# centers for disease control and prevention · kenya Annual Report 2016

Center for Global Health Office of the Director for Global Health



Cover Photo: A mother with her child at the St. Joseph's Community Center in the Pumwani Community of Nairobi. The woman participated in the U.S. government's World AIDS Day 2016 Pre-event which focused on reducing HIV transmission among young women.

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U.S. government interagency PEPFAR team planting sukuma (kale) as part of a World AIDS Day 2016 Pre-event in Nairobi.

#### **Message from the Director**



Colleagues and Friends,

I am pleased to share this year's report highlighting key activities from CDC Kenya in 2016. Since CDC began working in Kenya over 35 years ago, we remain committed to the agency's vision of a world where people live safer and healthier lives. Achieving this vision requires us to address current Kenyan health concerns while also responding to the challenges posed by global emerging health risks. In addition to our day-to-day programmatic work, we continue to conduct and support research of global importance.

In 2016, we maintained focus on strengthening Kenya's ability to prevent, detect and respond to infectious disease threats under the Global Health Security Agenda. Key accomplishments included the establishment of the Public Health Emergency Operations Center with support from the World Health Organization (WHO) and the launch of a workforce development program for public health managers. The Improving Public Health Management for Action (IMPACT) program graduated its first cohort of 14 distinguished fellows in September 2016, and now they are applying their training across the country. CDC Kenya continues to respond to disease outbreaks as they occur in different parts of the country. We supported responses to 30 outbreaks in Kenya and neighboring countries. Working alongside our Kenyan and U.S. interagency partners, we look forward to continue strengthening public health and to helping Kenya reach the goals defined under the WHO International Health Regulations.

In its response to HIV/AIDS, Kenya launched new guidelines on the use of antiretroviral drugs for treating and preventing HIV. The revised guidelines support the "Test and Treat" agenda, recommending antiretroviral therapy (ART) for all HIV-infected individuals irrespective of their CD4 count. Kenya currently has 1.5 million people living with HIV with now over a million on treatment. The guidelines also recommend the use of drugs for pre-exposure prophylaxis (PrEP) to prevent HIV among HIV negative individuals at high risk of HIV acquisition. Implementing these two interventions (Test and Treat and PrEP) will significantly contribute towards achieving HIV epidemic control in Kenya. CDC Kenya played an important role, technically and financially, towards the development of this new public health guidance.

In September 2016, the Bill and Melinda Gates Foundation recognized the Kisumu research station as a site for the Child Health and Mortality Prevention Surveillance (CHAMPS) initiative, in collaboration with CDC and the Kenya Medical Research Institute (KEMRI). CHAMPS aims to increase understanding of the causes of child mortality to guide public health action. In addition to CHAMPS, the Clinical Research Center in Kisumu was also selected as a site for the National Institutes of Health (NIH) funded HIV Prevention Trials Network. These network sites are critical to defining appropriate and novel interventions to prevent HIV transmission.

This report is a sample of the many accomplishments and contributions made to public health efforts in Kenya. Additionally, we have included a "Behind the Scenes" section this year to highlight our staff.

In 2017, we anticipate continued progress in public health in Kenya and the region. The launch of the Africa CDC in Addis Ababa, Ethiopia marks an important step in African leadership in assuring health security across the continent. We at CDC Kenya are ready and willing to provide the support and technical expertise to help them achieve those goals.

Kevin M. De Cock, MD, FRCP (UK), DTM&H CDC Kenya Country Director Nairobi, Kenya, April 2017

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#### Acronyms

AMR	Antimicrobial Resistance	WHO	World Health Organization
ART	Antiretroviral Therapy	ZDU	Zoonotic Disease Unit
ASLM	African Society of Laboratory Medicine	KNH	Kenyatta National Hospital
CHAMPS	Child Health and Mortality Prevention Survey	KPP	Key and Priority Populations
CoAg	Cooperative Agreement	M&E	Monitoring and Evaluation
DGHP	Division of Global Health Protection	MDR TB	Multidrug-Resistant Tuberculosis
DGHT	Division of Global HIV & TB	MERS-	Middle East Respiratory Syndrome Coronavirus
DGMQ	Division of Global Migration and Quarantine	CoV	
DHAP	Division of HIV/AIDS Prevention	MIA	Minimally Invasive Autopsy
DPDM	Division of Parasitic Diseases and Malaria	МоН	Ministry of Health
DREAMS	Determined, Resilient, Empowered, AIDS-free, Mentored, and Safe	MSM	Men Who Have Sex with Men
ECHO	Extension for Community Health Outcomes	NACC	National AIDS Control Council (Kenya)
ELISA	Enzyme-linked Immunosorbent Assay	NASCOP	National AIDS & STI Control Programme (Kenya Ministry of Health)
eMTCT	Elimination of Mother to Child Transmission of HIV	NCBDDD	National Center on Birth Defects and Developmental Disabilities
FELTP	Field Epidemiology and Laboratory Training Program	NIC	National Influenza Center (Kenya)
GID	Global Immunization Division	NIH	National Institutes of Health
GIS	Geographic Information Systems	NPHI	National Public Health Institute
GOK	Government of Kenya	NPHLS	National Public Health Laboratory Services
HHS	U.S. Department of Health and Human Services	ОН	One Health
ID	Immunization Division	PBIDS	Population-Based Infectious Diseases Surveillance
IMPACT	Improving Public Health Management for Action	PCR	Polymerase Chain Reaction
IPT	Isoniazid Preventive Therapy	PEPFAR	President's Emergency Plan for AIDS Relief
IRS	Indoor Residual Spraying of Insecticide	PLHIV	People Living with HIV
JOOTRH	Jaramogi Oginga Odinga Teaching and Referral Hospital	PMI	President's Malaria Initiative
KEMRI	Kenya Medical Research Institute	РМТСТ	Prevention of Mother-to-Child Transmission of HIV
KENITAG	Kenya National Immunization Technical Group	QI	Quality Improvement
NASAC	National Antimicrobial Stewardship Advisory Committee	RCER	Risk Communication and Emergency Response
NASCOP	National AIDS & STI Control Programme (Kenya Ministry of Health)	RDT	Rapid Diagnostic Test
NIH	National Institutes for Health	RRI	Rapid Results Initiative
NPHLS	National Public Health Laboratory Services	RSV	Respiratory Syncytial Virus
OTZ	Operation Triple Zero	RVF	Rift Valley Fever
PEPFAR	President's Emergency Plan for AIDS Relief	SLMTA	Strengthening Laboratory Management Toward Accreditation
PfSPZ	Plasmodium falciparum and Sporozoite	SP	Sulfadoxine-Pyrimethamins
PMI	President's Malaria Initiative	STI	Sexually Transmitted Infection
PrEP	Pre-exposure Prophylaxis	TAC	TaqMan Array Card
SAB	Social Asset Building	ТВ	Tuberculosis
SLIPTA	Stepwise Laboratory Improvement Toward Accreditation	USAID	U.S. Agency for International Development
ТВ	Tuberculosis	VMMC	Voluntary Medical Male Circumcision
UNHCR	United Nations High Commissioner for Refugees	WHO	World Health Organization
VL	Viral Load	WRP	Walter Reed Project—U.S. Department of Defense
VMMC	Voluntary Medical Male Circumcision	ZDU	Zoonotic Disease Unit

#### Organization



CDC'S Impact in 2016				
HIVART	<b>561,000</b> PEOPLE	561,000 people on ART represents a <b>99% achievement rate</b> against the fiscal year (FY) 2016 target		
<b>S</b>	<b>176,000</b> VMMC	176,000 voluntary medical male circumcisions (VMMC), an <b>119%</b> <b>achievement rate</b> against FY2016 target		
	<b>30</b> OUTBREAKS	<b>Supported 30</b> outbreak investigations		
I.	<b>90%</b> of RESPONSES	90% of outbreak responses <b>received laboratory support</b>		
	<b>250,000</b> PEOPLE	250,000 people <b>are part of a health and</b> <b>demographic surveillance system</b> that collects health and demographic information every six months <b>in</b> <b>Siaya County, Western Kenya</b> .		
	<b>86</b> ARTICLES	<b>CDC Kenya staff co-authored and</b> <b>published</b> 86 peer-reviewed scientific articles and book chapters in 2016		



**Protect and improve health in Kenya**, and globally, through science, communication, policy, partnership, and evidence-based **public health action**.



# HIV and TB



**CDC Kenya's Global HIV & Tuberculosis (TB) Program** supports the Government of Kenya (GOK) to expand and strengthen national HIV prevention, care, treatment, and surveillance by providing technical and financial support through the U.S. President's Emergency Plan for AIDS Relief (PEPFAR).

- HIV Prevention programs support best practices among partners who offer HIV testing and counseling, voluntary medical male circumcision, evidence-based behavioral interventions, and prevention programs for key populations at high risk for HIV.
- HIV Care & Treatment helps thousands of Kenyans living with HIV to receive care and treatment, including services for pregnant women and mothers with HIV designed to reduce risk of mother-to-child transmission of the virus.
- Health Systems and Evaluation coordinates the generation of high quality strategic information, including program, epidemiologic, and expenditure data, to inform HIV epidemic control and promotes quality of these data for programs and scientific dissemination to advance Kenya's health sector and national HIV response.
- Surveillance and Epidemiology provides expert guidance in implementing national HIV surveillance and conducting public health research to improve programs and inform HIV policy.
- Laboratory, Blood Safety & Infection Control focuses on improving the accessibility and quality of laboratory services and reducing the risk of HIV infection through improved blood safety and infection control practices in healthcare and laboratory facilities.

# Realizing the Potential of DREAMS through the Eyes of Young Women

The Kenya DREAMS Initiative—Determined, Resilient, Empowered, AIDS-free, Mentored, and Safe—was launched in December 2015. One year later there have been countless stories of success to demonstrate how this U.S. interagency collaboration is impacting the lives of adolescent girls and young women to diminish the worrying rate of new HIV infections among this group. The following stories of Lucy and Nancy demonstrate how two resilient young women are realizing their DREAMS.



Lucy, a 22-year old, single mother of two sons, is an example of moving from dependence to independence. In March 2016, Lucy was living with her mother in Landimawe, a low-income informal settlement in eastern Nairobi. Through the engagement of CDC's implementing partner Hope Worldwide Kenya, Lucy was enrolled into the DREAMS Social Asset Building (SAB) group. After participating in SAB and being inspired to start a business, Lucy developed a viable plan to sell tomatoes and charcoal, and she was given a business start-up kit. Fast forward to the end of 2016, and Lucy's business is thriving with an increased selection of items at her vegetable stand providing reliable income and allowing her to rent a place to live which she shares with her sons.



At the age of 14, Nancy was abandoned by her parents and was taken in by an aunt who lived in Fuata Nyaya, a low-income informal settlement in Nairobi. Despite her strong academic success, Nancy primarily stayed at home doing household chores because her aunt could not afford to pay her school fees. With the support of DREAMS, Hope Worldwide Kenya enrolled Nancy in a girls' high school where she has since achieved and maintained an "A" average in her courses. She has now set her sights on becoming a psychologist and exploring entrepreneurial opportunities. Nancy is not only excelling in school, but is serving as a DREAMS Ambassador, where she willingly shares her story and encourages other girls and young women to aspire to achieve their dreams.

## Scaling Back the Rate of TB/HIV Co-infection by Scaling up IPT Coverage



In 2016 and through the support of CDC Kenya, over 300,000 people living with HIV began treatment isoniazid preventive therapy (IPT) for latent TB infection to prevent active disease.

#### What's the significance of IPT?

There's a dire public health need

- People living with HIV are at a much higher risk of developing TB compared to those without HIV<sup>1</sup>
- TB accounts for one in three HIV related deaths

It's an effective preventive measure

- IPT reduces the risk of TB by 65% and up to 80% when combined with ART
- IPT has the potential to significantly reduce the burden of TB in Kenya as a high TB and HIV burdened country

Although IPT has been recommended by WHO since 1998, implementation has been low. In 2005, only 25,000 people living with HIV were reported to have received IPT worldwide. The massive rollout of IPT coverage in Kenya was due in large part to CDC Kenya's:

- Provision of implementation resources and technical assistance
- Development of tracking tools
- Prioritization of IPT indicators in routine tracking practices
- Coordination of partner quarterly meetings focused on IPT scale up.

Through CDC Kenya's continued support of this critical intervention even greater declines in HIV/TB co-infection are expected.

<sup>1</sup> CDC. 2017. Factsheet: HIV and Tuberculosis. Available at: <u>https://www.cdc.gov/hiv/pdf/library/factsheets/hiv-tb.pdf</u>

#### Achieving Zeros Makes You a Hero: How Adolescents are Taking Charge of their Health

In 2016 it was estimated that approximately 133,000 adolescents were living with HIV in Kenya. Adolescents and young people (15-24 years of age) account for almost half of new infections in Kenya.<sup>2</sup> There are also poorer treatment outcomes for adolescents living with HIV with approximately 10,000 deaths annually and low viral suppression rates of 61% in Kenya. Similar to other programs, adolescents living with HIV have not been actively engaged in finding solutions for their health problems. As a result, there are minimal gains realized with interventions designed for adolescents. These issues have called for more innovative approaches that would move from "implementing programs to serve as the answer" to "seeing adolescents as the answer."



OTZ "hero" flashes the OTZ t-shirt during a performance that encourages other youth to achieve the triple zero outcomes

The Kenyatta National Hospital, through the support of CDC Kenya, started an initiative called Operation Triple Zero (OTZ), which empowers adolescents to be in charge of their own treatment and to commit to the "triple zero outcomes" – zero missed appointments, zero missed drugs and zero viral load. Participants who achieve these outcomes are dubbed "heroes" and inspire other youth through creative activities, such as song and dance, to also commit to managing their health and achieving improved health outcomes.

#### The OTZ Program Components Include:

- Treatment literacy
- Social groups and peer support
- Addressing self-stigma
- Transition to adult care
- Life skills

The program is grounded in the tenets of the asset-based approach, which nurtures the potential and strengths of adolescents to inspire them to improve and manage their health. To date, more than 70 adolescents have enrolled in OTZ and viral suppression has improved from 45% at the beginning of the program to 70% currently. Meaningful engagement of adolescents living with HIV, by employing the asset-based approach, is essential to ensuring survival and viral suppression. Improved treatment outcomes among adolescents leads not only to healthy and inspired adolescents, but also to productive and influential adults.

<sup>2</sup> WHO: <u>http://www.who.int/hiv/topics/tb/3is\_ipt/en/</u>

# Using Innovative Technology to Build Health Worker Capacity

Sharing best practices and the knowledge of field experts in the clinical practice of HIV and TB is not readily available to healthcare workers in rural area facilities. Further, the costs of travel to obtain expert knowledge, coupled with delays in clinical intervention for these underserved populations, have resulted in inefficiencies in timely delivery of care.



Videoconferencing demonstration at Project ECHO launch

Project ECHO (Extension for Community Health Outcomes), which originated from a concept developed by Dr. Sanjeev Aurora of the University New Mexico, was designed to improve care in hepatitis management. The project links less-experienced providers in underserved communities with subject matter experts and their peers using real-time video technology to provide consultations and case-based learning. This approach has been demonstrated to minimize costs and improve the speed of timely and evidence-based care.

Project ECHO aims to engage national expertise in management of difficult cases. In turn, the opportunity to routinely connect with frontline healthcare workers gives national stakeholders a deeper understanding of operations and issues at the site level while building the capacity of providers to effectively manage their difficult cases.

Project ECHO uses a hub and spokes model to share expert knowledge through a video conferencing software. The ECHO platform in Kenya provides a routine outlet for providers to discuss HIV and TB patient cases with their peers and to engage in group problem solving through a provider network. Providers engage in weekly meetings via video and teleconference sessions during which they listen to a short instructive session, share challenging cases seen at spoke clinics, and ask questions about best practices. Kenya's Project ECHO model consists of the:

- National hub at NASCOP in the country's capital of Nairobi
- Regional hub in Western Kenya at the Jaramogi Oginga Odinga Teaching and Referral Hospital (JOOTRH)
- Regional spokes composed of 10 health facilities in both Siaya and Kisumu counties

CDC Kenya began a pilot of Project HIV ECHO in April 2016 working with Columbia University. In early 2017, the project will undergo an evaluation to determine if the model is successful in improving provider skills to justify program expansion nationally. Currently the provider driven demand has been substantial with an additional nine sites requesting to join the ECHO community of practice. CDC Kenya is committed to adopting innovative approaches to improve the health of those that need it most and, to that end, will continue to explore the benefits of Project ECHO and how to best adapt it to the unique needs in Kenya.

# **Assessing the Impact of HIV Treatment Programs through a Mortuary Study**

As we look towards an AIDS-free generation and observe the decrease in new HIV infections, it is important that we understand the extent and causes of HIV-associated deaths. Mortality, however, is hard to track programmatically and difficult to measure in community surveys. CDC worked with the National AIDS and STI Control Programme (NASCOP) to implement HIV surveillance at two mortuaries in Nairobi to establish the proportion of deaths that were associated with HIV.

Despite an approximately 70% coverage of antiretroviral treatment (ART) among adults in Nairobi, the study found that 19.5% of deaths were HIV-positive. While ART considerably



Mortuary technician preparing specimen

reduces HIV-related mortality, there is more work to do to ensure that everyone who is HIVinfected knows their status and accesses and adheres to treatment.

## **Impacting Health through High Quality** Laboratory Systems

Quality laboratory services are essential for timely and effective disease diagnosis and management as well as for public health surveillance. In the absence of quality laboratory services, clinicians may resort to treatment based on observation and empiric judgement rather than on laboratory confirmations. Additionally, response to public health disease outbreaks would be delayed. In collaboration with the GOK and implementing partners CDC Kenya has made substantive contributions to strengthening the quality and improving the efficiency of laboratory services. Improvements have been evidenced through:

The Stepwise Laboratory Improvement Towards Accreditation (SLIPTA) initiative, launched in 2010, which has led to 60% of 140 laboratories enrolled in the program achieving SLIPTA stars, as recognition of guality practice. Additionally, the SLIPTA initiative had a catalytic effect on ISO

accreditation—the ultimate mark of quality—of medical laboratories in Kenya with an increase from three accredited laboratories in 2010 to 28 in 2016.

- A reduction in the laboratory turn-aroundtime for viral load (VL) testing from 33 to 11 days, which enables healthcare workers to make timely decisions on appropriate follow-up for patients on ART. This impacts patient retention, adherence to treatment, viral suppression and positive health outcomes.
- An estimated 40% increase in the number of VL tests performed in 2016 compared to 2015 in the Western Kenya counties, which translates to more people who are living with HIV being tested per national guidelines to monitor the effectiveness of antiretroviral therapy in controlling the virus.

Kenya was the recipient of five awards at the 2016 African Society of Laboratory Medicine (ASLM 2016) conference in recognition of significant outcomes in laboratory quality systems improvement.



#### Using Small-Scale GIS Techniques to Demonstrate the Impact of HIV Programming

Application of geographical information systems (GIS) in public health may include spatial mapping – a useful tool for displaying epidemiological data. Mapping is commonly applied to larger geographic areas, such as a region or county. Presenting the data at such a high level may not allow program managers to fully understand available data. Using GIS techniques at a more local level allows for multiple approaches to interpreting data.

To understand local epidemics, CDC Kenya is using spatial data and mapping of HIV disease in smaller geographic regions (sub-county, facility or even household location) to identify trends over time and possible underlying risk factors for contracting HIV. In the figure below, CDC Kenya epidemiologists used program data, such as the number of children living with HIV and the number of pre-natal care services delivered to show changes in mother-to-child transmission rates over time and space. The results showed that from 2007-2013 there was a reduction in motherto-child transmission of HIV from 20.1% to 8.3%.

#### Mapping HIV infection trends in mother to child transmission in Western Kenya.

Reducing mother-to-child transmission of HIV is a key objective towards elimination of mother-to-child transmission (eMTCT) of HIV. Geographical disparities in program achievements may signify gaps in eMTCT efforts, and indicate areas needing further resources and intervention.



This example, and similar analyses, are guiding stakeholders at the national, county, and local levels in designing programs that will have meaningful impact. Analyses showing impact help Kenya's PEPFAR program, the Government of Kenya, and partners communicate the impact of our efforts to reduce mother-to-childtransmission, a critical component of the HIV prevention programs in Kenya.

## Key Outcomes in the Fight against HIV and TB in FY 2016

#### HIV and Tuberculosis Outcomes

PEPFAR Indicator	CDC Kenya Supported Sites	% of CDC Target Reached
Number of HIV testing and counseling sessions performed with results received by client	6,514,000	157%
Number of adults and children current on ART	561,000	99%
Number of pregnant women who know their HIV status	409,000	82%
Number of HIV positive pregnant women who received antiretroviral prophylaxis to reduce risk of mother-to-child transmission of HIV	30,000	74%
Number of TB/HIV co-infected patients in TB clinics who received ART	10,000	107%
Number of HIV/TB co-infected patients initiated on IPT	40,000	33%
Percentage of viral load tests with an undetectable viral load (<1000 copies/ml)	86%	87%

#### **HIV Prevention**

PEPFAR Indicator	CDC Kenya Supported Sites	% of CDC Target Reached
Number of males that have received voluntary male medical circumcision services	176,000	119%
Number of key populations who received evidence-based HIV prevention interventions	140,000	189%
Number of people who inject drugs on medication- assisted therapy for at least 6 months	600	39%

#### Health System Strengthening and Capacity Building

PEPFAR Indicator	CDC Kenya Supported Sites	% of CDC Target Reached
Number of testing facilities with the capacity to perform clinical laboratory tests	1,850	103%
Number of laboratories that have been accredited or achieved an acceptable level towards attainment of accreditation	67	49%
Number of Site Improvement through Monitoring Systems site visits conducted	400	124%

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# Global Health Protection



#### CDC Kenya's global health protection programs support efforts to protect

the public's health by developing and strengthening Kenya's ability to rapidly detect and respond to disease outbreaks and emerging infectious disease:

- Global Migration and Quarantine Program works with local and international partners to reduce morbidity and mortality among migrant populations, including refugees resettling to the U.S.
- Global Health Security provides technical assistance to GOK to ensure rapid detection and response and promote comprehensive outbreak surveillance.
- Influenza Program supports influenza surveillance to detect new influenza strains, monitor risk factors for severe disease associated with influenza virus infections, and to evaluate new diagnostic, treatment, and prevention strategies.
- Diagnostics and Laboratory Systems Program helps Kenya develop enhanced state-of-the-art diagnostic capacity to process and test for infectious diseases.
- Field Epidemiology and Laboratory Training Program (FELTP) has graduated hundreds of future global health leaders with basic, intermediate and advanced skills in epidemiology and laboratory management.
- Integrated Human-Animal Health Program promotes a "One Health" approach involving human, animal, and environmental health experts to address epidemic threats.
- Risk Communication and Emergency Response Program works with first responders, humanitarian organizations and the GOK to provide technical support on emergency preparedness, response and recovery and risk communication.
- Global Immunization Program assists GOK in developing national policies, strategies, action plans, and implementing projects to prevent and control vaccine preventable diseases. CDC Kenya continues to focus on maintaining polio-free status, achieving measles elimination and rubella control, and supporting immunization priorities of the Global Health Security Agenda.

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## **One Health Approach to Tackle Anthrax**

In May 2016, Kenya's Zoonotic Diseases Unit (ZDU) received reports of a possible anthrax outbreak in Murang'a County with three reported cases of livestock deaths. The first death had no clinical signs of anthrax, the second had clinical signs of anthrax and was disposed of, and the third death was reviewed by a veterinarian who recommended the cow meat was safe for human consumption. The owner of the animal proceeded with butchering the animal and the meat was shared with the community.

Twenty-one individuals linked to the same cow were identified with symptoms associated with anthrax infection or had risk factors for infection. Field Epidemiology and Laboratory Training Program (FELTP) residents, both veterinarian and medical doctors, responded to the outbreak, identified the cause, characterized the type of infection and reported the animal and human cases. A temporary clinic was established to monitor the community, provide drugs to prevent illness, and treat those that were infected. Local animal health workers implemented vaccination and guarantine activities. Most of those who consumed or touched the meat developed cutaneous anthrax, the most common and least dangerous form of anthrax disease. No deaths were reported in this outbreak.



Lesion from cutaneous anthrax infection

It is regrettable that delayed notification of sudden animal deaths in a region with previous anthrax outbreaks resulted in the contact and consumption of contaminated beef. Nonetheless, the outbreak was quickly contained due in large part to the rapid mobilization of FELTP residents with zoonotic disease outbreak response training provided by CDC Kenya. With reported frequent outbreaks of anthrax in Murang'a County, ZDU is looking to decentralize One Health in the county as a priority to enhance surveillance. Findings from the response will be shared with the county to help contain further anthrax outbreaks.

## Malaria Outbreak in Kenyan Refugee Camp

In early 2016, the United Nations High Commissioner for Refugees (UNHCR) alerted CDC Kenya to a significant increase in malaria cases in the Kakuma Refugee Camp. The camp, located in northwestern Turkana County, is home to approximately 200,000 refugees with an additional 10,000 local residents living near the camp. At the request of UNHCR, staff from CDC Kenya's Global Migration and Malaria Programs collaborated to perform a rapid assessment of malaria epidemiology and control measures.

The team confirmed that a malaria outbreak had occurred from December 2015–March 2016, which stretched the response capabilities of the camp's health clinics ability. The camp health team planned to conduct a malaria outbreak response campaign of indoor residual spraying of insecticide (IRS) throughout the camp. The



Nabie Bayoh of CDC Kenya, left, and Maurice Ombok of KEMRI, right, collect larvae samples from a stagnant pool at the Kakuma refugee camp.

assessment team recommended evidencebased interventions to control malaria. These included switching to a safe and effective class of insecticide for the IRS campaign and distributing enough long-lasting insecticidal bednets to achieve universal coverage of sleeping space in the camp.

This collaborative effort by UNHCR, CDC and non-governmental organizations led directly to the procurement of >70,000 bed nets and the generous donation of insecticide by the Kenya National Malaria Control Program, providing preventive interventions to nearly 30,000 homes, schools and other structures in the camp.

#### **Antimicrobial Surveillance System Strengthening**

The GOK is developing policies and surveillance systems to detect and contain antimicrobial resistance (AMR). CDC's Division of Healthcare Quality Promotion, working with CDC Kenya, is supporting multiple groups in developing and implementing the national AMR strategy, including Kenya's National Antimicrobial Stewardship Advisory Committee (NASAC), a multi-sectorial committee that includes the animal and agricultural sectors, and the National Public Health Laboratory Services (NPHLS) system.

# There are three primary goals of the AMR surveillance system:

- 1. Describe the national burden of AMR in eight WHO priority pathogens
- 2. Update appropriate treatment guidelines
- 3. Guide research on AMR

Kenya will submit their national AMR data to the WHO Global AMR System beginning in 2017.

In 2017, CDC and NPHLS will pilot the AMR surveillance system at two public hospitals, one in Kitale (western Kenya) and the other in Thika (central Kenya). NPHLS and CDC conducted an assessment of the microbiology and susceptibility testing capacity at these laboratories. The assessments found that basic laboratory equipment and laboratory information systems were in place, but testing and reporting capacities needed to be strengthened. Work plans aimed at improving these capacities were developed by NPHLS, and partners are currently assisting with implementation. Initial activities includes training laboratory staff in microbiology testing methods and standard operating procedures, providing a supply of laboratory reagents, and activating microbiology sections of the laboratory information system. The pilot sites plan to start reporting their AMR data to NPHLS in 2017.

Moving forward, NASAC will revise the AMR surveillance plan to incorporate lessons learned from the pilot site experiences. Over the next five years, the number of pathogens and specimens will be expanded to include all priority pathogens identified in the National AMR Surveillance Plan and to all major facilities in Kenya.

## Establishing an Evidence Base for Influenza Vaccination in Kenya



Children <2 years old are at high risk for severe complications associated with influenza. The rates of influenza-associated hospitalizations among children <5 years in Africa are twice as high as those estimated in the Americas and in Europe. Each year in Kenya, 8,000–18,000 children <5 years old are hospitalized with severe acute respiratory illness associated with influenza. Sixty percent of those are children are under 2 years old.

In 2016 the newly formed Kenya National Immunization Technical Group (KENITAG), with support from CDC Kenya, made a recommendation to the Minister of Health to use an annual influenza vaccination to protect children from 6–23 months of age. This recommendation was derived from KENITAG evaluating evidence-based data generated in Kenya on the burden of influenza and on identifying high-risk groups that could benefit from vaccination. The next step in the process of adopting the recommendation is the successful completion of a demonstration project within the existing public health infrastructure and an assessment of acceptability of the vaccine among community members and healthcare workers.

This initial recommendation for annual influenza vaccination among children 6–23 months of age has the potential of substantially reducing healthcare utilization for influenza and influenzarelated complications (such as pneumonia, and exacerbation of underlying chronic medical conditions). Also, because Kenya does not offer national health coverage, households with children with influenza may have their livelihoods affected due to direct and indirect costs associated with an episode of influenza.

CDC Kenya's Influenza Program monitors the circulation of influenza viruses and contributes information for the selection of viral strain to be added to the annual influenza vaccine formulation to be used in the Southern Hemisphere. Moreover, data generated through this collaboration have been instrumental in documenting influenza disease morbidity (including hospitalization) and mortality in Kenya as well as costs associated with influenza in the community and nationally.

#### Increasing Kenya's Ability to Detect and Respond to Hepatitis Outbreaks

In 2016 there were two outbreaks of hepatitis in Kenya, involving hepatitis A and B. Unfortunately, the country lacked the capability to confirm laboratory diagnosis for hepatitis. CDC Kenya hosted a training on both molecular and ELISA (enzyme-linked immunosorbent assay) techniques for hepatitis. The trainees came from the National Blood Transfusion Center, Kenyatta National Hospital, the NPHLS, and KEMRI's Hepatitis Center. At the conclusion of the training, the participants were tested for and achieved competency in hepatitis diagnosis. With this new capability, Kenyan public health officials can now diagnose hepatitis with high accuracy and a shortened turnaround time for mounting a response and deploying appropriate intervention strategies.

#### **Kenya Graduates First Cohort for the IMPACT Distinguished Fellows Program**



Kenya's first cohort of Distinguished Fellows graduated from IMPACT in October

The first cohort of Kenya's Improving Public Health Management for Action (IMPACT) Distinguished Fellows graduated in 2016. This five-month intensive public health management training program focused on increasing knowledge and skills of seniorlevel managers working for the GOK. The fellows learned about program planning and management, communication, community assessment, budgeting/financial planning,

and emergency planning, preparedness and response. To complete the program, fellows were required to design a public health program that effectively utilized and integrated core principles from IMPACT curricula. Fellows presented their programs to their cohort and representatives from Kenya's Ministry of Health, CDC Kenya, the Kenya School of Government, the International Union Against Tuberculosis and Lung Disease, and Kenyatta University.

# Western Kenya **Research**



#### CDC's Western Kenya Programs are implemented in close collaboration with

host government research institutions. This collaboration of more than 35 years has developed into a sophisticated and comprehensive platform for scientific study and service delivery. CDC has ongoing projects with the NIH and international nongovernmental organizations such as the Bill and Melinda Gates Foundation.

- Evaluates new tools to prevent the spread of the epidemic and improve the health of persons infected with HIV.
- Measures the burden of TB and helps develop new ways to prevent and treat the disease.

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- Conducts surveillance and innovation research aimed at reducing morbidity, mortality and transmission from malaria.
- polio-free status, achieving measles elimination and rubella control, and supporting immunization priorities of the Global Health Security Agenda.

# Kisumu Field Research Site Now a CHAMPS site

In September 2016, the Kisumu field research site was declared a Child Health and Mortality Prevention Surveillance (CHAMPS) site. The Bill and Melinda Gates Foundation is launching the site in collaboration with CDC and KEMRI. CHAMPS aims to increase understanding of how, where and why children are getting sick, which will enable scientists and public health leaders around the world to take action. CHAMPS is a long-term program (approximately 20 years) that will ultimately take place in as many as 20 sites with high childhood mortality rates (>50 deaths in children under five years of age per 1,000 live births) throughout South Asia and sub-Saharan Africa. The program will begin in six sites including in Kenya; Bangladesh; Ethiopia; Mali; Mozambique; and South Africa. CHAMPS is focused on high-quality data collection and the strengthening of public health capacity in developing countries.

#### Hot on the Trail of TB Cases in Western Kenya

Kenya, like many sub-Saharan African countries, has a high disease burden of TB and HIV. Globally, two billion people are infected with TB, which is one-third of the world's population. While TB rates have slowly declined in recent years (1% reduction annually), disease trends suggests the possibility of a steeper decline (10%) by improving access to TB testing and treatment, by scaling up TB prevention through HIV treatment, and by providing preventive therapy for TB.

To improve access of TB patients to diagnosis and treatment, CDC Kenya and partners in Kisumu and Siaya counties compared active case finding at health facilities with active case finding in communities and among household contacts of TB patients. Active case finding is the systematic identification of people with suspected active TB within a predetermined target group, using tests, examinations or other procedures that can be applied rapidly. The results of this study found active case finding at health facilities produced the highest yield, and this will now be scaled up in the counties. Results were also shared with the National TB Program for possible scale-up elsewhere in Kenya.

Improved TB case finding is expected to help accelerate TB control. More impact is expected if this were combined with Test and Start for HIV (to increase the proportion of HIV infected individuals on HIV treatment, as this will not only improve their survival, but will also reduce their risk of getting TB), and with preventive therapy for TB. These wide ranging interventions have now started in Kisumu County and their impact will be assessed in the years to come.

#### **Conducting a Pediatric Trial of Malaria** Vaccine in Kenya



Children are the beneficiary of this malaria vaccine trial. Source: PATH

Between 2000–2015 there was a three-fold increase in global malaria control and elimination funding, leading to widespread malaria control interventions throughout sub-Saharan Africa. During this time there was a 66% reduction in malaria mortality in Africa and an 18% decline in malaria cases globally. Despite these advancements, malaria remains a leading killer worldwide, with over 400,000 malaria deaths per year. Children under five and pregnant women remain at risk for malaria. New tools are needed to both prevent malaria and reduce the complications of infection.

In 2016, CDC Kenya's Malaria Program, in collaboration with KEMRI, NIH, and Sanaria began a randomized controlled trial to evaluate the tolerability, safety, and efficacy of a Plasmodium falciparum sporozoite (PfSPZ) vaccine, in children

aged 5–17 months in western Kenya. The first vaccination was administered in July 2016. This is the first pediatric trial of PfSPZ in Kenya, and the first trial globally to evaluate the dose of 1.8 million sporozoites per vaccine in children.

The first part of the study, which was completed in January 2017, aimed to determine the youngest age at which the vaccine can be given safely and effectively, and also to determine if the high dose of the vaccine can be given safely and with minimal side effects in children aged 5-17months. The second part of the study, which began in January 2017, aims to determine the protective efficacy of the vaccine. It will continue for approximately one year of follow up. If this vaccine proves to be safe and highly efficacious, it would provide a desperately needed tool in the global fight against malaria.

# Behind the Scenes



#### Team Highlight: A Look at the Essential Contributions of the DGHT Cooperative Agreement Management Team

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The Global HIV & TB program through PEPFAR, awarded \$174 million to 41 partners in fiscal year FY 2016. The administrative actions needed to ensure the seamless continuation of life-saving programs at such a scale is no easy feat. The strategic concepts introduced into the HIV/AIDS arena during 2016, such as test and start and 90-90-90 in addition to the modifications in grant award processes, required programmatic as well as management changes of CDC cooperative agreements.. These new areas of focus were further complicated by the pending close-out of 25 cooperative agreements (CoAgs), and by the expansion of programs through a new supplemental funding process that replaced other familiar practices. While this new process improves transparency and accountability in the extension of CoAgs, the administrative actions are highly scrutinized, lengthier, and require stronger justifications to receive approvals from CDC Atlanta.

Despite these many changes and complex new systems, the DGHT CoAg Team worked through the challenges to deliver high quality and awardwinning support to partners and other CDC staff members to ensure that CDC-supported activities in Kenya continued without interruption. Below are a few examples of what they were able to accomplish:

- Processed four supplements, which totaled more than \$26 million in awards, through the new supplemental funding process;
- Helped coordinate, with the Program Budget and Extramural Management Branch in

Atlanta, the successful award of \$111 million to 20 new CoAgs;

- Organized a CoAg Management Training to increase partners' capacity for managing awards in compliance with HHS/CDC regulations;
- Reviewed and recommended actions for 13 partners using the Business System Assessment process. By implementing the recommended actions, the assessed partners were better positioned to employ stronger internal controls, procurement procedures, and sub-award management practices.

While much of the HIV & TB activities occur at the community-level, the CoAg Management Team serves an essential role in ensuring that CDC's partners have systems that safeguard PEPFAR funded assets and enables seamless partner transitions and continued service delivery.

#### "The Power of One"

In May 2016, CDC Kenya initiated a quarterly employee award recognition program to acknowledge staff members who have provided exceptional service in the previous 12 months. The selected staff member's photo is prominently displayed in the CDC office and he/she enjoys a dedicated parking spot for 3 months following the award. The following staff members were recognized in 2016:

Julie Mwabe serves as a health communication specialist for CDC Kenya. Julie was instrumental in developing and disseminating communication materials to extend the visibility and reach of CDC's work in Kenya. She operated seamlessly



between the U.S. Embassy Nairobi's Public Affairs Section to ensure that the health activities in Kenya were coordinated and clearly communicated to a broad array of audiences. Julie's dedication and professionalism are acknowledged by staff and partners in the communication field.

Dr. Hellen Muttai serves as Chief of the Western

Kenya Branch at CDC's Division of Global HIV and TB (DGHT) and supervises a team of 17 staff members; oversees 4 out of the 5 counties that contribute to more than 50% of the HIV



burden in Kenya (Homabay, Migori, Kisumu,

Siaya); and manages a program budget of \$60 million. The Kenya PEFPAR interagency team nominated her as the CDC co-chair for the interagency pediatric HIV treatment acceleration team, under the Accelerating Children's Treatment (ACT)—a global PEPFAR initiative. With strong leadership and humility, Dr. Muttai led the USG interagency team to develop a strategic plan to increase coverage and services for HIV-positive children not only in western Kenya, but across the country. Kenya's ACT strategy included the Kenya ACT dashboard pioneered by Dr. Muttai, which now serves as a best-practice model for other PEPFAR countries around the world. Since ACT was established in Kenya, 2,142,259 children have been tested for HIV and 86,219 children were on ART by June 2016, exceeding anticipated targets. Because of these achievements the Kenya, the PEPFAR team was awarded the Best ACT Country at the 2016 PEPFAR Annual Meeting. Dr. Muttai's leadership contributed to this honor in no small way.

Joshua Mutugi has been instrumental in ensuring that the CDC Kenya office is a much cleaner, comfortable and enabling work environment and has in a great sense contributed to allowing CDC



staff work towards being "happier, healthier, safer people." Joshua is dependable, responsive, friendly, and always demonstrates an open and willing attitude to serve,

despite requests that are made at the close of business. Joshua also demonstrates very strong leadership as evidenced by his hygieneengineering team, which continually appears to be motivated and serve with a notable sense of diligence. Alongside the enhanced quality and outlook of the CDC work space, fresh paint, and new photos, Joshua's commitment to his work lights up the office environment.

# CDC Kenya **Partners**

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African Medical and Research Foundation Africa Field Epidemiology Network American International Health Alliances Association of Public Health Laboratories Association of Schools of Public Health Bill and Melinda Gates Foundation Biomeme Inc. Carolina for Kibera Center for Health Solutions Christian Health Association of Kenya Christian World Services Clinical and Laboratory Standards Institute Columbia University Coptic Orthodox Church County Government of Siaya Defense Threat Reduction Agency (U.S. Department of Defense) Eastern Deanery AIDS Relief Program Elizabeth Glaser Pediatric AIDS Foundation Emory University

Family Health International GlaxoSmithKline **Global Implementation Solutions** HealthStrat Henry Jackson Foundation Hope Worldwide Kenya Impact Research & Development Organization Islamic Relief Kenya Institute for Disease Modeling, Seattle International Organization for Migrations International Panel Physicians Association International Rescue Committee International Training & Education Center for Health Kenya Conference of Catholic Bishops Kenya Medical Research Institute Kenya Ministry of Agriculture, Livestock and Fisheries Kenya Ministry of Health Kenya Wildlife Services Kenyatta National Hospital Kenyatta University

Liverpool School of Tropical Medicine	Takeda
London School of Hygiene and Tropical Medicine	Training Programs in Epidemiology and Public Health Interventions Network
LVCT Health	United Nations High Commissioner for Refugees
mHealth Kenya	United States Agency for International Development
Mkomani Clinic Society	University of California San Francisco
Moi University	University of Maryland, Baltimore
National Blood Transfusion Services	University of Nairobi
National Malaria Control Program	Vysnova
Palladium	Washington State University
PATH—The Malaria Control and Elimination Partnership in Africa	World Health Organization

Sanaria

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#### For more information please contact

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