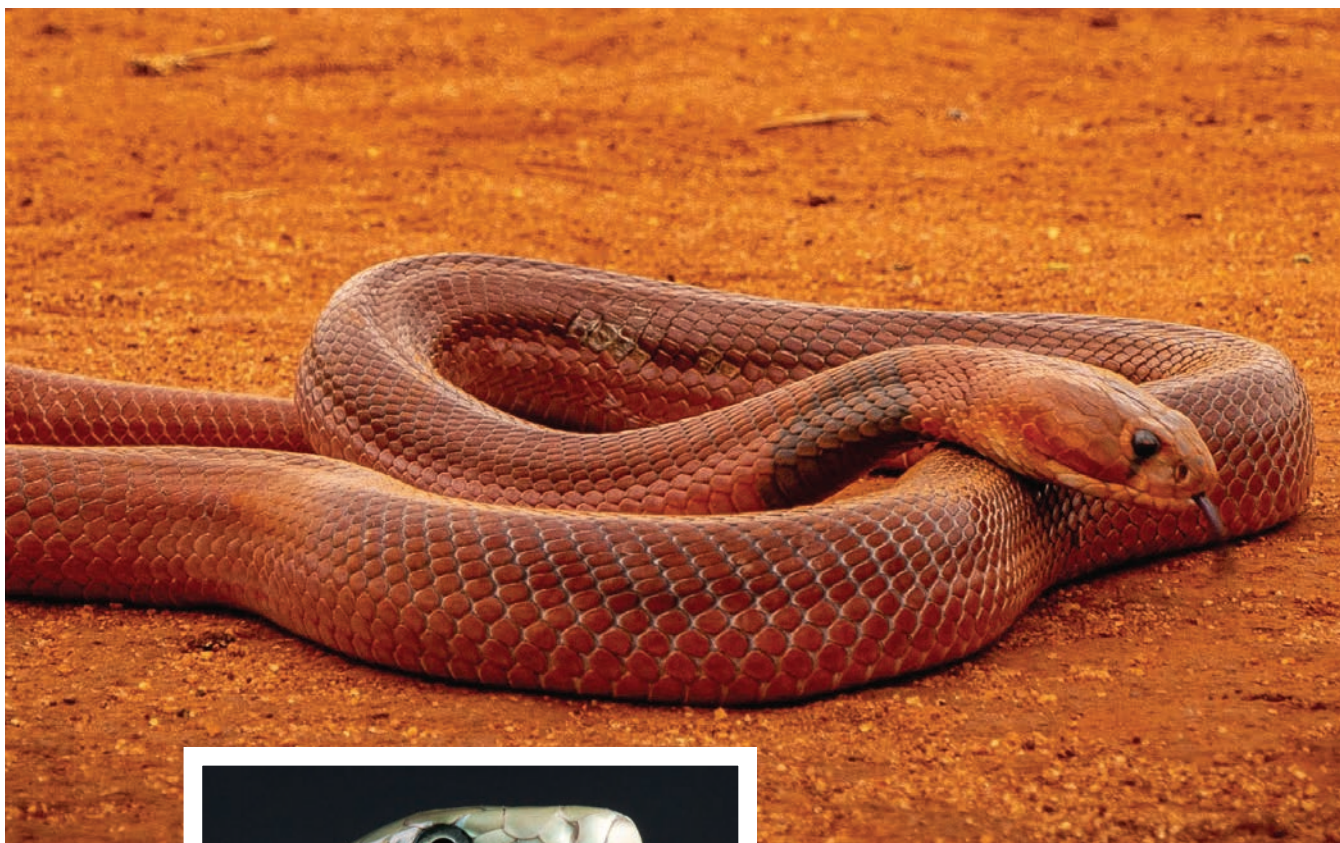






ADF ILLUSTRATION





This red spitting cobra, above, was used to train wildlife workers during LEAD Ranger's two-day snakebite first aid and removal course. LEAD RANGER

The black mamba's bite has been called "the kiss of death," and it is regarded as the most dangerous snake on the continent. It carries a powerful neurotoxic venom and occupies Sub-Saharan savannas, rocky slopes and woodlands. ISTOCK

The Kaltungo hospital treats snakebite victims exclusively, and Samson's case is common. A carpet viper's venom prevents coagulation, which can lead a person to bleed to death without treatment. Like many people in rural areas, Samson started out treating his bite at home using traditional methods, which only delay effective treatment at the risk of severe illness and death. When the bleeding continued, he traveled more than 160 kilometers to reach the hospital. Kaltungo is the only hospital of its kind in Sub-Saharan Africa, and it sees a lot of patients. As PBS filmed, three snakebite victims arrived within 30 minutes' time.

The hospital doesn't always have the antivenom it needs because of government funding shortages, PBS reported. Sometimes,

patients have to buy their own antivenom from a nearby pharmacy.

Samson's experience is repeated all over the continent year in and year out. The problem is so pervasive that the World Health Organization (WHO) in June 2017 reinstated envenoming — poisoning from snakebites — to its list of neglected tropical diseases alongside chikungunya, dengue fever, leprosy and rabies, among others. The move is significant because it "adds impetus to antivenom development and boosts the likelihood of investor funding for snake-bite prevention and treatment access initiatives," the WHO stated.

There are more than 3,000 species of snakes in the world, and about 20% are venomous. However, only about 7% are considered "medically important" because of the harm their venom causes, according to the WHO.

Even so, Africa is home to hundreds of species of snakes, and a significant number are venomous,

including some of the most dangerous snakes on the planet. For example, the black mamba is perhaps Africa's most fearsome snake. It averages 2.5 meters long but can grow to more than 4 meters. It can move at more than 20 kilometers per hour and is highly aggressive when threatened or cornered. The snake's skin is brownish gray, but it gets its name from the pitch-black maw that is visible when it opens its jaws to strike.

The black mamba's neurotoxic venom shuts down its prey's nervous system through paralysis. Two drops are sufficient to kill an adult human, and without antivenom, death can come in a few short hours.

The black mamba is but one of Africa's dangerous venomous snakes. The deadly roster includes the boomslang, the puff adder, the green mamba, the Gaboon viper and the Cape cobra — just one of several species of cobras on the continent.

With such an array of dangerous snakes spread across the continent, snakebites are a serious health concern for Africans. The WHO estimates that globally 5 million people are bitten by snakes each year, resulting in 2.7 million envenomings. Of those, between 81,000 and 138,000 die each year. Another 400,000 people require amputations or are permanently disabled. Many other snakebites go unreported.

The numbers are equally sobering for Africa. The WHO estimates that up to 20,000 people a year die from snakebites in Sub-Saharan Africa alone, a number that is almost certain to be underreported. Even with the most conservative estimates, snakebites kill far more people in one year than the deadly Ebola virus has killed in Africa since the 2014 West African pandemic.

Most snakes, be they venomous or harmless, desire to avoid contact with people. They will flee rather than attack, unless stepped on, mishandled or when defending themselves from a person trying to kill them as pests.

Naturally, most people encounter snakes in rural settings or in remote forests and jungles. This makes effective care for snakebite victims all the more complicated, because after a bite from a venomous snake, time is of the essence. Victims must seek immediate professional medical care — not traditional healers — so that appropriate antivenom treatments can begin. Such treatment is the only hope for those bitten by the black mamba and the other most venomous snakes.

### The Antivenom Challenge

Antivenom, also known as antivenin, is the most effective way to treat those bitten by venomous snakes. Often it is the only treatment that can

stave off death. However, production and availability of antivenom can be a challenge, especially for poorer nations with limited health infrastructure. It's also expensive.

To produce antivenom, a snake specialist must "milk" venom from a snake. This requires the precarious handling of the deadly serpent while forcing it to open its mouth and bite through a plastic membrane that covers a glass. The handler gently presses the back of the head to force the venom to drip into the glass. The painstaking milking of one snake produces a



Johan Marais, CEO of the African Snakebite Institute, shows venom extracted from a puff adder through "milking." Each milking produces a small amount of venom, but multiple processed vials are required for effective snakebite treatment. LEAD RANGER

small amount of the toxin. For example, it took three years and 69,000 milkings to produce 1 pint of venom for one species of North American snake, according to ZME Science. But anyone bitten by a deadly snake will require multiple vials of antivenom that match the snake and its geographic region.

Once venom is extracted, it is subjected to a process that is more than 100 years old. The venom is freeze dried at temperatures below 20 degrees Celsius and labeled with the snake's species and geographic origination. From there, the venom is diluted and injected into animals — most often horses — and extracted in blood weeks later after antibodies have formed and bonded to the venom.

Plasma is extracted from the blood and treated to isolate active agents. Then samples are converted to powder or liquid concentrates, frozen, and shipped to hospitals and treatment centers, according to ZME Science.

Despite this process, Johan Marais, CEO of the African Snakebite Institute (ASI) in South Africa, said scarcity isn't really the biggest problem with antivenom. "The problem is the cost



# Countries With No Local Antivenom Production



Although venomous snakes are found all over the African continent, most nations have no local antivenom production capability. Antivenom typically is the only effective means of staving off serious injury and death.

WORLD HEALTH ORGANIZATION

of antivenom as well as refrigerated facilities to store it and the expertise to use it," he told *ADF* via email. "Doctors need training to properly administer antivenom."

Marais said one vial of antivenom can cost up to 1,736 South African rand, which is roughly \$105. That means treatment for one bite can require between \$630 and \$1,575 just for antivenom. The ASI does not produce antivenom, but it does promote and market serums produced by the South African Vaccine Producers (SAVP), a subsidiary of the nation's National Health Laboratories Service. SAVP is the only producer of antivenom in South Africa.

Some estimates place the number of vials necessary to treat bites — and the costs of those vials — at much higher numbers, with some bites requiring 20 to 25 vials at rates of up to \$2,200 each, ZME Science reported.

The Australia-based Global Snakebite Initiative has developed a program called AntivenomAID, which aims to develop "safe,

effective and affordable antivenoms." The project will use a private-sector partnership in which scientists, clinicians and manufacturers develop an antivenom effective against most "medically important" Sub-Saharan African snakes, thus improving the quality of life among the rural poor and in farming communities.

AntivenomAID seeks to establish benchmarks for antivenoms and protect the market against the presence of ineffective, substandard products.

These challenges surrounding antivenom's production, distribution and quality control are why education and good, common sense are so important in combating the snakebite problem.

## Education Is Key

Marais' group focuses on education and snake awareness. The ASI website is full of free downloadable posters and tips for identifying snakes, avoiding bites and treating snakebite victims. Marais and his staff train others in snake awareness, first aid and proper handling of venomous snakes. ASI has trained doctors, private wildlife rangers, veterinarians, wind and solar farm companies, and security staffers for mining and construction companies who work all over the continent, from Guinea to Kenya and Angola to Mozambique.

Among Marais' clients is LEAD Ranger, a Kenya-based not-for-profit training provider that focuses on scouts and rangers employed by nongovernmental organizations and private entities, such as Wildlife Works, Mara Elephant Project and others, said Boris Vos, head of operations for LEAD Ranger.

Snakebite First Aid is a module in the organization's Ranger Life Saver Instruction Course, Vos told *ADF* by email. "We address preventive measures for snakebites, in regards to field camps and rural communities, snake recognition and immediate treatment in case of snakebites. The underlying principle in regards to treatment is that the primary role of a ranger is to avoid further bites, stabilize the patient and evacuate to definitive medical care at the earliest opportunity."

Because rangers operate in remote areas, they often are the first point of contact if a snake bites someone, so training them to handle bites properly is essential.

A significant part of the instruction addresses anatomy, physiology and snakebite pathology. "We find this is crucial in explaining why traditional methods, also in regards to so-called witchcraft, are not effective," Vos said. "There is an incredible amount of misinformation and misconception about snakes and snakebites, especially in rural areas. To counter that, the rangers need to be equipped with the underlying knowledge."



The puff adder is so widespread that it is responsible for the most fatalities on the continent. It lives everywhere except for the Sahara region, and its cytotoxic venom destroys tissue at the cellular level. ISTOCK

Some national military forces on the continent also incorporate instruction on snakebite avoidance and treatment into Soldiers' training.

### **Snakebites and Soldiers**

African Soldiers train and serve in some of the most challenging environments on Earth, whether it be the deserts of northern Mali or the dense jungles of the Democratic Republic of the Congo. This service, which includes national training, international peacekeeping missions and more, inevitably will bring Soldiers into contact with all manner of wildlife, including snakes.

The Malawian Defence Force's (MDF's) basic military training contains a range of first aid instruction that includes information on snakes

and snakebites. "All types of poisonous snakes, biting habits, habitat, poison reaction and remedies or mitigating measures are taught," Capt. Wilned Kalizgamangwere Chawinga of the MDF Public Information Office, told *ADF* by email.

"When embarking on a military exercise in any jungle, instructors conduct safety briefs to all Soldiers involved," Chawinga said. "Medics that carry antivenom on top of other medicines go along with each section or platoon assigned to a specific operation."

This process also is followed when MDF Soldiers participate in peacekeeping missions, and a supply of antivenom is stored at the battalion level one hospital, Chawinga said. Even so, Soldiers rarely are bitten.

"The secret lies on knowing never to disturb their habitats," Chawinga said. "Once in the jungle, and after noticing that you are within the territory of very dangerous wild animals or snakes, the best action is to relocate to other areas." □





# COVID-19

*Changes Face of Crime*





## *As the Global Pandemic Spreads, Criminals Adapt to the Shifting Landscape*

ADF STAFF

**T**he Mitchells Plain neighborhood sits along the outskirts of Cape Town, South Africa, in a section called Cape Flats.

It is a part of the city known for its notorious street gangs, who violently clash with each other and terrorize the residents. The gangs sport flashy and colorful names such as the Hustlers, Rude Boys, Ghetto Kids and Spoilt Brats. The language of graffiti marks walls, shacks and homes.

The gangs' dealings in drugs, weapons and the shellfish abalone led to deadly turf wars. In 2018, Cape Town saw more than 2,800 murders, a rate of about 66 slayings per 100,000 people, *The New York Times* reported in 2019.

Gang violence was so bad that in July 2019, President Cyril Ramaphosa called in Soldiers from Cape Town-based 9 SA Infantry Battalion to help police halt the bloodshed in Cape Flats neighborhoods, defenceWeb reported. After two months, Ramaphosa ordered a second deployment of 1,322 Soldiers as part of Operation Lockdown, which was extended through March 2020, just as the COVID-19 pandemic was spreading in Africa.

The military presence sought to bring calm to the townships in Cape Town, the *Times* reported, while helping schools and other public services to resume operations safely.

As the pandemic spread the new coronavirus across South Africa, life began to change in the townships — and with it, the behavior of its gang members.

### *COVID-19 changes crime*

There are many types of organized crime in Africa: drug and human trafficking, weapons smuggling, extortion and petty rackets of all sizes. Many of

those unlawful enterprises were stifled due to changes and restrictions arising out of lockdowns and travel patterns associated with COVID-19. But authorities are already seeing criminals adapt to the new normal.

“The locking down of public movement and the sealing of borders have had an immediate impact on some criminal activities, which have slowed or stopped,” according to the March 2020 report “Crime and Contagion: The impact of a pandemic on organized crime” published by the Global Initiative Against Transnational Organized Crime. “But, equally, reports are already emerging of criminal groups who have exploited confusion and uncertainty to take advantage of new demand for illicit goods and services. Criminal opportunism will emerge further as the crisis unfolds.”



A South African Soldier stands guard as suspects lay on the ground after being searched for drugs and weapons during a joint police operation in Cape Town. AFP/GETTY IMAGES





The COVID-19 pandemic has changed the way gold is smuggled out of the Democratic Republic of the Congo. Smugglers now favor trucks over planes. AFP/GETTY IMAGES

## ***As criminals have changed tactics, law enforcement and security forces have had to adapt with them.***

The Global Initiative paper argues that the pandemic is likely to affect organized crime in four major ways:

- Social distancing, travel restrictions and other constraints have limited criminals' ability to engage in certain acts. They can be expected to adjust to these constraints.
- The pandemic has redirected the attention of law enforcement and politicians, which could allow criminals to increase or redirect their activity.
- With the ever-increasing need for personal protective equipment (PPE) and other medical items, criminal organizations already at work in the health sector have new chances to exploit their positions.
- Cyber crime is emerging as a domain for long-term criminal growth as other avenues for lawlessness have constricted or closed.

As criminals have changed tactics, law enforcement and security forces have had to adapt with

them. Below are some examples of how each of these four categories have manifested themselves on the continent.

### ***Criminals adjust to changes***

In the Manenberg township of Cape Town — a city known for its proliferation of organized crime — 10 large gangs and about 40 small ones operate in the violent enclave, according to the Global Initiative's website.

Two weeks after a nationwide lockdown, the gangs made temporary peace with one another and began handing out food packages to residents. But Global Initiative's interviews with Manenberg residents and others indicated that gangsters sometimes embedded drugs and weapons in the food parcels. When the food wasn't used as cover for contraband, it became a type of currency that gangsters used for support and to build indebtedness for recruitment.

"The very gangsters who now support NGOs [nongovernmental organizations] and religious bodies during the lockdown by distributing food

parcels are the same gangsters who will hound those NGOs and religious leaders for a reference letter and to testify on their behalf when they [the gangsters] get on the wrong side of the law,” a senior police official in Cape Town told the Global Initiative.

Residents said they fear gang members will keep a tab on who they help and one day exact a return on their investment. “Today, they will give me a food parcel in front of my son, but a few months later they will remind him of the food parcel and tell him to deliver ‘goods’ for them,” a Manenberg resident said in April 2020. “This is going to come back to us.”

### **The focus of law enforcement**

Vanda Felbab-Brown, a senior fellow with the Brookings Institution and an expert on security threats, wrote that the pandemic and related restrictions are likely to change the way law enforcement assets are used.

That probably will manifest itself in a transfer of law enforcement from rural areas to more urban settings, where populations are denser. This shift can leave rural communities “vulnerable to crimes of opportunity and crimes of desperation,” she wrote.

In Africa, this has led to an increase in poaching for personal subsistence and for international trafficking.

Conservation experts and park rangers told the BBC in a May 2020 report that the closing of the safari tourism industry has left thousands unemployed and many turning to poaching animals such as antelope for food.

“Since this pandemic of COVID-19, the threat has gone high in terms of people wanting to do poaching,” said John Tanui of the Lewa Wildlife Conservancy, a 250-square-kilometer park in Kenya where 100 scouts and rangers patrol. “Once these guys either they don’t have a job, they want an income, they may want to try other things like maybe poaching a rhino, poaching an elephant, and sell those trophies for their living.”

Charlie Mayhew, chief executive of Tusk, an organization that supports conservation in Africa, agrees. “This is definitely the biggest threat that we’ve seen to the conservation world. We are already beginning to see significant redundancies, job losses, across the whole of the tourism and conservation sector right across Africa,” Mayhew told the BBC. “So the big concern for us really is that this may drive an upsurge in poaching for bushmeat and snaring — hunting just to put food on the table.”

Some who are out of work may turn to selling wildlife parts on the illegal market. Global Conservation Force says many anti-poaching units are funded by money raised through safari lodging revenue. With tourism halted, the rangers often do not have the money to patrol game



A worker in Nairobi makes personal protective equipment. Counterfeit masks and other equipment have become a big criminal enterprise during the COVID-19 pandemic. REUTERS

preserves. This gives free rein to poachers who traffic in rhino horn and ivory.

Other trafficking flows also are changing because of the pandemic. Ian Ralby, CEO of I.R. Consilium and a maritime expert, told *ADF* that gold coming out of the Democratic Republic of the Congo is moving by trucks instead of planes because of flight reductions. “The maritime space is absorbing some of what criminal goods would have flown before,” he added, saying that authorities should give shipping more scrutiny.

## **Operation PANGAEA XIII**

**An Interpol-led effort in March 2020 to seize counterfeit medicine and medical equipment**



**Seizures:** 4.4 million units



**Value:** \$14 million



**Arrests:** 121



**Websites taken offline:**  
More than 2,500

### **PARTICIPATING AFRICAN NATIONS**

Botswana, Eswatini, Ghana, Mozambique, Niger, Senegal, Seychelles, South Africa and Zambia

Source: Interpol, <https://www.interpol.int/en/Crimes/Illicit-goods/Pharmaceutical-crime-operations>





A man watches from his Cape Town home as South African Soldiers support police in gang-ridden neighborhoods. AFP/GETTY IMAGES

### *Medical needs present opportunities*

As COVID-19 spread globally, so did the need for medical PPE, which includes face masks, face screens, gowns, sanitizers and medicines. Ralby told *ADF* that he has seen counterfeit PPE emerge as a criminal trend, with networks setting up to produce and distribute the items at exorbitant prices.

Criminals indeed wasted no time. Soon after COVID-19 began to spread across the globe, Interpol announced the results from Operation Pangea XIII, which ran March 3-10, 2020. The crackdown resulted in 121 arrests worldwide as police, customs and health regulators from 90 nations, including nine African nations, seized counterfeit face masks, bad hand sanitizers and unauthorized antiviral drugs, among other things.

In that one week, authorities inspected more than 326,000 packages and seized more than 48,000 of them, Interpol said. Pangea found 2,000 web links advertising COVID-19-related items. Authorities seized more than 34,000 bad masks, items such as “corona spray,” and other packages and medicines. Inspectors also seized unauthorized doses of chloroquine, an antimalarial medication once touted as a treatment for COVID-19.

“Once again, Operation Pangea shows that criminals will stop at nothing to make a profit,” said Jürgen Stock, Interpol’s secretary general.

“The illicit trade in such counterfeit medical items during a public health crisis shows their total disregard for people’s well-being or their lives.”

Interpol reported that the operation shut down more than 2,500 websites, social media pages, online marketplaces and advertisements for illicit pharmaceuticals, and more were expected to be shuttered. The operation disrupted 37 organized crime groups.

### *Pandemic widens cyber crime arena*

One of the social byproducts of COVID-19 is the proliferation of local and nationwide lockdowns and the call for social distancing. As a result, many businesses have closed or significantly altered their modes of commerce.

As fewer people congregate in public places, opportunities for street-level crime are likely to decrease in many places, wrote Felbab-Brown for the Brookings Institution. This can reduce crimes such as muggings because no one is on the streets, and burglaries may decrease because more people are at home.

However, with more people sheltering at home, the opportunity for internet-based crime increases. Homebound people are more likely to shop and conduct other activity online. In Africa, many people already conduct banking and money transfers using mobile phones.

# HOW ‘PHISHING’ SCAMS WORK



Criminals send “phishing” emails to trick people into sharing personal information on fake websites that closely resemble those of legitimate financial institutions. Email links direct recipients to the fake site, which will ask them to input sensitive information to “verify” or “update” financial information.

## TIPS

- Do not click on anything in unsolicited emails.
- Immediately delete such emails; never reply.
- Do not automatically believe unsolicited emails.
- Type a bank’s URL (web address) into the internet browser to access its web page.
- Ensure that a site is authentic before entering personal information.
- Contact your bank immediately if you think your device has been compromised.
- Use complex passwords and change them often.

The South African Banking Risk Information Centre (SABRIC), a nonprofit formed by major banks to help combat organized crime, indicated in March 2020 that criminals are exploiting the pandemic, according to a report at ITWeb, a South African business technology website.

Criminals use bogus emails and text messages to fraudulently offer PPE, vaccines or other medical products by directing people to “phishing” websites. The emails often appear legitimate by using logos of reputable companies. Some phishing links seek to steal private bank information.

“Although some spoofed e-mails can be difficult to identify, we urge bank clients to think twice before clicking on any link, even if an email looks legitimate,” SABRIC acting CEO Susan Potgieter told ITWeb. “Any suspicious e-mails should not be opened and are best deleted.”

## Opportunities to collaborate

Ralby told *ADF* that maritime authorities are seeing changes in the way criminals operate at sea. Oil prices, already trending low in the past few years, have been further degraded by falling demand as nations shut down and curtail travel worldwide. Because of this, oil theft — once pervasive in the Gulf of Guinea — has given way to the Somali style of piracy in West Africa that involves kidnapping for ransom.

Finding ways for maritime officials to continue cooperating, especially by harnessing low-cost technology, will be key moving forward, Ralby said. In the recent past, African authorities have spent hundreds of thousands of dollars to gather at large, regional meetings to discuss how they might better cooperate. Such efforts involve hotels, plane flights and venue expenses. In fact, officials from



A Nigerian medical worker helps a colleague put on protective equipment before community COVID-19 testing. REUTERS

many policy and security arenas do the same.

Now the same officials can log onto Zoom or another online meeting platform and hold a meeting any time with no expenditures whatsoever. Those meetings can span oceans and continents, thus linking regions with shared interests in fighting global trafficking and other crimes.

Ralby said that in 2020 Gulf of Guinea officials conducted a number of webinars focused on maritime security during the COVID-19 pandemic.

“And importantly, it’s not external parties that are organizing these meetings,” he said. “It is African states, African NGOs, African governments getting themselves together to say, ‘Look, we’ve got a shared interest in this.’ That’s exciting.” □





A medical worker puts on protective equipment before entering an Ebola treatment center in Beni, Democratic Republic of the Congo.

# DRC Fights COVID-19 With Experience

Health care workers are applying techniques used in the treatment of previous viruses to deal with the current pandemic

ADF STAFF | PHOTOS BY AFP/GETTY IMAGES

**E**arly in the 2018 Ebola epidemic in the eastern Democratic Republic of the Congo (DRC), contact tracers used paper forms, filling them out each day for every contact made. At the end of the day, tracers turned in the paperwork to their supervisors, who alerted doctors if any of the contacts showed signs of Ebola. The process was slow, tedious and bureaucratic.

The World Health Organization (WHO) noted that paperwork also drew unnecessary and unwelcome attention to contact tracers. Sometimes, people chased them away.

Contact tracers later traded their papers for mobile phones. They gathered data discreetly and transmitted the information to supervisors from the field, using an application called Go.Data. Epidemiologists could access the data almost in real time and act quickly.

"It is particularly focused on case and contact data collection and management," said Armand Bejtullahu, project leader at WHO and one of the chief architects of the tool, the WHO reported on its website. "This allows the software to produce outputs, such as contact follow-up forms and dynamic visualization of chains of transmission."

The Global Outbreak Alert and Response Network reports that Go.Data now is being used all over the world to trace COVID-19 carriers.

The DRC has deep experience fighting disease. Before COVID-19 and Ebola, the DRC endured outbreaks of AIDS. It is generally believed that HIV, the virus that causes AIDS, originated in Kinshasa, in the



DRC, about 1920 when it crossed from chimpanzees into humans. In 1976, the first case of Ebola was discovered, also in the DRC.

COVID-19 originated under circumstances similar to the two other diseases, but in China instead of Africa.

Now researchers believe the response to HIV and Ebola can inform and help direct the response to COVID-19.

“As researchers who have long experience with HIV/AIDS prevention, vaccines, and therapies, some of whom also have experience with Ebola, we believe it is critical to build the response to the COVID-19 pandemic on lessons from the HIV pandemic and recent Ebola outbreaks,” wrote researchers for *The New England Journal of Medicine* in October 2020.

The researchers said the AIDS and Ebola epidemics proved that interventions must be based on “sound science.” COVID-19, they said, “presents an important opportunity for smart deployment of our hard-won knowledge.”

### NEW RESPONSE PROCEDURES

The 2014-2016 West African Ebola pandemic forced health care workers to change how they respond to disease outbreaks and other health crises. The WHO and other organizations have made these recommendations for applying those lessons to future outbreaks:

**Research has to be at the heart of a health emergency response.** The WHO Research and Development Blueprint was created in 2016 to trigger rapid activation of research and development during epidemics. Workers

Family members watch as a victim of Ebola is buried.

## Digital Changes Everything

ADF STAFF

The Ebola outbreaks solidified the value of using digital data and mobile phones as medical tools. Mobile electronic health records programs, sometimes called mHealth, offer something traditional record-keeping cannot: speed and flexibility.

In its research on the Ebola outbreaks, the Health Initiatives Foundation said that mHealth lets officials “quickly disseminate the latest information to front line health care workers.” The foundation added that increasing the speed of communication is “a general boon to any large public health response.”

In a 2015 study, the Brookings Institution noted that Ebola treatment units benefited from using digital rather than paper records, in part because paper records cannot be removed from a treatment unit. Deborah Theobald, co-founder of Vecna Technologies, which created the mHealth platform in Nigeria, pointed out, “If the patient is isolated, so is their paperwork.”

Brookings has noted that despite the benefits of mHealth, barriers in some countries will prevent the full positive impact of these technologies. Many developing nations lack the electrical infrastructure necessary to power mobile devices. And even after Ebola, many countries continue to have cumbersome health care regulations.

“It often takes an emergency situation like the Ebola crisis to make substantive changes,” the institute noted. “Success in the long term is only possible if leaders create an environment that is more hospitable to mHealth.”







Electrical engineer Victoire Muhindo demonstrates how his automatic hand-washing machine works to help fight Ebola in the Democratic Republic of the Congo.



A United Nations peacekeeper has his shoes cleaned with a chlorine solution before leaving an Ebola treatment center in Mangina, Democratic Republic of the Congo.

used the blueprint to fast-track effective tests, vaccines and treatments during the 2018-2020 Ebola response in the DRC.

“Integrating ethically sound, rigorous research into emergency responses ensures that the world is better prepared for the next disease outbreak,” the WHO reported.

***Rapid laboratory testing can make or break a health crisis response.*** Faster test results mean faster access to care, which increases survival chances.

“A rapid diagnosis helps prevent the spread of the disease among the family, friends, and others in the social network of a person confirmed to have Ebola,” the WHO reported. “The faster these contacts are identified, the faster they can be vaccinated and protected from the disease.”



# Experience Means Versatility

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Experience in dealing with Ebola has proven to be so valuable that Ebola “veterans” are being dispatched to COVID-19 hot spots to apply their expertise.

In early 2020, Chiara Camassa, an administration officer for the United Nations World Food Programme (WFP), was sent to Haiti as the agency’s “point person” on COVID-19 issues. Her appointment came as a result of her experience with Ebola in West Africa in 2014.

During the Ebola crisis, Camassa worked from WFP’s regional response hub of Accra, Ghana, the United Nations reported. She had to adapt quickly, and her role was expanded far beyond the distribution of food. “She was responsible for the deployment and tracking of assets, mostly generators, prefabs, sanitation structures and other equipment for treatment centers, offices and infrastructure throughout three affected countries: Guinea, Liberia and Sierra Leone,” the U.N. noted.

Natasha Nadazdin of the WFP said the death toll during the Ebola crisis would have been much higher were it not for her agency venturing out of its traditional areas of expertise.

“The initial thinking was this is a medical crisis and we cannot cross lines and we shouldn’t be doing things the World Health



A doctor is inoculated with an Ebola vaccine in Goma, Democratic Republic of the Congo.

Organization (WHO) should be doing,” she said, as reported by the U.N. “But when we became aware of the potential dimensions of that crisis, then it became clear that WFP would have to get involved in a very serious way because of our logistics capacity to procure quickly and organize the supply chain.”

In a 2015 editorial, Margaret Chan, then director of the WHO, wrote: “The Ebola outbreak has taught us many lessons, among them that the response to outbreaks and emergencies must start and end at ground level — which means that certain key capacities have to be in place before launching a response, including leadership and coordination, technical support, logistics, management of human resources and communications.”

“It has also shown that the organizations working to contain outbreaks and emergencies must collaborate closely,” she added.

***The community must be engaged in the response.*** A one-size-fits-all approach to public engagement doesn’t work. Each community is unique and wants responders who are familiar, from the area and speak local languages. Sometimes when outsiders try to help, they are met with resistance and disbelief. In many cases, science and disease control clash with local customs.

***Train health care workers on disease specifics.*** During the DRC Ebola outbreak, a survey showed that 85% of health care workers believed they could avoid infection by abstaining from handshakes or touching. Correcting these myths was a critical part of the response, especially for health professionals.

***Support survivors.*** During the West African Ebola crisis, survivors weren’t getting the follow-up attention they needed for possible medical, psychological and social challenges. They needed support to minimize the risk of continued disease transmission.

Depending on the disease, health care workers will need to establish follow-up protocols. Ebola survivors got monthly follow-up exams for six months and quarterly exams for a year.

Ebola survivors often have eye problems, even

permanent blindness. In West Africa, eye clinics were established early on to identify and treat people.

***Set up a fast-response funding mechanism.*** Disease outbreaks often move faster than money can be allocated for a response. As a result of the Ebola outbreaks, WHO learned to set up a rapid response called the Contingency Fund for Emergencies so that money is immediately available to jump-start a response.

The fund is surprisingly versatile. WHO has used it to respond to more than 100 events, including Ebola outbreaks, cyclones in Mozambique and the Rohingya refugees crisis in Bangladesh.

***A crisis is an opportunity to build bridges.*** Medical crises require scientists and health care workers to work closely with the public. The AIDS epidemic showed that collaboration between researchers and the public was feasible — and necessary.

“AIDS advocates pressured scientists to act more quickly, to be more transparent, and to communicate clearly about scientific rationale and methods,” *The New England Journal of Medicine* reported. “The result was shorter timelines for scientific investigation, regulatory review, and implementation of effective interventions.” □



# NIGERIAN QUARRY BECOMES TOURIST SENSATION

BBC NEWS AT [BBC.CO.UK/NEWS](https://www.bbc.co.uk/news)

An abandoned quarry in Nigeria has become a tourist hot spot after images were posted on social media in August 2020.

Photos of the rocky cliffs climbing into a blue sky, a moss-lined footpath, small green hills and a lake that shimmers in the sun have been shared all over the world.

Days after the post, the site, known as Crushed Rock, in Mpape, a neighborhood outside the capital, Abuja, was thronged. There have been a DJ stand, food vendors, hundreds of

sunbathing selfie-takers and a band of classical musicians.

The COVID-19 pandemic also has encouraged young, middle-class Nigerians to explore the hills in the country's rocky central region. The lockdown, which prevented people from traveling elsewhere, has meant people are exploring places closer to home.

The area around Mpape, which means "rock" in the local Gwari language, supplied much of the stone used to transform Abuja from a small

village in the 1980s into the capital.

"The quarry has existed for more than 10 years," said Mpape resident Courage Ebenz, who is somewhat bemused by the sudden influx of city dwellers.

Nigeria has an abundance of beautiful natural sites, but this man-made location has its own appeal, with three main tiers that each give a stunning view of the water below. But those who might want to plunge into the water should be warned: Locals say it is full of abandoned machinery.

## Mali Gets \$1 Million to Restore Parts of its Heritage

The community chief in So, in central Mali's Dogon region  
AFP/GETTY IMAGES



BBC NEWS AT [BBC.CO.UK/NEWS](https://www.bbc.co.uk/news)

Activists aiming to maintain traditional culture have pledged \$1 million to help the people of central Mali's Mopti region restore parts of their heritage, which has been threatened by armed conflict.

The United Nations' cultural organization, UNESCO, is working with the International Alliance for the Protection of Heritage in Conflict Areas to support rehabilitation of the Cliff of Bandiagara, also known as the Land of the Dogons, which has been a UNESCO World Heritage Site since 1989. The area is known for its homes carved into the limestone rock and the architecture, as well as the traditional way of life.

Fighting in Mali has led to the partial or total destruction

of 30 of the area's 289 villages, the U.N. said. Buildings and cultural objects have been lost, resulting in the "deterioration of cultural practices and traditions of the Dogon, Peuls, Bozo, Bambara and Sonrhay groups," the U.N. reported.

The disappearance of certain traditions has fueled inter-communal conflict. Although historically there had often been conflict between more settled communities and roving pastoralists, this began to become more violent after a 2012 uprising in northern Mali.

The U.N. said the \$1 million will be spent over the next three years to protect ceremonial objects and restore the damaged architectural heritage, "notably housing, granaries and sites dedicated to traditional culture."





# Famous Theater in South Africa RAISES CURTAIN ONLINE

VOICE OF AMERICA

South Africa's Market Theatre is one of several African cultural institutions that has gone entirely online because of COVID-19 restrictions that prevent large gatherings.

This small institution has seen other difficult times. It often is known as the "Theater of the Struggle" for its flouting of apartheid-era laws after opening in 1976. Now, theater staff members hope their artistic message, which touches on current events, will resonate beyond Africa.

Artistic director James Ngcobo said the acclaimed theater, which has received 21 international awards for its work, is seizing the opportunity to spread its stories beyond this country by streaming its entire season online. It also is writing new, topical shows that touch on issues many South Africans, and people across the world, are facing. Ngcobo said he cooked up the plan shortly after South Africa's government announced a strict lockdown in late March 2020,

shuttering most nonessential businesses.

South African actor and playwright Paul Slabolepszy said it is more important than ever that art continues to be made.

"We explain ourselves, our conversations come through storytelling. If we were living just with the struggles that we have with no hope, life would be terrifying," he said. "We need stories all the time. We need to connect in any way we can to feel human."

National theaters in Algeria and Egypt also are doing live shows online, and Somalia's National Theatre reopened for Independence Day celebrations.

Ngcobo said the Market Theatre has gotten an enthusiastic response to its online offerings from people in other African countries, and the U.S. and Europe. But he thinks that the continent's artistic houses could do more. His theater is communicating with institutions in Ghana, Namibia and Zimbabwe to help them go online.

## TANZANIAN GETS BILLION YOUTUBE VIEWS

BBC NEWS AT [BBC.CO.UK/NEWS](https://www.bbc.co.uk/news)

Tanzanian pop star Diamond Platnumz has become the first Sub-Saharan African singer to get 1 billion views on his YouTube channel.

Over the past 10 years, the 30-year-old award-winning musician has popularized "bongo flava," a uniquely Tanzanian offering. The music has romantic melodies with an urban beat influenced by traditional taarab music from the East African coast.

"Diamond Platnumz is very hard working and has great showmanship," says DJ Edu, who hosts the weekly pan-African music show *This Is Africa* for BBC World Service.

With more than 43% of Tanzania's 55 million people having access to the internet, mainly via smartphones, there is a huge homegrown Swahili-speaking audience ready to lap up his love songs.

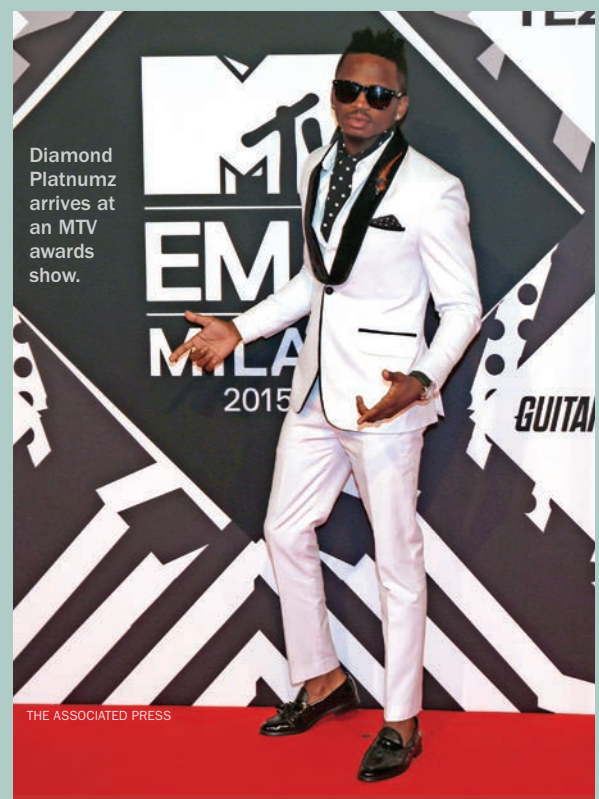
Other Tanzanian musicians such as Harmonize also are huge on YouTube.

YouTube is the critical platform, because money can be made through advertising. More important for musicians in Africa, over the past decade YouTube has allowed them direct access to an audience without them relying on TV stations.

Diamond Platnumz still languishes behind some North African stars, who have huge followings in the Middle East.

Then there are African artists who now live outside of Africa, such as Malian-born singer Aya Nakamura, who trumps the Tanzanian musician with more than 1.7 billion YouTube views. The 25-year-old, who moved to France when she was a young girl, is best known for her 2018 hit *Djadja*.

Akon, the Senegalese-American rapper, surpasses them both with 3.5 billion views.



Diamond Platnumz arrives at an MTV awards show.

THE ASSOCIATED PRESS





AFP/GETTY IMAGES

# SMARTPHONE MALWARE

## LEADS TO CALLS FOR **AFRICAN TECH INDEPENDENCE**

ADF STAFF

**C**yber security experts say Africa's top smartphone brand has sold tens of thousands of phones loaded with malicious software. The phones drain users' data, sign them up for subscription services without their knowledge, and make them unwilling accomplices in fraudulent ad schemes.

The Triada malware turned up on Chinese-made Tecno W2 smartphones in Ethiopia, Cameroon, Ghana and South Africa, according to a report. Triada uses a hard-to-remove program known as x-Helper to do its dirty work, experts say.

In addition to creating fake subscriptions, the malware generates fake clicks on banner ads in the background of sites that made millions of dollars for cyber criminals by defrauding advertisers with fake impressions.

"The fact that the malware arrives preinstalled on handsets that are bought in the millions by typically low-income households tells you everything you need to know about what the industry is currently up against," said Geoffrey Cleaves, managing director of Secure-D, an anti-fraud platform that studied the problem, according to CNN.

"This particular threat takes advantage of those most vulnerable," Cleaves added.

This is not the first time Africans have found themselves dealing with suspicious behavior by technology originating in China.

In 2017, African Union officials discovered that for five years the computer servers — made and installed as a gift by the Chinese government — had been transferring reams

of data every night from the AU's headquarters in Addis Ababa, Ethiopia, to servers in Shanghai. By 2018, the AU had replaced the servers, refusing China's offer to help configure them.

Still, many African nations have been slow to act on cyber security.

A 2018 study by the AU found that only eight countries reported having a national cyber security strategy. Only 14 had laws protecting citizens' personal data online. The same report found that African nations were the source of hundreds of thousands of cyber attacks around the globe each year.

In 2014, the AU adopted its Convention on Cyber Security and Personal Data Protection to build a legal foundation for protecting citizens online. The AU launched its 10-member Cyber Security Expert Group in December 2019 to advise union leaders on how best to address online security threats.

The Expert Group's chairman, Abdul-Hakeem Ajijola of Nigeria, said the Tecno security breach is a wake-up call. He believes African nations must develop their own capacities for encryption and data security to protect their citizens.

"Africa must initiate and sustain capacity development of people, processes and technology," he told *ADF* in an email. "We must encourage and facilitate the private sector as the prime driver of technology development and deployment while governments ensure fair play, equity and regulatory compliance."



## CLINIC OFFERS HOPE TO VICTIMS OF EXTREMIST VIOLENCE IN BURKINA FASO

AGENCE FRANCE-PRESSE

**Asseta Rouamba** was one of thousands fleeing extremist violence in Burkina Faso's troubled north when her daughter contracted malaria, putting the pair in an even more desperate situation.

"We are exposed. In addition to the precariousness of our shelter, there are food and health difficulties," the 74-year-old said inside a white tent at a health center outside the northeastern city of Kaya.

"This center has welcomed us with free care, which has been a huge relief."

Kaya, the capital of the Centre-Nord region, has been overwhelmed with an influx of people forced to flee their homes by a violent insurgency. More than 1,100 people have died, and more than a million have been displaced in the violence since 2015. The bloodshed is stretching already-slim resources in the country's north.

Kaya has been largely spared from the violence, but 472,000 people have taken refuge in the area around the city since January 2019. A third of that number has been taken in at reception sites in Kaya's Sector Six, which is home to the health and social promotion center that treated Rouamba's daughter.

An average of 160 people visit the center per day. The International Committee of the Red Cross (ICRC) has earmarked \$118,000 to fund consultations, vaccinations, maternity care, testing and malnutrition treatment at the center. The funding is part of a \$16.2 million program the ICRC launched in April 2020 to boost protections for vulnerable civilians and provide essential services in the Sahel region.

Head nurse Issa Sawadogo said the center had struggled since the start of the influx, "but now we are feeling good, more or less."

"With the rehabilitation of the maternity ward, toilets, laundry room and reception room, our health center has been given a more human face," the nurse added.

Adjaratou Sawadogo, a 43-year-old mother of three who fled violence in the central Barsalogho department, also sang the center's praises.

"There is no distinction in the treatment between the local population and we displaced people," she said.

**Peter Maurer, president of the International Committee of the Red Cross, right, visits a mother and her newborn baby at the health and social promotion center in Kaya, Burkina Faso.** AFP/GETTY IMAGES

## TUNISIAN COMPANY PRINTS 'BIONIC HANDS'

AGENCE FRANCE-PRESSE

A Tunisian startup is developing a 3D-printed bionic hand, hoping the affordable and solar-powered prosthetic will help amputees and other disabled people across Africa.



Unlike traditional devices, the artificial hand can be customized for children who otherwise would require an expensive series of resized models as they grow.

The company Cure Bionics also has plans to develop a video-gamelike virtual reality system that helps youngsters learn how to use the artificial hand through physical therapy.

Mohamed Dhaouafi, the 28-year-old founder and CEO of Cure Bionics, designed his first prototype while still an engineering student in his home city of Sousse.

"One team member had a cousin who was born without a hand and whose parents couldn't afford a prosthesis, especially as she was still growing up," he said. "So we decided to design a hand."

Dhaouafi launched his startup in 2017 from his parents' home, at a time when many of his classmates chose to move abroad seeking higher salaries and international experience.

"It was like positive revenge," he said. "I wanted to prove I could do it. I also want to leave a legacy, to change people's lives."

The device works with sensors attached to the arm that detect muscle movements, and artificial intelligence-assisted software interprets them to transmit instructions to the digits.

To teach youngsters how to use them, Cure has been working on a virtual reality headset that "gamifies" physical therapy. "Currently, for rehabilitation, children are asked to pretend to open a jar, for example, with the hand they no longer have," Dhaouafi said.

"It takes time to succeed in activating the muscles this way. It's not intuitive, and it's very boring."

In Cure's version, the engineer said: "We get them to climb up buildings like Spider-Man, with a game score to motivate them, and the doctor can follow up online from a distance."

Cure hopes to market its first bionic hands within a few months, first in Tunisia and then elsewhere in Africa, where more than three-quarters of people in need have no access to them, according to the World Health Organization.

"The aim is to be accessible financially but also geographically," Dhaouafi said.



# Armed Groups in Eastern DRC Move Toward Peace

A Congolese Soldier stands guard during an official visit to a camp for internally displaced people in South Kivu province, Democratic Republic of the Congo.

AFP/GETTY IMAGES

AGENCE FRANCE-PRESSE

About 70 armed groups have agreed to a cease-fire in the Democratic Republic of the Congo's (DRC's) South Kivu province, a flashpoint in the country's troubled east.

"All the armed groups of South Kivu agree to a cessation of hostilities and to instruct their respective members," read a statement issued after a meeting in Murhesa near the provincial capital, Bukavu.

The three-day meeting, attended by DRC Deputy Defence Minister Sylvain Mutombo, was co-organized by U.S. conflict-resolution group Search for Common Ground.

A similar meeting was held in December 2019 at the same venue, when 32 local armed groups agreed to cease hostilities.

Since the start of 2020, 139 violent deaths have been recorded in the province at the hands of militias or the army, according to the monitoring group Kivu Security Tracker. About 20 civilians were

massacred in the village of Kipupu in July 2020.

About 18 months after President Felix Tshisekedi took office on pledges of bringing peace to the volatile region, the goal remains elusive.

In eight months about 1,300 people were killed in the provinces of Ituri, North Kivu and South Kivu,

according to a June 2020 United Nations estimate.

More than half a million people have been displaced. Violence in South Kivu province often is between Rwandan-speaking Tutsi Congolese, known as the Banyamulenge, and other local ethnic groups, the Babembe, Bafuliro and Banyindu.



AFP/GETTY IMAGES



## SUDAN, SOUTH SUDAN SIGN DEFENSE COOPERATION AGREEMENT

ADF STAFF

Sudan and South Sudan have signed a joint defense and military cooperation agreement, the latest indication of improved relations between the two countries. The deal will allow the countries to work together on issues such as border security and countertrafficking.

South Sudanese Defence Minister Angelina Teny and Sudanese Defense Minister Ibrahim Yassin signed the deal on October 29, 2020, in Sudan's capital, Khartoum. It outlines a plan to pursue joint training, information exchanges, promotion of peace, working on disaster response and combating cross-border crimes.

"The two heads of state are the ones leading these efforts," Teny said, referencing a 2012 agreement — never implemented — that addressed issues such as cross-border trade. "And this may be the first time a huge step like this is taking place in the implementation of the co-operation agreement between the two countries."

After a contentious split, Sudan and South Sudan made major strides toward peace in 2020. In October, Sudanese transitional leaders traveled to Juba to sign a peace agreement with rebel groups from within Sudan. South Sudanese President Salva Kiir mediated the deal.

There also are signs of progress in resolving claims over the



Lt. Gen. Abdel Fattah al-Burhan, chairman of Sudan's Transitional Military Council, left, South Sudanese President Salva Kiir and Sudanese Prime Minister Abdalla Hamdok celebrate the signing of a peace deal with rebel groups in Juba, South Sudan. AFP/GETTY IMAGES

disputed Abyei region and demarcating the countries' shared 2,000-kilometer border.

"The relationship between Sudan and South Sudan continues to strengthen," Parfait Onanga-Anyanga, United Nations special envoy for the Horn of Africa, told the U.N. Security Council.

The two countries have agreed to open 10 border crossing points and cooperate on oil production, the *Sudan Tribune* reported.

## Nigerien Forces Free 11 Hostages Abducted by Extremists

AGENCE FRANCE-PRESSE

Troops from Niger have freed 11 villagers, four of them children, who had been seized by Boko Haram extremists and taken across the border into Nigeria.

"The hostages were freed by our troops on the Nigerian side of Lake Chad, near a Boko Haram base," said Yahaya Godi, secretary of the Diffa region governorate in southeast Niger.

"There are 11 people, including three women and four children, two of them babies, who were seized by the Boko Haram terrorist group."

The abductions took place August

11 and 12, 2020, in two villages in Gueskerou, a district on the Niger side of Lake Chad. Forces liberated the hostages less than a week later.

The marshy shoreline of the lake, shared by Chad, Niger and Nigeria, has become a hunting ground for cross-border extremists, who attack remote communities and often carry out kidnappings for ransom.

According to Niger's state TV, the troops tracked the kidnappers and freed the hostages just as their families were about to pay a ransom of 2 million CFA francs (\$3,600). The

television station showed guns and ammunition recovered from the abductors. "The Army has delivered a heavy blow to the enemy," said Godi, who welcomed the hostages after their ordeal.

Niger faces extremist attacks in the west from groups in Mali and Burkina Faso and in the southeast by Boko Haram and a splinter group called Islamic State West Africa Province.

The Diffa region alone hosts about 300,000 people who have fled their homes, according to the United Nations.



AFP/GETTY IMAGES



## CAMEROON CANCELS LOGGING PLANS

BBC NEWS AT BBC.CO.UK/NEWS

Plans to allow industrial logging in one of Central Africa's last intact forests have been halted in a move welcomed by environmentalists.

Ebo forest in southwestern Cameroon is home to 40 Banen communities and numerous endangered wild-life species, including Western gorillas, chimpanzees, forest elephants, grey parrots and large frogs.

Cameroon's government formally announced it was canceling a previous decree that would have allowed timber extraction across nearly half of the 150,000-hectare forest. The conservation group Greenpeace responded, saying the suspension of logging operations must be the first step toward protecting Ebo's residents. It has vowed to keep campaigning, along with its partner Rainforest Rescue.

A government official told the BBC that the forest eventually will be reclassified as a logging concession or as a protected forest.

"The present statement will not last long," said Jean Robert Onana, communications director for Cameroon's Ministry of Forestry and Wildlife. "Classification is a normal procedure and a legal procedure. If we don't classify this forest, it is subject to poaching or illegal logging."

He said Cameroon knows environmental conservation is important, adding that 30% of the national territory is under conservation.



## Animal Thought Lost to Time Found in Djibouti

BBC NEWS AT BBC.CO.UK/NEWS

**A** little-known mammal related to an elephant but as small as a mouse has been rediscovered after 50 years of obscurity.

The last scientific record of the "lost species" of Somali elephant shrew was in the 1970s, despite local sightings. The creature was found alive and well in Djibouti during a scientific expedition.

Elephant shrews, or sengis, are neither elephants nor shrews, but are related to aardvarks, elephants and manatees. They have distinctive trunk-like noses, which they use to feast on insects. There are 20 species of sengis in the world, and the Somali sengi is one of the most mysterious, known to science only from 39 individuals collected decades ago and stored in museums. The species was previously known only from Somalia, hence its name.

Scientists had heard reports of sightings in Djibouti, and Houssein Rayaleh, a Djiboutian research ecologist and conservationist who joined the trip, believed he had seen the animal before. He said although people living in Djibouti never considered the sengis to be "lost," the new research brings the Somali sengi back into the scientific community.

"For Djibouti this is an important story that highlights the great biodiversity of the country and the region and shows that there are opportunities for new science and research here," he said.

# Free Tablets Help Malawian Students Learn Remotely

VOICE OF AMERICA

**S**tudents in Malawi were out of school for six months because of the COVID-19 pandemic. Although most were able to study from home with internet or radio lessons, many in remote villages were left out.

Voluntary Services Overseas (VSO), an international development organization, and partner One Billion helped bridge the gap by distributing 1,000 solar-powered tablet computers with programmed lessons to rural primary school students. All content is in Malawi's main language, Chichewa, and helps students improve reading, writing and math.

Parents say the donation eased education worries during the school closure.

"I lost hope, but with the coming of these [tablets], we are very happy because now my children have something to do," said parent Olive Makison. "They have stopped playing around.



A fourth-grade student uses a donated solar-powered tablet computer in Lilongwe, Malawi.  
CRAIG MAWANGA/VSO

They are now learning. This will improve their education."

"What happens is that the moment that the learners start using them, there is what we call 'diagnostic tools' that place the kid at a right curriculum depending on his or her levels, so the kid starts learning from there," said

Yesani Kapanda, VSO program manager.

Students' progress was monitored remotely.

"We have put a SIM card in those tablets, and we are able to monitor what is happening," Kapanda said. "If the learners are not using them, we are able to identify such households."

## Fast Action Saved Ethiopian Airlines

AGENCE FRANCE-PRESSE

Quick adaptation has enabled Ethiopian Airlines to pull through tough COVID-19 restrictions and "saved the airline," its CEO said.

CEO Tewolde GebreMariam said the airline maximized freight operations due to air travel

restrictions. Despite losing \$1 billion and having 850 of its employees contract COVID-19, the company reported a \$44 million profit for the first half of 2020 and has not defaulted on its loan repayments, the CEO said.

The company also has avoided

laying off full-time employees or seeking debt restructuring, Tewolde said.

The airline, which is the largest in Africa, responded to a 90% drop in international passenger traffic by repurposing 45 passenger jets to build out its cargo fleet. It stripped the seats from its passenger planes to make way for cargo. This worked for the airline because air freight demand surged.

"I would say that those actions have saved the airline," Tewolde said. "We were very quick, very fast, flexible and agile to move our forces, resources and everything to cargo."



THE ASSOCIATED PRESS





REUTERS

## Ethiopia Works to Save Endangered Coffee WORLD BANK

**N**estled in the dense rainforest of the Kafa Biosphere Reserve in southwest Ethiopia are thousands of genetic variants of coffee, an important seed bank of wild arabica that faces extinction.

Preserving Ethiopia's prized arabica coffee is key not only for coffee drinkers worldwide, but also for the estimated 15 million people in Ethiopia whose livelihoods depend on it. Ethiopia is Africa's biggest coffee producer and the world's fifth-largest exporter. In 2018, Ethiopia's coffee production was 7.5 million 60-kilogram bags, according to the International Coffee Organization.

The Kafa zone, about 460 kilometers southwest of Addis Ababa, is considered the birthplace of wild

arabica. The arabica plants found here are being used to develop coffee varieties that are resistant to diseases and have the potential to survive in a changing climate.

A 2019 study found that 60% of 124 wild coffee species are threatened with extinction because of land use change, deforestation and climate factors. Wild coffee, study author Aaron Davis said, is vital for the long-term viability of the coffee sector.

"The sheer scale of genetic diversity found in these wild places simply cannot be replicated in botanic gardens or research collections," Davis said. "We will need these resources more than ever over this century."

Designated in 2010 by the United Nations as a national biosphere, the

Kafa Biosphere Reserve extends across 760,000 hectares and has a population of about 1 million people. It is known as Ethiopia's "green lung" for the carbon dioxide the forest consumes.

The World Bank's Sustainable Land Management Project has worked with farmers in the area around the biosphere, providing advice on sustainable farming practices and supporting efforts to reverse deforestation and forest degradation, improve soil health, and preserve biodiversity.

"By boosting livelihoods in the transitional zone, this should lessen pressure on the core zone and reduce the need for communities to access resources there, thus preserving wild coffee in the long run," said Paul Martin of the World Bank.

## Company Creates Tool to Fight Locust Swarms

ADF STAFF

In 2020, John Oroko of Kenya witnessed the devastation wrought by desert locusts. It was a call to action.

His agricultural company, Selina Wamucii, launched a mobile app called Kuzi that uses artificial intelligence (AI) to fight the crop-devouring swarms as a second wave hit East Africa in early 2021.

"It is nothing short of a catastrophe," Oroko told ADF. "I shudder to think what it means for the livelihoods of already-vulnerable communities on this continent."

The worst locust invasion in 70 years has threatened the food supplies of East Africa, where millions already were going hungry. By mid-April 2020, more than 25 million hectares of farmland were under locust attack across the Horn of Africa.

That sparked the idea for Kuzi.

The free app uses satellite and soil sensor data, ground meteorological observation and machine learning to predict the breeding, occurrence and migration routes of desert locusts. It generates a real-time locust



Locusts swarm on a tree in northern Kenya. THE ASSOCIATED PRESS

breeding index and a live heatmap of locusts in the region with potential migration routes.

Its name is Swahili for the wattled starling, a bird known in East and Southern Africa for eating locusts.

Kuzi uses deep learning — an element of AI that emulates the human brain to process data into patterns for decision-making — to identify the formation of locust swarms. The app then sends free text alerts to farmers and pastoralists two to three months before locusts are expected to attack farms and livestock, allowing for early intervention.



# DIVA TAXI SHOWS UGANDAN WOMEN'S ECONOMIC POWER

THE ASSOCIATED PRESS

Women in Uganda are taking on a new role, as drivers for an all-female ride-hailing service, Diva Taxi.

The taxi service, dreamed up by a local woman who lost her logistics job at the start of the COVID-19 outbreak, was launched in June 2020 and has recruited more than 70 drivers. They range from college students to mothers hoping to make good use of their secondhand Toyotas.

It's uncommon to find female taxi drivers in Uganda, a socially conservative country where most women labor on farms or pursue work in the informal sector. Diva Taxi believes countless women are looking for jobs at a time of severe economic distress. The International Labor Organization has said women's employment in developing countries is likely to be hit harder than men's in the pandemic.



A woman with Uganda's all-female ride-hailing service trains new drivers in self-defense in Kampala. THE ASSOCIATED PRESS

"I should say I was personally affected by COVID," Diva Taxi founder Gillian Kobusingye said.

She found herself prevented from working as authorities imposed restrictions on movement to slow the spread of the virus. For several weeks, even taxis were not authorized to operate in Uganda.

She formed the business based on the idea that women wanted driving opportunities and might be more reliable workers than men.

A prospective driver must have a car in good condition and a smartphone equipped with the mobile app that clients use, along with a valid driver's license and a certificate of good conduct issued by Interpol.

The Diva Taxi app has been downloaded at least 500 times, and each of the company's 72 drivers provides an average of 30 rides each week, Makyeli said. The company expected to have 2,000 active users by the end of 2020.



Ghanaian farmers seed pineapple plants in Ekumfi. AFP/GETTY IMAGES

## GHANAIAN FARMERS WORK FOR ORGANIC CERTIFICATION

VOICE OF AMERICA

In Ghana and elsewhere in West Africa, organic food is growing in popularity. But organic produce is not easily regulated, and consumers are paying extra for unverified claims.

Farmers across the region have created their own system, with support from international bodies, to certify that produce is organic, meaning it is grown without the use of chemical pesticides or synthetic fertilizers.

Organic farmer Kobina Hudson grows about 40 types of vegetables and fruits in Ghana. Up until about a year ago, the only way his customers could be assured of his organic practices was by trusting his explanations. But now, across Ghana, farmers like him take part in a participatory guarantee system (PGS).

Farmers monitor each other to follow organic guidelines with spot checks, reviews of practices and knowledge sharing. Their products are then certified organic to sell to local markets.

Hudson supports the system. Before its introduction, he would have to explain his farm and practices to customers, even inviting them to visit the farm themselves.

"With PGS, it's a certificate, so it's always easier if you can say that 'This body, you can call this body, I'm registered with them — they have certified me.' That's why I definitely want this PGS to work," Hudson said.

PGS organic agriculture plans are used across the world. This system also is used in Benin, Burkina Faso, Nigeria, Senegal and Togo.

"Many people in Ghana just say, 'I do organic,' and they don't really have the deep understanding of what organic is, so it's been a challenge," said Abosede Olawumi Benedict, system coordinator in Ghana. "But we kind of see a new dimension with COVID-19 — so many people really want to be sure now that what they are eating that has been labeled organic is organic."





# YASUKE, the African Samurai

ADF STAFF

ARTWORK BY ANTHONY AZEKWOH

**A**lmost 500 years ago, a man named Yasuke drew crowds wherever he went in Japan. He was the first foreign-born man to become a samurai, Japan's elite warrior caste.

He also was the first, and only, black man most Japanese people had ever seen. A fellow samurai described him at that time as being stunningly tall, "and his skin was like charcoal." He is believed to have been 1.88 meters tall, towering over Japanese men, who averaged 1.6 meters at that time.

His given name is not known. Yasuke, pronounced *yas-kay*, was his Japanese name.

He arrived in Japan in 1579. Historians believe he was a native of Portuguese Mozambique, but others say he may have come from Ethiopia or Nigeria. Some historians insist that he was a slave, but others say that he could not have become an accomplished samurai so quickly without having come from a warrior background.

He may have been the first black man to set foot in Japan. He was traveling with an Italian Jesuit and attracted the attention of the warlord Oda Nobunaga, who was trying to unify the country and become its shogun, or sole military ruler.

Yasuke is said to also have visited India before arriving in Japan, which would have intrigued Nobunaga. One historian noted that Nobunaga also would have appreciated that, unlike the Jesuits, Yasuke had no religious agenda. Almost immediately after meeting Yasuke, Nobunaga gave him a considerable amount of money.

All accounts concur on Yasuke's great intelligence. He learned to speak Japanese quickly and well; he would never have risen in Japanese society without it. He reached the upper levels of the samurai in about a year — an extraordinary achievement under any circumstances.

Yasuke and Nobunaga were similar. Both sought the company of disciplined and intelligent people.

Filmmaker Floyd Webb said that while Nobunaga was a fan of Noh, a form of classical musical drama, Yasuke liked to dance and perform Utenzi, a type of Swahili narrative poetry celebrating heroic deeds.

Nobunaga made Yasuke his weapon bearer, a complex role combining senior aide, trusted advisor and keeper of state secrets.

Yasuke's time as a samurai was brief. By 1582, only two years since Yasuke had become a Japanese warrior, Nobunaga had become the most powerful warlord in the country. In his quest to unify the country under his rule, he had destroyed the rival Takeda clan earlier that year at the Battle of Tenmokuzan, giving him control of central Japan. Nobunaga's only remaining rivals were the Mōri, Uesugi and Hōjō clans. Each clan had internal problems of its own.

In June 1582, he went to battle against the Mōri clan. He split his army and rode off with Yasuke and 29 other trusted Soldiers. While the 31 men rested at the temple of Honno-Ji, 13,000 Soldiers serving under Akechi Mitsuhide, one of Nobunaga's trusted generals, ambushed and attacked them.

The temple was set afire, and with the situation hopeless, Nobunaga carried out a ritual suicide known as *seppuku*.

Yasuke is said to have been the only survivor of the ambush. He later was captured and made to stand before Mitsuhide, who called him "an animal" but spared his life and commanded that he be returned to the Jesuits. He may have spent his remaining years at a mission in Kyoto. No one knows.

The story of Yasuke lives on, particularly in Japan, where he is best remembered in an award-winning children's book. He has been the subject of documentaries, more books, and even featured in comic books and video games.



# CLUES

- 1 This city was built as a fortified colony on the Atlantic coast in the early 16th century.
- 2 It is one of the first settlements Portuguese explorers created in Africa on the route to India.
- 3 Among the original surviving buildings is the Church of the Assumption.
- 4 The city has a large cistern, which was featured in a 1951 movie production of Shakespeare's *Othello*.





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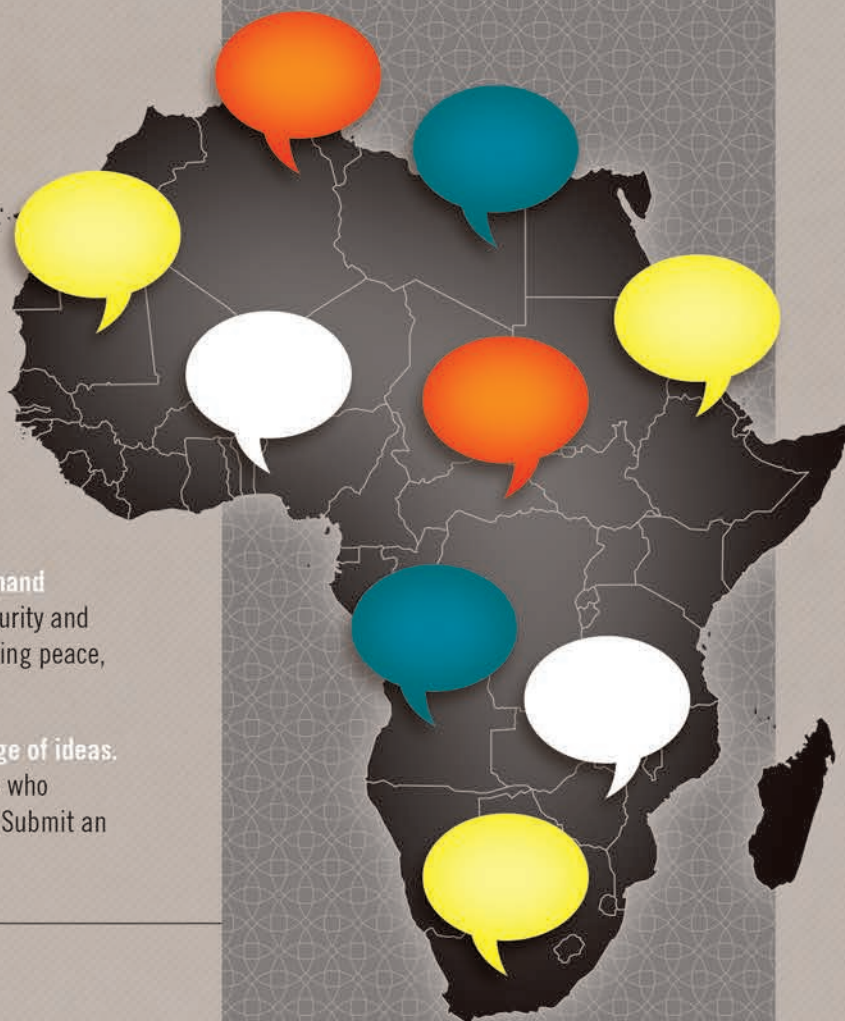
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Unit 29951  
APO AE 09751 USA

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