



UPDATES FROM THE FIELD

SPECIAL EDITION: GLOBAL DISEASE DETECTION

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ADVANCING THE SCIENCE OF GLOBAL PUBLIC HEALTH

Dear Colleagues:

I was working in Thailand in 2003 when the SARS epidemic took the world by surprise. SARS showed us that we don't always know what's coming, or where and how it will spread. Without systems in place to detect diseases early and close to the source, outbreaks become epidemics, economies are shaken, and lives are lost.

We learned a lot in that outbreak. During that time, my colleague Dr. Scott Dowell joined me and the CDC Country Office in Thailand to incubate a new program focused on emerging infectious diseases. This was the genesis of the Global Disease Detection (GDD) program.

GDD was one of the first ways we systematically approached our commitment to global health security. Through the program, countries are building stronger systems to prevent, detect, and respond to health threats. In 2014, a growing partnership of nearly 50 nations agreed to the Global Health Security Agenda. With over a decade of experience between SARS and Ebola—and a total of over 1,700 outbreaks and public health emergencies responded to—GDD remains critical to this work. But there is more to do.

Under Dr. Joel Montgomery's leadership, GDD continues its front-line focus. As of today, GDD has supported over 50 countries through 10 Centers worldwide. Centers strengthen national and regional capacity through emerging infectious disease detection and response; workforce development; laboratory systems; preparedness and communication; addressing the animal and human interface responsible for zoonotic infections; and conducting public health research.

It is my privilege to share this *Updates from the Field* devoted to one of our most successful global health programs. These stories illustrate the innovation, determination, and resourcefulness it takes to protect people all over the world through advancing the science of global public health. Read on!

ADMIRAL JORDAN W. TAPPERO, MD, MPH
*Director, Division of Global Health Protection
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SEEKING SUBMISSIONS

Send story ideas to Dana Pitts:
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READ ONLINE

<http://www.cdc.gov/globalhealth/healthprotection/fieldupdates/index.html>



PEOPLE. PATHOGENS. PROTECTION.

Deadly disease threats are out there—some we know about, and some we have yet to discover. We can save lives by giving countries resources to find and stop threats before they spread. We need lab systems to identify emerging diseases; surveillance to tell us when a “blip” might signal a new threat; and networks that can both respond at the source and connect globally. Most importantly, we need to work together.

Every day, our staff are in all corners of the world, doing whatever it takes: knocking on doors in remote villages, swabbing the noses of African buffaloes, making do, taking creative approaches, and stopping diseases in their tracks. Welcome to Global Disease Detection.

JOEL MONTGOMERY, PhD
 Chief, Global Disease Detection
 Division of Global Health Protection
 Center for Global Health, CDC



Joel Montgomery describes CDC activities in Kibera, Kenya to the Assistant Secretary for African Affairs, Linda Thomas-Greenfield, U.S. Department of State.


GLOBAL DISEASE DETECTION

We focus on strengthening core capacities in host countries to improve their ability to identify and control emerging infectious diseases at the source. Beginning in 2006, the program measured progress in five key activities:

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OUTBREAK RESPONSE: Improve the timeliness and reliability of outbreak investigations and responses
- 












PATHOGEN DISCOVERY: Identify novel threats before they spread
- 

TRAINING: Build capacity and improve the quality of epidemiology and laboratory science
- 

SURVEILLANCE: Strengthen surveillance systems to detect, assess, and monitor the public health threats
- 

NETWORKING: Enhance collaboration through shared resources and synergy

GLOBAL DISEASE DETECTION BY THE NUMBERS

SELECT ACCOMPLISHMENTS FROM GDD CENTERS, 2006–2014		
	10	GDD Centers help countries build core capacities in support of the International Health Regulations and Global Health Security
	50+	Countries received support from the GDD Centers for outbreak response, laboratory and pathogen discovery, training, surveillance and networking
	1,735	Outbreak investigations supported in partnership with ministries of health
	1,158	Outbreak investigations received laboratory support
	97,687	Public health professionals trained on topics including epidemiology, risk communications, health economics, scientific writing, policy, rapid response, and informatics
	2,787	Training sessions conducted on epidemiology, laboratory, all hazards preparedness, risk communication and other topics
	60	Pathogens detected that were new to a region of the world
	12	Pathogens detected that were new to the world
	289	New diagnostic tests in 59 countries, which improved disease detection capability and accelerated response interventions
	623	Peer-reviewed scientific articles published
	75,000,000+	People under surveillance for key infectious diseases and syndromes

ENDING UP IN AN UNEXPECTED LOCATION

"We were [in the country of Georgia] doing a survey. We randomly selected houses before we got there by satellite imagery from Google Earth, and then used GPS coordinates to try to find the selected houses in the field. Unfortunately, a number of the houses that were on the satellite imaging from Google Earth no longer existed, had been destroyed, or had been abandoned. Hence, ending up on some railroad tracks with only a pig for company!"

ASHLEY GREINER, MD, MPH, EIS '14



SOUTH CAUCASUS GOING ABOVE AND BEYOND TO ELIMINATE HEPATITIS C IN THE COUNTRY OF GEORGIA

Georgia is the first country to take on the challenge of completely eliminating Hepatitis C (HCV)—a serious viral infection—and they're using a team of international disease detectives to find out how it's spreading.

To stop a disease in its tracks, you need to get ahead of it. But if the disease you're tracking doesn't respect boundaries, then neither can you. This may mean going off the beaten path into remote villages where your GPS doesn't work, or into people's homes and businesses. Sometimes people speak your language, and sometimes they don't.

In the country of Georgia, the culprit is HCV, affecting almost 7% of the population. Over time, HCV can cause liver damage and even liver cancer. As part of an ongoing collaboration between the U.S. Centers for Disease Control and Prevention (CDC) and Georgia's National Center for Disease Control, epidemiologist Dr. Stephanie Salyer, who is based in Atlanta, and her team conducted a door-to-door survey to find out how HCV is spreading.

A UNIQUE SET OF CHALLENGES

Communication was the first challenge. Some Georgian citizens speak Armenian and Azerbaijani languages, but little to no Georgian. To address this, multilingual field staff from Georgia, Armenia and Azerbaijan were hired to conduct the survey.

The teams also found navigation challenging, particularly in rural areas. Despite using GPS to find survey locations, teams sometimes ended up hiking in the middle of nowhere past abandoned houses.

But perhaps the most difficult challenge was "hearing heartbreaking stories from people in the field with Hepatitis C. A lot of team members personally knew people impacted by this disease," said Stephanie.

PUTTING DATA TO WORK

Survey results are already informing national strategy. Experts assumed that HCV in Georgia could be traced back to intravenous drug use, reusing syringes, or being previously incarcerated. New information may indicate that transmission could also be associated with lack of infection control surrounding medical and dental procedures, and even tattoo parlors and manicure salons. Data is making researchers and policymakers look in new directions.

Stephanie recalls the commitment of the survey teams: "I would have to force them to come back at the end of the day," she says. "They really went above and beyond."

Progress in eliminating HCV in Georgia is a product of strong collaboration between the U.S. CDC's Division of Viral Hepatitis in Atlanta and Georgia's National Center for Disease Control.

Georgia's survey teams really went above and beyond. I would have to force them to come back at the end of the day.



Locating survey households.

Read the full story: http://www.cdc.gov/globalhealth/healthprotection/gdd/stories/georgia_eliminate_hepatitis.html

CENTRAL AMERICA BUILDING EOCs ON A SHOESTRING

Having Emergency Operations Centers (EOCs) that can respond within two hours is one of the goals of the Global Health Security Agenda. But do EOCs need to come with a high price tag? Not according to Luis Hernandez, who is on the road 200 days a year setting up EOCs in all corners of the world.

Luis Hernandez knows firsthand that mounting an effective response is about more than having the latest technology and equipment. From his Guatemala office, he helps countries with small budgets and limited staff create EOCs of their own. Not only has he been setting up successful EOCs in Central and South America, but he has traveled across the globe to help Bangladesh, Kenya, Thailand, Guinea, and India.

Here's what Luis has learned about building an EOC on a shoestring.

FIND AN EMPTY ROOM

Any empty room will do. Luis usually finds an unused conference room. "You don't need a multi-million dollar EOC to respond to an emergency," he says.

GET A FEW COMPUTERS... AND SOME OTHER STUFF

The EOC in Guatemala has 12 laptops, a projector, and a screen. "I had to borrow a conference table from the influenza program," Luis says, laughing. "I need a network and I need power. I have three flat-screens—also borrowed. We have an old plotter I fixed up to print maps for the Ministry of Health."

TRAIN PEOPLE WELL

By far, the most important resource in an EOC is people. "If you don't have the right people with the right training, a multi-million dollar facility is no use. If you have the right people, with their laptops they can do their jobs," says Luis. When budgets don't allow for dedicated staff, as in Guatemala, Luis recommends training staff who can shift focus from their day jobs and become emergency responders at a moment's notice.

CONNECT WITH NEIGHBORS

A functional EOC is about training the right people and connecting with others. In Central America, a regional emergency management technical committee enables countries to find out how others are preparing.

DO AMAZING WORK

Central America demonstrates the power of a low-tech, low-cost EOC. Among other achievements, they've responded to the 2014 Ebola outbreak, linked resources when dengue came to the region, helped regional governments develop emergency action plans, and provided a model for how small EOCs can work all over the world.

Work in building EOCs is supported by countries' Ministries of Health and U.S. and international partners. In Guatemala, this work is coordinated through the GDD Regional Center for Guatemala and Central America, which is part of CDC's country office.

If you don't have the right people with the right training, a multi-million dollar facility is no use.



Guatemala Ministry of Health EOC Earthquake Tabletop Exercise, March 2014.

Read the full story: <http://www.cdc.gov/globalhealth/healthprotection/gdd/stories/guatemala-resourceful-eoc.html>

SOUTH AFRICA TRACKING AND TAMING ZOOONOTIC DISEASES

Many emerging infectious diseases are zoonotic, meaning they are transmitted from animals to humans. A One Health program in South Africa connects physicians and veterinarians to better understand causes of human disease by looking at animals in a new light.

How do you tonsil swab a wild African buffalo? More importantly, why? The answer is that buffalo are reservoirs for certain zoonotic diseases. Many infectious diseases (such as rabies) are transmitted through animals, which is why tracking animal diseases that could potentially jump to humans is a crucial aspect of public health. Early detection means spotting these diseases in animals before they make people sick.

BRIDGING ANIMAL AND HUMAN HEALTH

Dr. Marietjie Venter of GDD South Africa visited Kruger National Park along with a PhD student from the University of Pretoria. As part of a wildlife surveillance program, a skilled group of veterinarians sampled 30 buffalo in three hours. They swabbed tonsils and collected blood, fecal, and stomach content to investigate foot and mouth disease.

While buffalo are natural reservoirs for foot and mouth disease, which can spread to cattle, they are also thought to carry Rift Valley fever, bovine tuberculosis, and other viruses that could potentially spread to humans. The University's Zoonoses Research Unit will use the samples collected by the veterinarians to investigate for these zoonotic diseases.

PARTNERSHIP IN ACTION

The expanded partnership with the University's research unit improves surveillance capacity, adds data collection sites, and enhances reporting. According to Dr. Wanda Markotter, Principal Investigator for the original partnership agreement, "This new project will significantly enhance the collaboration between the Health and Veterinary faculties and provide feedback to the Ministries of Health and Agriculture in South Africa."



African buffalo carry diseases that can be transmitted to humans.

So, back to that buffalo. Are you curious about how those specimens are collected?

- STEP 1:** Tranquilizer dart.
- STEP 2:** Apply blindfold.
- STEP 3:** Move with tractor to recovery area.
- STEP 4:** Collect sample.
- STEP 5:** Provide tranquilizer antidote.
- STEP 6:** Run!

Doctors treating humans may want to count their blessings.

This new project will significantly enhance the collaboration between the Health and Veterinary faculties and provide feedback to the Ministries of Health and Agriculture in South Africa.



Collecting samples from African buffalo in Kruger National Park.

Read the full story: http://www.cdc.gov/globalhealth/healthprotection/gdd/stories/south_africa_zoonotic_diseases-.html

INDIA

COORDINATED OUTBREAK RESPONSE PUTS DIARRHEA ON THE RUN

Globally, there are nearly 1.7 billion cases of diarrheal disease every year. In India, the problem is widespread: acute diarrheal diseases and food poisoning routinely account for over 40% of infectious disease outbreaks.

People think of their wedding day as the happiest day of their lives. In India, weddings often include several days of festivities with friends and family. Symptoms like “abdominal pain,” and “vomiting” are unwanted guests, but they crashed one wedding party in Gujarat State.

Fortunately, India is committed to strengthening outbreak response and surveillance for acute diarrheal and foodborne diseases. Within 24 hours, four people were deployed to conduct an investigation to find the cause of the wedding outbreak. Two investigators were Indian EIS Officers and two were from the U.S. Centers for Disease Control and Prevention (CDC). Combining forces, they surveyed households to track down nearly 400 wedding guests from four villages to identify potential cases and get more information about foods the sick guests ate. Ninety-two people reported symptoms and eight were hospitalized.

SPOILED MILK

The culprit? The team traced the likely source of the outbreak to basundi, a dessert made of condensed milk topped with dry fruit and served cold. The officers discovered there was a 10 hour power outage two days before the wedding that affected the dairy where the milk was purchased.

PRACTICE MAKES PERFECT

Solving foodborne outbreaks is not easy. It takes training, patience, practice, and many partners. Thanks to a network called the Global Foodborne Infections Network (GFN), countries, including India, are getting the tools and relationships they need to solve outbreaks. Epidemiologists, microbiologists, lab technicians, and healthcare staff are trained and mentored on procedures for stool specimen collection, transport, laboratory testing, and reporting.

The key to cracking foodborne outbreaks is testing specimens from sick people. In two years, as part of a pilot project, over 30 outbreaks have been detected and reported in four districts; 2,000 samples have been properly collected, transported, and tested. Clinical specimens were tested in 75% of those outbreaks—results that are on par with the best standards in the world.

Plans are being discussed to double the number of districts and add activities. With better ability to track, test for, and prevent foodborne illnesses, gatherings all over India could turn away uninvited bacterial guests.

Progress in tracking and responding to acute diarrheal disease and outbreaks in India is thanks to the Global Acute Diarrheal Disease Pilot Project in partnership with CDC’s Division of Foodborne, Waterborne, and Environmental Disease, the Global Foodborne Infections Network, and India’s National Centre for Disease Control’s Integrated Disease Surveillance Program.

The key to cracking foodborne outbreaks is testing sick people. Results from a pilot study in India are on par with the best standards in the world.



An India EIS officer helps the district rapid response team take interviews after a food poisoning outbreak in Gujarat. Photo courtesy of Mayank Dwivedi.

Read the full story: http://www.cdc.gov/globalhealth/healthprotection/gdd/stories/india-diarrhea_on_run.html

THAILAND OPEN BORDERS, SAFE BORDERS—KEEPING WATCH FOR OUTBREAKS

Thailand has been strengthening their disease tracking systems for over a decade. A new border health project will better detect potential health threats in border areas, using advanced molecular detection and a network of laboratories to provide fast and accurate results.

At a hospital on the edge of Thailand, near the border with Laos, a healthcare worker examines a traveler complaining of fever. He knows that dengue fever is common, but he can't be sure that's it. Dengue often shares symptoms with [Zika virus](#). And then there are other possible causes—some more frightening than others.

It used to take a long time to receive laboratory test results because samples had to be shipped to Atlanta. Thailand can now conduct tests and give results quickly in the field. "Using advanced molecular detection means test results are ready in a matter of hours. This is a huge improvement," notes Dr. Christopher Gregory of GDD Thailand.

The worker gathers clinical information and draws blood. If it's dengue, he'll know soon. If not, he'll send the sample to a central laboratory to test for antibiotic-resistant infections. If further testing is needed, the sample will travel to the Ministry of Public Health's central laboratory in Bangkok. Eight hospitals and clinics near the borders of Laos and Myanmar will soon be screening patients with fever through this coordinated monitoring program.

STOPPING OUTBREAKS BEFORE THEY CROSS BORDERS

This year, Thailand wrapped up a pilot project on the Laos border that collected data on hospitalized patients with sudden onset of severe fever. In 2016, the project will expand to include Tak province on the Myanmar border. The project aims to improve pathogen and outbreak detection, determine the burden of high priority diseases, evaluate diagnostic tests, and enhance laboratory capacity.

RELATIONSHIPS ARE KEY

Partnerships are at the core of protecting health at Thailand's borders. The Thai Ministry of Health, the U.S. Centers for Disease Control and Prevention (CDC), and the U.S. Defense Threat Reduction Agency all provide critical pieces of the program. A thirty-five year history of trust and collaboration between Thailand and CDC makes it easier to overcome challenges that arise.

Thanks to coordinated monitoring efforts like these, we can continue to identify and contain infectious disease outbreaks in Thailand and across the globe before they become epidemics.

This project receives support from the U.S. Defense Threat Reduction Agency and is conducted in partnership with the Thai Ministry of Health.

A thirty-five year history of trust and collaboration between the Thai Ministry of Health and CDC makes it easier to overcome challenges.



CDC and Defense Threat Reduction Agency staff at a pre-implementation site visit to Mae Sot General Hospital, Thailand, January 2015.

Read the full story: http://www.cdc.gov/globalhealth/healthprotection/gdd/stories/thailand_open_borders_safe_borders.html

LESSONS FROM EGYPT— PROTECTING THE POWER OF ANTIBIOTICS

Cultural roadblocks can sometimes stand in the way of addressing the danger of antimicrobial resistance. In Egypt, barriers are steadily coming down thanks to a national program that works closely with hospitals and communities to address healthcare-associated infections and change the way antibiotics are used.

Dr. Maha Talaat has led infection control and prevention work in Egypt for over a decade. She and her team are addressing the issues that can lead to the loss of effective antibiotics: misuse by people; laboratories lacking equipment to identify the source of infections; physicians lacking trust in systems; and widespread taboos against collecting and sharing personal health data.

Tackling a national problem begins one step at a time.

STEP 1: START COUNTING

In Egypt, no one knew exactly how widespread or what the main causes of drug-resistant infections were. The team worked with local and global experts to identify hospitals with the highest infection risk, and helped them reduce it based on what surveillance data revealed.

They began by looking for active infections in intensive care units in hospitals around Egypt, working with hospital laboratories to help identify pathogens, and using smart devices to gather patient information. They started small in 2010, but the program now reaches more than 50 hospitals with over 1500 intensive care unit beds, with more added every day.

STEP 2: MAKE IT POSSIBLE

At first, physicians did not trust the use of smart devices to gather data. However, nurses were excited to have state-of-the-art technology in their hands. Clinicians were soon won over by the ability to instantly see results and create reports.

STEP 3: MAKE IT VISIBLE

Before the surveillance program, hospitals were blind to the main pathogens causing infections in their patients and the number of patients infected. With data in hand, participating hospitals improved infection control practices to reduce the number of infections by 36 percent.

STEP 4: MAKE IT SOCIAL

The team launched a community-based pilot campaign to teach people to use antibiotics correctly. The campaign saw a striking reduction in antibiotic prescriptions for respiratory infections from 81% to 60.4%, proving that targeted education can translate into cultural change.

Reducing antibiotic resistance in Egypt depends on strong partnerships with the Egyptian Ministry of Health, Ministry of Higher Education, USAID, the Center for Disease Control and Prevention (CDC) Division of Healthcare Quality Promotion, and the World Health Organization (WHO).

With data in hand, participating hospitals improved infection control practices to reduce the number of infections by 36 percent.



Infection prevention and control specialists travel in Egypt.

Read the full story: http://www.cdc.gov/globalhealth/healthprotection/gdd/stories/egypt_power_of_antibiotics.html

BANGLADESH

FIVE STEPS TO SCIENTIFIC WRITING SUCCESS

Excellent scientific writing practices help junior scientists grow and thrive. In Bangladesh, rigorous training and access to writing and statistical coaches ensure that staff have the skills to become independent scientists.

Scientific writing can be difficult, but it's important to get it right. Good scientific writing is “how we communicate and participate in the global conversation,” says [Dr. Stephen Luby](#), former Centers for Disease Control and Prevention (CDC) Country director in Bangladesh. How scientists present their work can have a direct effect on public health and policy decisions.

Thanks to a commitment to train and mentor junior scientists, excellence in scientific writing practices has become the standard. Lessons from Bangladesh can inform other countries looking to invest in the next generation of scientific leaders. Here are 5 STEPS to successful scientific writing in Bangladesh:

1. HIRE WELL

Staff in Bangladesh use a rigorous examination and interview process to screen candidates for critical thinking and English language skills, ensuring that only junior scientists with the highest potential are hired.

2. SET EXPECTATIONS

Everyone hired to conduct research must also write scientific protocols and manuscripts. Retention and promotion depend on productive scientific writing.

3. PROVIDE FOCUSED, PRACTICAL TRAINING

Junior scientists must complete 12 courses within two years. Participants learn about topics including data analysis, ethics and plagiarism, and how to give presentations.

4. STRUCTURE THE WRITING AND FEEDBACK EXPERIENCE

Authors start with bulleted outlines, which are concise and easier to review than full paragraphs. There is no ghost-authorship, and coaches do not rewrite manuscripts. Steve and a colleague, Dorothy Southern, developed a [guide](#) to easily provide feedback. The guide is available through Stanford University.

5. PROVIDE MENTORSHIP

Junior scientists receive extensive mentoring, meeting with their supervisor to make sure they stay on track. All of the researchers in the first course have produced first-authored manuscripts, and most have now earned their PhD or are working on their doctoral thesis.

According to Diana Diaz Granados, head of the Training Support Group at the Center for Communicable Diseases in Bangladesh, “The future for scientific writing in Bangladesh is bright. It is a big investment in time and requires a serious commitment to developing independent scientists, but the results are worth it.”

A new program, [Data for Health](#), will extend training for scientific writing in Bangladesh and improve the strategic use of data for policy, thanks to a partnership between the Bloomberg Foundation and the CDC Foundation.

Scientific writing is how we participate in the global conversation.



Diana Diaz Granados, Head of the Training Support Group and Dr. Zaikul Hassan, Research Investigator.

Read the full story: http://www.cdc.gov/globalhealth/healthprotection/gdd/stories/five_steps_bangladesh.html

KENYA

UNLOCKING THE MYSTERY OF CHILDHOOD DEATHS

A team of researchers is partnering with Kenyatta National Hospital to produce some of the most comprehensive information on respiratory deaths among children in Africa. The hope is that lessons will benefit communities worldwide.

Kenya is determined to save children's lives by understanding why they are dying. Respiratory tract infections, particularly pneumonia, are a leading cause of death in Kenyan children under the age of five. A new study called the Pediatric Respiratory Etiology Surveillance Study merges traditional pathology, new laboratory technology, and information from autopsies to better understand the cause of respiratory disease among children.

MAKING NEW CONNECTIONS

- **CAUSE OF DEATH:** The study follows children hospitalized in the pediatric and intensive care wards at Kenyatta National Hospital in Nairobi. In the unfortunate event that a child dies of respiratory disease, the program provides guardians with grief counseling and extra time before asking their permission to conduct an autopsy. The technique used in the autopsy for specimen collection is minimally invasive and therefore more culturally sensitive. Being more sensitive to the needs of parents has increased rates of study participation to 60%.
- **NEW DIAGNOSTICS:** Laboratory testing is needed for the study because it can be difficult to tell the source of a respiratory infection based on symptoms alone. A new test called the TAQMAN Array Card, is being used to test samples from children in the study. The multiple-pathogen test can diagnose between 20–40 pathogens for up to eight patients at the same time, and do it within 2.5 hours. Faster and better results can help guide treatment and detect outbreaks sooner.
- **COMBINING INNOVATION:** The study analyzes the molecular data from the multiple-pathogen technology card in tandem with the pathological data from the autopsies. This groundbreaking approach could unlock the mystery of why so many young children die of respiratory disease.

PUTTING IT TO THE TEST

Information from the study is already being used by healthcare workers at the hospital. Testing picked up an outbreak of respiratory syncytial virus in the neonatal ward, which led to improved infection control practices and helped stop the spread of the virus. The methods used in the study will serve as a model for other programs and countries as they work to save the lives of young children.

A commitment to reducing childhood deaths through the Pediatric Respiratory Etiology Surveillance Study is being led by the Centers for Disease Control and Prevention (CDC) Influenza Division through their successful Influenza program in Kenya in collaboration with Kenyatta National Hospital. Support is also provided from CDC's Division of High Consequence Pathogens and Pathology.

A groundbreaking study in Kenya is producing some of the first data on respiratory deaths among children in Africa.



Researchers in Kenya are working to prevent respiratory deaths among children.

Read the full story: http://www.cdc.gov/globalhealth/healthprotection/gdd/stories/kenya_mystery_childhood_deaths.html

CHINA DISEASE DIPLOMACY: FROM CHINA TO ATLANTA TO SIERRA LEONE

The 2014 Ebola outbreak marked the first time China led their own response to a large-scale public health event. The Chinese government built a new lab in Sierra Leone, and the Centers for Disease Control and Prevention (CDC) in Atlanta had a laboratory technique that would help them. As Chinese nationals, Drs. ShuYu Wu and Yuzhi Zhang of GDD China were uniquely able to cross language and travel barriers to bring the technique to Africa.

Neither ShuYu nor Yuzhi had ever been to Africa or worked on an international outbreak response before. They were scheduled to arrive in Sierra Leone in mid-September 2014. But first they would have to travel from China to Atlanta, GA, for specialized laboratory training.

THE JOURNEY BEGINS

The two laboratory experts traveled to Atlanta before going to Sierra Leone to be further trained by Ebola experts working in the Viral Special Pathogens laboratory. While in Atlanta, they kept in close contact with Chinese laboratorians in Sierra Leone to discuss the training and equipment needed to carry out the diagnostic tests. “We held teleconferences with China’s Jui Lab and discussed with CDC in Atlanta what, if any, modifications we could make if certain equipment was not available,” says Yuzhi.

MAKING DO AND GETTING RESULTS

Armed with specialized training and hours of interaction with the Chinese laboratory, the two set off for Sierra Leone. Even with all the preparation and support they received in Atlanta, they still faced challenges when they arrived in Sierra Leone. Sierra Leone has limited resources; safe water is scarce. Even basic services failed them. Says Yuzhi, “We encountered power outages almost every day.”

On a typical day during their deployment, they spent about 8 hours in the lab working side-by-side with Chinese laboratorians. Every night, they communicated with colleagues in Atlanta to discuss the day’s results and problems and troubleshoot for the next day. It wasn’t long before the test worked as planned and results were shared with the responders.

A REWARDING COLLABORATION

The deployment was a rewarding experience for the two scientists. “Working together and sharing experiences helps improve trust and collaboration between the United States and China,” says Yuzhi.

This work was supported by CDC’s [Viral Special Pathogens Branch](#) in partnership with [China CDC](#).

Working together and sharing experiences helps improve trust and collaboration between the United States and China.



Yuzhi and ShuYu show laboratory staff how to perform the diagnostic test.

Read the full story: http://www.cdc.gov/globalhealth/healthprotection/gdd/stories/disease_diplomacy_china.html

KAZAKHSTAN

JOINING FORCES TO MODERNIZE LABORATORIES

As part of a large-scale project to modernize Kazakhstan's laboratories, the Stepwise Laboratory Improvement Process is producing immediate and measurable results. Participating laboratories now offer targeted training to other facilities within their region, spreading improvement grassroots-style, one facility at a time.

In Semey, a town on the steppe in eastern Kazakhstan by the Russian-Siberian border, sits one of Kazakhstan's many laboratories. Semey laboratory needed crucial updating. Doors did not have locks or biohazard signs to keep patients out. A red line across the floor designated the clean area from the working area, which was confusing, especially to new staff. There was no eyewash station and most technicians were unaware of the requirement to have one.

After the fall of the Soviet Union, networks to support this laboratory and others like it faded. Directors recognized the need to modernize their laboratories and needed help coming up with a strategy for doing so.

Things needed to change.

CHANGING THE WAY LABS WORK

In 2014, the Ministry of Healthcare and Social Development began working on a large-scale project to modernize Kazakhstan's laboratories alongside CDC and other international partners. The goal was to introduce the Stepwise Laboratory Improvement Process, which is a training and mentoring program developed by world experts to create immediate, measurable improvement in laboratories.

The Semey laboratory was one of five chosen for the first phase of the project. Over the 15 months of Stepwise training, the five laboratories were transformed. Each now has a designated quality manager and biosafety officer who teach staff how to meet requirements and do their jobs better. Among other improvements, Semey now has an actual wall separating the clean area from the working area. Locks and signage were added to doors, and every laboratory now has at least one eyewash station.

SUSTAINABILITY AND CONTINUED COLLABORATION

Kazakhstan now has a complete strategy to improve its laboratories. Policy documents issued by the Kazakh Government were revised to define the roles and responsibilities of reference, clinical, and public health laboratories. Strategic plans were drafted defining step-by-step expectations for laboratory achievements in future years. Together with partners, they will implement activities in the strategic plan, improve more laboratories, draft additional guidance, train the workforce, and realize new goals.

Progress in modernizing laboratories in Kazakhstan is thanks in part to support from the [Centers for Disease Control and Prevention \(CDC\) Foundation](#) to the Ministry of Healthcare and Social Development of Kazakhstan.

Kazakhstan now has a complete strategy to improve its laboratories.



Kazakhstan lab specialists at a state laboratory in Almaty.

Read the full story: http://www.cdc.gov/globalhealth/healthprotection/gdd/stories/kazakhstan_laboratory_reform.html

GLOBAL DISEASE DETECTION OPERATIONS CENTER

There are two main ways the GDD program uncovers disease threats and helps countries respond to an outbreak:

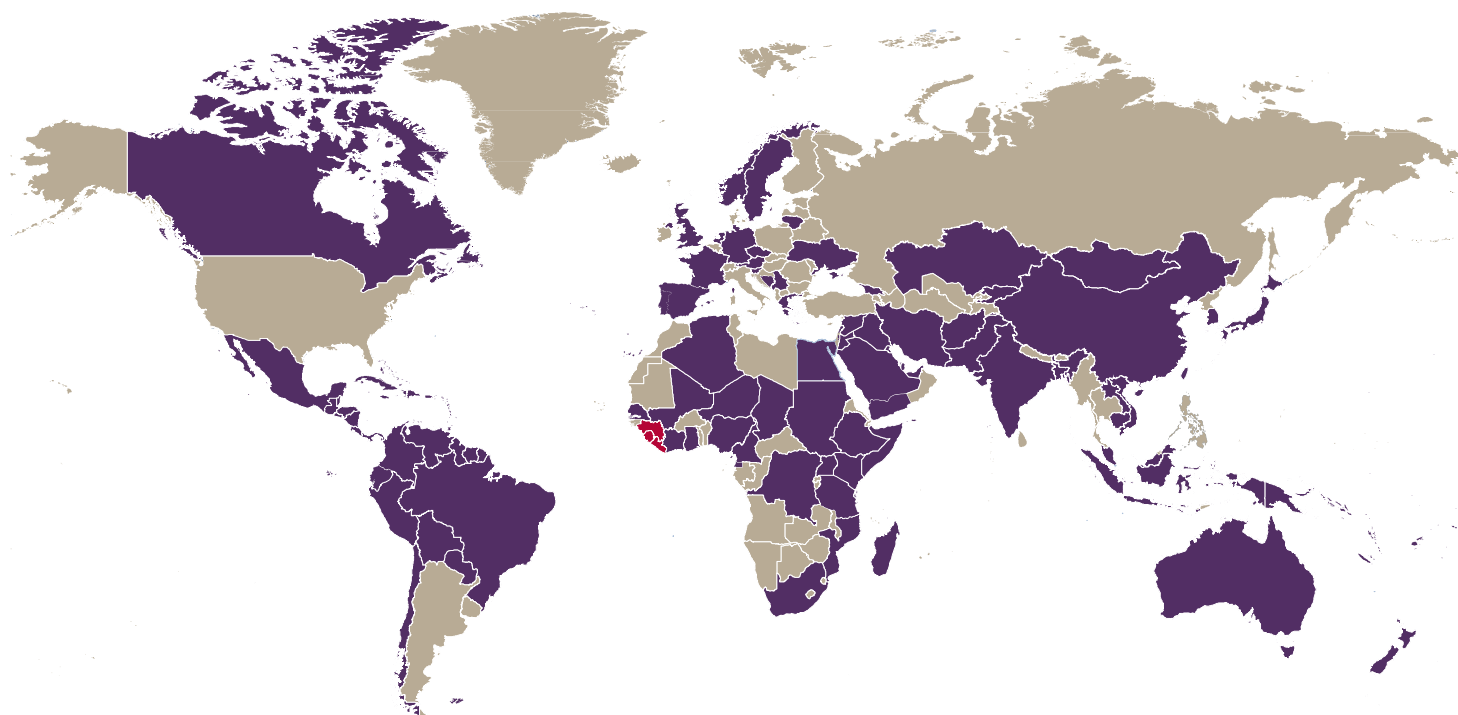
- From the GDD Centers located in 10 countries
- From the GDD Operations Center, located at CDC headquarters in Atlanta

The GDD Operations Center monitors outbreaks across the globe and assesses their potential risk to the global community. They do this by scanning numerous sources of information about disease events and other health threats, searching the internet and other media for key words in over 50 languages. Between March 2014 and December 2015, the Operations Center tracked over 196 outbreaks in 127 countries, in addition to *Ebola*. From *MERS* in the Middle East to *cholera* in East Africa and *chikungunya* in the Americas, these outbreaks justify global concern and have affected many lives. The lesson is this: We cannot focus our energies on any single pathogen or part of the world.

OUTBREAK-AFFECTED COUNTRIES

(Data as of 03 December 2015)

Global Disease Detection Operations Center reported on over 196 outbreaks in over 127 countries since March 2014.



- Ebola - Heavily affected countries
- Countries with other outbreaks since March 2014 as reported by CDC's GDDOC

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