

Updates from the Field

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Making a Difference During a Pandemic

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Division of Global Health Protection

Accessible Version: <https://www.cdc.gov/globalhealth/healthprotection/fieldupdates/2021/index.html>



**U.S. Department of
Health and Human Services**
Centers for Disease
Control and Prevention

Photo: Chung H. (Ken) Chen/CDC

Message from the Director



Photo: Peter Thompson, La Crosse Tribune

The COVID-19 pandemic demonstrates the stark reality that a health threat anywhere is a health threat everywhere.

Until every country has the capacity to prevent, detect, and respond to health threats, we are all vulnerable.

Now more than ever, we live in an interconnected world where disease threats such as Ebola, measles, and COVID-19 spread faster and more unpredictably. Health threats have a profound impact on economic and political systems and weaken the social fabric of every nation.

As I reflect on 2021, and the challenges we faced amidst the ongoing COVID-19 pandemic and other public health threats, I am also reminded of the advances we made. For more than 30 years, our division has worked with ministries of health and partners worldwide to strengthen existing public health systems and help close gaps in global health security.

Through our Field Epidemiology Training Program we have helped train more than 19,000 disease detectives to collect, analyze, and interpret data and respond to outbreaks before they spread. We also established in-country rapid response teams and emergency operations centers to respond to disease outbreaks and other public health crises such as the 2021

Haiti earthquake that displaced more than 38,000 people from their homes, damaged or destroyed approximately 90 health centers in southwestern Haiti, and disrupted access to clean water. In addition, we have developed and strengthened over 30 National Public Health Institutes—CDC-like science-driven institutions that lead essential public health functions.

This issue of Updates from the Field highlights some of DGHP's 2021 successes, emphasizing the importance of investing in public health systems to advance global health security and respond to COVID-19 and other crises. For example, during the 2014–2016 Ebola epidemic, Guinea did not have a national Emergency Operations Center (EOC) network. By 2021, because of Global Health Security Agenda funding, Guinea's EOC network had the capacity to simultaneously coordinate responses to polio, measles, yellow fever, COVID-19, and Ebola—and activate within 24 hours of each emergency declaration.

This issue also provides a glimpse into the pivotal role our experts played supporting the Government of India's scale-up of laboratory capabilities. Our experts participated in national and sub-national level advisory and expert committee groups and contributed to the rapid expansion of SARS-COV-2 testing. These efforts were critical to India mitigating COVID-19's second wave. Although we've made significant strides, we must remain vigilant in our pursuit of global health security. We will continue to leverage resources, so countries are better positioned to respond to emerging health threats. I am confident that by working together, we will come out stronger as a nation and a people.



RADM Nancy Knight, MD

Director, Division of Global Health Protection
Center for Global Health

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CDC Experts and Partners Unite to Respond to Haiti Earthquake Amidst COVID-19 Pandemic



During the pandemic, other public health threats do not wait to strike. Disease outbreaks and natural disasters may overlap, disrupting the public health system, devastating economies, and threatening the social fabric of communities. On August 14, 2021, a 7.2 magnitude earthquake struck Haiti's southwestern region, killing more than 2,240, injuring approximately 12,700, and threatening the country's health security. CDC immediately activated an Incident Management System (IMS)—a temporary, formal organization structure to coordinate an emergency response — and recruited experts from across the agency to respond to the earthquake. By leveraging existing President's Emergency Plan for AIDS Relief (PEPFAR) agreements alongside global health security (GHS) investments, CDC collaborated with in-country partners, the Ministry of Public Health and Population (MSPP), the Haitian directorate for potable water and sanitation (DINEPA), and the National Public Health Laboratory (LNSP). Together, they quickly responded to lead the earthquake response without neglecting other public health priorities in Haiti, such as COVID-19 and waterborne diseases.



Training in Rapid Diagnostic Testing (RDT) for cholera in Les Cayes, Sud Department on October 21, 2021 with Ministry of Public Health and Population (MSPP) MSPP nurses and laboratory technicians. Photo: Chung H. (Ken) Chen/CDC

Accelerating Response Efforts Through Collaboration

CDC efforts to build Haiti's public health infrastructure began years ago. In response to the 2010 Haiti earthquake, which resulted in 800,000 confirmed cholera cases and 9,700 lives lost, CDC has invested in expanding existing partnerships with the government of Haiti to strengthen the country's public health infrastructure. These partnerships contributed to a rapid response to the August 2021 earthquake. The 2021 earthquake displaced more than 38,000 from their homes and damaged or destroyed approximately 90 health centers in southwestern Haiti. Experts from CDC worked with



38,000
displaced



- Developing infection prevention and control (IPC) measures and updating standard operation procedures (SOP) for healthcare facilities

“The cross-agency engagement and strong local partnerships during this response were key to our success,” said Lieutenant John Rossow from CDC’s Global Rapid Response Team (GRRT). “This response highlighted the importance of engaging subject matter experts across the agency in their respective fields, particularly during complex emergency response when a variety of infectious diseases and other health concerns are present.”

The earthquake displaced more than 38,000 from their homes, damaged or destroyed approximately 90 health centers in southwestern Haiti.



 approximately **90 health centers** affected

Haitian health organizations to provide skills and expertise in various response areas including in water, sanitation, and hygiene (WASH), vaccine uptake, surveillance and laboratory, security, and more.

The collaboration of multiple internal and external partners enabled the response to accomplish a broad range of activities, including

- Ensuring laboratory and epidemiologic surveillance capacity was restored to monitor for waterborne diseases given damage to water infrastructure, flooding, and crowding among displaced persons
- Supporting a scale-up of vaccination against COVID-19 by providing additional vaccines to the affected departments or geographic areas of the country and by supporting new vaccination sites and access points (mobile clinics)
- Rehabilitating water and sanitation infrastructure and supporting hygiene promotion in health facilities and assembly points serving displaced persons
- Providing technical expertise to minimize the impact of COVID-19 in the context of border health and community transmission
- Providing technical expertise and support for rapid detection of COVID-19 cases and tracing of contacts

Strengthening and Maintaining Cholera Surveillance

As a result of post-earthquake flooding and damaged water treatment infrastructure, addressing potential waterborne illness was a high priority. Field Epidemiology Training Program (FETP) fellows were immediately deployed to earthquake-affected areas to conduct rapid needs assessments, which provided more detailed information on the extent of the damage and priority needs by department; these data helped inform decisions about which response



Ministry of Public Health and Population (MSPP) COVID-19 vaccination site funded by CDC in Les Cayes, Haiti on October 21, 2021. Photo: Chung H. (Ken) Chen/CDC

activities to prioritize. Following the earthquake, CDC staff at headquarters in Atlanta provided support to prevent a possible outbreak of waterborne illness. Using the Epidemic Intelligence from Open Sources (EIOS) system, CDC staff conducted media scans across social media, online news (including local media), and official press releases to detect signs of emerging waterborne outbreaks.

“Surveillance, particularly event-based surveillance (EBS), can help identify the first signs that something new is emerging. Often the first signals of a new outbreak or event are reported in media before they appear in official sources”, explains Larry Hinkle, CDC Global Disease Detection Operating Center (GDDOC) epidemiologist.

Potential outbreaks of waterborne disease were a significant concern due to the country’s limited access to WASH services, previous history of cholera, and significant damage to WASH infrastructure from the 2021 earthquake. Fortunately, no confirmed cases of cholera have been detected since February 2019.

To support the 2021 earthquake response, CDC leveraged investments in existing laboratory, surveillance, and water and sanitation infrastructure that were established after the 2010 earthquake. CDC experts and the CDC Haiti Country Office worked with the MSPP and LNSP to strengthen laboratory systems to support cholera surveillance by training local nurses to roll out cholera rapid diagnostic testing (RDT) in assembly points. Additionally, CDC coordinated with the MSPP and LNSP to ensure integrated reporting with existing national systems. This collaboration strengthened surveillance of both waterborne diseases and COVID-19 cases in the earthquake affected areas. CDC also worked with Haiti’s Directorate for Potable Water and Sanitation (DINEPA) to scale up monitoring of free chlorine residual in municipal water systems, water trucking filling stations, and other sites to ensure the population had access to treated water. In response to the earthquake, CDC is supporting DINEPA and UNICEF on rehabilitation of WASH infrastructure in communities, health institutions, and schools.

Increasing COVID-19 Vaccination Rates

Prior to the 2021 earthquake, there was limited communication about COVID-19 vaccines and 10 administering sites in Haiti. This limited communication contributed to low vaccine demand across the country. Vaccination activities were interrupted when five of the 10 vaccination sites were destroyed in the earthquake.

To prevent transmission in displaced populations, CDC and in-country partners worked diligently to scale up vaccination opportunities in earthquake-affected areas. With support provided by CDC through the CDC Foundation and implementing partners, a total of 154 vaccination sites have been supporting vaccination, including 13 of 16 total in the earthquake-affected areas. Given limited



154
vaccination sites

vaccine supplies, coupled with low vaccine demand, less than 3,000 vaccine doses were administered in earthquake-affected areas prior to the earthquake. Following the earthquake, CDC partners began work to increase access and vaccination outreach. Various outreach activities including increased radio and television broadcasts, vaccination sites, meetings with community members and health workers, mass vaccination events, and flyers aimed to increase demand for vaccines. One week after CDC support was scaled up, 3,000 additional people were vaccinated through partner funding.



3,000

additional people vaccinated



Andrea Martinsen (DGHP CDC Atlanta Public Health Engineer), Melissa Etheart (CDC Haiti Medical Epi), Evenel Thermidor (DINEPA CDC Project Lead), and Gabriel Tondreau (Water Quality Specialist) are testing for free chlorine residual at the DINEPA (the Haitian directorate for potable water and sanitation) truck filling station in Les Cayes, Sud Department. Photo: Amber Dismar, CDC, September 29, 2021

Collaboration Builds Resilience and Response Success

The successful response to the 2021 Haiti earthquake was built on decades of work led by the CDC Haiti Country Office to help build the capacity of the government of Haiti and its partners to rapidly respond to natural disasters frequently experienced in the country. This collaboration helped to strengthen surveillance and reporting of both waterborne diseases and COVID-19 cases, implement the use of rapid diagnostic tests for cholera in assembly points of displaced persons, and restore and accelerate COVID-19 vaccination rates to pre-earthquake levels in earthquake-affected areas within days. Each partner contributed unique skills and experiences to respond to this natural disaster while continuing to support ongoing public health priorities. CDC has worked to

ensure emergency response investments strengthen Haiti's national labs and surveillance networks and help build resilience.

During her deployment to Haiti from October 4-24, 2021, Christine Dubray, CDC GRRT member speaks with pride about resilience during Haiti's public health crises and notes,

“The resilience of our Haitian CDC colleagues, responding to multiple public health emergencies, and at the same time juggling with stressful ongoing insecurity affecting them and their families, is inspiring and needs to be recognized every day.”



Global Health Security Investments Improve Guinea Ebola Outbreak Response



The Centers for Disease Control and Prevention (CDC) established an office in Guinea in 2015, during the Ebola outbreak in West Africa, to help develop capacities to prevent, detect, and respond to public health threats.

The capacity Guinea has to stop public health emergencies has come a long way since it faced the West Africa Ebola epidemic of 2014–2016. Collaboration and support from the U.S. Centers for Disease Control and Prevention (CDC) and partners in Guinea helped to end a recent Ebola outbreak in just four months.

In 2021, an outbreak that started in February resulted in 23 cases and 12 deaths in N'Zérékoré Prefecture in Guinea, the only region affected. The public health

system had the necessary resources, including laboratory capacity, public health workforce, and surveillance and emergency response systems for a coordinated response. In contrast during the 2014–2016 outbreak more than 3,800 people became infected and over 2,500 people died in Guinea. Ebola spread to 10 countries worldwide, including the United States. Outdated public health infrastructure in Guinea during that time contributed to a delay in disease detection and widespread death.

The Impacts of Laboratory Investments in Guinea

The 2014–2016 Ebola epidemic highlighted the need for strengthened global health security in Guinea for a safer and healthier world. CDC opened an office in Guinea in 2015 to help prepare the country for disease response, strengthen laboratory infrastructure, and strengthen workforce capacity. Early in the 2014–2016 Ebola epidemic, the ability to test for Ebola in-country was limited and could require up to seven days to confirm a diagnosis. CDC helped improve testing ability and worked with partners to train laboratory staff and build capacity. In 2016, the U.S. Department of Defense donated a laboratory to the Ministry of Health (MoH) that contributed to the overall in-country capacity for Ebola diagnostic testing in Guinea. The laboratory was used to support the 2021 Ebola outbreak and COVID-19 diagnostic testing. CDC also supported the development of regional laboratories in the cities of Kankan and Labe.

The Impacts of Disease Detection and FETP Workforce in Guinea

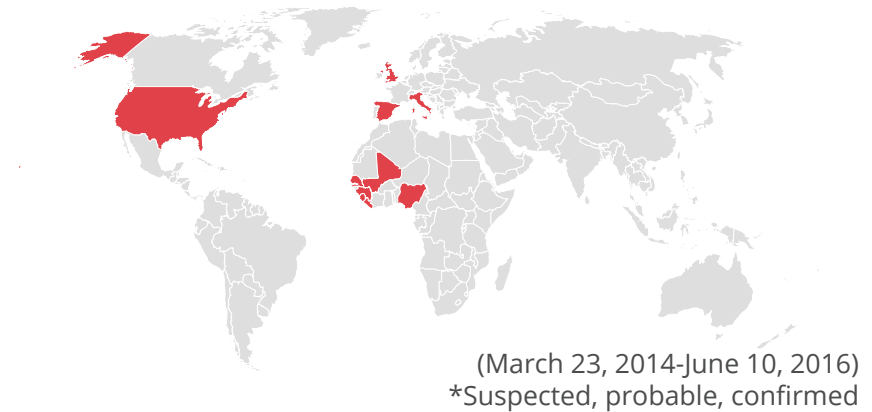
One of the most impactful ways for improving disease surveillance is trained field epidemiologists, or disease detectives.

In 2016, CDC launched the Guinea Field Epidemiology Training Program (FETP) with funding from Global Health Security Agenda (GHSA). Since its inception, Guinea's FETP has trained nearly 200 disease detectives, many of whom held key surveillance and response positions during the 2021 Ebola outbreak.

2014 Ebola Outbreak

● Countries affected: **10**

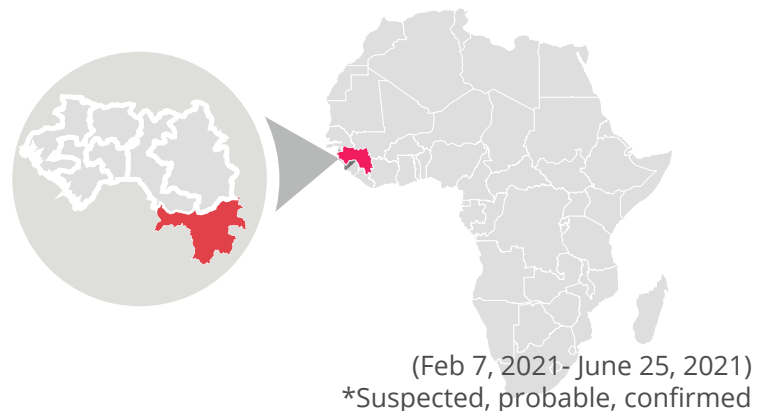
Confirmed cases*:	Outbreak lasted:	Deaths:
28,646	Over 2 years	11,323



2021 Ebola Outbreak

● Countries affected: **1**

Confirmed cases*:	Outbreak lasted:	Deaths:
23	Over 4 months	12



During the 2014–2016 Ebola epidemic, it took nearly four months to identify the first case while the disease spread. In 2021, trained FETP disease detectives responded to the first Ebola case and helped contain the spread of the disease. These epidemiologists helped quickly isolate suspect cases and identify contacts to help keep others from becoming sick.

The Impacts of Surveillance Upgrades

In 2020, Guinea’s National Public Health Institute, Agence Nationale de Sécurité Sanitaire (ANSS), with assistance from the African Field Epidemiology Network (AFENET), used the District Health Information Software (DHIS2) to develop a case-based module to manage the response to the COVID-19 pandemic. ANSS created a similar module for the 2021 Ebola outbreak. This module captures information on cases, contacts, and alerts, and will be enhanced with future outbreaks. CDC helps develop and implement these systems with funding and technical assistance, including building capacity at the national and sub-national levels. These upgrades facilitated the prompt identification of Ebola in 2021 in only 15 days, compared to four months during the country’s earlier outbreak.

In Guinea, data collection has advanced from an Excel database used during the 2014–2016 epidemic, to a modern disease surveillance system.

In 2016, the country started implementation of an electronic surveillance data collection system through DHIS2. CDC deployed experts to aid with enhancements to Guinea’s DHIS2 Ebola tracking system. They also supported data analysis and

reporting that helped improve data quality and timeliness. Guinea’s ANSS uses DHIS2 to capture and report aggregate data for epidemic-prone diseases to inform response.

The Value of Emergency Operations Centers and a Coordinated Response

During the 2014–2016 Ebola epidemic, Guinea did not have a national Emergency Operations Center (EOC) network. CDC provided staff and financial support to activate an improvised EOC. Members of Guinea’s MoH also received CDC emergency management training. Now ANSS operates as a centralized coordinating agency to manage outbreaks. CDC, with GHSA funding, developed 38 district-level EOCs that collaborate under ANSS. By 2021, Guinea’s EOC network had the capacity to simultaneously coordinate responses to five diseases—polio, measles, yellow fever, COVID-19, and Ebola—and activate within 24 hours of each emergency declaration.

CDC’s GHSA investments in Guinea in four essential areas—laboratory, workforce development, surveillance, and emergency preparedness and response—played a key role in the country detecting and responding to the 2021 Ebola outbreak.


These successes do not mean that the work is over. CDC’s continued investments ensure that Guinea is ready to address future disease emergencies and protect the health of people there and around the world.



Guinean Red Cross workers and CDC health communicator, Pascale Krumm, check community feedback data from the Gouecké health center. Gouecké was ground zero of the 2021 Ebola outbreak, where a nurse died from Ebola at the end of January 2021. Photo: Pascale Krumm/CDC

Ebola Response in 2014

Ebola Response in 2021

 Laboratory	<ul style="list-style-type: none"> • Limited in-country laboratory capacity for diagnostic testing • Results took about 7 days 	<ul style="list-style-type: none"> • Local laboratories capable of testing • Results take about 1 day
 Workforce Development	<ul style="list-style-type: none"> • International experts and staff needed for response 	<ul style="list-style-type: none"> • Guinea has 179 disease detectives trained for outbreak response
 Surveillance	<ul style="list-style-type: none"> • Four months to detect first case • Data collected in Excel 	<ul style="list-style-type: none"> • 15 days to detect first case • All surveillance data collected by Ministry of Health in the country's DHIS2 electronic platform
 Emergency Operations	<ul style="list-style-type: none"> • International partners managed improvised Emergency Operations Center (EOC) 	<ul style="list-style-type: none"> • National EOC network activated within 24 hours of an alert. EOC is centrally coordinated under Agence Nationale de Sécurité Sanitaire (ANSS)
 Coordination	<ul style="list-style-type: none"> • Disjointed response 	<ul style="list-style-type: none"> • Unified response coordinated under ANSS leadership using modern technology



CDC Experts Help India Scale-up Laboratory Systems in Response to COVID-19's Second Wave

Partnering to Increase Public Health Laboratory Capabilities

On January 30, 2020, India, with a population of 1.39 billion, reported its first case of COVID-19. The CDC office in India (CDC India), with its 40 U.S. assignees and locally employed staff, quickly activated its incident management system to support both the U.S. Mission and the Government of India (GOI) with COVID-19 response efforts. To ensure effective management and rapid deployment of CDC India staff, teams were formed and aligned with the most critical response activities. They regularly provided situational reports to U.S. leadership and other sections within the U.S. Mission in India. CDC India was able to leverage decades of cooperation with the GOI on global health security efforts to build laboratory capabilities and provide technical assistance and support in key areas of the response.

By March 2020, the threat of COVID-19 loomed large, and the GOI worked hard to establish an effective response plan. At that time, CDC India was already collaborating with the National Health System Resource Center (NHSRC), the technical wing of the GOI's National Health Mission (NHM), to create a network of Integrated Public Health Laboratories (IPHL) for the COVID-19 response. Building on a collaboration that saw the development of India's first model IPHL in the Raipur District in the state of Chhattisgarh, CDC India was able to support NHM in developing operational guidelines to establish an IPHL network across the country. The IPHL concept immediately found favor at the highest level of the GOI and was formally incorporated into India's COVID-19 response strategy.



In April 2020, CDC staff offer training on how to make alcohol-based hand rub at the All India Institute of Medical Sciences during the COVID-19 pandemic. Photo: CDC India office



CDC India trains health workers on “Sample Collection, Packaging, and Safe Transportation along with Rapid Diagnostic Testing” as a part of outbreak preparedness training. Photo: CDC India office

The Government of India (GOI) announced a pandemic economic stimulus package of USD 266 billion to establish a network of IPHL in 730 districts across the country. This effort helped to strengthen and expand India’s core public health lab capabilities and build on existing investments to expand laboratory testing capacity.

Providing Technical Expertise to Keep Labs Safe

Almost a year later (mid-March 2021), India faced a second wave of COVID-19 infections that strained the country’s public health system. Infection rates soared

to about 32 million and more than 400,000 deaths. In response, CDC developed peer-to-peer relationships with India’s National Public Health Institute (known as “NCDC”, or the National Centre for Disease Control) and the GOI.

In accordance with international standards, CDC India provided technical guidance and training on safe COVID-19 sample collection, testing, and transport to over 10,000 healthcare workers across 210 districts in the country.

CDC India provided technical guidance and training for

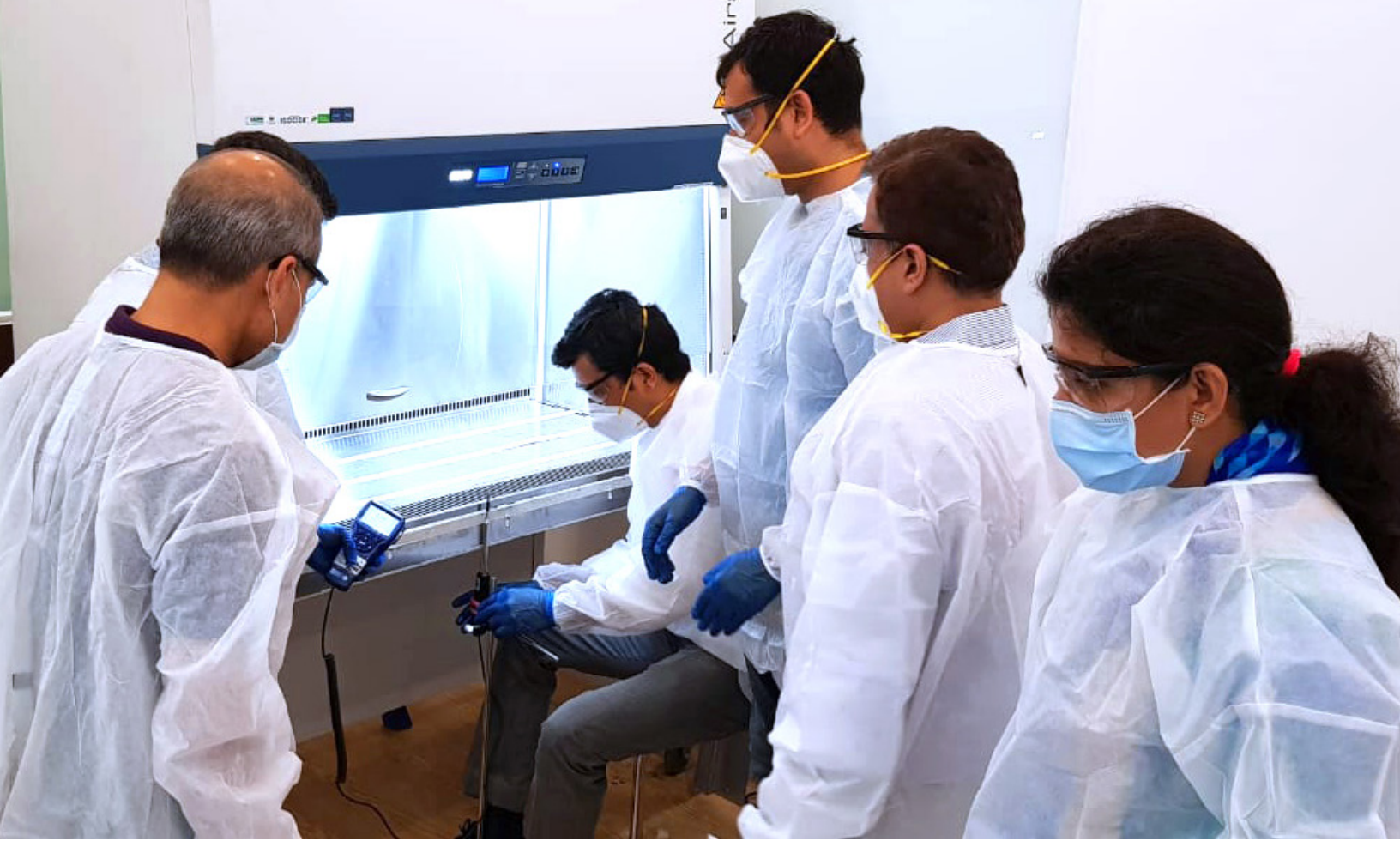


10,000
healthcare
workers

spread
across



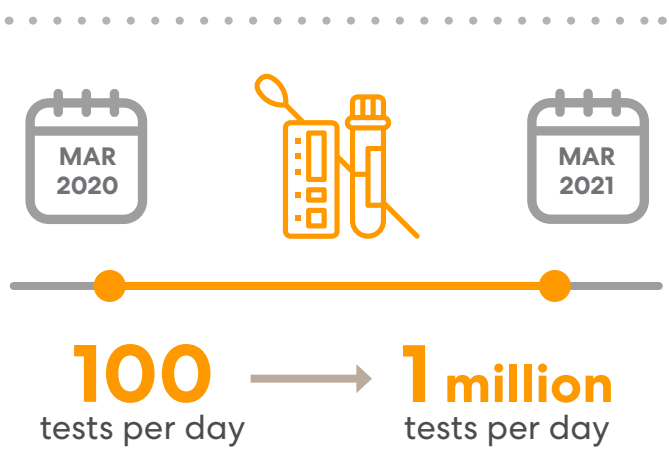
210
districts in
India



CDC Lab Team in collaboration with U.S. Biothreat reduction program and NSF International, organized the second-ever biosafety cabinet certification training in Gurugram, 2021. Photo: CDC India office

Participants included frontline workers of the GOI National Disaster Response Force and research scientists involved with COVID-19 biorepositories (facilities that collect, catalogue and store samples of biological material for laboratory research) in the Department of Biotechnology.

CDC experts also played a pivotal role in supporting the GOI scale-up of lab capabilities by participating in several national and sub-national advisory and expert committee groups. These interactions helped to shape the implementation of new GOI resources and programs. CDC’s technical expertise contributed to the rapid expansion of SARS-COV-2 testing in India from approximately 100 tests per day in March 2020 to around 1 million tests per day by the end of March 2021.



In addition, CDC’s Lab and Infection Prevention and Control teams jointly developed a guidance document on safe practices for COVID-19 testing laboratories, which was accepted by the All India Institute of Medical Sciences in New Delhi and is now available on its website. CDC also conducted online trainings on the basics of laboratory and

field biosafety activities for GOI, academic partners, implementing partners, professional societies, and state health departments.

Impact of Investments in Laboratories

CDC's longstanding partnership with the GOI spans over 50 years and has strengthened during the COVID-19 pandemic. GOI's efforts and investments in laboratories, along with CDC's collaboration and technical support, have significantly improved and streamlined specimen transport systems and supply chains, and they have provided quality-assured results to inform public health action across the country and the region. GOI has included CDC's model of IPHL in the new health plan announced by the Prime Minister of India and known as the Prime Minister's Ayushman Bharat Health Infrastructure Mission. CDC's support has strengthened workforce capacity by training thousands of postgraduate medical students and first-line responders on public health emergency management. Alumni of these

programs are either leading or supporting GOI COVID-19 response efforts in various capacities. Many of CDC India's pre-pandemic collaborations, programs, and relationships with GOI laid a strong foundation for India's ongoing response to COVID-19. India's sizeable population, location, and disease burden have made the GOI an important CDC partner and helped to inform and advance global health security. This was aptly summarized by CDC India Country Director Dr. Meghna Desai, who said,

“The past 18 months have been some of the most challenging and fulfilling times of my 20-year global health career. The peer-to-peer engagement that is the hallmark of CDC's global health work was exactly the need of the hour for India.”



CDC developed the first sustainable integrated model for District Public Health Labs, Raipur, Chattisgarh, 2020, Photo: CDC India office



Laboratory Renovations Prepare Kenya for COVID-19

On March 12, 2020, Kenya detected its first case of COVID-19 after putting laboratories and public health workers on high alert, following the World Health Organization (WHO) declaration of COVID-19 as a Public Health Emergency of International Concern.

For more than 40 years, CDC has helped strengthen public health and laboratory systems in Kenya, creating an integrated research and program center to prepare for disease threats, such as COVID-19.

Established by CDC's Division of Global Health Protection (DGHP) in 2006, the Nairobi laboratory is a Biosafety Level (BSL) 3 laboratory, a distinction used to ensure the protection of laboratory staff, the general public, and the environment from infectious pathogens. During its first 10 years in operation, the laboratory successfully investigated over 190 disease outbreaks in Kenya, and an additional 13 in the African region. Also, the Nairobi laboratory assisted multiple countries in Africa by providing technical training and diagnostic laboratory support for outbreak response.



CDC Kenya laboratory staff, Albina Makio, prepares COVID-19 specimens for testing at the Nairobi laboratory. Photo: Bonventure Juma, CDC Kenya

Ensuring Effective and Efficient Laboratories

Just one month after identifying the first case of COVID-19, CDC Kenya completed a three-year renovation on its Nairobi diagnostics laboratory. The laboratory had closed in June 2016 because it could not maintain the requirements of a BSL-3 laboratory.

The renovation was extensive. According to Dr. Elizabeth Hunsperger, director of CDC Kenya's diagnostic laboratory program, "The renovations took almost three years due to multiple complications with the equipment. The infrastructure of the building was old, and many of the materials needed for this specialized laboratory were not available."

Completing the renovations correctly remained a top priority for the Nairobi laboratory team. The laboratory's management and operations team in Kenya oversaw the completion of the project, coordinating with partners throughout the process. Ensuring that the laboratory could run safely and effectively as a BSL-3 laboratory was necessary to prepare the laboratory team to respond to local and global outbreaks – including the COVID-19 pandemic.

Increasing Laboratory Capacity to Detect COVID-19

Just weeks before COVID-19 was first detected in Kenya, all equipment was returned to the laboratory

from storage as the team prepared to face the novel coronavirus.

From the onset of the COVID-19 outbreak, the laboratory implemented a strategy to test all suspected cases identified by the Kenya Ministry of Health (MoH). “These specimens were received through the MoH and tested in our laboratory,” Hunsperger said.

Working 24 hours a day and seven days a week, the laboratory team successfully tested samples from across the country by leveraging existing CDC Kenya-supported surveillance networks, used to understand the country’s disease burden.

These surveillance sites, previously used for acute febrile illness, severe acute respiratory illness, influenza-like illness, and the population-based infectious disease surveillance system, proved to be valuable resources in understanding how the COVID-19 outbreak unfolded in Kenya. Initially, the laboratory focused on testing all suspected cases found through the surveillance network. As the pandemic progressed and cases grew, this expanded to testing samples collected by the government of Kenya from various locations, including mass testing campaigns, truck drivers at all ports of entry, quarantine centers, and international travelers.

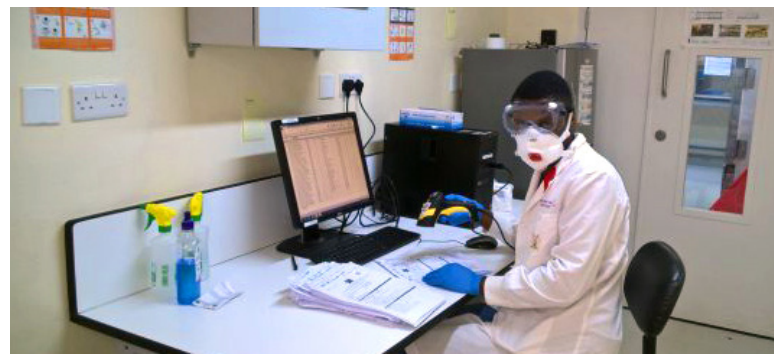
The Work Continues

The Nairobi laboratory opened just in time to significantly support COVID-19 testing in Kenya. By the end of August-2021, the laboratory processed nearly 242,000 COVID-19 specimens. Through the network of CDC Kenya laboratories, including the Nairobi laboratory, CDC supported the systems that

performed 45% of all COVID-19 testing in Kenya. In addition, the laboratory team helped train staff, including those from the National Influenza Center and HIV laboratories supported by the President’s Emergency Plan for AIDS Relief (PEPFAR), in all 47 counties on proper biosafety and biosecurity measures, which help protect laboratory staff, the environment, and the general public.

As one of the two laboratories that make up Kenya’s diagnostic laboratory program, the Nairobi laboratory’s response to COVID-19 will prepare the larger network of CDC Kenya-supported laboratories for future disease threats. Laboratory work must not become stagnant, and especially during a growing response, laboratories must retain the highest quality processes to ensure safety and efficiency. “Quality assurance systems need to be established and continually updated throughout the outbreak to ensure high quality results,” Hunsperger said.

The leadership and expertise of the laboratory team, including Hunsperger and Bonventure Juma, deputy director of the diagnostic laboratory program, and the long-established relationship with the Kenya MoH, helped the Nairobi laboratory and its dedicated staff to respond to the COVID-19 outbreak. As COVID-19 continues to impact populations across the globe, recognizing and building upon CDC’s successes, such as the increased laboratory capacity in Kenya, will contribute to overcoming COVID-19 and future disease threats.



CDC Kenya laboratory staff, Tim Mujete, receives COVID-19 specimens to be logged at the Nairobi Photo: Bonventure Juma, CDC Kenya



CDC Leverages Acute Febrile Illness Surveillance System to Respond to COVID-19



Laboratory technicians record AFI sample storage information using a mobile app and a tablet at the National Public Health Laboratory in the Dominican Republic. Photo: Dr. William Duke/Brigham and Women's Hospital

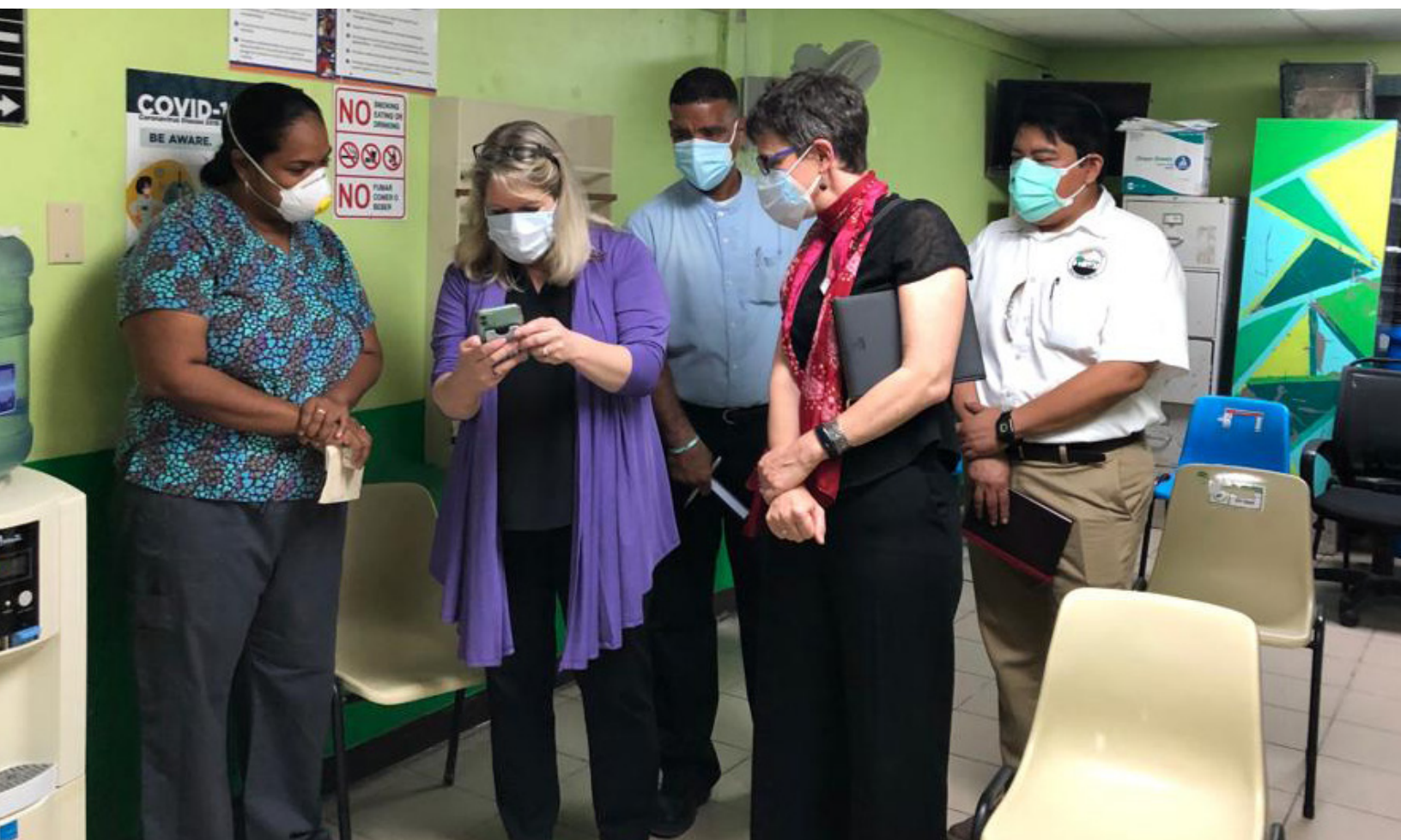
To better understand, detect, and respond to emerging and reemerging infectious disease threats, the U.S. Centers for Disease Control and Prevention (CDC) is supporting acute febrile illness (AFI) surveillance in over 20 countries across the globe. AFI is characterized by a rapid onset of fever and other symptoms such as headache, diarrhea, chills, and cough and can be caused by viruses, bacteria, parasites, and fungi. AFI surveillance with laboratory confirmation can help better define the cause of illness and identify new diseases that were previously not recognized in a country or region. It also strengthens public health responses to these threats, reduces the spread of diseases within countries and across borders, and increases health protection for the affected populations. AFI surveillance is key in supporting CDC's work to advance Global Health Security.

Integrating SARS-CoV-2 Testing to Address the COVID-19 Pandemic

Conducting AFI surveillance leads to greater detection of emerging and epidemic-prone infectious diseases that may be unknown, understudied, or difficult to track. Additionally, surveillance systems can support high-priority investigations using available staff, material, supplies, reagents, and testing processes.

During the COVID-19 pandemic, CDC leveraged existing AFI surveillance platforms to integrate testing for the virus that causes COVID-19, SARS-CoV-2, in many countries to help address the pandemic response.

The adapted surveillance systems inform the key actions needed to reduce transmission and increases the scientific knowledge about COVID-19 and any similar illnesses that might emerge in the future. In response to the COVID-19 pandemic, CDC created a Global AFI Surveillance Virtual Community of Practice and hosted meetings for AFI partners across the globe to regularly meet, exchange information, and share best practices.



Kristy Murray, Principal Investigator from Baylor College of Medicine, Emily Zielinski-Gutierrez CDC-CAR Regional Director, Dr Russell Manzanero, lead epidemiologist for Belize and AFI Surveillance site staff in Belize City, Belize are checking the data at one of the collection sites in Belize. Photo: Gerhaldine Morazan/Medical Laboratory Services at Ministry of Health Belize



Preparing respiratory samples for testing by a laboratory technician in Guatemala. Photo: Nicholas Tenorio/CDC

Building Capacity through a Regional AFI Surveillance Network

Since 2018, CDC experts from the Division of Global Health Protection in Atlanta, ministries of health (Belize, Dominican Republic, El Salvador, and Guatemala), and partner universities have been working with the CDC Central America Regional office (CAR) to develop a coordinated, regional AFI surveillance network in Central America and the Dominican Republic. CDC and la Universidad del Valle de Guatemala have over 30 years of infectious disease surveillance history in Guatemala. The network was expanded in 2018 when Baylor College of Medicine (Belize) and Brigham and Women's Hospital (Dominican Republic) were added as new AFI surveillance partners. Through training, technical assistance, and the procurement of equipment and supplies, this regional partnership aims to build public health capacity and translate research into public health policy and actions.

Leveraging AFI Regional Network Successes for COVID-19 Response

The healthcare facility-based AFI surveillance in Belize, led by Baylor College of Medicine, has enrolled over 3,000 participants across its 11 hospital and clinic sites since 2020 (as of December 31, 2021). The AFI surveillance platform tests for over 50 different disease-causing pathogens and has identified the parasite *Trypanosoma cruzi*, which causes Chagas disease, as well as Zika virus, rickettsia, respiratory syncytial virus, rotavirus, SARS-CoV-2, and other pathogens. Rapid laboratory identification and notification to local and national health authorities ensured that Belize's Ministry of Health was alerted to these infectious disease threats and provided with key information. Baylor College of Medicine has worked with Belize's Ministry of Health to establish local SARS-CoV-2 sequencing capacity to respond to the COVID-19 pandemic. Given the success of the

Belize AFI surveillance project, CDC and Baylor College of Medicine are planning to launch an AFI surveillance site in El Salvador in early 2022.

In the Dominican Republic, the hospital-based AFI surveillance, led by Brigham and Women's Hospital, has enrolled almost 1,800 participants since 2019 (as of December 16, 2021). The AFI surveillance tests for six pathogens (influenza viruses, dengue viruses, chikungunya virus, Zika virus, Leptospira, and SARS-CoV-2). Leptospira testing by polymerase chain reaction (PCR) was a new diagnostic capacity introduced at the national laboratory in the Dominican Republic. The existing AFI surveillance platform was critical in supporting the early diagnostic testing of SARS-CoV-2 at the National Public Health Laboratory Dr. Defilló (Laboratorio Nacional de Salud Publica Dr. Defilló).

“Creating a regional AFI surveillance network has proven to be a unique opportunity to collaboratively advance public health in the region. Our AFI surveillance infrastructure has been a valuable resource enabling CDC to support countries in Central America and the Dominican Republic in their COVID-19 response. And AFI surveillance can be used once again to investigate and respond to the next emerging or re-emerging threat in our region.”

Dr. Emily Zielinski Gutierrez, Director, CDC Central America Regional Office, Division of Global Health Protection

Adaptation of AFI Network Improves Health Protection

DGHP has leveraged ongoing acute febrile illness (AFI) surveillance activities to respond to COVID-19. These efforts enhance the ability of countries to monitor community spread and COVID-19 activity intensity in an efficient and cost-effective way by using resources and existing infrastructure already in place.

CDC's AFI surveillance network in Central America and the Dominican Republic has combatted emerging disease threats, strengthened collaborations, and improved regional capacity for disease surveillance. Continued investment in AFI surveillance in Central America and the Dominican Republic can help reduce the spread of diseases within countries and across borders, improving the ability to detect disease threats before they happen. The successful adaptation of the AFI network has led to a greater understanding of new and potential disease threats and better characterization of risk factors and patterns of disease transmission. It has also enhanced responses to COVID-19 and increased health protection for populations in Central America and the Dominican Republic.



A laboratory technician preparing disinfectant at a regional hospital in San Pedro de Macoris, Dominican Republic to protect against COVID-19 spread. Photo: Dr. William Duke/Brigham and Women's Hospital



Colombia Increases Surveillance to Protect Pregnant Women Against COVID-19

Throughout the COVID-19 pandemic, Colombia, like many other countries, has been challenged to rapidly identify and protect the most vulnerable groups from COVID-19. People with pre-existing health conditions, the elderly, and those with compromised immune systems were identified as being at greatest risk of severe illness and death. At the beginning of the pandemic in March 2020, the risks for pregnant women and their unborn babies were generally unknown. By improving COVID-19 surveillance for this population, Colombia's National Public Health Institute (INS) and members of the country's Field Epidemiology Training Program (FETP) worked to address this gap.

CDC's Collaboration with INS Strengthens Surveillance

For more than 100 years, the INS has demonstrated its increasing effectiveness in public health response both nationally and internationally. Through the 1992 launch of Colombia's FETP to develop a workforce of disease detectives, CDC has collaborated with the INS to strengthen its emergency preparedness and response efforts, laboratory capacity, and use data to make decisions. With CDC's continued support in strengthening the national public health surveillance system, the INS was able to quickly respond to this need for risk assessment of maternal and newborn health during this pandemic.



Colombia Launches National Surveillance Project

Members of the INS's COVID-19 Risk Analysis Group (SAR) identified key questions about the COVID-19 risks for pregnant women, including

- Do COVID-19 infections endanger pregnancies?
- Could COVID-19 infections indirectly affect maternal health?
- What limitations exist in diagnosing pregnancy complications through virtual prenatal doctors' visits?

In search of answers, the SAR worked with FETP Colombia residents, Grace Alejandra Ávila and Nathaly Roza Gutiérrez, and FETP Colombia graduates, Franklyn Prieto and Maritza González, to collect and report on how COVID-19 infections were affecting maternal health across the country. Data were

collected through Colombia's national surveillance system in coordination with SAR. According to Dr. Maritza González, FETP Colombia coordinator, "Our teams demonstrated how flexibility, adaptability, synchronization, and communication were essential to respond to the continuously changing needs of the COVID-19 pandemic."

Sharing Data through a Monthly Bulletin

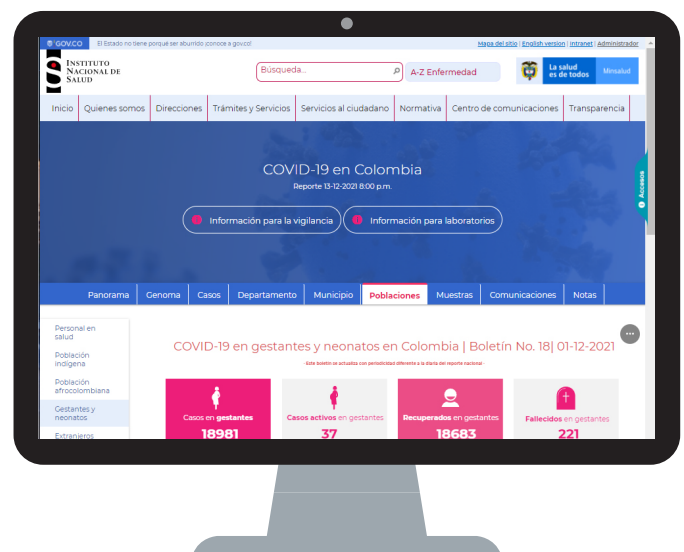
A public health surveillance system links laboratories and regional and national health departments to collect, review, and share data on specific diseases or health threats. Doing this successfully requires good communication and coordination between these groups, especially when there is a change in the surveillance system. For SAR, this meant accessing national laboratory databases and connecting with the national surveillance system to find information on pregnant women with confirmed or probable COVID-19. Linking and analyzing these data turned into a routine operation that is now reported online through a monthly bulletin available to public health officials and the general public. The bulletin is updated regularly and includes a dashboard with a summary of infection and death counts of pregnant women by age group, region, and other factors.

Impact of INS's Monthly Bulletin and FETP Engagement

Studies on COVID-19 and maternal health find that pregnant women are at higher risk of severe illness and death. INS research using the SAR monthly bulletin data confirms this higher risk in the Colombian population. In 2021, COVID-19 was the leading cause of death in pregnant women in Colombia. The publication of this bulletin provoked the government to respond. In June 2021, the

President of Colombia signed a decree to prioritize the vaccination of pregnant women and up to 40 days following childbirth, directly citing INS's monthly bulletin. The impact of the pandemic on pregnant women and their babies, along with government policy response, highlights the importance of continued surveillance and reporting on this topic.

Effective communication and collaboration between different groups to improve public health surveillance strengthened the SAR project and increased awareness of how COVID-19 affects the health of pregnant women. The work of FETP graduates and residents in the INS's real-time response to public health emergencies highlights the value of FETP in disease detection and response, and demonstrates the importance of a well-connected public health system during a public health crisis. Strengthening Colombia's public health surveillance system helped the country better protect the lives of pregnant women and their unborn babies from the potentially devastating effects of COVID-19.



INS bulletin on pregnant women and newborns with COVID-19 in Colombia



Thailand FETP Graduate Leads COVID-19 Response to Address Health Inequities Among Those Living with Noncommunicable Diseases



Dr. Ern and other Thai investigators prepare a questionnaire for Myanmar migrants as part of a COVID-19 outbreak investigation at the shrimp market. Photo: Rittikrai Namket, Thailand Ministry of Public Health, Division of Epidemiology, Department of Disease Control

Every morning, Dr. Pitiphon Promduangsi, also known as Dr. Ern, walked into her 6 o'clock meeting with two goals: contain a deadly COVID-19 outbreak and keep her team motivated despite the ongoing challenges posed by COVID-19, noncommunicable diseases (NCDs), and health equity.

In January 2021, she became leader of the Surveillance Rapid Response Team, managing a COVID-19 outbreak at a shrimp market in Samutsakorn province near Bangkok. Dr. Ern, a

graduate of Thailand's Field Epidemiology Training Program (FETP) NCD track, had been working on the COVID-19 response since Thailand confirmed its first case in mid-January 2020. The program trains field epidemiologists, or "disease detectives," to prevent, detect, and respond to public health threats. NCDs are a major disease threat in Thailand, estimated to cause 74% of all deaths. To address this burden, Thailand's FETP program began providing specialized training in NCD epidemiology and surveillance in 2017.



This training prepared Thailand's FETP NCD graduates and residents to play a key role in the COVID-19 response because people living with NCDs are more likely to experience severe symptoms or die from COVID-19.

Dr. Ern's team managed a data reporting system that tracked new COVID-19 cases in the area around the shrimp market, conducted in-person contact tracing at local factories and in neighboring provinces, and provided health information to community members. She drew on her FETP training to teach hospital and factory workers how to conduct health screenings for employees at risk for COVID-19. The data they collected showed about 300-500 people near the shrimp market were testing positive for COVID-19 each day. Communication between hospitals, public health departments, and local employers was critical to finding the best approach for contact tracing and healthcare referrals.

Addressing Inequity One Person at a Time

Health equity means ensuring opportunities for everyone to be as healthy as possible. To achieve health equity, barriers (such as social and economic differences) that prevent people and communities from achieving optimal health, must be removed.

NCDs, such as heart disease, diabetes, cancer, and chronic respiratory disease, when combined with COVID-19, make health inequities worse. Global estimates show that one in five people are at higher risk for severe COVID-19, mostly due to an underlying NCD.



FETP NCD graduates, Dr. Ern (second left) and Chanatip Chailek (third left) and the Department of Disease Control Thailand healthcare personnel discuss strategy during the COVID-19 outbreak response. Photo: Rittikrai Namket, Thailand Ministry of Public Health, Division of Epidemiology, Department of Disease Control

To maintain their health, many people living with NCDs need to be regularly monitored by a health practitioner or physician for treatment and management. However, many factory workers living and working in the vicinity of the shrimp market have difficulty accessing routine health care for NCDs. Further complicating access to care during the COVID-19 pandemic, up to 75% of countries reported service disruptions in NCD management and treatment.

While addressing the health inequities posed by NCDs and COVID-19 is a daunting task, Dr. Ern made sure that people with confirmed COVID-19 and NCDs were sent to field hospitals for health assessment and treatment.

Maintaining Motivation

Volunteers from more than 10 provinces in Thailand played a major role in strengthening the COVID-19 response in Samutsakorn. Their work was critical to decreasing the number of COVID-19 cases and supporting Thailand's regional and national response. Dr. Ern drew on her FETP training in management and communication to keep the team motivated by showing how their contributions to an investigation of a COVID-19 outbreak at the shrimp market helped stop the spread of COVID-19 in Thailand.

"This experience was like working with friends and family, even when it was hard," Dr. Ern said.

"If someone didn't have the capacity or energy to keep going, other team members stepped up and provided support. And when spirits were low, we worked together to build them back up. This support system gave me resilience during such an unprecedented time."

Making an Impact

The COVID-19 emergency response in Thailand demonstrates how the FETP NCD program prepares participants to respond to complicated health threats that worsen health and social disparities and threaten global health security. Addressing health disparities and improving health equity are key goals for CDC.

"The skills FETP NCD residents are learning in Thailand are making a huge difference in the COVID-19 response," says Dr. Phanthanee Thitichai, FETP NCD graduate and mentor. "It shows how NCD experience is necessary when working on infectious disease outbreaks. Each resident is contributing. Thailand is fortunate to have FETP NCD residents and graduates that can help address these public health challenges."

10
PROVINCES

Volunteers from over ten provinces in Thailand played a major role in strengthening the COVID-19 response in Samutsakorn.





Dr. Ern (yellow shirt) with Department of Disease Control Thailand staff and healthcare personnel during a COVID-19 outbreak daily briefing. Photo: Rittikrai Namket, Thailand Ministry of Public Health, Division of Epidemiology, Department of Disease Control



CDC Helps Nigeria Launch New Emergency Management Certification Program

In 2019, Nigeria became a Global Health Security Agenda (GHSA) partner committed to achieving GHSA 2024 targets and International Health Regulation requirements. To help Nigeria achieve these targets, the U.S. Centers for Disease Control and Prevention (CDC) supported the Government of Nigeria by strengthening core outbreak response capacities in workforce development, surveillance, laboratories, and emergency response, among other areas. To enhance Nigeria's emergency response capacity, Nigeria CDC (NCDC) partnered with CDC and Georgetown University to launch the Intermediate Public Health Emergency Management (PHEM) Certification Program. The intermediate PHEM certification is a first-of-its-kind initiative established to train public health experts on public health emergency response.

Nigeria Builds Regional Capacity through PHEM

The leadership of Dr. Chikwe Ihekweazu, former director of NCDC, and the NCDC team of PHEM experts have changed the response capacity of Nigeria's public health system. Nigeria is committed to training Emergency Operations Center staff at the national and sub-national levels. The Intermediate PHEM Certification program is another sign of that



Official presentation of new PHEM Intermediate Participants' Training Manual to Lagos State Director of Surveillance, Epidemiology & Health Security at the training venue, September 2021.

commitment and positions Nigeria as a leader in the West African region that has the capacity to provide expert assistance not only to Nigeria but to neighboring countries during times of crisis. CDC's National Public Health Institute (NPHI) program has played a central and critical role in coordinating and providing technical oversight to NCDC with oversight from Georgetown University for PHEM implementation.

The Intermediate PHEM training is part of the U.S. Government's efforts to support pandemic preparedness globally. NCDC partnered with CDC's NPHI Program and the Division of Emergency Operations to train a cadre of PHEM Experts who advanced beyond basic PHEM and Public Health

Emergency Operations Center (PHEOC) capabilities. Similar to the Field Epidemiology Training Program (FETP), the PHEM program has different levels—basic and advanced. The intermediate certification is new and only launched in Nigeria. Although numerous countries have adapted to basic emergency management principles, the intermediate certificate program is more intensive and is the first of its kind globally.

The Intermediate PHEM professional development certification training in emergency management was held in September 2021 in Lagos with 35 participants drawn from NCDC and States Ministries of Health (SMoH) using a revised curriculum. PHEM experts and other support staff facilitated the course through virtual and in-person sessions. The two-week intensive training covered topics such as situational awareness, operations, planning, logistics, finance, law and authorities, public information, and crisis and emergency risk communication. NCDC Emergency Operation Centers now have certified emergency management experts at the national and subnational level. The training will continue in 2022 with training of additional cohorts of staff over a two week period.

CDC Nigeria Country Director, Dr. Mary Boyd, discussed the importance of the certification during the training, “Individuals are now more equipped to go back to their states and implement and also share the training with others at the state level.” Dr. Uwa Okhuarobo, State Epidemiologist who received the training, spoke on the impact it will have, “This is an opportunity to build capacity and when we get back home, engage with our colleagues to ensure that we prepare for future outbreaks and continue to strengthen our various public health operations across the states.”

Impact of PHEM Certification

As a result of the recent Intermediate PHEM training, Nigeria now has 35 trained PHEM experts in addition to the four international advanced PHEM Fellows, who were trained at U.S. CDC. Advanced PHEM Fellows have the necessary skills and experience

to train Public Health Emergency Responders and practitioners at the intermediate level. In 2017, Nigeria had the largest outbreak of Monkeypox to date in Western Africa. Additional outbreaks, such as Ebola, Cholera, and, most recently, COVID-19, have emphasized the need for emergency response services. This increased workforce capacity plus having the largest FETP in Africa results in NCDC being a regional leader in times of crisis. In addition, the impact of this training has led to Africa CDC utilizing the PHEM successes in Nigeria to adapt and replicate in other countries.

Emergency management protects communities by coordinating and integrating all activities necessary to build, sustain, and improve a country's capability to prepare for, respond to, and recover from public health threats such as infectious disease outbreaks, natural disasters, acts of terrorism, or man-made disasters. By having experienced and certified PHEM personnel, communities can respond faster to public health threats.



Facilitators (CDC-N and NCDC) reviewing a session on PHEOC De-Escalation and De-Activation during the training, September 2021.



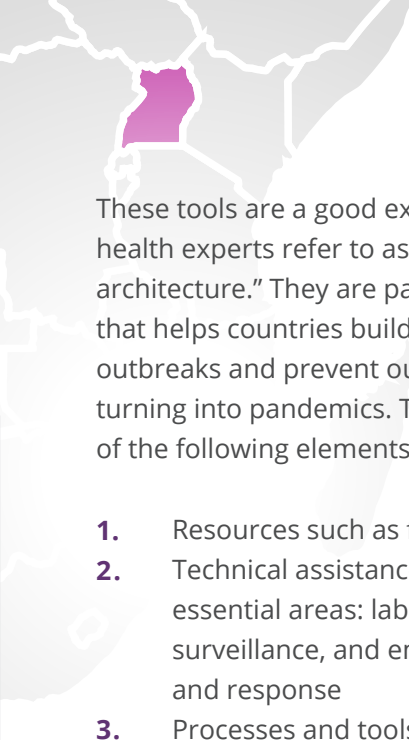
CDC Helps Countries Close Gaps in Global Health Security through Operational Planning



A burial team simulates proper safe burial procedures during a simulation exercise at Kagando Hospital, Uganda in 2019. Photo: Daniel Stowell/CDC

The health and economic impact of the COVID-19 pandemic has illustrated why every country must improve their ability to detect and rapidly respond to deadly infectious disease outbreaks. CDC's Division of Global Health Protection (DGHP) leads implementation of global health security (GHS) activities to do this, helping countries strengthen health systems, build outbreak response capacity, and meet international standards under the International Health Regulations (IHR).

In addition to working with countries to build GHS capacity, DGHP also produces tools to help countries identify areas where they lack capacity and develops approaches countries can use to plan and implement activities to address these gaps.



These tools are a good example of what global health experts refer to as the “global health security architecture.” They are part of a support system that helps countries build their capacity to identify outbreaks and prevent outbreaks from potentially turning into pandemics. The support system consists of the following elements:

1. Resources such as funding and staffing
2. Technical assistance to build capacity in four essential areas: laboratories, workforce, surveillance, and emergency management and response
3. Processes and tools to identify gaps and plan actions to address them

CDC Establishes an Effective Planning Approach

DGHP, in conjunction with CDC partners, worked closely with the World Health Organization to develop the Joint External Evaluation (JEE), a tool that more than 110 countries have used to assess their capacity and identify gaps, and National Action Plans for Health Security (NAPHS), plans to address the gaps and map out ways to address them. However, action to implement the plans has often been slow. Recognizing this, DGHP worked with the governments of Nigeria, Sierra Leone, and Uganda, as well as WHO and Resolve to Save Lives, to develop a planning approach that helps turn assessments into action. This planning approach included these key principals:

- **Focus** efforts on a small number specific and priority gaps in health security capacity
- **Set short-term outcomes** to be completed for 6-12 months
- **Generate support** from across sectors of government
- **Institute regular check-ins** on progress of the plan with annual reassessments
- **Track progress** of the activities in the plan
- **Create accountability** for the actions in the plans

Stepwise Approach and Activity Tracking Gets Uganda “Out of the Red”

CDC has worked with Uganda for years to develop this new approach. DGHP supported Uganda as they piloted an early version of the JEE, and later when they conducted an official JEE. They also helped Uganda launch the Kampala Declaration, a commitment to addressing their gaps, and worked with them to develop a National Action Plan for Health Security (NAPHS).

DGHP was there again when Uganda resolved to adopt a revised planning approach to implement their NAPHS. Uganda has focused at improving all areas that were identified in the JEE as having no or limited capacity (scores of 1 or 2 out of 5), known as the ‘reds.’

In a recent internal self-assessment, Uganda’s indicators scored with no capacity declined from 10% to 2%. Indicators scored with limited capacity declined from 30% to 20%. Uganda “Got Out of Red” in 4 indicators and increased capacity in 18 indicators in areas such as national laboratory systems, human resources, emergency preparedness, and border health.

This approach was particularly successful in improving preparedness at points of entry (airports and border crossings), which had received previously weak scores on their JEE. As part of this process, the Uganda Ministry of Health held a nationwide Ebola

Virus Disease outbreak simulation exercise in April 2019 which included detection of Ebola in two major points of entry and one community. This simulation exercise identified critical gaps in their alert notification and communication to rapid response systems, and Uganda began implementing measures to improve these systems. Within two months, the field hospital which conducted the simulation exercise quickly detected an Ebola case. Uganda was able to quickly deploy rapid response teams and launch active surveillance and alert notification networks to prevent community spread. A potential Ebola epidemic was avoided, which Uganda credits in large part to the simulation exercise.

Annual Planning Improves Sierra Leone's JEE Scores

Sierra Leone also had difficulties implementing their NAPHS and realized that a new approach was needed to translate the plan into action. DGHP staff worked with the Government of Sierra Leone, WHO, and Resolve to Save Lives to implement a new annual

approach to planning that has proven effective. Since 2018, DGHP and partners have helped Sierra Leone use the JEE to conduct a self-assessment of their capacity and then hold a workshop where key activities to address the gaps are prioritized for the upcoming 6-12 months. Once the plan is developed, Sierra Leone uses an online activity monitoring system to track activities in the plan, enhancing their ability to quickly adapt when goals are not being met. Following this new approach, Sierra Leone improved the number of JEE indicators that were scored a '4' (of 5) from 12% to 33% from 2018 to 2020 (see Figure 1 light green bars). Over the same period of time the number of indicators scored at a '1' (of 5; dark red bars) decreased from 33% to 14%. These included improvements in areas such as surveillance, emergency operations and response, and medical countermeasures.

The Government of Sierra Leone has now taken over this annual process and has continued to see significant improvements, including for emergency



Members of a safe and dignified burial team simulate safe placement of the body of a patient who has died from Ebola in a body bag during a response exercise at Kagando Hospital, Uanda in 2019. Photo: Daniel Stowell/CDC

Comparison of IHR JEE Indicator scores, Sierra Leone, 2018-2020

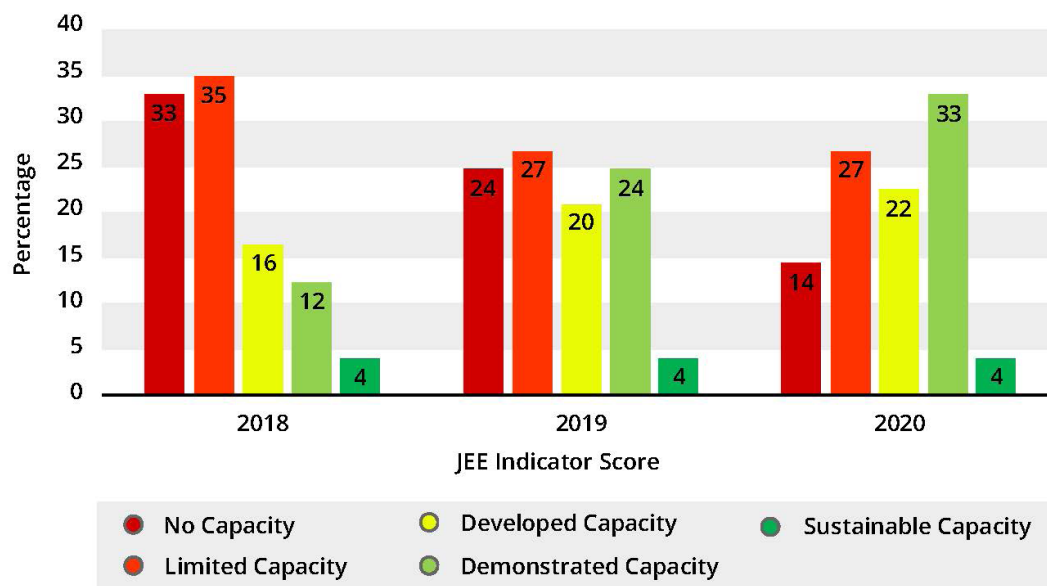


Figure 1. JEE Capacity Improvements after the Introduction of Operational Planning in Sierra Leone, 2018-2020. This figure shows the distribution of indicators at each JEE capacity score (1-5) and highlights the rapid improvement in Sierra Leone's public health capacities over time.

response. Despite the COVID-19 pandemic, Sierra Leone has now doubled the number of high-scoring JEE technical areas compared to when they launched the NAPHS in 2017. "Systems have been strengthened from previous operational planning, including integration of surveillance, labs, and animal health for improved detection and response mechanisms" noted one participant of the last planning meeting. Dr. Mohamed Vandi, Director, Directorate of Health Security and Emergencies, Sierra Leone, noted a "Clear indication that the planning we have done has yielded much success. We are still a country with weak health structures, but we were able to [handle COVID-19] relatively better compared to other countries, because of the way we are strengthening our planning cycle to help the global health security agenda."

The Way Forward

The COVID-19 pandemic has shown the world that more work is needed to build capacity to manage infectious disease outbreaks globally. Global health security experts have acknowledged that translating plans into action is critical and CDC's expertise in

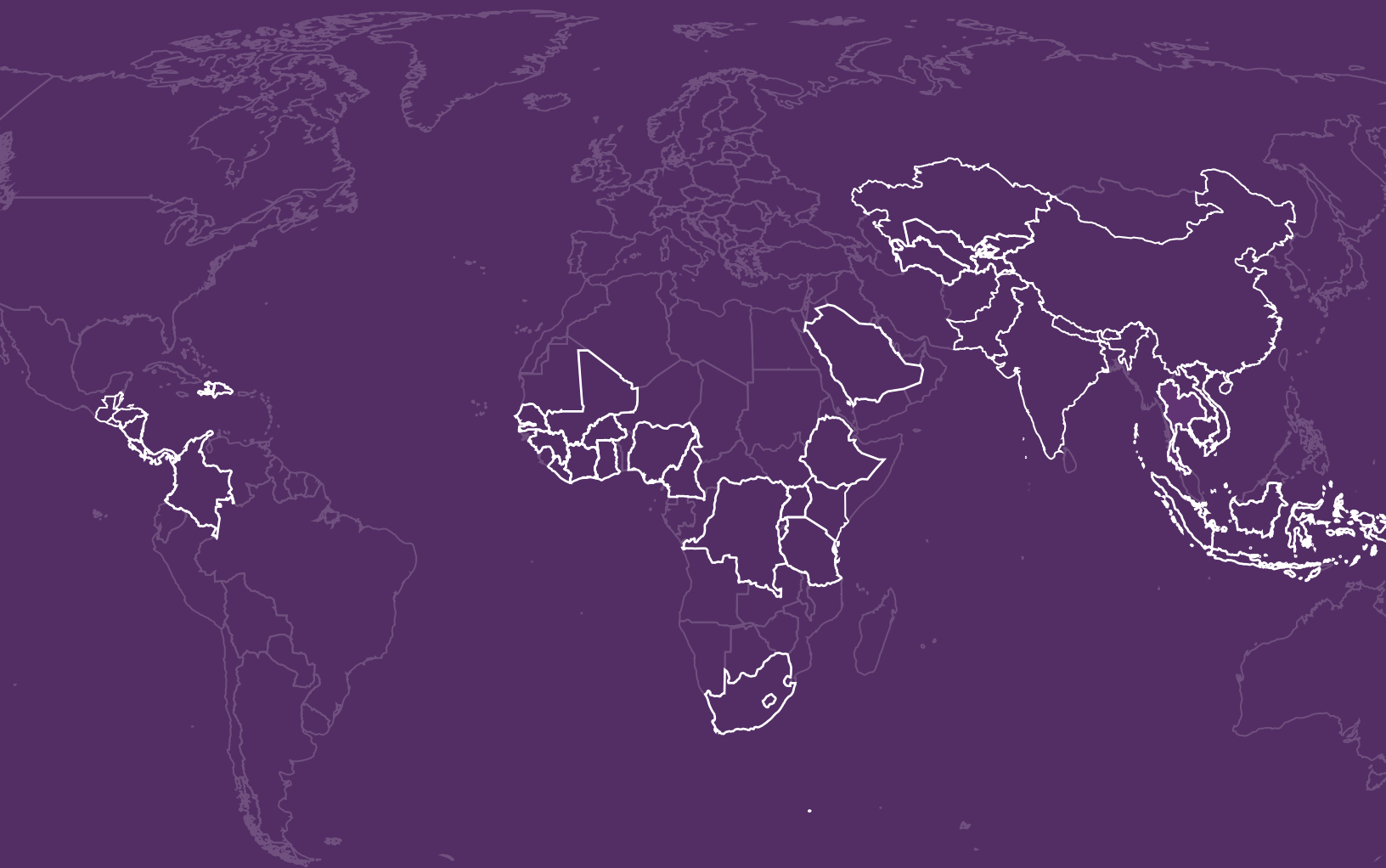
this area is crucial. As Mike Mahar, DGHP Lead for GHSA, notes,

"When it comes to working with the U.S. administration and with WHO and global partners to promote health security, CDC has already helped build much of the architecture to improve GHS, and there is strong evidence that the tools and processes we've developed work. Encouraging countries to adopt this short-term approach to planning will help them move from identifying where gaps are to actually making progress to closing those gaps."

DGHP

DIVISION OF GLOBAL HEALTH AND PROTECTION

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