

AN ORIGINAL DATA STORY

# EPIDEMIOLOGICAL STORIES THAT DIDN'T HAPPEN

As the world continues efforts to stop COVID-19 and better prepare for the next disease threat, these stories serve as a reminder that we *can do better*.

Getty Images

In 10,000 BCE, a deadly new virus emerged in Northeast Africa, killing indiscriminately and causing a disease we now know as smallpox. Due to global migration, smallpox arrived in China by the 4th century CE, and in Europe in the 7th century,<sup>1</sup> and continued to kill millions of people until a coordinated global effort eradicated the disease in 1977.<sup>2</sup> The speed at which viruses can travel the globe and cause human and economic devastation has increased steadily since we first experienced smallpox, as COVID-19 and other diseases have tragically demonstrated.

## EBOLA IN NIGERIA

However, humans can, and have, improved their ability to fight back.

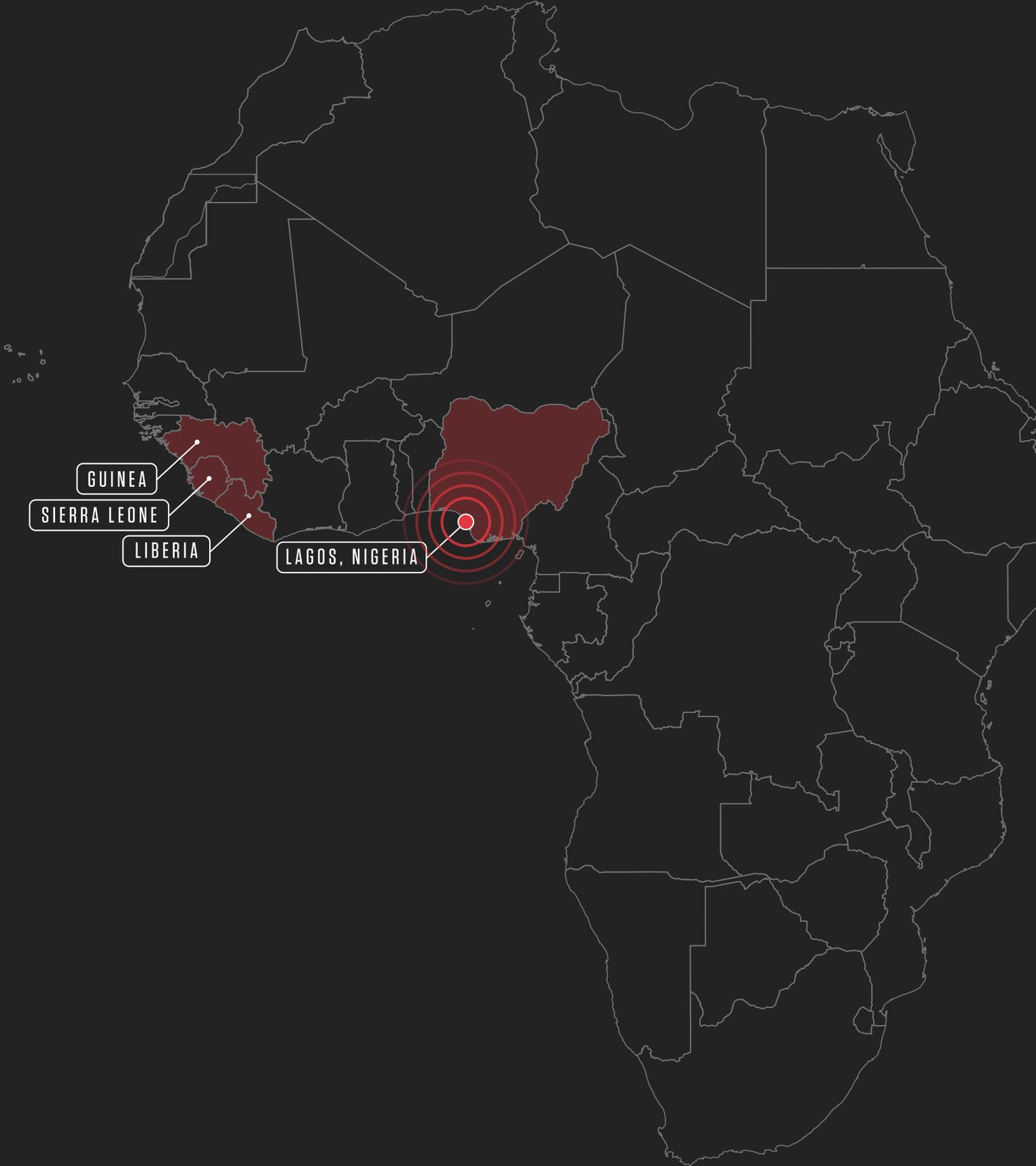
**In mid-2014, West Africa was in the grip of the largest epidemic of Ebola the world had ever seen.** While the epidemic had primarily taken hold in Liberia, Guinea and Sierra Leone, countries across West Africa were on high alert. On July 20, 2014, a man infected with Ebola landed in Lagos, Nigeria, a city of 21 million. Infections began to spread immediately. By the end of the month the first patient had died, an infected individual had flown to another city and nearly one thousand contacts had been exposed to the virus.

And yet, in Nigeria, **the outbreak was over in less than three months.** Thanks to a herculean public health response, Nigeria was free from Ebola by October 2, after 20 cases and eight deaths total in the country.<sup>3</sup>

Nigeria stopped Ebola from spreading nationally, and potentially regionally, with effective communication, coordinated response activities and dedicated leadership.



Unsplash. Zaisan Monument, Ulaanbaatar, Mongolia.



GUINEA

SIERRA LEONE

LIBERIA

LAGOS, NIGERIA



IFRC/The Kenya Red Cross Society

# WE CAN STOP EPIDEMICS BEFORE THEY HAPPEN

In these case studies, we highlight the successes of these epidemics that weren't.

In this report, we share inspiring stories of Epidemics That Didn't Happen, or whose impact was lessened, because of careful planning and swift strategic action. These Epidemics That Didn't Happen show us how the trajectory of an epidemic can be fundamentally altered when a country invests in and prioritizes preparedness for infectious disease outbreaks and readiness to act when it strikes.

As the world continues to work to stop COVID-19 and better prepare for the next disease threat, these stories serve as a reminder that we can do better. By investing in and prioritizing preparedness and response systems, we can save millions of lives and trillions of dollars and avert global tragedy in the years to come.



CHAPTER 02

**YELLOW FEVER**



CHAPTER 03

**EBOLA**

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IN BRAZIL**

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IN UGANDA**

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Strategic National Stockpile, undisclosed location. US Department of Health and Human Services

## HOW DOES THIS RELATE TO COVID-19?

In contrast, the COVID-19 pandemic has largely been a story of failure. The pandemic revealed tremendous gaps in many countries' preparedness and response systems, including the United States. But this does not mean that effective preparedness and response are out of reach. COVID-19 offers reason for hope in countries that have had successful responses that should also be recognized. Senegal, which still has significant preparedness gaps, used their years of outbreak response—particularly their experience with Ebola—along with data-driven policies and strong leadership to manage a highly effective response. And Senegal is not alone; countries such as Vietnam and Mongolia have, despite limited resources, mounted effective responses and kept COVID-19 under greater control than much of the rest of the world. Both have seen some of the lowest infection and death rates in the world.

The bottom line is many countries have demonstrated what works: strong preparedness systems coupled with decisive responses. When countries can prepare and respond appropriately, even if not perfectly, their communities, neighbors and the world are safer for it.



Unsplash. Cilacap Tengah, Cilacap Regency, Central Java, Indonesia. Second dose of the COVID-19 vaccine.

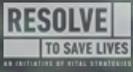
“ *The COVID-19 pandemic has largely been a story of failure. The pandemic revealed tremendous gaps in many countries’ preparedness and response systems, including the United States.* ”

Global COVID-19 Cases

*Disclaimer: The eight case studies included in this report provide examples of strong preparedness and response to specific outbreaks. This is not to suggest that every action taken was perfect, or that the countries in question will handle future outbreaks in the same manner. We highlight these examples to show what is possible, but do not endorse any country's response as a standard for these or future response efforts. Many examples of effective outbreak detection and control exist throughout the world; these eight studies were chosen to illustrate different aspects of effective public health programs.*

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**PAHO**

EPIDEMICS THAT DIDN'T HAPPEN

CASE STUDY:

# YELLOW FEVER IN BRAZIL

*A risk-based response:  
How protective actions stopped  
yellow fever in Brazil*

## ABOUT YELLOW FEVER

The yellow fever virus, which spreads between mosquitoes and primates (human and non-human), was brought to the Americas from Africa by the Atlantic slave trade. One of the earliest recorded outbreaks was in the mid-17th century in the Yucatan,<sup>1</sup> and between 1693 and 1905 it killed more than 100,000 people in the United States.<sup>2</sup> Outbreaks continue to occur in tropical areas of Africa and South America, where it cannot be fully eliminated as it circulates between mosquitoes and non-human primates indigenous to the forest. **Brazil was able to eliminate urban yellow fever in 1942.**

Learn more about the transmission cycle of yellow fever [here](#).



Mass YF vaccination in Vitoria, Esperito Santo, Brazil 2017. © PAHO/WHO, Sylvain Aldighieri

In humans, the disease typically begins with a fever, chills, headache, nausea, fatigue and weakness. But severe cases can enter a second “toxic phase” that causes jaundice, making eyes and skin appear yellow—the symptom that gives the disease its name, and sometimes liver and kidney failure, amongst other symptoms.<sup>3</sup> There is no cure for yellow fever, and 30-60% of those with severe infections die.<sup>4</sup> An effective vaccine was developed in the late 1930s;<sup>5</sup> 90% of those who receive the vaccine are immune within 10 days.<sup>6</sup> In recent years, large yellow fever outbreaks have caused global supply shortages of the vaccine.<sup>7</sup>

There is no cure for yellow fever and 30-60% of those with severe infections die.





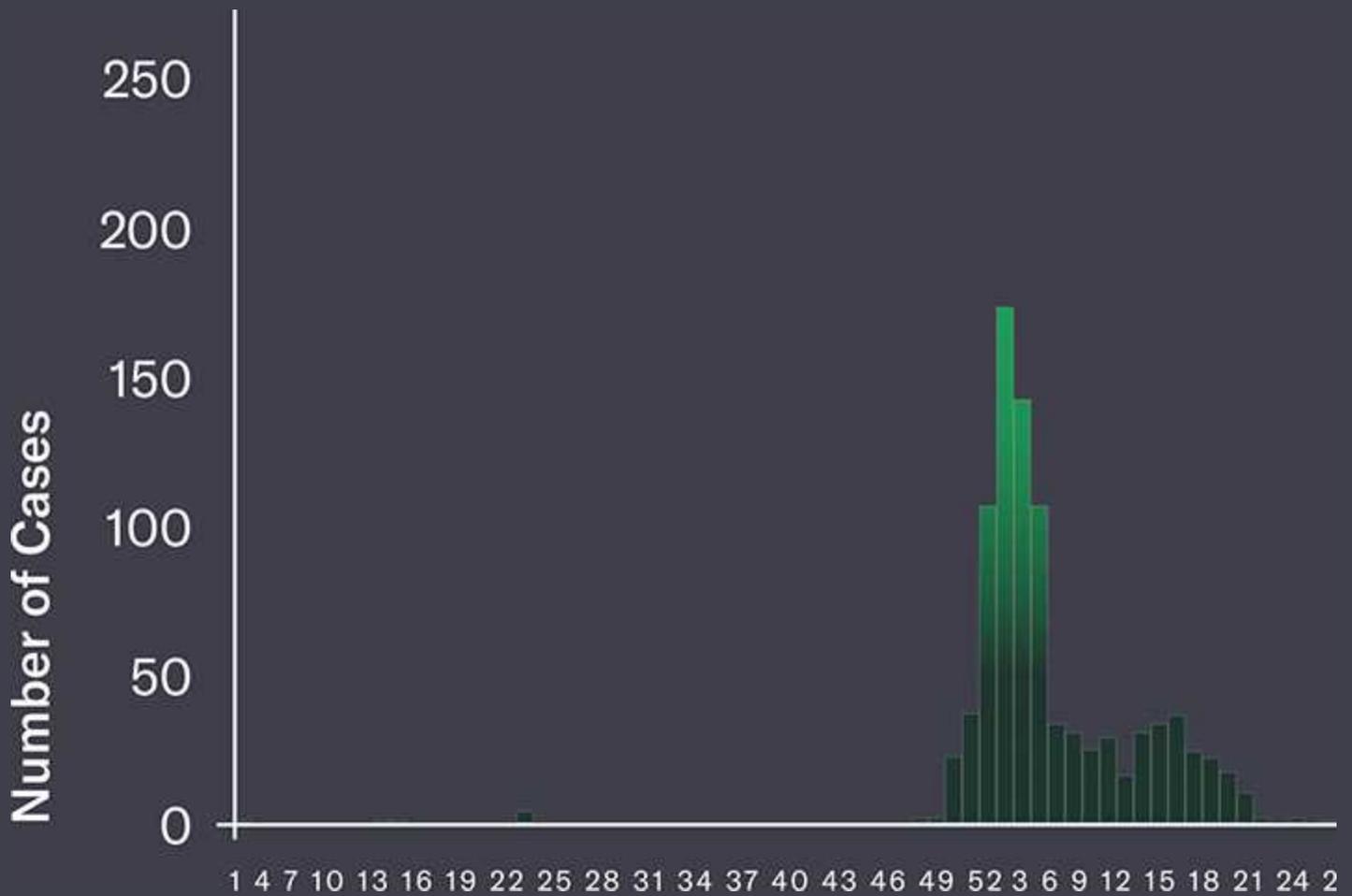
Rural Ecosystem with YF transmission both epizootics and human cases, Ladainha municipality, Minas Gerais, 2017. © PAHO/WHO, Sylvain Aldighieri

In Brazil, people living or working in or near the rainforest are most at risk for yellow fever infection. In recent years, environmental changes have led to higher circulation of the yellow fever virus among monkeys in forest ecosystems which, along with closer contact of humans and mosquitoes and changes in human behavior, led to an explosion of infections in nearby human populations. The greater number of cases—including both animal and human outbreaks—allowed the rapid spread of disease into forest areas near large Brazilian cities, including Rio de Janeiro and São Paulo, where yellow fever vaccination coverage is low due to the disease’s long absence.<sup>8</sup>

## In southeast Brazil, yellow fever is seasonal, with most infections taking place from December to May.

### WHAT HAPPENED

Prior to 2016, there were relatively few cases of yellow fever in Brazil—the 2015/2016 yellow fever season had only three confirmed human cases and two deaths. But in December 2016, it became clear to epidemiologists monitoring yellow fever in southeast Brazil that an epidemic was imminent. The largest outbreak of yellow fever in Brazil in modern times was emerging,<sup>9</sup> just as the global yellow fever vaccine supply was running dangerously low.



## Epidemiological Week

**Source:** Data published by the Brazil Ministry of Health (2016-2018, as of EW50) and the Sao Paulo State Secretariat of Health (EW 51 of 2018 to EW 9 of 2019) and reproduced by PAHO/WHO

During the 2016-2017 season, cases climbed to 792, with 274 deaths. In the December 2017-May 2018 season, cases and deaths continued to rise, with 1,266 new human cases, and 415 deaths.<sup>10</sup> Infections were concentrated in areas surrounding major cities that were not typically considered high risk for yellow fever; officials feared that transmission could explode if the disease started to spread between humans and urban mosquito species.<sup>11</sup>

Also worrying to the international community was the spread of yellow fever beyond Brazil's borders. From January to March of 2018, the US Centers for Disease Control and Prevention (CDC) reported at least four deaths and 10 cases among international travelers returning to Europe and South America from Brazil.<sup>12</sup> Fear of a broader outbreak loomed.

“ *The US CDC reported at least four deaths and 10 cases among international travelers returning to Europe and South America from Brazil.*

”

# KEY PREPAREDNESS FACTORS



Risk Assessment & Planning



Emergency Response Operations



National Laboratory System



Disease Surveillance



National Legislation Policy & Financing



Human Resources



Risk Communications

## THE RESPONSE

Controlling the 2016-2018 outbreak required Brazil to significantly expand immunization as infections crept toward major cities. Brazil was well-positioned to do this: the country is one of the largest producers of the yellow fever vaccine in the world and has an integrated public health system that prioritizes routine vaccination, including yellow fever vaccine administered to young children. However, at the time of the outbreak, vaccine supplies were low; a yellow fever outbreak in Angola and DRC had depleted the Brazilian government's stocks.<sup>13</sup>

Brazil developed an ambitious vaccination plan. Authorities drastically expanded yellow fever vaccinations in 2017, distributing 45 million vaccine doses and an additional 24 million in 2018,<sup>14</sup> including in the highly populated states of São Paulo, Rio de Janeiro and Bahia. Eventually, to stay ahead of further spread of yellow fever cases, officials expanded yellow fever vaccination to the entire country, targeting an additional 77 million people.<sup>15</sup>

Brazil was uniquely able to respond to yellow fever, as it had developed scientific expertise on the endemic disease starting in the late 19th century and was a part of developing the yellow fever vaccine in the 1930s motivated by national risk.<sup>16</sup> As it was already one of the major producers of the vaccine, by 2018 it was able to double its monthly production to 8 million doses<sup>17</sup> to support its ambitious goal to vaccinate the entire population.<sup>18</sup>



Río de Janeiro Government Health Ministry, PAHO and NGOs discussing yellow fever at the Unidade de Pronto Atendimento, Secretaria de Saúde, Rio de Janeiro. © PAHO/WHO, Sonia Mey-Schmidt

To manage the large number of vaccinations needed amid a vaccine shortage, officials requested additional supplies from an international stockpile to supplement their domestic production ability.<sup>19</sup> To stretch supply further, in collaboration with Pan American Health Organization (PAHO) and the World Health Organization (WHO), Brazil decided to use partial doses of vaccine. Studies show that one-fifth of a standard dose can provide up to one year of immunity and can be beneficial in containing outbreaks.

In conjunction with vaccination, health officials prioritized surveillance of yellow fever outbreaks among animals—providing advance warning of where human cases would later appear—case management to reduce deaths among those infected and highly specific testing diagnostics.

By the end of the 2019 yellow fever season, these measures had produced dramatic results: only 85 yellow fever cases and 15 deaths were reported. A disease that had threatened to expand throughout **Brazil and across borders had been contained.**

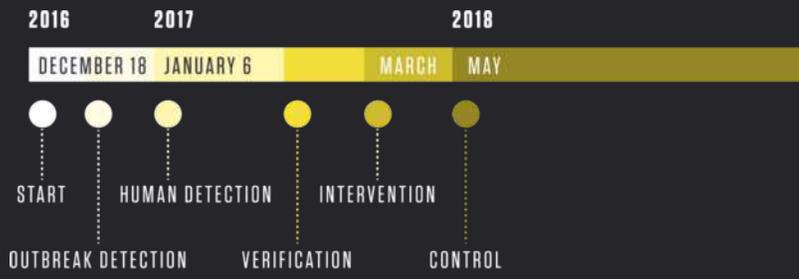


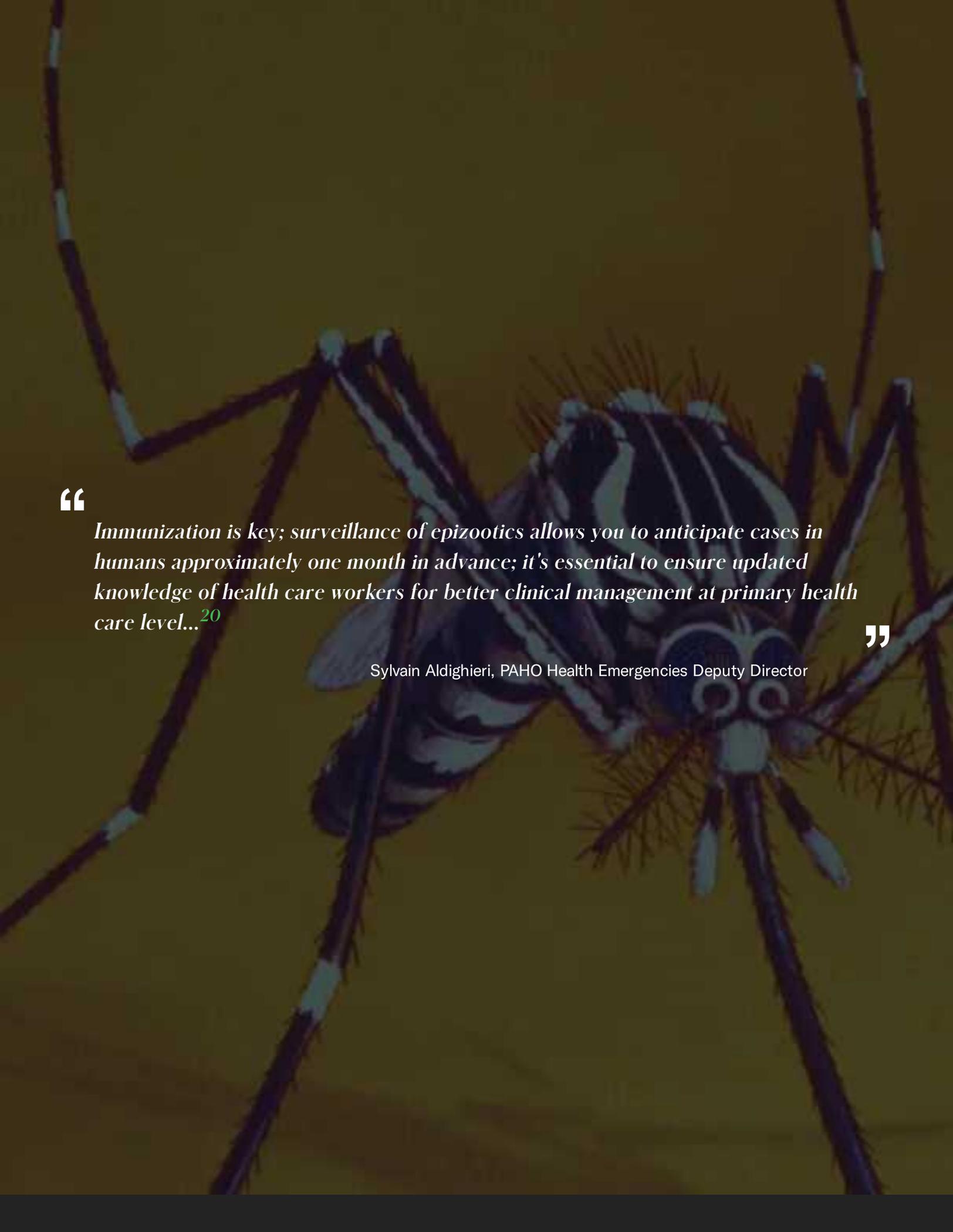
People can get vaccinated in primary health care clinics, mobile vaccination posts, their own homes (for homebound patients) and other facilities. © PAHO/WHO



Health workers arrived with their mobile vaccination equipment and set-up their vaccination post in the street, in Grajaú, São Paulo. © PAHO/WHO, Sonia Mey-Schmidt

# TIMELINE





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*Immunization is key; surveillance of epizootics allows you to anticipate cases in humans approximately one month in advance; it's essential to ensure updated knowledge of health care workers for better clinical management at primary health care level...<sup>20</sup>*

”

Sylvain Aldighieri, PAHO Health Emergencies Deputy Director

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EPIDEMICS THAT DIDN'T HAPPEN

CASE STUDY:

# EBOLA IN UGANDA

Effective surveillance:  
How Uganda detected cases of  
Ebola at the border



## ABOUT EBOLA

Ebola Virus Disease is a rare but deadly disease caused by a virus transmitted initially from animals to humans. Bats are thought to be the natural host to the disease, and initial infection can occur when humans come in contact with a bat or eat an animal that has been infected by a bat.<sup>1</sup> An outbreak of Ebola can occur when an infected person spreads the virus via bodily fluids to other humans. **Since Ebola's discovery in 1976, death rates have ranged from 25% to 90% during outbreaks.** While there have been relatively few outbreaks, the most devastating occurred in 2014-2016 in several countries in West Africa, infecting around 28,600 people and killing approximately 11,325.<sup>2</sup>



Resolve to Save Lives

Initial symptoms can be similar to the flu, but later stages include poor liver and kidney function and internal and external bleeding.<sup>3</sup> Supportive treatment, such as oral or intravenous fluids, dramatically improves chances of survival, and a treatment was approved in 2020.<sup>4</sup> Effective vaccines have been available since 2019, but supply remains limited and there are significant logistical challenges for delivery.<sup>5</sup>

An outbreak occurs when an infected person spreads Ebola via bodily fluids to other humans.



## WHAT HAPPENED

**B**eginning in August 2018, an Ebola outbreak took hold in North Kivu and Ituri, provinces of DRC. Ongoing conflict in the area severely hampered the response, and the virus was able to spread widely. By the time the outbreak in DRC was over in June 2020, 3,481 people had been infected, and 2,299 died, making it the second largest outbreak of Ebola to date. Its 66% case fatality was relatively high compared to other outbreaks.<sup>6,7</sup> DRC's North Kivu and Ituri provinces border Western Uganda. Given the sizable outbreak in DRC and the movement of large numbers of citizens and refugees across the border, Uganda was at high risk for international spread.

## Having prepared for an Ebola outbreak since August 2018, Uganda rapidly mobilized its response teams.

In early June 2019, a five-year-old boy tested positive for Ebola at the Bwera Hospital in Kasese district, Uganda, close to the DRC border. The child had recently traveled with family to DRC for the burial of his grandfather, who had died from Ebola. Within days, the boy and two other members of the family, a grandmother and three-year-old brother who also tested positive for Ebola, had died.<sup>8</sup> The Ministry of Health declared the outbreak on June 9, 2019 and instituted response measures to stop any spread.

However, the boy and his family were the first of only a handful of cases that were reported in Uganda during the entire outbreak in DRC, despite millions of border crossings between the two countries. No further cases spread in Uganda from these individuals.

# KEY PREPAREDNESS FACTORS



Risk Assessment & Planning



Emergency Response Operations



National Laboratory System



Disease Surveillance



National Legislation Policy & Financing



Human Resources



Risk Communications

Having prepared for an Ebola outbreak since August 2018, Uganda rapidly mobilized its response teams.

Within days of the Ebola outbreak being declared in DRC in August 2018, Uganda activated its national emergency preparedness and response systems. Within weeks, Uganda opened multiple Ebola Treatment Centres and rapid testing laboratories near the DRC border, where border screenings were conducted for all people entering the country.<sup>9</sup> By November 2018, the Ugandan government had vaccinated nearly 5,000 health care workers and response staff—all before any cases had been identified in Uganda.<sup>10</sup>

When the five-year-old boy and his family returned to Uganda from DRC in June 2019, they were quickly identified at a routine Ebola screening point at Mpondwe border crossing, tested, and then placed in an Ebola Treatment Centre once confirmed positive.<sup>11</sup> Because the Ugandan government had set up field laboratories capable of testing for Ebola in the area, test results were available within six hours and confirmed via additional testing within 24 hours.

The national and district emergency response team was immediately convened to reinforce response activities, including scaling up risk communications and vaccinating nearly 300 contacts of the cases.<sup>12</sup> No further infections were identified, and the outbreak was declared over on July 25, after the recommended 42-day period with no new cases had elapsed.<sup>13</sup>

Uganda's extensive border screenings identified several individuals with suspected Ebola symptoms; they were isolated and tested, with test results often returned within 24 hours. Apart from the boy and his family, only two other positive cases emerged during the DRC epidemic, both of which were quickly identified, investigated and managed, avoiding further infections.<sup>14, 15</sup>

The quick activation of Uganda's health emergency response systems—in place long before Ebola cases in DRC threatened an outbreak in Uganda—prevented any further infections.



Resolve to Save Lives

**“ We thank all the stakeholders including donors, implementation partners and local communities for working quickly with the response mechanism to ensure that the cases were detected early, contacts managed well and no secondary cases emerge. As a country we are proud to have this outbreak closed. ”**

————— Hon. Minister of Health of Uganda, Dr. Jane Ruth Aceng

Other PITC	6,450	112	1.7%
PMTCT	1,963	19	1.0%
VMMC	3,173	9	0.3%
<b>Grand Total</b>	<b>17,679</b>	<b>298</b>	<b>1.7%</b>

**15+ by Sex**

Modality	HTS_TST	TST_POS	Yield
<b>Index Case</b>	5,912	157	2.7%
Female	2,254	58	2.6%
Male	3,658	99	2.7%
<b>Other PITC</b>	6,283	107	1.7%
Female	3,582	53	1.5%
Male	2,701	54	2.0%
<b>PMTCT</b>	1,963	19	1.0%
Female	1,963	19	1.0%
<b>VMMC</b>	1,913	9	0.5%
Male	1,913	9	0.5%
<b>Grand Total</b>	<b>16,071</b>	<b>292</b>	<b>1.8%</b>

OCT '18 - JUL '19

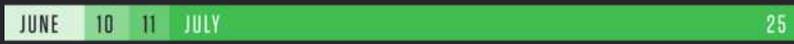
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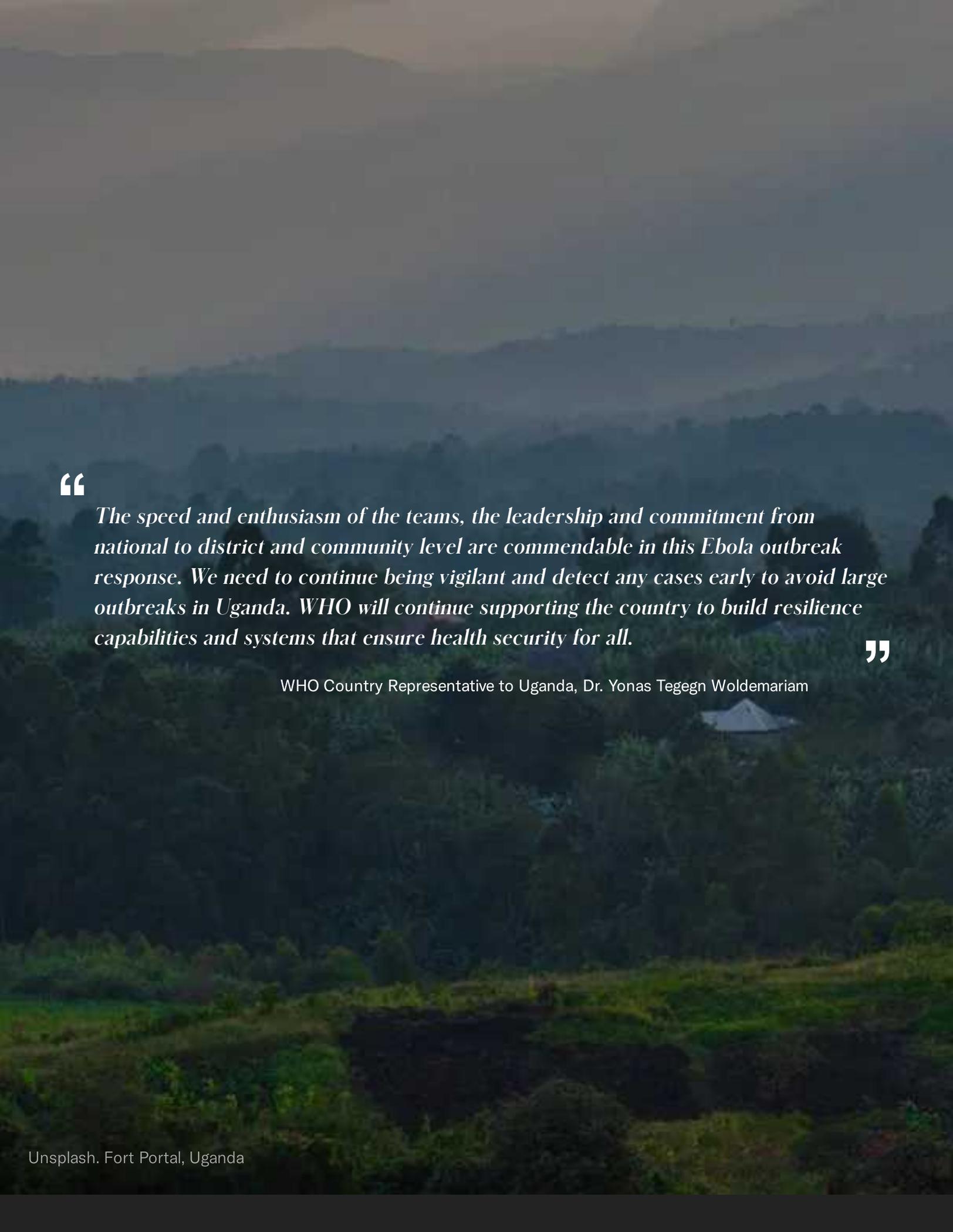
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# TIMELINE

2019



- DETECTION
- VERIFICATION
- INTERVENTION
- CONTROL



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*The speed and enthusiasm of the teams, the leadership and commitment from national to district and community level are commendable in this Ebola outbreak response. We need to continue being vigilant and detect any cases early to avoid large outbreaks in Uganda. WHO will continue supporting the country to build resilience capabilities and systems that ensure health security for all.*

”

WHO Country Representative to Uganda, Dr. Yonas Tegegn Woldemariam

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EPIDEMICS THAT DIDN'T HAPPEN

CASE STUDY:

# ANTHRAX IN KENYA

Building community trust:  
How Kenya controlled a deadly  
anthrax outbreak

## ABOUT ANTHRAX

Although anthrax is commonly associated with bioterrorism, it is an ancient disease that some scholars believe is referenced in the writings of Homer and Virgil and even the Biblical plagues of Moses,<sup>1</sup> as well as in ancient China.<sup>2</sup> Anthrax is a bacterium found naturally in soil that can infect livestock and wildlife as they graze.<sup>3</sup>

**Humans can become infected by eating infected meat**, or through a cut in the skin that becomes exposed to bacteria when slaughtering or handling animals; human-to-human transmission is uncommon.



IFRC/The Kenya Red Cross Society



**A**nthrax can cause infection in the lungs, intestines and in cuts or abrasions on the skin.<sup>4</sup> Cutaneous anthrax, the most common form of the disease in humans, causes itchy bumps or blisters that can turn into black, painless ulcers. About 20% of people afflicted with cutaneous anthrax die if they are not treated with antibiotics. However, with treatment, nearly all survive.<sup>5</sup> The World Health Organization (WHO) reports that cases of anthrax in humans dropped from as many as 20,000–100,000 a year in the 1950s to 2,000 in the 1980s due to the introduction of an animal vaccine<sup>6</sup> in the 1930s and a human vaccine in the 1950s.<sup>7</sup>

**Because early and mild symptoms can mimic other infections, the exact number of cases is likely higher than reported.**

In addition to the human health burden of anthrax, the loss of livestock due to anthrax takes a terrible toll on communities. The loss of income impairs families' ability to purchase food, health services and education. During anthrax outbreaks, livestock markets can be closed to control the spread, leading to economic losses even for farmers whose herds are not directly affected. The key to preventing anthrax in humans is controlling infection in livestock. Cases of human anthrax are now primarily reported where animal vaccination programs are inadequate.<sup>8</sup>

You can learn more about Anthrax [here](#).

# KEY PREPAREDNESS FACTORS



Risk Assessment & Planning



Emergency Response Operations



National Laboratory System



Disease Surveillance



National Legislation Policy & Financing



Human Resources



Risk Communications

## WHAT HAPPENED

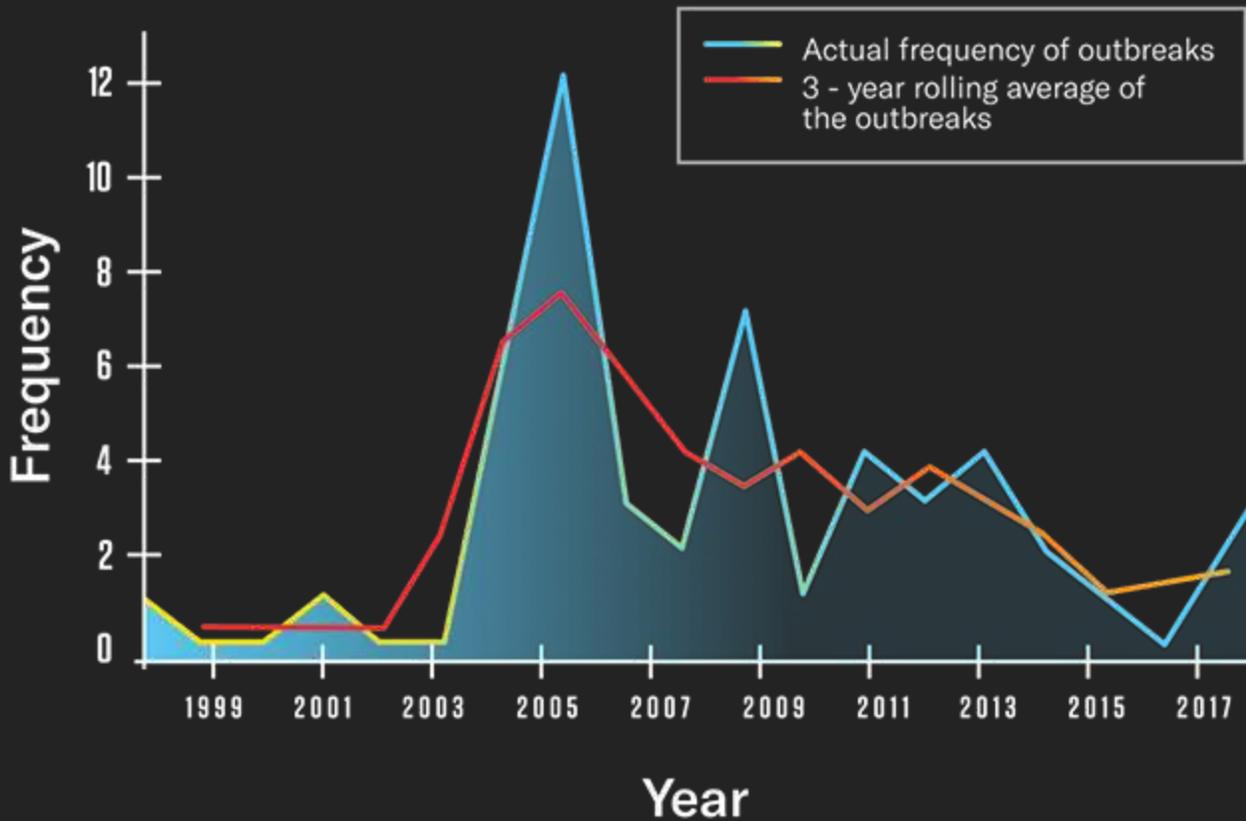
On August 15, 2019, in Narok—a town in the southwestern part of Kenya along the Great Rift Valley near the Maasai Mara National Reserve—a Red Cross volunteer received some disturbing news.

A community member shared that a local young herder and two students had eaten meat from a dead cow and were now sick. When they arrived at the nearest health facility, all three were diagnosed with anthrax.

## THE RESPONSE

The volunteer, who had recently received training from the Kenya Red Cross Society's Community-Based Surveillance system, took immediate action, sending an SMS alert to the system. The alert was received by a supervisor who notified the local health and veterinary authorities, triggering action through the government's national surveillance system.

## Anthrax Outbreaks in Wildlife in Kenya



Data Source: Cambridgecore.org

“ Through Community-Based Surveillance, our community members are now aware of basic signs of potential epidemic diseases like anthrax and they can report to us instantly so that we can upscale the case to our supervisors. Our community members are also shunning away unhealthy habits like handling dead animals since we have been creating awareness through many platforms, for example community dialogues and household visits.”

————— Red Cross CBS Volunteer



Community-based surveillance, which allows disease surveillance to happen in communities by community members, is a component of the Community Epidemic and Pandemic Preparedness Program led by the Kenya Red Cross Society, with support from the International Federation of Red Cross and Red Crescent Societies and the United States Agency for International Development (USAID). The program recognizes that information about the beginning of outbreaks often reaches standard surveillance systems late. It works to connect communities with the national health and surveillance systems, training members to participate in notification of high-risk diseases. It is simple, adaptable and low-cost.

The volunteer reported that, even though the local Maasai, a semi-nomadic herding community, was familiar with anthrax, many were skeptical of its risks. Goats and sheep in the affected area were also showing signs of illness.

The Community-Based Surveillance message led the supervisor and Government County Veterinary Officer to investigate the health of livestock in the area. Within days, the county vaccinated 10,600 cattle and 14,000 sheep in the vicinity.

**“** *By just over a month after the incident, the situation was under control after four human cases and one death, and the community was safer and better prepared than it had been before.*

**”**



IFRC/The Kenya Red Cross Society

To gain the trust and participation of local farmers, the government and Red Cross immediately convened a traditional community dialogue session. School teachers were shown how to screen potentially infected children and report any incidence of illnesses to public health officers or area volunteers. The Community Epidemic and Pandemic Preparedness Program also conducted wider health information and awareness-raising activities, such as radio broadcasts, school activities, household visits and community group education sessions. These activities improved community health knowledge and practices on safe disposal of animal carcasses, reporting unusual animal illnesses and general information on disease outbreaks. The outreach work was so successful that the community recognized the risk, prioritized mitigation efforts and has taken over financing its own animal vaccinations.

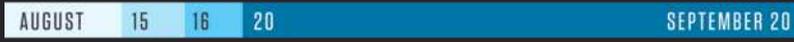
By just over a month after the incident, the situation was under control after four human cases and one death, and the community was safer and better prepared than it had been before.



IFRC/The Kenya Red Cross Society

# TIMELINE

2019



- START
- DETECTION
- VERIFICATION
- CONTROL

A woman wearing a vibrant yellow, blue, and green patterned shuka stands in the foreground on the right, looking towards a herd of cattle in a grassy field. The background shows rolling hills under a clear sky. The image is dimmed to serve as a background for text.

“

*We thank the Kenya Red Cross Society for initiating the community-based surveillance concept that has strengthened weak linkages of facility-based surveillance by capacity building. Community health volunteers do real-time reporting of potential epidemic diseases from the community.*

*This facilitates quick and timely response to save lives.*

”

County Government Disease Surveillance Official (Health sector)

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EPIDEMICS THAT DIDN'T HAPPEN

CASE STUDY:

# MONKEYPOX IN NIGERIA

Rapid response teams at the ready:  
Nigeria's approach to containing  
monkeypox

## ABOUT MONKEYPOX

Monkeypox is a rare viral disease closely related to cowpox and smallpox. Although the virus was identified in 1958 in a group of monkeys used for research, rodents and primates appear to be the main animal carriers of the virus.<sup>1</sup> The first human case was identified in 1970 in the Democratic Republic of Congo (DRC); most human cases have emerged in West and Central Africa, although outbreaks have also occurred in the United States, United Kingdom and Israel in recent years.<sup>2</sup>

NIGERIA, WEST AFRICA

While there is some human-to-human spread, the primary mode of transmission is through contact with infected animals. Symptoms include fever, rash, swollen lymph nodes and painful blisters, similar to those caused by smallpox. In severe cases, monkeypox can be fatal; it has a fatality rate of up to 11%.<sup>3</sup> **The smallpox vaccine is 85% effective against monkeypox**, but the vaccine has not been widely used since 1980, when smallpox was eradicated.<sup>4</sup> There is no other vaccine or medicine to prevent or treat monkeypox.

Although monkeypox remains rare, it has become more common since the 1980s. From 1981 to 1986, 404 cases were identified across Africa. In the DRC,<sup>5</sup> where most of the world's cases occur, there have been more than 1,000 cases per year since 2005,<sup>6</sup> and 4,594 cases were reported from January to September 2020 alone.

In severe cases, monkeypox can be fatal; it has a fatality rate of up to 11%.



## WHAT HAPPENED

**A**fter 39 years with no reported cases of monkeypox, Nigeria's largest outbreak took place in 2017.<sup>7</sup> Between 2017 and 2019, more than 300 cases were reported.<sup>8</sup> Until September 2019, most of those cases had been limited to Lagos and Delta states on the Nigerian coast.

On September 12, 2019, a suspected case of monkeypox was identified for the first time in Akwa Ibom, a state on Nigeria's eastern coast. Ten days later, the diagnosis was confirmed by laboratory testing. Although there had been monkeypox cases in surrounding states, the confirmed case, along with nine other suspected cases, were the first cases in Akwa Ibom, and authorities were alarmed about the possibility of further spread.

**Officials also moved to categorize monkeypox as an infection requiring immediate reporting to national authorities for faster alerts and response.**



## THE RESPONSE

Years of preparation by Nigeria health officials ensured that they were ready to fight the new outbreak in Akwa Ibom state. When monkeypox first reappeared in Nigeria in September 2017, the Nigerian Centre for Disease Control (NCDC) published national guidelines for outbreak response.<sup>9</sup> Officials also moved to categorize monkeypox as an infection requiring immediate reporting to national authorities for faster alerts and response. NCDC provided rapid response teams anywhere there were confirmed cases and undertook extensive communications to educate the public about the virus and its risks.<sup>10</sup>

The national rapid response team sent to assist local and state authorities joined state public health and laboratory officials to address the outbreak together. The combined team worked to identify additional cases, carried out contact tracing and supported improved surveillance, case management and sample collection methods. Poor sample collection from the initial suspected cases meant that, aside from the single positive, other test results were inconclusive. In total, the rapid response team identified eight more suspected cases, all of whom tested negative. Of the 18 total suspected cases, only one was laboratory confirmed.

# KEY PREPAREDNESS FACTORS



Risk Assessment & Planning



Emergency Response Operations



National Laboratory System



Disease Surveillance



National Legislation Policy & Financing



Human Resources



Risk Communications

The rapid response team also conducted surveys to understand awareness of monkeypox amongst clinicians in Akwa Ibom. Results showed a strong understanding of the virus and how to identify and manage it, but weakness in sample collection protocols and high levels of stigma toward patients. In response, local medical personnel were provided with training in sample collection and education to reduce stigma. Other gaps were identified at the local infectious disease hospital, and recommendations were made for further improvements. Teams also ran education campaigns to counter the stigma against infected people that was prevalent throughout the community.

The rapid response team supported the state to take full ownership of the outbreak response, improve surveillance and continue efforts to reduce stigma toward those infected with monkeypox. Further, the team urged Akwa Ibom state to more proactively ensure that cases were taken to the local infectious disease hospital, which was hindered by a lack of funds to fix a broken ambulance and the run-down state of the hospital.<sup>11</sup>



Laura Gil Martinez / IAEA. Abel Wade (left), Director of the National Veterinary Laboratory in Yaoundé, Cameroon, and Emmanuel Nakouné (right), Scientific Director at the Institut Pasteur in Bangui, Central African Republic, at the Institut Pasteur.

“ *Thanks to the swift action taken by the Ministry of Health and local authorities, the outbreak in Akwa Ibom had been contained within a month’s time.*

”



Akwa Ibom Ministry of Health

At the end of the rapid response team's visit, the Akwa Ibom state's commissioner for health communicated to the community about the outbreak, asking them to avoid contact with animals that could harbor the virus and to avoid touching anything that had been in contact with infected animals. People were also asked to self-quarantine while health officials collected samples and sent them for testing.<sup>12</sup>

The rapid response teams and the collaboration between state and national experts led to the quick and thorough outbreak response. Thanks to the swift action taken by the ministry of health and local authorities, within a month's time, the outbreak in Akwa Ibom had been contained within a month's time.

## TIMELINE

2019



● DETECTION ● VERIFICATION ● INTERVENTION ● CONTROL



“

*The ability of the state to respond quickly to this outbreak showcases what is possible when we make the right investments in public health.*

”

Dr. Nsisong Asanga, Field Epidemiologist

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COVID-19

CASE STUDY:



# COVID-19 IN MONGOLIA

Cases Overview

**25.4K** **13.3K** **56**

TOTAL CASES

RECOVERED

DEATHS

Mongolia has had fewer than 2,000 cases of COVID-19 and just two deaths, despite sharing the world's longest land border with China. The country was able to prevent the spread of COVID-19 by taking action quickly, starting with a mask order the day after the novel coronavirus was identified.

## ABOUT SARS-COV-2

**O**n December 31, 2019, a statement from the Wuhan Municipal Health Commission describing cases of pneumonia caused by an unknown virus was reported to the World Health Organization office in China.<sup>1</sup> By January 2021, COVID-19, the disease caused by SARS-CoV-2, had killed more than 2 million people and infected at least 100 million worldwide.<sup>2</sup>

SARS-CoV-2 is a novel coronavirus. Coronaviruses were identified as a cause of the common cold in humans in the 1960s but were not considered a threat to public health. While colds can sometimes cause severe illness in infants and the elderly, they did not generally pose a great danger to the general population. That changed with the emergence of severe acute respiratory syndrome (SARS) in 2002 and Middle East respiratory syndrome (MERS) in 2012, both caused by new human coronaviruses that are more lethal and can cause severe illness in normally healthy people.<sup>3</sup>

## Within two months of its discovery in Wuhan, SARS-COV-2 had proven an even more serious adversary.

By March 11, 2020, WHO had declared COVID-19 a global pandemic, prompting extreme lockdown measures and travel restrictions as the deadly disease spread all over the world. As humans had not yet encountered COVID-19, there was no natural immunity or established care protocols, and governments relied on public health and social measures such as quarantines, mask use and physical distancing to slow the spread while the scientific community rushed to develop treatments and vaccines.

Scientists were able to develop vaccines to protect against COVID-19 in less than a year. Typically, vaccine development takes five to 10 years.<sup>4</sup> Doctors have also learned to better manage patient care, which in some areas has improved life expectancy. Still, there is no cure for COVID-19, and it may take years for vaccines to reach the global population. While countries work to address major hurdles to equitable distribution of vaccines, continued public health measures are still needed to save lives.

*Disclaimer: These stories showcase various countries that executed preparedness plans to mount a strong initial response to COVID-19. As the pandemic stretches on and tests the capacities of all countries' response efforts, increased cases, deaths and response missteps may still occur.*



Staff members wear hazmat suits as they take part in a drill to prepare for the COVID-19 coronavirus in Ulaanbaatar, the capital of Mongolia on May 7, 2020. (Photo by Byambasuren BYAMBA-OCHIR / AFP) (Photo by BYAMBASUREN BYAMBA-OCHIR/AFP via Getty Images)

## WHAT HAPPENED

Along with the rest of the world, Mongolia found out about the spread of what was later discovered to be SARS-CoV-2 in China on New Year's Eve of 2019. The seriousness of the outbreak quickly became apparent to officials in Mongolia. Extensive commercial contact and air travel between the two countries posed a serious threat. Officials also recognized that even a relatively modest outbreak could overwhelm their health system, and that the limited supply of ventilators could not support a large number of patients.<sup>5</sup>

## THE RESPONSE

On January 9, the World Health Organization (WHO) announced that the cause of the viral pneumonia was a novel coronavirus.<sup>6</sup> The very next day, while many governments waited, Mongolia issued an advisory for all Mongolians to wear masks.<sup>7</sup> Within six weeks, public transport and other services were only available to those wearing masks. Officials also activated a State Emergency Committee based on a 2017 emergency preparedness law to coordinate the national response, well in advance of WHO's declaration of public health emergency.<sup>8</sup>

As the global situation rapidly worsened in January and more countries reported cases, Mongolia was quickly stepping up its control measures, restricting travel from China and isolating those traveling from countries with COVID-19 cases. Before any cases were confirmed, Mongolia cancelled celebrations of the Lunar New Year—Tsagaan Sar, the country's most important annual holiday—in late February. Travel across the country was restricted during the holiday, and again after the first domestic case of COVID-19 was detected on March 10, which also led to a closure of most businesses. Officials used broadcast television to replace in-person primary school instruction and switched to online education for universities.<sup>9</sup>

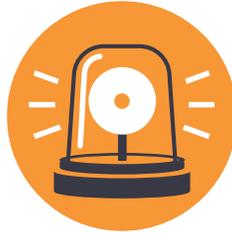


© Global Press Journal/Dolgormaa Sandagdorj  
Mongolian students adjust to remote learning

# KEY PREPAREDNESS FACTORS



Risk Assessment & Planning



Emergency Response Operations



National Laboratory System



Disease Surveillance



National Legislation Policy & Financing



Human Resources



Risk Communications

Mongolia's leaders kept the public informed via text messages and daily updates to the nation on all broadcast media; clear and accurate information came from one source, eliminating undue confusion. Other response measures included an extensive contact tracing system, quarantining and testing all travelers, random community testing, walk-up testing clinics and the creation of isolation and quarantine camps—all set up in the month of February, before the country's first case. The camps were created as it was not possible for many to quarantine at home. Those suspected of having COVID-19 and those who had been close contacts with confirmed COVID-19 cases were required to stay in the camps for monitoring. All COVID-related health care was provided free of charge, apart from charges for meals.<sup>10</sup>

The risk-based early response efforts prepared the country to suppress potential outbreaks. In early March, a French national was found to have broken his quarantine and subsequently tested positive for the virus after showing symptoms of COVID-19. From the announcement of his positive test on March 10, it took only six days for all 181 of the patient's contacts to be traced, tested and quarantined.<sup>11</sup>



Unsplash. Mongolie Sunrise over the yurts - Mongolia

“ *Here’s the thing: we don’t actually have a great public health system. That’s why our administrators were so afraid of COVID-19. We don’t have many respirators, for example.* ”

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Davaadorj Rendoo, epidemiologist at the National Center for Public Health of Mongolia,  
as quoted in *Technology Review*

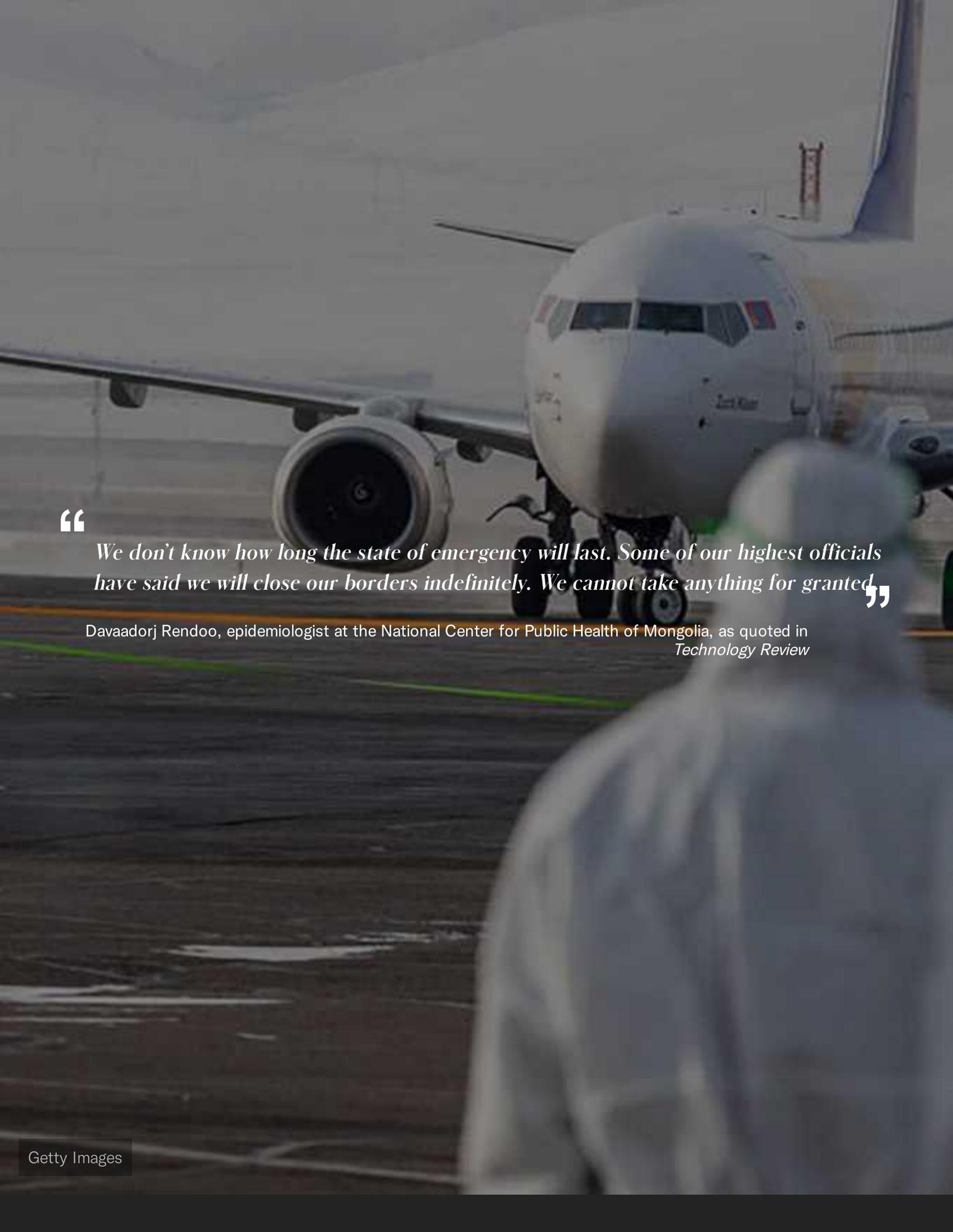


Unsplash. Ulaanbaatar, Mongolia

Although cases of COVID-19 have increased—most recently after an infected truck driver entered the country from Russia—as of February 2021, transmission remained limited. The total number of cases remains under 2,000 out of a population of over 3 million, with two deaths.<sup>12</sup>

Strict control of disease outbreaks can have negative social and economic impacts, and Mongolia has been criticized for not always striking the correct balance, with particular concerns about restrictions of civil liberties. These frustrations led to protests that prompted the resignation of many Mongolian leaders, including the prime minister, in early 2021.<sup>13, 14</sup>

Although the response has faced difficulties, Mongolia's immediate actions to address the outbreak including recommending masks, setting up facilities for quarantine and isolation, scaling up hospital capabilities, creating a robust contact tracing system and scaling up testing—all in the first months of the outbreak— have helped the country to avoid widespread cases and, critically, to record only two deaths.<sup>15</sup>



“  
*We don't know how long the state of emergency will last. Some of our highest officials have said we will close our borders indefinitely. We cannot take anything for granted,*”

Davaadorj Rendoo, epidemiologist at the National Center for Public Health of Mongolia, as quoted in  
*Technology Review*

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COVID-19

CASE STUDY:

**RESOLVE**  
TO SAVE LIVES  
AN INITIATIVE OF VITAL STRATEGIES

# COVID-19 IN SENEGAL

Cases Overview

**39.8K**   **38.6K**   **1.1K**

TOTAL CASES

RECOVERED

DEATHS

When COVID-19 arrived in Senegal from travelers returning from Europe, the country was ready with a plan—having spent years running simulations to prepare for just such an outbreak. Quick action by the government, supported by effective public communications, has produced impressive results and saved many lives.

## ABOUT SARS-COV-2

**O**n December 31, 2019, a statement from the Wuhan Municipal Health Commission describing cases of pneumonia caused by an unknown virus was reported to the World Health Organization office in China.<sup>1</sup> By January 2021, COVID-19, the disease caused by SARS-CoV-2, had killed more than 2 million people and infected at least 100 million worldwide.<sup>2</sup>

SARS-CoV-2 is a novel coronavirus. Coronaviruses were identified as a cause of the common cold in humans in the 1960s but were not considered a threat to public health. While colds can sometimes cause severe illness in infants and the elderly, they did not generally pose a great danger to the general population. That changed with the emergence of severe acute respiratory syndrome (SARS) in 2002 and Middle East respiratory syndrome (MERS) in 2012, both caused by new human coronaviruses that are more lethal and can cause severe illness in normally healthy people.<sup>3</sup>

**Within two months of its discovery in Wuhan, SARS-COV-2 had proven an even more serious adversary.**

By March 11, 2020, WHO had declared COVID-19 a global pandemic, prompting extreme lockdown measures and travel restrictions as the deadly disease spread all over the world. As humans had not yet encountered COVID-19, there was no natural immunity or established care protocols, and governments relied on public health and social measures such as quarantines, mask use and physical distancing to slow the spread while the scientific community rushed to develop treatments and vaccines.

Scientists were able to develop vaccines to protect against COVID-19 in less than a year. Typically, vaccine development takes five to 10 years.<sup>4</sup> Doctors have also learned to better manage patient care, which in some areas has improved life expectancy. Still, there is no cure for COVID-19, and it may take years for vaccines to reach the global population. While countries work to address major hurdles to equitable distribution of vaccines, continued public health measures are still needed to save lives.

*Disclaimer: These stories showcase various countries that executed preparedness plans to mount a strong initial response to COVID-19. As the pandemic stretches on and tests the capacities of all countries' response efforts, increased cases, deaths and response missteps may still occur.*



A woman protects herself while passing through an informal market after bulldozers cleared it ahead of disinfecting in the popular Medina neighbourhood in Dakar on March 22, 2020. - The Senegalese government wanted to be firm on Saturday in the fight against the new coronavirus, ruling out "all tolerance" in the face of violators of established rules, including the ban on assemblies, in a country which has reached nearly 60 confirmed cases. (Photo by JOHN WESSELS / AFP)

## WHAT HAPPENED

When Senegalese officials learned of the mysterious viral pneumonia reported in China, there was great worry given the limited health resources in Senegal, where there were only seven doctors for every 100,000 citizens.<sup>5, 6</sup> On March 2, the first case of COVID-19 was confirmed in the country. A Frenchman who lived in Dakar returned in late February from a ski vacation in the Alps with symptoms including headache, sore throat and fever,<sup>7</sup> quickly confirmed to be COVID-19. The deadly virus had arrived in Senegal.

## THE RESPONSE

In the days following the first case, several more quickly emerged among people traveling to Senegal from Europe: a second Frenchman, a Briton<sup>8</sup> and a Senegalese man returning from Italy. Several people with COVID-19 infected family members, quickly increasing the number of cases.<sup>9</sup>

The country was prepared. Senegal's Health Emergency Operations Center, set up in response to the 2014-2016 West African Ebola outbreak in nearby countries, had been running regular outbreak response simulations for years.<sup>10, 11</sup> In January, when COVID-19 first emerged as a threat, the center began assessing the country's preparedness and supporting improvements based on that assessment.<sup>12</sup>

Key to Senegal's ability to detect early cases was its emphasis on testing. The Institut Pasteur Dakar was instrumental in scaling up testing capabilities. By February, it was one of two labs in Africa able to test for SARS-CoV-2, and its experts subsequently trained many other labs across the continent.<sup>13</sup> Critically, test results in Senegal are returned within 24 hours. This has been accomplished by setting up 24-hour labs across the country to expand testing. Senegal has also created digital platforms to deliver results.<sup>14</sup>



Unsplash. Outbreak response in action: Centers for Disease Control and Prevention (CDC) staff support the 2019 nCoV response in the CDC's Emergency Operations Center (EOC).

# KEY PREPAREDNESS FACTORS



Risk Assessment & Planning



Emergency Response Operations



National Laboratory System



Disease Surveillance



National Legislation Policy & Financing



Human Resources



Risk Communications

For those testing positive, the government guaranteed a hospital bed (later moving to home-based care for less serious cases),<sup>15</sup> while those who required quarantine after exposure were housed in hotels and provided with meals. Potential cases were quickly identified by contact tracers who followed up every case to stop further spread.<sup>16</sup>

As transmission continued throughout March, the president issued a series of orders closing schools, canceling religious festivals, closing houses of worship and many businesses and putting in place international and regional travel restrictions.<sup>17, 18, 19</sup> The orders culminated in the declaration of a state of emergency, which imposed a nighttime curfew as well as a requirement to wear masks<sup>20</sup> outside the home.<sup>21</sup> (This requirement was relaxed as cases diminished, but it was reinstated in January 2021 due to a dramatic increase in cases.)<sup>22</sup>



Unsplash. "Dakar Senegal - Looking North" by Jeff Attaway is licensed with CC BY 2.0.

“ *Senegal, like all other countries in sub-Saharan Africa, is used to managing outbreaks and has the experience and capacity to respond.... The experience gained from the Ebola outbreak has been useful in triggering preparedness and response interventions.*

”

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Dr. Lucile Imbuoa, Senegal country coordinator at the World Health Organization, as quoted in *Devex*



Mike Aleo. Dakar, Senegal

Supporting these efforts was a comprehensive communications plan that focused on transparently sharing information with the public via a variety of channels, including Facebook, radio and television. As a part of the strategy, government authorities took steps to tailor messaging as they rolled out their mask mandate, working with anthropologists and communications experts to understand attitudes about mask-wearing. Officials also worked with local leaders, women's groups and traditional storytellers to disseminate messages to the community, in person and over the radio.

At the national level, the government provided daily updates on the status of COVID-19 and supported programming to educate the populace about COVID-19.<sup>23</sup> Clear communication was credited with the high levels of public support for measures taken to control the outbreak.<sup>24</sup>

The response in Senegal was so effective that it was ranked second out of 36 countries evaluated by Foreign Policy Magazine.<sup>25</sup> When the state of emergency was lifted in late June, it did not lead to an immediate spike in cases as other countries have seen.<sup>26</sup>

Like any country responding to a public health crisis, Senegal has tried to balance measures strict enough to contain the disease with civil liberties and the need to offset response measures through strategies to mitigate social disruption. Concerns around violations have led to protests.<sup>27</sup>

Despite these difficulties, Senegal's response has been remarkably effective at preventing COVID-19 fatalities, with only 4.76 deaths per 100,000 population as of February 16, 2021, compared to 177 in the UK.<sup>28</sup>



“  
*[Senegal deserves] to be in the pantheon of countries that have ... responded well to this crisis, even given its low resource base.*  
”

Judd Devermont, director of the Africa program at the Center for Strategic and International Studies, as quoted in *USA Today*

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COVID-19

CASE STUDY:

RESOLVE  
TO SAVE LIVES  
AN INITIATIVE OF VITAL STRATEGIES

# COVID-19 IN VIETNAM

Cases Overview

2.8K

TOTAL CASES

2.5K

RECOVERED

35

DEATHS

When SARS-CoV-2 arrived in Vietnam in late January 2020, the government was ready to respond based on weeks of intensive preparations, underpinned by years of proactive work to build effective outbreak response systems and work towards a universal healthcare system.

## ABOUT SARS-COV-2

**O**n December 31, 2019, a statement from the Wuhan Municipal Health Commission describing cases of pneumonia caused by an unknown virus was reported to the World Health Organization office in China.<sup>1</sup> By January 2021, COVID-19, the disease caused by SARS-CoV-2, had killed more than 2 million people and infected at least 100 million worldwide.<sup>2</sup>

SARS-CoV-2 is a novel coronavirus. Coronaviruses were identified as a cause of the common cold in humans in the 1960s but were not considered a threat to public health. While colds can sometimes cause severe illness in infants and the elderly, they did not generally pose a great danger to the general population. That changed with the emergence of severe acute respiratory syndrome (SARS) in 2002 and Middle East respiratory syndrome (MERS) in 2012, both caused by new human coronaviruses that are more lethal and can cause severe illness in normally healthy people.<sup>3</sup>

## Within two months of its discovery in Wuhan, SARS-COV-2 had proven an even more serious adversary.

By March 11, 2020, WHO had declared COVID-19 a global pandemic, prompting extreme lockdown measures and travel restrictions as the deadly disease spread all over the world. As humans had not yet encountered COVID-19, there was no natural immunity or established care protocols, and governments relied on public health and social measures such as quarantines, mask use and physical distancing to slow the spread while the scientific community rushed to develop treatments and vaccines.

Scientists were able to develop vaccines to protect against COVID-19 in less than a year. Typically, vaccine development takes five to 10 years.<sup>4</sup> Doctors have also learned to better manage patient care, which in some areas has improved life expectancy. Still, there is no cure for COVID-19, and it may take years for vaccines to reach the global population. While countries work to address major hurdles to equitable distribution of vaccines, continued public health measures are still needed to save lives.

*Disclaimer: These stories showcase various countries that executed preparedness plans to mount a strong initial response to COVID-19. As the pandemic stretches on and tests the capacities of all countries' response efforts, increased cases, deaths and response missteps may still occur.*



Unsplash Ho Chi Minh City, Ho Chi Minh City, Vietnam  
Life goes on in covid-free Vietnam

## WHAT HAPPENED

On January 22, 2020, a 65-year-old Chinese man and his son, both residents of Vietnam, arrived at Cho Ray Hospital, the largest hospital in Vietnam, with concerning symptoms. The man had recently traveled to Wuhan, China, with his wife. Upon their return home to Ho Chi Minh City, Vietnam, the couple visited their son and traveled to four different cities using various forms of transportation.<sup>5, 6</sup> Swabs of both father and son came back positive for the novel coronavirus, and health officials worried about what this would mean for the spread of the virus in Vietnam. On January 23, 2020, the day the two men tested positive, three Vietnamese women returning from a business trip to Wuhan arrived at two different hospitals presenting with COVID-19 symptoms; all eventually tested positive.<sup>7</sup> COVID-19 had arrived in Vietnam.

## THE RESPONSE

Hospitals in Vietnam were prepared to treat COVID-19 patients when they began to arrive on January 22 and 23. When the first cases of viral pneumonia were reported in China on New Year's Eve of 2019, Vietnamese officials worried that the disease could be similar to severe acute respiratory syndrome (SARS) and began immediate preparations to respond. Just over two weeks later, on January 16, the government released a COVID-19 response plan and by January 20, hospitals were preparing to properly isolate, treat and manage patients. The next day, national surveillance guidelines for COVID-19 were published and a week later, a national committee was launched to manage a "whole of government" strategy.

As a result, when hospitals saw the first patients, appropriate isolation measures were quickly taken. Hospitals outfitted workers in personal protective equipment from a robust stockpile. At the start of COVID-19, Vietnam already had 12,000 trained contact tracers, compared with only 2,200 in the United States, a country with more than three times the population.<sup>8</sup> As a result, when patients tested positive, contacts were quickly traced, quarantined and tested, keeping cases from spiraling out of control.<sup>9</sup>



Unsplash. Hanoi, Vietnam Hanoi train street

# KEY PREPAREDNESS FACTORS



**Risk Assessment & Planning**



**Emergency Response Operations**



**National Laboratory System**



**Disease Surveillance**



**National Legislation Policy & Financing**



**Human Resources**



**Risk Communications**

The success of Vietnam's response was not just attributable to quick action in January. Vietnam had spent years preparing for a disease outbreak, increasing per capita health spending by 9% per year since 2000. This was not the country's first experience with a novel coronavirus, as Vietnam had been badly affected by the 2002—2003 SARS outbreak. Vietnam was the second country to be impacted by SARS, which infected 63 health care workers, resulting in five deaths. But thanks to quick action by the government, Vietnam was the first country to stem the outbreak.<sup>10</sup> The government's response to SARS became the foundation for a game plan for future outbreaks and prompted the government to build a national disease surveillance system and national public health operations center. By 2016, hospitals across the country were tracking events in real time, reporting potentially dangerous diseases to national authorities within 24 hours of detection.<sup>11</sup>



Unsplash Ho Chi Minh, Ho Chi Minh City, Vietnam. A man with a face mask on the street.

“ *Thanks to its years of epidemic preparedness and commitment to saving lives, Vietnam is one of the countries with the fewest COVID-19 cases and deaths in the world.*

”



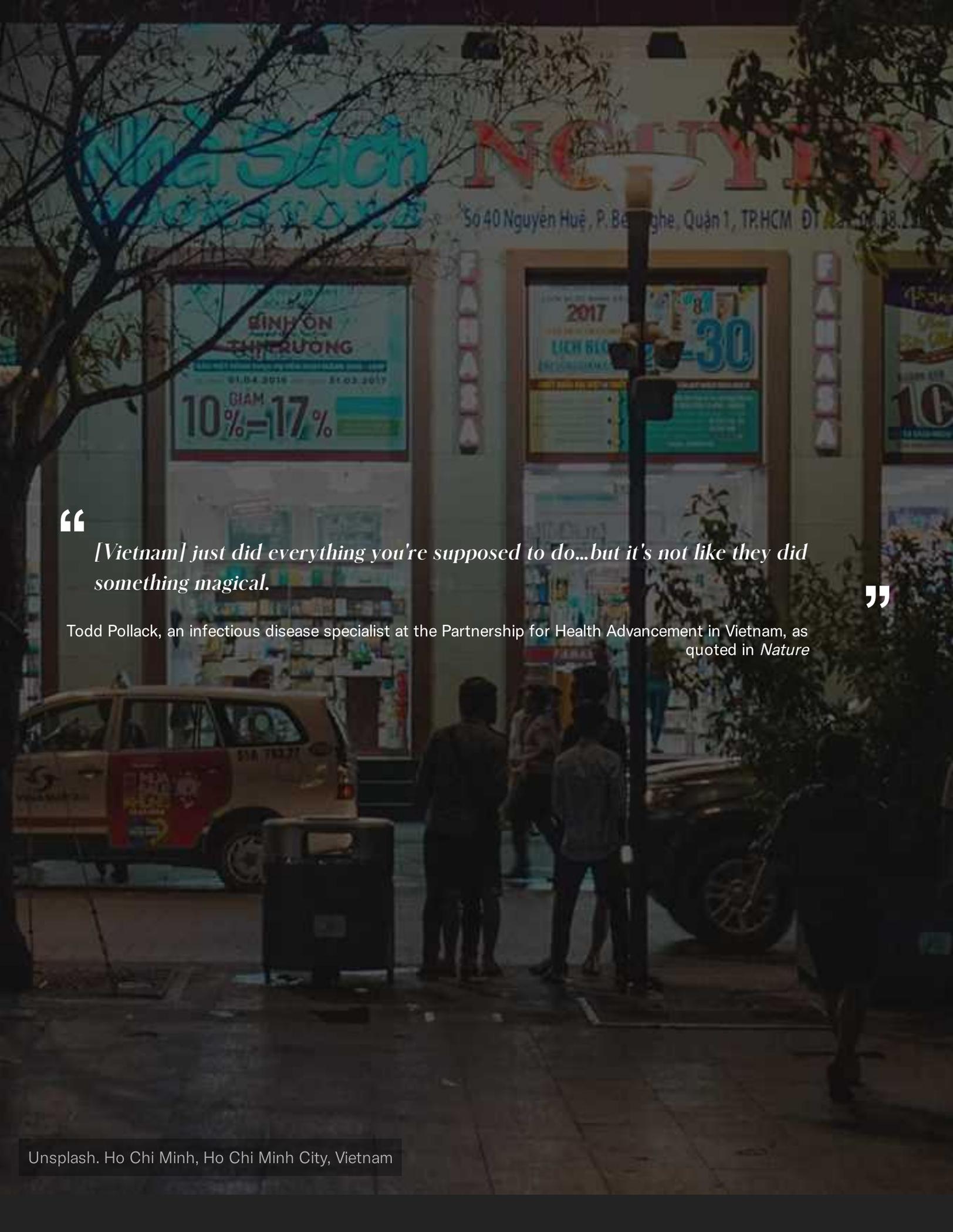
Residents wearing face masks practise social distancing as they stand in a queue for free rice at the St. Joseph's cathedral in the old quarters of Hanoi on April 27, 2020, after Vietnam eased its nationwide social isolation effort to prevent the spread of the COVID-19 novel coronavirus. - Vietnam eased social distancing measures on April 23, with experts pointing to a decisive response involving mass quarantines and expansive contact tracing for the apparent success in containing the coronavirus.

In its response to COVID-19, Vietnamese officials stated that the response would prioritize saving lives above economic impacts. This policy led to a cascade of effective policies. In January 2020, government officials met with test makers to encourage development of COVID-19 tests; between early February and early March, multiple locally developed tests were released. Testing scaled up quickly, expanding from two sites in January to 120 by May.

Vietnam instituted effective contact tracing policies that identified close contacts, who were isolated at hospitals if positive or quarantined at government facilities for 14 days if negative. To carry out effective contact tracing, public health officials coordinated with the military and other civil servants and localities. To ensure widespread access to care, all COVID-related health care has been provided free of charge.<sup>12</sup>

Despite keeping COVID-19 largely contained throughout the country, cases began to emerge in Da Nang in July, signaling that the virus had been spreading locally without detection for some time.<sup>13</sup> The outbreak prompted a reinforcement of successful policies—social distancing, mask-wearing, bans on public gatherings, travel restrictions, contact tracing and testing. After mask-wearing fell to 35% in late July, following the relaxation of efforts due to the initial success of the COVID-19 response, it increased to 90% by early August.<sup>14</sup> As Da Nang is a popular vacation destination, more than one million people who had traveled there in July were identified for tracing in provinces across Vietnam. Officials also locked down the local hospital and set up field hospitals to manage care while testing one person from each of 70,000 households. In all, 550 cases were identified from July 23 to September 2, when the local outbreak was declared over.

Despite setbacks and local flare ups, Vietnam has had fewer than 1,600 COVID-19 cases as of January 26, 2021, and 35 COVID-19 deaths (all of which occurred during the Da Nang outbreak). Thanks to its years of epidemic preparedness and commitment to saving lives, Vietnam is one of the countries with the fewest COVID-19 cases and deaths in the world.



“

*[Vietnam] just did everything you're supposed to do...but it's not like they did something magical.*

”

Todd Pollack, an infectious disease specialist at the Partnership for Health Advancement in Vietnam, as quoted in *Nature*

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COVID-19

CASE STUDY:

RESOLVE  
TO SAVE LIVES  
AN INITIATIVE OF BIAL, STRONGID

AFRICA CDC  
Leading the Way

# COVID-19 IN AFRICA

Cases Overview

**4.5M**   **4M**   **118.5K**

TOTAL CASES   RECOVERED   DEATHS

Built on a commitment to collaboration over competition, swift action from Africa Centres for Disease Control and Prevention (Africa CDC) and political coordination led by the African Union helped galvanize a continent-wide response to COVID-19, dramatically expanding public health capacity and saving countless lives.

## ABOUT SARS-COV-2

**O**n December 31, 2019, a statement from the Wuhan Municipal Health Commission describing cases of pneumonia caused by an unknown virus was reported to the World Health Organization office in China.<sup>1</sup> By January 2021, COVID-19, the disease caused by SARS-CoV-2, had killed more than 2 million people and infected at least 100 million worldwide.<sup>2</sup>

SARS-CoV-2 is a novel coronavirus. Coronaviruses were identified as a cause of the common cold in humans in the 1960s but were not considered a threat to public health. While colds can sometimes cause severe illness in infants and the elderly, they did not generally pose a great danger to the general population. That changed with the emergence of severe acute respiratory syndrome (SARS) in 2002 and Middle East respiratory syndrome (MERS) in 2012, both caused by new human coronaviruses that are more lethal and can cause severe illness in normally healthy people.<sup>3</sup>

## Within two months of its discovery in Wuhan, SARS-COV-2 had proven an even more serious adversary.

By March 11, 2020, WHO had declared COVID-19 a global pandemic, prompting extreme lockdown measures and travel restrictions as the deadly disease spread all over the world. As humans had not yet encountered COVID-19, there was no natural immunity or established care protocols, and governments relied on public health and social measures such as quarantines, mask use and physical distancing to slow the spread while the scientific community rushed to develop treatments and vaccines.

Scientists were able to develop vaccines to protect against COVID-19 in less than a year. Typically, vaccine development takes five to 10 years.<sup>4</sup> Doctors have also learned to better manage patient care, which in some areas has improved life expectancy. Still, there is no cure for COVID-19, and it may take years for vaccines to reach the global population. While countries work to address major hurdles to equitable distribution of vaccines, continued public health measures are still needed to save lives.

*Disclaimer: These stories showcase various countries that executed preparedness plans to mount a strong initial response to COVID-19. As the pandemic stretches on and tests the capacities of all countries' response efforts, increased cases, deaths and response missteps may still occur.*



## WHAT HAPPENED

Leaders of African Union member states watched warily as COVID-19 cases spread across the world in early 2020. Many African countries had fragile health systems, already burdened with major infectious disease epidemics of HIV, tuberculosis and malaria, along with occasional outbreaks of diseases such as Ebola and yellow fever. Managing COVID-19 would put further pressure on health care systems and force countries to compete for resources. On February 14, Egyptian authorities reported the first case of COVID-19 in Africa. An effective response was urgently needed to avoid tragedy on the continent.

## THE RESPONSE

Although African countries individually prepared to tackle COVID-19, the leadership at Africa CDC recognized that a continent-wide response would be necessary to support state-level efforts and mobilize resources most effectively. Africa CDC—the public health arm of the African Union—had been launched just three years earlier to help increase African countries' abilities to detect, prevent and respond to disease threats quickly and effectively. Although Africa CDC had already supported responses to several outbreaks, COVID-19 presented the first pandemic that would impact the entire continent.

By the time that first case arrived on the continent in February, Africa CDC had already taken a critical step: they had activated their emergency management system on January 27, enabling evaluation and planning to begin in earnest as cases spread across the world.<sup>5</sup> Although many countries had systems in place to address disease outbreaks, COVID-19 presented particular difficulties. Only two countries were capable of testing for the virus—South Africa and Senegal—and many would face shortages of critical supplies, including personal protective equipment, ventilators, medical staff and contact tracers.



# KEY PREPAREDNESS FACTORS



Risk Assessment & Planning



Emergency Response Operations



National Laboratory System



Disease Surveillance



National Legislation Policy & Financing



Human Resources



Risk Communications

As Africa CDC staff identified gaps and prepared to support countries, they also worked with the highest levels of political leadership on the continent to ensure a coordinated response. By March, a continent-wide strategy devised by Africa CDC for managing the COVID-19 pandemic had been agreed to by all African heads of state.<sup>6</sup> This allowed for a coordinated response across the continent, led by Africa CDC, with the benefits of country cooperation, instead of the competition that many countries elsewhere struggled with.

The strategy was clear: quick diagnosis and isolation of positive cases, quarantine of contacts, social distancing, effective public communications, reinforced infection prevention and control in hospitals and access to tools to treat severe cases. Drawing on experts from across the continent, along with WHO officials and external partners, Africa CDC established working groups to tackle each area.



African Union's Centers for Disease Control and Prevention (Africa CDC), director Dr. John Nkengasong speaks during a press briefing on the coronavirus cases in Africa, on March 10, 2020, in Addis Ababa, Ethiopia. Africa CDC

“ *The greatest success is the political backup of the leaders of this continent who have understood that they need this kind of institution [Africa CDC] to overcome the health challenges they are facing on the continent.* ”

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Dr. Benjamin Djoudalbaye, Head, Division of Policy, Health Diplomacy and  
Communication at Africa CDC

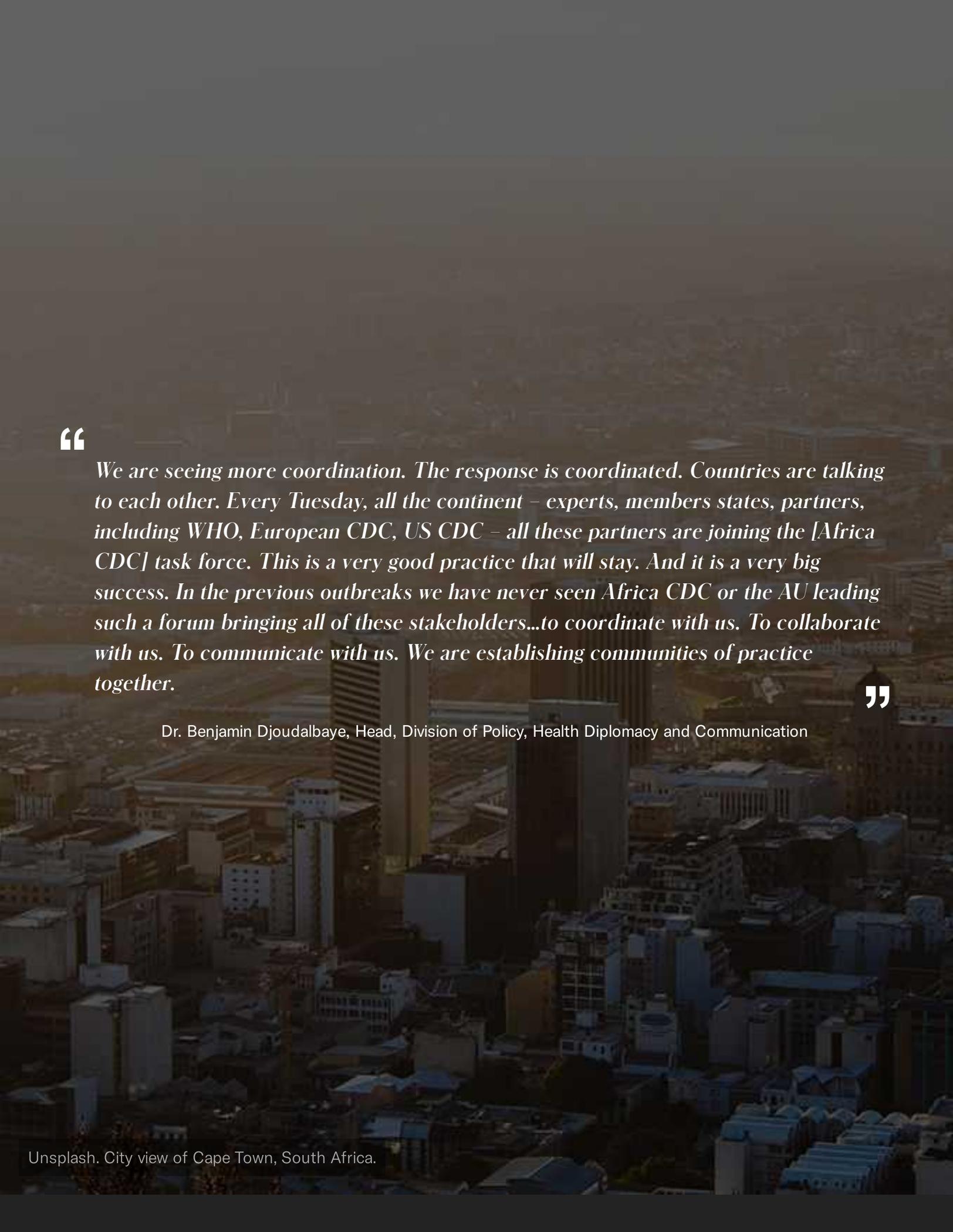


A staff member of the Ministry of Health measures the temperature of drivers and passengers during the testing of the COVID-19 Coronavirus on the highway in Nakuru, Kenya, on March 31, 2020. Africa CDC

While the pandemic is not over yet, the African continent has seen many successes. Between February and April 2020, tens of thousands of clinicians and community health care workers were trained in the management of COVID-19. Testing capacity was expanded from two countries to 43, with nearly 20,000 lab staff trained and equipment previously used for HIV and tuberculosis testing repurposed for COVID-19.<sup>7</sup> Africa CDC worked with countries to unite disparate disease surveillance systems, creating a continent-wide view of COVID-19 infections.<sup>8</sup> Further, a pooled procurement system was established to reduce the cost of medical equipment. As vaccines have been approved, Africa CDC has worked to speed procurement. Through the committees established under the continent-wide cooperation strategy, experts regularly exchange data and share best practices.

Much of the success to date began with preparation. Lessons learned from past epidemics, such as Ebola, made possible a swift and coordinated response to COVID-19. **When the virus arrived on the continent, Africa CDC had already established regional coordinating centers, increased lab capacity and unified surveillance networks.** In 2015, African heads of state and government established the Africa Volunteer Health Corps, with responders that could be deployed in less than 72 hours during disease outbreaks and other health emergencies. As of now, 196 have now been sent across Africa to support responses. In addition, Africa CDC established the Pathogen Genomics Intelligence Institute, capable of sequencing viral genomes to track the evolution of COVID-19 variants. Initially, the target was to have these centers in three countries; currently there are centers in 16 countries, with ambitions to expand further still.

The work Africa CDC undertook from its inception, from investments in lab systems to clinical trainings, along with a fast response based on the principle of cooperation, has proven to be effective. The focus on collaboration over competition allowed countries to focus their energy on response activities. **To date, the entirety of Africa has seen just over 100,000 COVID-19 deaths, a fifth of the death toll of the United States, despite having more than three times the population.** While emerging variants in South Africa and elsewhere remain a threat, and Africa CDC warns against declaring victory too early, it is clear that the coordinated response spurred by Africa CDC has saved lives while better preparing the continent to address future outbreaks.



“

*We are seeing more coordination. The response is coordinated. Countries are talking to each other. Every Tuesday, all the continent – experts, members states, partners, including WHO, European CDC, US CDC – all these partners are joining the [Africa CDC] task force. This is a very good practice that will stay. And it is a very big success. In the previous outbreaks we have never seen Africa CDC or the AU leading such a forum bringing all of these stakeholders...to coordinate with us. To collaborate with us. To communicate with us. We are establishing communities of practice together.*

”

Dr. Benjamin Djoudalbaye, Head, Division of Policy, Health Diplomacy and Communication

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EPIDEMICS THAT DIDN'T HAPPEN

# CONCLUSION

COVID-19, Ebola, measles—each of these diseases has dominated the headlines in recent years.

North  
Atlantic  
Ocean

**T**hese epidemics have impacted large numbers of people, caused many deaths and spread in multiple countries. But just as important are the ones you never heard about. Between 1980 and 2013, there were more than 12,000 outbreaks<sup>1</sup> of human infectious diseases in 219 countries.<sup>2</sup> As the examples in this report demonstrate, many of these were successfully controlled—some before they even became news. These are the **Epidemics That Didn't Happen**.

And yet, when COVID-19 hit, the world was not ready. COVID-19 revealed gaps in how we think about and measure epidemic preparedness. Some countries struggled despite having stronger preparedness systems by traditional metrics, while others with weaker systems managed strong responses. Key factors not captured in traditional metrics of epidemic preparedness—strong and timely policies, good communication and quality of governance—were decisive.

Preparation is key, but  
failure to act can be deadly.

In moments of public health crisis, communicating clearly and effectively, while working collaboratively with partners and communities, can make an incredible impact on the response.

Overall, countries that have been most successful in controlling COVID-19 were both better prepared and had strong governance during their pandemic response. **Both are needed to save lives.**



Photo by JOHN WESSELS/AFP via Getty Images

A public health crisis, on top of the lives lost, can cost billions and devastate economies when countries are unprepared. Estimates of the economic impact of the COVID-19 pandemic reach up to more than \$33 trillion. Dramatically increasing investments in preparedness won't be cheap—one recent estimate suggested that it could cost from \$20 to \$40 billion annually. But this would be cost-effective even if these investments don't fully stop future epidemics.<sup>3</sup>



Pandemic Crowds, Macau, China (Unsplash)

**“** *Preventing epidemics requires a commitment from all of society, from governments to fund public health, from politicians to support public health, and from the public to be involved.* **”**

—— Dr. Tom Frieden, President and CEO of Resolve To Save Lives

It has also become clear that the focus cannot solely be on low- and middle-income countries. After all, competent leadership in many low- and middle-income countries, particularly in Africa and Asia, has kept COVID-19 under far better control than in most of the world. The most striking failures in addressing COVID-19 have come from high-income countries such as the United States and some European countries.



Unsplash. COVID-19 testing.

The case studies explored in **Epidemics that Didn't Happen** show that devastating human and economic losses can be avoided. Modest investments, improved health systems and better coordination and communication by determined leaders can put structures in place to find, stop and prevent outbreaks before they spread. Leaders around the world must:

- Increase prioritization of and sustained investment in countries' ability to prepare AND respond;
- Recognize and emulate strong examples set by countries around the world; and
- Prioritize timeliness of early warning and response systems.

The COVID-19 pandemic has reinforced the need to work together—the reality that we are all connected.

**Going forward, we must not only fill the gaps in country preparedness, but also incorporate improved means to assess, and more importantly, improve, governance for current and future public health emergencies.**



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