

CDC Kenya

CENTERS FOR DISEASE CONTROL AND PREVENTION • KENYA

Annual Report 2018



U.S. Department of
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Centers for Disease
Control and Prevention



Cover photo: Young girl in the informal settlement of Kibera. Photo on this and next page: Kenyan Girl Guides. Photo taken at the St. Johns Children's Home in Pumwani



CDC in Kenya

Our Mission: To protect and improve health in Kenya and globally through science, communication, policy, partnership, and evidence-based public health action.

For 40 years, the Centers for Disease Control and Prevention (CDC) has helped strengthen public health and laboratory systems in Kenya, creating an integrated research and program center. This model ties together multiple program areas, leveraging technical skills and a strong partnership with

the Government of Kenya to build sustainable public health capacity. CDC Kenya saves lives by conducting research on the effectiveness of new interventions and by preventing disease, reducing death and disability, and implementing evidence-based public health programs.



Four Decades Forward: CDC Kenya Celebrates 40th Anniversary

Colleagues and Friends,

It was in 1979, 40 years ago, that CDC initiated work in Kenya. As always, chance played an important role in choices made and developments that ensued. The big CDC was established in 1946 as an infectious disease control agency succeeding the Malaria Control in War Areas unit that was set up in Atlanta early during World War II. Tropical medicine and infectious challenges in faraway places have been integral to CDC's character from its earliest days. In the mid-1960s CDC took on a leadership role in malaria eradication efforts, with the late Robert Kaiser, a former EIS officer, heading the effort. Kaiser later became head of CDC's parasitic diseases program and in 1979 assigned one of his staff, Harrison Spencer, to initiate malaria research in Kenya. Chloroquine resistance had just been described in East Africa and a technique to culture *Plasmodium falciparum* outside of the human body had been recently introduced. "Why Kenya?" one may ask. Certainly, there was enough malaria to study, and the country's research and educational infrastructure was strong. Undoubtedly, however, other issues were relevant; Kaiser had met his wife in Nairobi, and felt a lifelong affinity with the country.

A small but vibrant Kenyan and international tropical medicine community existed in Nairobi in 1979, working on malaria, leishmaniasis, schistosomiasis, filariasis, hydatid disease and other conditions. Harrison divided his time between Nairobi and western Kenya where he conducted his fieldwork. The Kenya Medical Research Institute (KEMRI) was established at the same time, explaining the strong links between the Kenya Ministry of Health, KEMRI and CDC that have endured over time. The malaria work increased in complexity and scope, giving insight not only into basic science but also burden of disease and epidemiology. Interventional work was emphasized such as the large evaluation of insecticide-impregnated bed nets, prevention and management of malaria in pregnancy, and vaccine trials. CDC staff came and went, but over time, a full-time CDC presence was established in Kisumu, working out of the KEMRI campus in Kisian.

By the time the first case of AIDS was described in Kenya in 1984, silent spread of HIV was already extensive and the region around Lake Victoria was the most heavily affected. CDC decided in the early 2000s to expand its research to include HIV, and the advent of the Global Fund to Fight AIDS, Tuberculosis and Malaria and the President's Emergency Plan for AIDS Relief (PEPFAR) shortly thereafter fundamentally changed the landscape. Increased funding for other areas such as emerging infectious diseases and a broader vision of the requirements of global health—recognition that U.S. domestic health was related to health everywhere—led to substantial CDC expansion. Evolution led to CDC Kenya becoming the agency's most diverse overseas office, working programmatically as well as on research for HIV/AIDS, malaria, tuberculosis, influenza and other infectious diseases and public health issues, and conducting regulatory functions for immigrants and refugees traveling to the United States.

One of CDC's contributions apart from conducting research and program work has been to support the development of scientific and public health leadership in Kenya. Through the Kenya Field Epidemiology and Laboratory Training Program (FELTP) and the related Improving Public Health Management for Action (IMPACT) program, CDC has offered hands-on, in-the-field training to the next generation of epidemiologists and public health leaders. These programs have produced over 300 graduates, many of whom have gone on to hold leadership positions in the Ministry of Health and other organizations in Kenya and internationally.

I am pleased to share this report with you, one that tells the story of CDC in Kenya over the last year. We sincerely thank all partners and the Government of Kenya for their work that does so much to make Kenya a safer and healthier country. CDC Kenya would not be where it is today without the contributions and commitment of all our staff over the past 40 years, emphasizing that the greatest asset of any successful organization is its people. I salute them all. We dedicate this report to the memory of Dr. Harrison Spencer who started it all.

Sincerely,

Kevin M. De Cock, MD, FRCP (UK), DTM&H
CDC Kenya Country Director

CDC's **IMPACT** in 2018



630,000
PEOPLE

630,000 people are
**on life-saving
antiretroviral
therapy.**



400,000
WOMEN

More than 400,000
**pregnant women
know their HIV
status.** Of those tested
positive, **99% are
on treatment.**



92%
OF PEOPLE
LIVING
WITH HIV

92% of patients living
with HIV and on CDC-
supported treatment
have suppressed HIV
to undetectable levels in
their blood.



25
OUTBREAKS

25 outbreak
investigations
supported



107
ARTICLES

107 peer-reviewed
scientific articles
**published
or in press**

Timeline of Key Events in CDC Kenya History

1979

Dr. Harrison Spencer establishes field research center for malaria in Kenya as antimalarial resistance emerged in Africa

1979

Launch of partnership between CDC and KEMRI

1979

Evaluation of schistosomiasis morbidity in relation to the intensity of exposure

1992–1999

Asembo Bay Cohort Project—Longitudinal study on childhood illnesses in 15 villages

1994

Identification of unsafe blood supply

1996–2001

Malaria Insecticide-treated Bednet Trial

2000

Leadership and Investment in Fighting Epidemics (LIFE) Initiative

2001

Voluntary counseling and testing (VCT) guidelines

2002

Launch of the Health and Demographic Surveillance System (HDSS) in Siaya

2004

Launch of the Kenya Field Epidemiology and Laboratory Training Program (FELTP)

2004

TB prevalence study and TB lab established

1979–1982

Saradidi Rural Health Project was the first major population study in East Africa

1980s

Malaria research continues in drug resistance, immune response, and entomological interventions

1997

HIV, Schistosomiasis, and reinfection

1997

Global Enterics Multicenter Study (GEMS)

1999

AIDS declared a national disaster by President Moi

2003

Kisumu Breastfeeding Study saw reduction mother to child transmission of HIV

2004

Launch of the President's Emergency Plan for AIDS Relief

2004

Launch of the Global Disease Detection Center

2005

Launch of the Influenza Program

2007

Launch of the Global Migration and Quarantine Africa Program

2008

Kenya joins the President's Malaria Initiative (PMI)

2009

Phase III Clinical Trial for RTS,S malaria vaccine

2009

HIV Research Laboratory the first to be ISO accredited outside of Atlanta

2009

PEPFAR I ends and PEPFAR II starts

2015

Release of the Strategic Timing of AntiRetroviral Treatment (START) results

2015

Launch of the Determined, Resilient, Empowered, AIDS-free, Mentored, and Safe (DREAMS) program

2016

Launch of the Improving Public Health Management for Action (IMPACT) program

2016

Clinical Research Center in western Kenya selected as HIV Prevention Trials Network (HPTN) site

2018

Kenya completes Joint External Evaluation (JEE) for Health Security

2018

Kenya Population-Based HIV Impact Assessment Survey (KENPHIA)

2018

Kenya selected for expanded pilot of RTS,S malaria vaccine

2011

Establishment of the Kenya Zoonotic Disease Unit

2012

Kenya AIDS Indicator Survey (KAIS)

2014–2015

CDC Kenya staff respond to the Ebola epidemic in West Africa

2014

Launch Global Health Security Agenda

2014

Second KAIS

2016

Selected as Bill and Melinda Gates Foundation Child Health and Mortality Prevention Surveillance (CHAMPS) site

2016

Initiation of “Test and Treat” and pre-exposure prophylaxis strategies for HIV

2017

Kenya Public Health Emergency Operations Center activates for national cholera outbreak

2017

Launched CHAMPS site in western Kenya offering new insights into under 5 childhood deaths.

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Acronyms

ACRONYM	DEFINITION	ACRONYM	DEFINITION
AMP	Antibody-mediated Prevention	LIFE	Long-acting Injectable for the Epidemic
ANC	Antenatal Care	LSTM	Liverpool School of Tropical Medicine
ART	Antiretroviral Treatment	mHealth	Mobile Health
BMT	Budget Marked-up Tool	MOH	Ministry of Health
CDC	Centers for Disease Control and Prevention	NASCOP	National AIDS and STI Control Program
cMIS	Continuous Malaria Indicator Survey	NGS	Next Generation Sequencing
CoAg	Cooperative Agreement	NIH	National Institutes of Health
CS	Cabinet Secretary	OCV	Oral Cholera Vaccine
CHAMPS	Child Health and Mortality Prevention Surveillance	OTZ	Operation Triple Zero
DOD	Department of Defense	PCR	Polymerase Chain Reaction
DP	Dihydroartemisinin-piperaquine	PEPFAR	President's Emergency Plan for AIDS Relief
EID	Early Infant Diagnosis	POE	Ports of Entry
EGPAF	Elizabeth Glaser Pediatric AIDS Foundation	RVF	Rift Valley fever
FELTP	Field Epidemiology and Laboratory Training Program	SMS	Short Message System
GBV	Gender-based Violence	TB	Tuberculosis
GOK	Government of Kenya	UCSF	University of California, San Francisco
HPTN	HIV Prevention Trials Network	USAID	U.S. Agency for International Development
IMPACT	Improving Management for Public Health Action	VL	Viral Load
KEMRI	Kenya Medical Research Institute	WASH	Water, Sanitation and Hygiene
KENITAG	Kenya National Immunization Technical Advisory Group	WHO	World Health Organization
		Xpert Ultra	Xpert MTB/RIF Ultra



Science

CDC Kenya conducts and translates research to inform policy and practice both in Kenya and globally; and to monitor and evaluate activities that ensure cost-effective health impact.



New Tools to Fight Malaria in Western Kenya

In Kenya, malaria remains a leading cause of illness and death. Since 1979, CDC has collaborated on malaria research projects in western Kenya, which harbors the largest burden of disease in the country. In 2018, CDC Kenya's malaria research program made headway in evaluating new prevention and treatment tools in the fight against malaria.



New study shows drug that kills mosquitoes could be used to fight malaria

One of these studies has shown the potential impact of a new drug strategy for breaking the transmission cycle of malaria. The study showed that when a mosquito bites a person who has taken ivermectin, an anti-parasitic drug, within the last 28 days, that the mosquito dies, thus breaking the malaria transmission cycle. This differs from existing drugs that target the parasite to reduce the spread of malaria.

For this study a team of scientists from CDC Kenya, KEMRI, the Liverpool School of Tropical Medicine (LSTM), and other organizations, carried out a randomized controlled trial. The results were published in June 2018 in *Lancet Infectious Diseases*, and show that adding high doses of ivermectin to the antimalarial dihydroartemisinin-piperaquine (DP) has a major and prolonged effect on mosquito mortality.

"This first evaluation of the impact of high dose ivermectin on mosquito mortality is highly encouraging and requires further evaluation in larger scale trials that target both malaria parasites and the mosquitos, as the world pushes towards malaria elimination", explained LSTM's Professor Feiko ter Kuile, senior author of the paper.

Ramping up disease surveillance

Disease surveillance systems are the backbone of all public health systems providing the data necessary to monitor trends, show the impact of interventions, estimate testing and treatment commodity needs, and identify and respond to outbreaks. Malaria surveillance poses a specific challenge; the majority of cases of malaria in western Kenya do not result in disease, and therefore case counts at health facilities substantially underestimate the burden in the community. Cross-sectional studies, which have traditionally been the gold-standard, are not sustainable due to their expense.

Understanding this, CDC invested resources over the last 3 years to investigate both new systems and novel ways for using existing systems to monitor malaria in the community. The first step was creating a continuous malaria indicator survey (cMIS) that is used for collecting data every working day of the year. This system provides the gold-standard for testing whether other approaches can accurately detect real-time trends in malaria infection. Next, the team focused on evaluating more sustainable methods for performing malaria surveillance. One such method determines whether positive malaria tests in pregnant women attending their first antenatal care (ANC) clinic visit accurately estimate malaria infection prevalence in the community. After 2.5 years of data collection, analyses demonstrates that women attending first ANC clinic visits show a strong correlation with community infection prevalence and may supplement existing surveillance systems. Initial study results were presented at the 2018 American Society of Tropical Medicine and Hygiene Annual Conference in New Orleans. Based upon this cutting-edge work in Kenya, the President's Malaria Initiative is performing pilot evaluations in four other sub-Saharan African countries.

The CDC team's next challenge is to evaluate use of this system to identify hotspots of malaria disease, and direct the appropriate response for targeted interventions. This important work has begun in earnest and will be the focus of the CDC Kenya's malaria surveillance studies for 2019 and 2020.

Informing Global Policy on the Use of Molecular TB Diagnostics

Tuberculosis (TB) is the leading infectious disease killer in the world. According to the World Health Organization (WHO), 1.6 million people died from the disease in 2017, including 230,000 children¹. One key to controlling TB is effective testing of those showing the signs and symptoms. While sputum smear microscopy remains the foundation of TB diagnosis in low- and middle-income countries, the test sensitivity is poor, especially in people living with HIV. Mycobacterial culture is considered the gold standard for definitive diagnosis of TB but it proves challenging in poorly resourced settings. Clinicians and public health officials urgently need new and improved tools for diagnosing TB.

CDC Kenya, in collaboration with the Kenya Medical Research Institute (KEMRI) and the Clinical

Diagnostics Research Consortium, participated in a landmark multi-country evaluation of the molecular TB diagnostic assay, Xpert MTB/RIF Ultra (Xpert Ultra). Funded by the U.S. National Institutes of Health (NIH), this was the first prospective study on the accuracy of Xpert Ultra for pulmonary (involving the lungs) TB and the detection of drug resistance. The study showed that Xpert Ultra was a superior test in diagnosing TB. Additionally, Xpert Ultra did not require any equipment changes to the existing GeneXpert technology beyond a new cartridge.

The findings of this study, published in *Lancet Infectious Diseases*², were used by the WHO to endorse Xpert Ultra for TB diagnosis for all adults and children with signs of TB.

¹ WHO—<https://www.who.int/news-room/fact-sheets/detail/tuberculosis>

² Findings from this landmark study were used by WHO to endorse Xpert Ultra for TB diagnosis for all adults and children with signs and symptoms of TB.

FELTP Resident Investigates Hepatitis B Prevalence Among Kenyan Healthcare Workers

The Kenya Field Epidemiology and Laboratory Training Program (FELTP) is a 2-year training program that aims to improve national and county-level public health systems by building advanced skills in applied epidemiology and laboratory management among a variety of healthcare professionals. The Kenya FELTP began in 2004 and has since trained over 300 healthcare professionals who, while in the program, contribute significantly to investigating and responding to major outbreak investigations including Rift Valley fever (RVF), polio, and measles across the country.

Ngina Kisengau, a recent FELTP graduate and clinician by training, successfully responded to the challenge of evaluating an outbreak of viral hepatitis B in Makueni County. During her time as a FELTP resident, she was alerted of a suspected hepatitis B outbreak in a county prison and became concerned about how it might increase the risk of hepatitis B infection among healthcare



"The FELTP program imparted me with key practical skills in public health surveillance and data analysis that I use in my work everyday." Dr. Ngina Kisengau

workers. Unfortunately, data on the prevalence of hepatitis B virus infection and vaccination rates in African healthcare workers are limited. Therefore, the Kenya FELTP (in collaboration with KEMRI, CDC and the Makueni County Government) proceeded to investigate vaccination rates and factors associated with hepatitis B vaccination among healthcare workers.

As part of the investigation, Ngina surveyed over 300 healthcare workers in 42 health centers, clinics and dispensaries throughout the county and tested blood specimens from 95% of the respondents for signs of immunity against hepatitis B virus. The survey and blood tests helped to identify health workers that were less likely to be vaccinated against hepatitis B. Results indicated that although 80% of workers had received at

least one dose of the hepatitis B vaccine, about half of those vaccinated did not receive all three recommended doses primarily because the vaccine was not readily available. Also, cleaners and waste handlers were less likely to be vaccinated compared to nurses, doctors, and laboratorians. These valuable conclusions were shared with county representatives and ultimately published in the *Oxford Journal of Public Health* in October 2018.

Ngina's study also motivated Makueni County to acquire additional doses of hepatitis B vaccine for healthcare workers. Thanks to Ngina's use of evidence-based data, she was ultimately able to protect the health of her fellow healthcare workers and influence vaccination efforts across Makueni County.

Prevention Solutions Underway for Women at Western Kenya Clinical Research Site

Young women and adolescent girls remain at high risk for HIV, and prevention methods that are both acceptable and accessible to them are critical to their well-being. Over the past 10 years, public health officials and researchers have made progress in preventing new HIV infections through the use of innovative methods. Additionally, many women are seeking contraception to prevent pregnancy. New research is looking at combined methods that offer dual protection from both HIV and pregnancy.

The Western Kenya Clinical Research site, a collaboration between CDC Kenya and KEMRI, has been conducting high-quality clinical research studies for more than a decade and in recent years has contributed data to more than a dozen multi-site international HIV and TB clinical trials.

Two important studies sponsored by the National Institutes of Health (NIH)'s HIV Prevention Trials Network (HPTN) are currently underway, one of which has already reached its target enrollment of participants: the Antibody Mediated Prevention

(AMP) study which looks at the effectiveness of a monoclonal antibody for the prevention of HIV; and the Long-acting Injectable For the Epidemic (LIFE) study which evaluates the safety and efficacy of an injectable antiretroviral, Cabotegravir, for HIV prevention in women.

Further plans are underway to launch two more studies that will use an intravaginal ring to prevent HIV in women. The recent study includes a ring that contains both an agent to prevent HIV infection and a hormonal contraceptive. Additionally, the NIH's Microbicide Trials Network's REACH (Reversing the Epidemic in Africa with Choices in Prevention) study will compare adherence to an intravaginal ring that has an antiretroviral drug and daily oral pre-exposure prophylaxis targeting women between the ages of 16-21 years.

These studies will help protect and empower adolescent girls and young women in Kenya and around the world from getting HIV.

Uncovering the Genetic Fingerprint of Pathogens that Cause Diseases in Kenya

Next Generation Sequencing (NGS), a technology that allows DNA and RNA to be sequenced much more quickly and cheaply, is rapidly changing the practice of microbiology. NGS capacity in public health laboratories is one of the most important advances in diagnosing infectious diseases over the last three decades because it gives each pathogen a unique fingerprint.

In 2018, CDC established NGS capacity in Kenya to detect bacterial pathogens. The teams involved worked concurrently in two of CDC's Global Disease Detection sites in Kenya and Thailand to develop this advanced capacity, provide training, and supply the required NGS equipment. Initial implementation included sequencing of *Salmonella* bacterial isolates to highlight the resistance patterns to commonly used antibiotics. The process tracks circulating bacteria in time and space, providing data which can be used to prevent spread and thus reduce disease in the Kenyan population.

Every year, Kenya experiences disease outbreaks from various pathogens. Often, health experts are

unable to determine which disease is causing the outbreak. Incorporating NGS technology in the diagnostic capacity now allows CDC to sequence an entire pathogen genome to identify whether the pathogen is viral or bacterial, characterize its antimicrobial resistance, determine factors that increase the pathogen's ability to cause severe disease as well as its typing and molecular epidemiology in the public health laboratory. This advanced technology, however, can be difficult to implement without the appropriate laboratory infrastructure and human resources.

Implementing NGS in Kenya has enabled laboratorians to become self-sufficient and problem-solve issues without external expertise. Once programs implement sequencing as a routine diagnostic technique for one enteric bacterial pathogen, the same methods may be applied for other bacterial pathogens. Scientists hope that this approach will set the stage for progression towards more complex NGS procedures including testing of a broader range of specimens, and increase capacity for detecting novel pathogens.

Kenya Paves the Way for Flu Shots During Pregnancy in East Africa

Expectant mothers are among those most at risk of developing serious complications from influenza (flu). When a woman becomes pregnant, changes to her immune system, heart, and lungs make her more prone to severe illness from flu, including illness resulting in hospitalization.

In 2012, the World Health Organization (WHO) recommended that pregnant women should have the highest priority for seasonal flu vaccination in countries starting or expanding flu immunization programs. This is because flu vaccine has a long track record of safety when administered during pregnancy and is the best way to protect expectant mothers from the effects of flu. Moreover, when a pregnant woman is vaccinated, she produces protective antibodies against flu that are passed in-utero to her baby, protecting newborns from flu for the first several months of life. Infants

younger than 6 months of age are too young to be vaccinated, but also are at high risk of serious flu complications, so the protection gained from their mother's vaccination is very important.

To guide the Kenya government as it considers expanding its flu vaccination program to include pregnant women, CDC Kenya—in collaboration with the Kenya Medical Research Institute (KEMRI)—is leading a demonstration project to vaccinate pregnant women in Kenya's Siaya County. The study aims to enroll more than 400 pregnant women, give them a flu vaccine and measure how well they develop immune protection after vaccination as well as measure the flu antibodies transferred in utero to the babies. The study includes vaccinating pregnant women who are HIV+ or who had malaria when vaccinated. The study began in June 2018 and has

already enrolled more than 100 mothers. The study team relate that pregnant women participating in the project have had positive experiences, and many have encouraged other pregnant women to participate in the study.

Kenya has not yet adopted a flu vaccine recommendation for pregnant women, partly due to lack of local data to support such a policy. The current recommendation of the Kenya National Immunization Technical Advisory Group (KENITAG) focuses on children 6 to 23 months of age due to the high number of flu cases among very young children. KENITAG has also requested

country-driven data on the impact of flu among pregnant women and their babies, emphasizing the need to understand if the flu vaccine would work as well in mothers who suffer from HIV or malaria, and if these mothers would transfer antibodies against flu to their babies.

CDC expects that findings from this study will inform decision-making by the Kenya Ministry of Health on the adoption of a flu vaccination policy for pregnant women. If adopted, this policy will serve as an important public health step in Kenya, and serve as an example to other countries in the region.



Service

Service stands as a core tenet of CDC's priority activities through the delivery and implementation of interventions for the most vulnerable populations. Through service delivery, CDC seeks to accelerate progress toward a world safe from disease threats and where lives are saved and health is improved.



Local Men's Club Provides Solutions to Improved Uptake of HIV Services in Turkana

As Kenya continues to make gains in controlling the HIV epidemic, targeted strategies are paramount in helping to stop the spread of disease. In 2018, the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) launched the MenStar Coalition to accelerate the delivery of innovative approaches in HIV services for men. Recent HIV-related data show that "men are less

likely to know their status, practice consistent prevention, or access treatment." CDC, together with its implementing partners, is leading the way to identify effective strategies that reach men so that they know their status, stay on treatment and manage their health—one such strategy is taking off in the remote areas of Turkana County.



Members of Epedor meet and discuss life issues. The group has also helped to bolster household food security in the often drought-affected region of Turkana. Photo by Gibson/EGPAF

Epedor

"Epedor" loosely translated from Turkana to mean "it is possible" is a program that is transforming the lives of men in the Turkana community. Similar to what has been observed globally, the Lokitaung health facility, a CDC-supported site, has recorded sub-optimal viral suppression and retention among their male patients. Given the challenges seen in the health facility, program administrators with the Elizabeth Glaser Pediatric AIDS Foundation (EGPAF) devised a differentiated service delivery model for men—*Epedor* is a tailored approach to providing HIV-related care for this group's unique needs.

Turkana is largely known to be a patriarchal society, where males have a strong influence over their families. *Epedor* serves as a men's adherence club and a social support group that offers peer-to-peer learning. Through peer education sessions about HIV treatment, *Epedor* calls on participants to make commitments to address various aspects of their life, including:

- Actions to improve their health,
- HIV testing for their spouse and children,
- Income-generating activities,
- Advocating against gender-based violence, and
- Avoiding alcohol and substance abuse.

The men's adherence club has led to considerable improvements among the males enrolled to date, including a reduced number of missed appointments, increased adherence to HIV treatment, and higher viral suppression rates. With these encouraging results, *Epedor* was quickly replicated in four other health facilities across Turkana. *Epedor* demonstrates that with a committed group of men, it is possible to witness transformative results.

³ PEPFAR Press Release, 2018. [Global Partners Pledge over \\$1.2 Billion to Launch the MenStar Coalition](#)

Lucy Nkatha, the Immunization Champion of Meru

A survivor of polio, Lucy Nkatha makes an impassioned case for immunizations when she meets with parents, women's groups and others skeptical about vaccines. Lucy is an "immunization champion" and in Meru County she is at the center of a national Polio Immunization Campaign team. The team—which includes WHO, CDC, UNICEF, and community partners—works tirelessly to prevent further spread of a strain of polio circulating in nearby Somalia and detected in an environmental sample in Nairobi.

Lucy received just one dose of the poliovirus vaccine as an infant in the late 1970s. As a result, she was not fully protected from the disease when at 3-years old, she became ill. Lucy was the third of nine children, and it was not easy for Lucy's parents to access a medical facility to vaccinate their children from their rural village of Limauru in Ncooro, Meru County.

While Lucy doesn't remember life before polio, her mother Joyce does. Joyce remembers Lucy as a healthy, active toddler. She recalls Lucy following behind her older siblings when they went to the stream to get water and filling her own, smaller pail. When Lucy fell sick with polio, everything changed. She spent three months in the hospital, and for the first two months after returning home, Lucy couldn't walk, move, or sit up on her own. One day, she began crawling, and that was how Lucy got around until she was 7-years old.

Lucy's disability made it impossible for her to walk the rocky hills to the primary school nearby, so she couldn't attend school with her brothers and sisters. When a schoolteacher heard about Lucy's situation, he took her to a missionary school for the disabled in nearby Tuuru. There, she received a cane and a caliper to help her walk and discovered a love for learning.

Twenty-five years later, Lucy is now 40-years old, married, and a mother to three teenage children. After running a hair salon for ten years, Lucy now focuses full-time on her family, volunteering in her community, and serving as a disabilities advocate and immunization champion. Says Lucy, "While I've managed to get beyond it, it's very tough to grow up with a disability in rural Africa" and Lucy doesn't want any other child to endure the struggles she did. This is her second time serving as an immunization champion for a polio vaccine campaign—she also supported the 2016 campaign.

During that campaign, Lucy visited the pastor of an indigenous faith who had warned followers against the polio vaccine. Sharing her story and the struggles she endured, she convinced the pastor to support the polio vaccination campaign. In the 2018 campaign, Lucy once again talked to religious leaders, parents, and women's groups about the importance of vaccinating every eligible child, every time the vaccinators come around. And again, Lucy is changing minds.



Asked why she takes time away from her own family to tell her story over and over, Lucy explains, "Disability from a vaccine-preventable disease is a huge burden on both the child and the parents, especially in my community. When a child is fully immunized, the child is secure, and the parents are too."

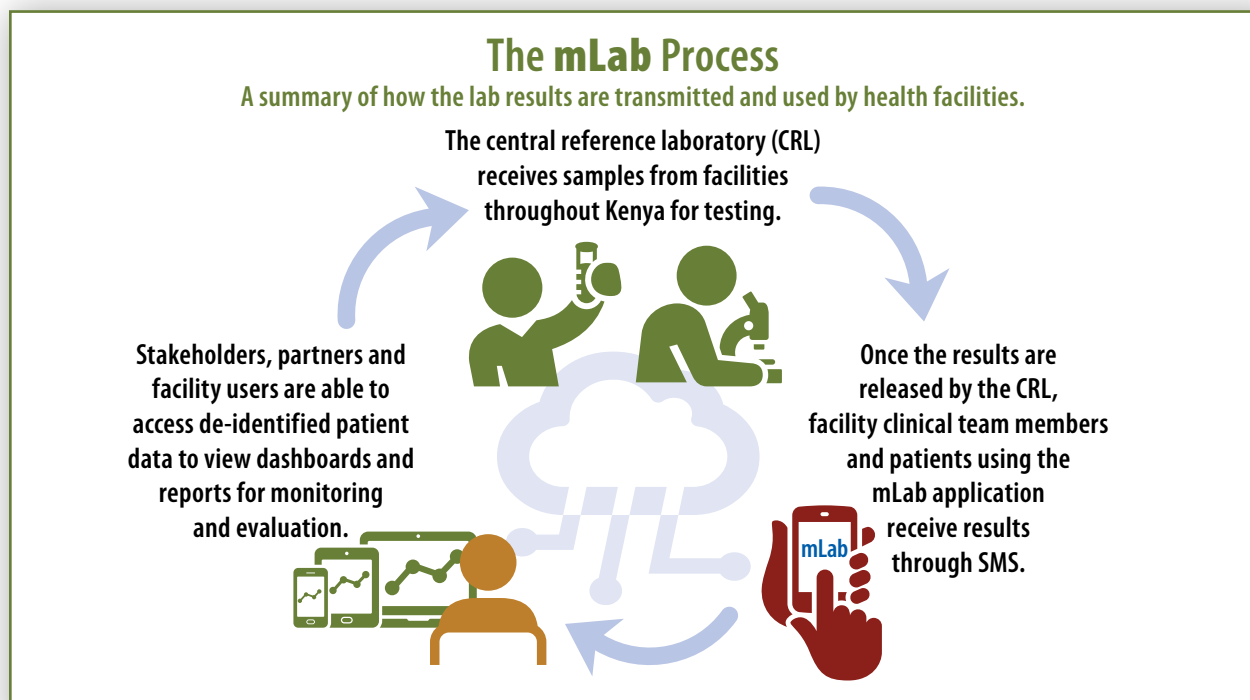
New Horizon for Health Care through Mobile Technology

Mobile solutions are reshaping various sectors in Kenya, and are taking root in the new age of communication. With the rapid advancement in mobile technology, the health care industry has not been left behind. Mobile technology is helping to enhance the delivery of health services and communication between public health systems, medical services providers, and patients.

In Kenya, where the doctor to patient ratio is 1:10,000, the need for innovation in the health sector is critical if hospitals and clinics are to offer quality services. Additionally, communication challenges among health care providers, patients and caregivers tends to be extremely frustrating. mHealth Kenya has been a local implementing partner for the CDC Foundation in the country,

overseeing and managing mobile technology projects in the health sector. Its innovations seek to bridge the communication gap between doctors and patients and to put health services within the public's reach.

In 2018, CDC—through PEPFAR funding and other laboratory stakeholders – collaborated with mHealth Kenya, an implementing partner, to develop an easy to use mobile application branded “mLab.” mLab offers access to real time viral load (VL) and early infant diagnosis (EID) results that are both secure and confidential. This enables facilities that lack proper infrastructure or internet to receive results through a secure short message system (SMS)-based platform.



Through this innovation, health facilities in Kenya have experienced reduced turnaround time in receiving their patients' VL and EID results from the central reference laboratory. Consequently, patient management has been improved because of the faster access to results, flagging of actionable results and ensuring that decisions for patient management are based on actual patient results. To date, mLab has been rolled out in over 65% of all

Kenyan counties, is being used at 731 facilities, and has transmitted over 725,000 results to patients. The mLab initiative has brought together a team of experts with a diversity of knowledge, experience, and a deep understanding of the health sector. The user-friendly format of the mLab app and the fact that it does not indicate personal identifying information offers a viable and sustainable solution for health communication across the country.

Operation Triple Zero Ignites International Interest

Kenya has been recognized globally for its new and innovative approach for reaching young people living with HIV who account for approximately 20% (303,700) of all people living with HIV in the country. Operation Triple Zero (OTZ) is designed to motivate adolescents and young people to take responsibility for their own health. The program nurtures the potential and strengths of adolescents in this regard. These adolescents are engaged as 'co-producers' in their health and motivate their peers through positive pressure and forge a shared commitment to achieve the three zeroes—**zero missed clinical appointments, zero missed drugs and zero viral load**.

Globally, young people (10 to 24 years), especially young women, continue to be disproportionately affected by HIV. This is the only age group in which

AIDS-related deaths are not decreasing globally. In 2019, 2.1 million people aged between 10 and 19 years were living with HIV and 260,000 became newly infected with the virus.⁴

There are many factors that put young people at risk of HIV. Adolescence and early adulthood are a critical period of development when significant physical and emotional changes occur. The transition from childhood to adulthood is also a time for exploring and navigating peer relationships, gender norms, sexuality and economic and personal responsibility. These factors often lead to suboptimal HIV treatment outcomes among this age group due to a decrease in follow up, low adherence to treatment and low viral suppression.

OTZ PROGRAM COMPONENTS

KEY MOTIVATORS for OTZ Participants

- Being a hero!
- Identification with OTZ club
- Regular motivational messages
- Recognition awards
- Ownership of one's health
- Tailored model of care

OTZ is based on THREE CORE SERVICE PACKAGES targeting AYP:



Adolescent and Young Person Package

- Comprehensive HIV treatment literacy
- AYP Connectedness through OTZ clubs and social media
- Leadership and empowerment
- Mentorship and motivation
- Adolescent participation



Healthcare Worker Package

- Training on the adolescent package of care
- Training on the pediatric and adolescent health care worker toolkit
- Implementing asset-based model in AYP HIV clinics



Caregiver Package

- Caregiver treatment literacy training
- Supporting AYP's to be their own health managers

⁴ UNAIDS Update: Active involvement of young people is key to ending the AIDS epidemic by 2030

“When I joined secondary school, I experienced a lot of stigma. I stopped taking my medications and this led to deterioration in my health...I joined an OTZ club...have taken charge of my health.”

—18 year old adolescent living with HIV



In November 2018, CDC Kenya organized a week long site visit with staff from CDC and USAID offices located in Nigeria, Ethiopia, Malawi, and Mozambique.

OTZ scale-up in Kenya has realized exponential growth from just one facility with 70 adolescents enrolled in 2016, to reaching approximately 47,000, or just over 60%, of all adolescents living with HIV. Data from 19 early-adopter partners show an average viral suppression of 85% in Kenyan youth enrolled in OTZ.

Kenya has received global recognition for this ground-breaking initiative, which is now recommended in the 2019 operational guidelines for all PEPFAR countries. In 2018, Kenya hosted technical teams from CDC Atlanta as well as staff from the U.S. Agency for International Development

(USAID) and the Department of Defense from four countries – Nigeria, Ethiopia, Malawi and Mozambique to help them learn how to extend the OTZ initiative into their countries' HIV/AIDS programming.

Adolescents' ownership of OTZ saves time and resources that would otherwise be used for counseling, making it easier and cheaper to scale up. Under its motto “Heroes for Zeros and Zeros for Heroes, It takes a Hero to be a Zero and a Zero to be a Hero” young people are demonstrating their ability to take the lead over their own health and inspire others to do the same.

U.S. Mission Celebrates 15 Years of PEPFAR in Kenya



More than 40 U.S. Embassy members volunteered at the Kibera Community Health Center — site to over 11,000 patients that receive free HIV care and treatment.

The year 2018 was particularly important for PEPFAR, as it marked the fifteenth anniversary of its enactment. When PEPFAR began, only 7,800 Kenyans living with HIV were on lifesaving antiretroviral treatment. Today, more than 1 million men, women and children are on treatment and able to live positively. To help celebrate these gains, the U.S. Department of State hosted a number of initiatives including a World AIDS Day 2018 event at one of the first PEPFAR sites, a gender-based violence photo exhibition, and a documentary highlighting the HIV journey in Kenya.

World AIDS Day: A Day of Celebration and Service



U.S. Embassy leadership, including Ambassador Robert Godec, celebrated the importance of youth taking ownership of their health and getting tested for HIV.

The World AIDS Day 2018 event doubled as an opportunity to serve and engage with the community in the informal settlement of Kibera, one of the largest such settlements in sub-Saharan Africa. Volunteers from the U.S. Embassy painted exterior walls, decorated the pediatric ward, and planted flowers and trees – allowing for a visual transformation of the health facility's main entrance. The volunteers stepped out into the community and saw first-hand the important role of health diplomacy and how it contributes to improving health and safety globally. In his remarks, U.S. Ambassador Robert Godec shared that “Today, death and despair have been overwhelmingly replaced with hope and life.” This was the theme of the WAD 2018 pre-event, honoring those lives lost while celebrating the lives regained over the last 15 years. The formal ceremony also served as the premier of the PEPFAR

Kenya documentary, which demonstrated the progress made towards controlling HIV and AIDS through collaborative efforts.

Honoring “Champions for Change”

Additionally, the U.S. government launched the gender-based violence (GBV) “Champions for Change” photo exhibition to honor individuals in the community that serve a critical role in preventing and responding to acts of GBV. These Champions included a Maasai moran (young male leader), a police officer, a former street girl, boda boda (motorcycle taxi) operators and more.



Margaret Waithera, shares her experiences as a survivor of abuse who now owns her own business and mentors young girls.

Kenya’s Cabinet Secretary (CS) for Education, Ambassador Amina Mohamed, Nairobi Women’s Representative, Esther Passaris, and Ambassador Godec were among the chief guests. In her remarks, CS Mohamed highlighted the harrowing statistics of school-going children being

abused on their way to and from school and her decision to change official school hours nationally. Ambassador Godec remarked, “The U.S. government recognizes that ending gender-based violence is paramount to securing a strong and health future for all.” The photo exhibition ran during the 16 Days of Activism Against GBV which is an international campaign aiming to generate awareness and call attention to GBV.

During this period, CDC Kenya and its implementing partners reported the following accomplishments from fiscal year 2018:

- More than 7.7 million Kenyans know their HIV status.
- 92% of patients living with HIV and on treatment have achieved control of the HIV virus (or viral suppression).
- More than 400,000 pregnant women know their status. And of those tested HIV positive, 99% are on HIV treatment, making it possible for babies to be born HIV free.
- Over 190,000 men received a voluntary medical male circumcision—97% of CDC Kenya’s annual target—to help prevent them from acquiring HIV infection.

While the PEPFAR 15 campaign was an important reminder of the progress made, we have a small window to finish the job. If the global community does not control HIV now and use every tool available, there is risk of these gains being undone.



Douglas, a Maasai Moran (young male leader), is recognized for going door to door sensitizing his community on the dangers of female genital mutilation.



Surveillance

CDC Kenya supports the development and implementation of population and facility-based disease surveillance systems that are used for data collection, analysis, and reporting. These surveillance systems assess disease burden in communities, identify outbreaks, guide public health action and evaluate the impact of health interventions.





HIV Survey among Fishing Communities on the Islands of Lake Victoria

Fishing communities on the shores of Lake Victoria in western Kenya are at high risk of HIV infection. Due to their geographic isolation, low literacy levels, high mobility, risk behaviors, and the near absence of a wide range of basic health services, these communities are particularly vulnerable to the HIV epidemic. Unfortunately, there have been limited population-based surveys among these communities that improve understanding of HIV epidemiology and inform interventions and services for this population.



The prevalence of HIV among these fishing communities is high, estimated around one-third, making them a priority for HIV prevention and treatment.

In 2018, CDC Kenya in collaboration with the National AIDS and STI Control Program (NASCOP), Kenya Medical Research Institute (KEMRI), and

University of California, San Francisco (UCSF) completed a household survey of fishing communities on eight island beaches of Lake Victoria. This study aimed to determine the prevalence of HIV, risk factors, and HIV service coverage among fishing communities. Data on demographics, behavior, home-based HIV and malaria rapid testing as well as viral load for HIV positive persons were collected from the participants.

Given the location remote location of the study sites, this study presented a number of challenges. "We almost capsized on our way to the islands!" recalled one of the study investigators. The team had to take one to three hour boat rides from the mainland across to the islands and back, facing harsh conditions such as the hot sun or rough waters. Despite the numerous challenges experienced, the team persevered and completed the study successfully.

Studies such as this one are critical to understanding the dynamics of the HIV epidemic and moving towards epidemic control. Due to untiring efforts of CDC researchers and their partners, Kenya's public health community has an increased understanding of how to better serve these fishing communities and continue making gains towards achieving HIV epidemic control.

Public Health Technical Assistance to Kenya Ports of Entry and Border Crossings



Malaba border crossing in western Kenya. Photo from Nation Media Group.

In light of recent infectious disease outbreaks in Africa, the Government of Kenya recognized the need to further improve port health services. Effectively mitigating the importation, or exportation, of infectious diseases and other public health threats requires strong national—and ports of entry (POE)—level preparedness and response capacity and cross-border collaboration. In 2018, the Kenya Ministry of Health's Port Health Services (PHS) adapted and implemented CDC's Division of Global Migration and Quarantine *Border Health Capacity Discussion Guide*. Through this process, tailored action plans were developed to address identified areas for improvement to strengthen services at two ground crossings (Busia and Malaba) and Jomo Kenyatta International Airport (JKIA). Busia and Malaba POE border Uganda and are the busiest with over 3,000 international travelers and 1,600 vehicles

crossing daily. JKIA is Kenya's main international airport with an average of 109 international and 55 domestic flights arriving every day and a total of 20,000 international travelers from Africa and other continents using the airport daily. The developed action plans included better characterization of cross-border population movement, enhancing inter-sectoral collaboration at POEs, improving community-based surveillance strategies around the POE and multisectoral and multi-agency disease preparedness and response plans at POEs. The next steps include mini-residency for PHS officers to learn about quarantine stations operating procedures and best practices, develop and finalize a multi-agency public health emergency response plans for the three priority POEs and initiate cross-border experience exchange mechanisms through regular conference calls.

KENPHIA in the Field

Through PEPFAR, CDC actively participated in the implementation of KENPHIA, the Kenya Population-based HIV Impact Assessment. KENPHIA required teams to work extensively across the country, including with field-based laboratory work. KENPHIA has also provided opportunities to see how PEPFAR has improved lives for countless Kenyans.



KENPHIA field teams visited remote areas to gather data on HIV and other conditions

In June 2018, Kenya's Ministry of Health, in collaboration with ICAP, an organization within Columbia University, launched KENPHIA to measure the reach and impact of HIV programs in Kenya. KENPHIA included 20,000 randomly selected households and interviews from approximately 35,000 people across the country. Survey participants received household-based HIV counseling and testing conducted by trained survey staff. KENPHIA will—for the first time—record population-based HIV estimates for all 47 counties and provide a national rate for Hepatitis B and syphilis prevalence. The results will measure national progress toward UNAIDS' 90-90-90* goals and guide policy and funding priorities.



Anthony Waruru (white shirt), CDC Kenya epidemiologist, participates in the study as a field monitor and provides technical assistance and feedback to field staff.

The PEPFAR funding for KENPHIA is coordinated and managed through CDC. Staff from the CDC's Division for Global HIV and TB (in headquarters) along with staff from CDC Kenya have worked together to:

- Advise on the protocol development,
- Facilitate weeks of training sessions for field staff,
- Provide technical assistance with survey implementation, and
- Serve as field monitors to ensure adherence to survey procedures.



Dr. Kevin De Cock (R), CDC Kenya country director, makes it a priority to visit teams in the field and learn about how the study is being implemented and accepted.

Dr. Emily Zielinski-Gutierrez, chief of CDC Kenya's Surveillance and Epidemiology Branch, explained that "observation of survey procedures occasionally allows monitors to hear an individual's story of being diagnosed and receiving life-sustaining antiretroviral therapy, affirming the reasons behind all the work we do."

Beyond serving as an expert advisor and key contributor to KENPHIA, CDC has demonstrated a strong commitment to supporting the survey teams that are largely responsible for implementing KENPHIA.

Data collection for KENPHIA wrapped up in February 2019. Preliminary survey findings are expected to be released in mid-2019 and will likely be a major reference for determining future HIV programming in Kenya.

*UNAIDS Fast-Track Targets: 90% of people living with HIV diagnosed; 90% of the diagnosed on antiretroviral therapy; and 90% of the treated virally suppressed by 2020.

When an Outbreak Occurs in an Unexpected Location

On June 19, 2018, CDC and KEMRI laboratory staff at KEMRI's Center for Global Health Research in Kisumu, Kenya were notified of a suspected case of viral hemorrhagic fever in a patient admitted to the Siaya County Referral Hospital. The patient, a fisherman, had developed a fever four days earlier and at the time of sample collection was bleeding from the mouth and nose. CDC tested the sample for Ebola, Marburg, Crimean-Congo, Yellow fever, Rift Valley fever (RVF) and dengue by a laboratory technique called polymerase chain reaction (PCR). The results identified RVF virus as the cause of the fisherman's illness. Unfortunately, the patient died a few hours after the sample was collected.

Rift Valley fever, a mosquito-borne disease that primarily affects animals occurs in large outbreaks every few years, but these outbreaks have not previously affected the counties neighboring Lake Victoria. As RVF is not well known by the local population, two scenarios emerged during this period following the patient's death. First, the deceased family blamed a neighbor for bewitching the victim following a recent physical altercation, leading to growing hostility in the village. Second, when the patient was admitted to the hospital, the healthcare workers who handled the case were quarantined for observation, but not before a number of them had had contact with the patient. Even though the patient did not have a history of travel outside of Kenya, other infectious disease threats such as Marburg which had been recently reported in Uganda were a concern. This made the confirmatory diagnosis all the more important.

Due to the longstanding relationship with CDC's work in western Kenya, the medical officer reached out to CDC and KEMRI to assist with laboratory testing. Within six hours, the sample had been transported over one hour's drive away, analysis completed, and the results of RVF were shared with the hospital. Quarantined staff were released under self-observation and the patient's family was informed of the cause of death, thereby reducing tension in the village. CDC management in western Kenya also mobilized immediate outbreak support which included raising awareness across the entire county as well as an assessment of the extent that animals and people were affected in the area. Residents were informed on how to properly dispose of dead animals in cases of abortion in sheep and cattle – one of the main symptoms of the infection. Health officials also instituted mosquito vector control by removing, or cleaning, mosquito breeding sites such as used tires, plastic garbage, water storage or other receptacles that accumulate water where mosquitoes can breed. The results also enabled the Ministry of Health, the Ministry of Agriculture and Livestock, KEMRI and CDC to conduct contact tracing.

The timely diagnosis and intervention by CDC in western Kenya alleviated additional health and economic losses often associated with RVF outbreaks and limited further infections. It also served as an important reminder that infectious disease threats can emerge anywhere at any time, and become a threat everywhere.

CDC's Role in Assessing Risks to Global Health Security in Kenya

Assessing the risk of disease emergence and spread is a key component of global health security. Resources and limited funds for detection, prevention and control need to be targeted to specific disease threats, either nationally, or to at-risk areas in Kenya, where threats are most likely to occur and spread. Moreover, risks present in one part of the world are informative for Kenya, but it

cannot be assumed that the risks are the same.

CDC Kenya, along with CDC Atlanta and partners, is supporting a wide range of risk assessment activities in Kenya, including for Zika, MERS-CoV, avian influenza, Rift Valley fever and cholera.

To understand the current risk of Zika infection in Kenya, in October 2017, CDC Kenya initiated a

cohort study of pregnant women in Mombasa. Women enrolled in the study when they first come for antenatal care and are followed up monthly until delivery. They are then assessed for acute Zika infection and the newborns are screened for any congenital abnormalities. To date, after testing more than 1,000 women, CDC Kenya have not identified any cases of Zika infection, suggesting that Zika is currently not a major threat to women in coastal Kenya.



Taking a blood sample from a camel in Marsabit County, Kenya to test for zoonotic pathogens including MERS-CoV.

In Marsabit County, the majority of camels show evidence of previous infection with MERS-CoV, yet no exposed camel handlers have been identified as infected to date. In order to understand the risk camels may pose to humans, CDC Kenya and partners initiated a longitudinal study in Marsabit County among camels and their herders. Young camels were enrolled and followed-up with bi-weekly testing to assess for acute infection with MERS-CoV and to detect the actual virus. To date over 200 camels and their handlers have been enrolled and testing is ongoing in the KEMRI laboratories with additional testing at CDC headquarters in Atlanta.

Avian influenza remains a global security threat to human and animal health. In 2017, influenza A/ H5N8 was detected among wild and domestic birds in on the shores of Lake Victoria in Uganda.

CDC Kenya responded by conducting a survey of more than 3,000 samples of wild bird feces on the Kenyan shores of Lake Victoria which identifies low pathogen viruses of H5N2. A more comprehensive avian influenza surveillance was initiated in the main poultry (live bird) markets around Kenya. Samples are collected from poultry at the various markets and on symptomatic partners during monthly visits.

In 2018, based on previous risk assessments, health authorities initiated enhanced surveillance for RVF nationally when heavy rain was predicted in Kenya which is often linked with outbreaks. To support the RVF outbreak response, CDC Kenya, together with Global Health Security Agenda partners, supported the Government of Kenya in securing public diplomacy funds to provide communication outreach to 20 high-risk counties as well as providing training on sample collection to the affected counties. In particular, the CDC supported outbreak investigations in Siaya County and disease surveillance activities in the Kakuma refugee camp detected human RVF infections. This work expanded the number of counties now considered at risk for future RVF infections.

Lastly, cholera remains a constant epidemic threat in Kenya and has been a particular burden since 2014. Control and prevention fundamentally lies with improved WASH (water, sanitation and hygiene) practices, however, oral cholera vaccine (OCV) can help control outbreaks and provide valuable protection while longer-term infrastructure is put in place. Yet it is clear that some areas of Kenya are more vulnerable than others, leading to the concept of cholera “hotspots” where the use of OCV and focused WASH efforts would be most effective. CDC Kenya and the Division of Foodborne, Waterborne and Environmental Diseases are supporting WHO, UNICEF and the Ministry of Health to complete Kenya’s Cholera Elimination Plan. This plan will include a “hotspot” analysis of pre-existing data conducted by partners. The data will allow policy makers to target WASH and vaccine efforts to parts of Kenya considered at highest risk.

CDC Kenya is supporting ongoing infectious disease risk assessments through a variety of means including outbreak investigations, surveillance, research studies and analysis of pre-existing data. These efforts will strengthen health security in Kenya by targeting resources where they are most needed.



International Accolades

CDC Kenya not only seeks to improve policies, processes and practices in Kenya, but to inform public health progress globally. In 2018, CDC Kenya celebrated the praises of multiple staff members that demonstrated impact beyond Kenya's border. This section calls attention to the accolades received by CDC Kenya staff members from international colleagues and partners.





Dr. Elizabeth Hunsperger

Director of Diagnostics and Laboratory Systems,
Division of Global Health Protection

Dr. Hunsperger was recognized by the United Nations Support Office in Somalia for her pivotal role in the training of African Mission in Somalia (AMISOM) medical officers. Dr. Hunsperger led the facilitation of learning sessions on dengue fever, malaria and other endemic diseases in the Somalia region. In addition, she oversaw the activities of a team that provided diagnostic assistance to the Somalia mission on suspected cases of viral hemorrhagic disease. Her efforts were further honored with a Meritorious Honor Award from the Department of State for her far-reaching support and collaboration.



Dr. Immaculate Mutisya

Public Health Specialist,
Division of Global HIV & TB
In Detroit, Michigan, Dr. Mutisya received the 2018 Adolescent Health Initiative

Excellence Award for her grassroots design and implementation of the Operation Triple Zero (OTZ) program. Her innovation and responsiveness to the needs of adolescents and youth living with HIV was highlighted as exceptional work that has impacted adolescent health outcomes. OTZ currently has more than 47,000 adolescents and youth enrolled and is being considered for adoption by 4 other countries.



Dr. Lucy Ng'ang'a

Deputy Director for Program and Science,
Division of Global HIV & TB

Dr. Ng'ang'a was the recipient of the Lahya Shiimi Award at the annual meeting for the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) in Amsterdam, Netherlands. She was cited for "her extraordinary ability to

approach challenges holistically with exceptional judgment...managing complex relationships, communicating intricate information, respecting diverse perspectives, and moving groups toward evidence-based decisions and effective partnerships that improve the lives of Kenyans." She also "inspires, motivates and offers unwavering and consistent sage advice to colleagues as each grows professionally along their journey in the fight to end HIV."



Dr. Marc-Alain Widdowson

Director,
Division of Global Health Protection



Dr. Gideon Emukule

Statistician,
Influenza Division

Dr. Marc-Alain Widdowson and Gideon Emukule were recipients of the Larry J. Anderson Award. They were cited "for Outstanding Public Health Science and the Charles C. Shepard Science Award, in recognition of the work published in *The Lancet*, 2017 on the 'Estimates of global influenza-associated respiratory mortality: a modelling study'.



Anthony Waruru

Epidemiologist,
Division of Global HIV & TB

During the 2018 Centre for Global Health (CGH) Annual Conference, Mr. Anthony Waruru received an award for the best poster presented at the Conference on Retrovirals and Opportunistic Infections (CROI) of 2017. Anthony's poster looked at finding hidden HIV Clusters to support geographic-oriented HIV interventions in Kenya.

CDC's Division of Global HIV & TB in Atlanta, Georgia offers quarterly awards to staff around the world for their innovation, impact and success. Three of CDC Kenya's teams were recognized through this initiative!

The CDC Kenya Cooperative Agreement (CoAg) Branch, Finance Team and April Kelley

were awarded the team award for Advancing Program Management and Operations with the Budget Marked-up Tool (BMT) to assist with increased financial accountability for HIV and TB funding in-country. The CoAg Branch was pivotal in tracking financial performance and using data for financial decision-making. The BMT is now being offered as resource to other CDC country offices for global use.

The CDC Kenya Laboratory Branch

was awarded the team award for Making Significant Contributions to Advancing Program and Science due to their leadership with implementing a remote login system to link health facilities and testing laboratories. This innovation reduces the turn-around-time from samples collection to the receipt of results at facilities thereby improving patient management.



Top l-r: April Kelley, Grace Okubo, Rahab Wangui, John Baru, Alice Njoroge, Ruth Kuria; Bottom l-r: Emmanuel Okumu, Bernard Warui, Cherubinus, Aroro, Carolina Granados, and Jacob Okal



Top l-r: Margaret Mburu, Mercy Njeru, Frank Basiye, Dr. Marie Downer, Frankline Mboya, Bottom l-r: Dr. Muthoni Junghae, Raphael Ondondo, Dr. Jane Mwangi, Catherine Macharia, Dr. Daniel Kimani, Dr. Ernest Makokha

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