

CDC Kenya

CENTERS FOR DISEASE CONTROL AND PREVENTION • KENYA

ANNUAL REPORT 2014



Center for Global Health
Office of the Director for Global Health





Cover Photo: A boy visits a prevention of mother-to-child transmission clinic in Nairobi with his mother.

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Letter from the Director

Dear Colleagues and Friends,

CDC Kenya staff and I are pleased to share CDC Kenya's 2014 Annual Report, an informal and necessarily brief summary of our broad activities in global health. I thank all partners for the productive collaborations and express appreciation to all colleagues at CDC Kenya for their support and dedicated work that extends across three broad themes and organizational units: health security; research and implementation science; and programmatic work and science to address HIV/AIDS.

If one event dominated global health discourse in 2014, it was the unprecedented Ebola epidemic in West Africa, which sorely tested the world's response capacity. A senior and field-experienced colleague said to me that CDC and Médecins Sans Frontières stood out internationally for their effective, deep, and flexible responses. CDC Kenya has contributed significantly to the overall effort, and I am grateful to those colleagues who deployed to West Africa and those remaining in Kenya who picked up additional work to enable this collective response. At the time of publication, over 25,000 cases of Ebola and over 10,000 deaths had been reported to the World Health Organization (WHO), and the epidemic is far from over. Liberia is close to "getting to zero" and incidence in Sierra Leone has declined substantially, but epidemic activity remains brisk and unpredictable in Guinea.

These events and trends around Ebola serve to emphasize the importance of the still evolving Global Health Security Agenda. The Ebola epidemic has again brutally demonstrated global interconnectedness, leading to unprecedented funding committed to health security and implementation of WHO's International Health Regulations. Kenya, because of its regional importance, advanced infrastructure and human capacity, and longstanding relationships with CDC and other agencies, will inevitably play an important role in this evolving area of work.

Productive work has continued in Western Kenya in HIV/AIDS, malaria, tuberculosis and other infectious diseases. This area of Kenya has amongst the most adverse health indicators although there has been substantial progress in recent years. Continued use of the Demographic Surveillance System for both research and programmatic implementation, coupled with population-based impact evaluations, offers opportunity for CDC and partners to use data to influence national and global health policy and practice.

CDC Kenya's third broad area of work is the programmatic effort in support of the U.S. President's Emergency Plan for AIDS Relief (PEPFAR). A major development in 2014 was the release of the second Kenya AIDS Indicator Survey (KAIS) report as well as the publication of a supplement devoted to KAIS in the *Journal of Acquired Immune Deficiency Syndromes (JAIDS)*, representing excellent collaboration among various organizations including CDC Kenya and agencies of the Government of Kenya. The new leadership of the Office of the U.S. Global AIDS Coordinator and Health Diplomacy is taking the program in new directions with increased focus on epidemic impact and control, requiring shifts in how PEPFAR operates in Kenya.

The activities described in this report demonstrate outstanding collaboration with many partners, but especially close working relationships with the Kenya Ministry of Health and agencies under its supervision. We thank all partners and wish all colleagues a productive 2015.

Kevin M. De Cock, MD, FRCP (UK), DTM&H
CDC Kenya Country Director
Nairobi, April 2015

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Acronyms

ACTG	AIDS Clinical Trials Group	HAART	Highly Active Antiretroviral Therapy
AFI	Acute Febrile Illness	HDSS	Health and Demographic Surveillance System
AFP	Acute Flaccid Paralysis	HMT	Health Management Team
ANISE	African Network for Influenza Surveillance and Epidemiology	HOA	Horn of Africa
ART	Antiretroviral Therapy	HPTN	HIV Prevention Trials Network
ARV	Antiretroviral	HRH	Human Resources for Health
BMGF	Bill and Melinda Gates Foundation	HRIS	Human Resources Information System
BSC	Biosafety Cabinets	HTC	HIV Testing and Counseling
CBDS	Community-based Disease Surveillance	ICS-RV	ImmunoCard STAT!® Rotavirus
cMIS	Continuous Malaria Indicator Survey	IDSR	Integrated Disease Surveillance and Response
CTU	Clinical Trials Unit	IHR	International Health Regulations
DoD	Department of Defense	IMC	International Medical Corps
DGHA	Division of Global HIV/AIDS	IOM	International Organization for Migration
DGHP	Division of Global Health Protection	IPC	Infection Prevention and Control
DICES	Drop-in Centers	IRDO	Impact Research and Development Organization
DLSP	Diagnostics and Laboratory Systems Program	ISO	International Organization for Standardization
ELISA	Enzyme-linked Immunosorbent Assay	JAIDS	Journal of Acquired Immune Deficiency Syndrome
EMS	Emergency Medical Services	KAIS	Kenya AIDS Indicator Survey
EQA	External Quality Assessment	KEMRI	Kenya Medical Research Institute
FELTP	Field Epidemiology and Laboratory Training Program	KNH	Kenyatta National Hospital
FESK	Field Epidemiology Society of Kenya	M&E	Monitoring and Evaluation
FGDs	Focus Group Discussions	MERS CoV	Middle East Respiratory Syndrome Coronavirus
GBV	Gender-based Violence	MIA	Minimally Invasive Autopsy
GBVRC	Gender-based Violence Recovery Center	MOH	Ministry of Health
GHS	Global Health Security	NACC	National AIDS Control Council
GID	Global Immunization Division		
GOK	Government of Kenya		

NASCOP	National AIDS & STI Control Programme	SLIPTA	Stepwise Laboratory Improvement Process Towards Accreditation
NHRL	National HIV Reference Laboratory	SOPs	Standard Operating Procedures
NIH	National Institutes of Health	STH	Soil-transmitted Helminthiases
NRC	Norwegian Refugee Council	STI	Sexually Transmitted Infection
PCR	Polymerase Chain Reaction	TAC	Taqman Array Card
PEPFAR	President's Emergency Plan for AIDS Relief	TAG	Technical Advisory Group
PHDP	Positive Health Dignity and Prevention	TB	Tuberculosis
PMI	President's Malaria Initiative	UCSF	University of California, San Francisco
PMTCT	Prevention of Mother-to-Child Transmission of HIV	UNHCR	United Nations High Commissioner for Refugees
PPP	Public-Private Partnership	UNICEF	United Nations Children's Fund
PT	Proficiency Testing	USAID	U.S. Agency for International Development
RCER	Risk Communication and Emergency Response	VMMC	Voluntary Medical Male Circumcision
RDT	Rapid Diagnostic Test	WHO	World Health Organization
RHP	Refugee Health Program	WRP	Walter Reed Project—U.S. Department of Defense
RNRL	Rwanda National Reference Laboratory	ZDU	Zoonotic Disease Unit
RSV	Respiratory Syncytial Virus		
RVF	Rift Valley Fever		

CDC'S Impact in 2014

	<p>3.4 million</p>	<p>People received HIV counseling and testing results (of 6.5 million supported through the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) in Kenya)</p>
	<p>6.5 million</p>	<p>Malaria rapid diagnostic tests and 4 million treatments procured and delivered by the President's Malaria Initiative (PMI)</p>
	<p>ISO 15189</p>	<p>ISO 15189 laboratory accreditation obtained for CDC supported Kenya Medical Research Institute (KEMRI) microbiology laboratory</p>
	<p>31,000</p>	<p>HIV-positive pregnant women received a full course of antiretroviral prophylaxis (of 57,000 supported through PEPFAR Kenya)</p>
	<p>425,000</p>	<p>Individuals received antiretroviral therapy, including 40,000 children, (of 740,000, including 71,000 children, supported through PEPFAR Kenya)</p>
	<p>154,000</p>	<p>Voluntary medical male circumcisions to reduce HIV risk were performed (of 229,000 supported through PEPFAR Kenya)</p>
	<p>1,300</p>	<p>Individuals were enrolled into two phase III malaria vaccine trials of one of the most promising vaccines</p>
	<p>58,000</p>	<p>People participated in surveillance for jaundice as well as for respiratory, febrile, and diarrheal conditions</p>
	<p>225,000</p>	<p>People are part of a health and demographic surveillance system that collects health and demographic information every four months</p>



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



Global Health Protection Accomplishments



The Division of Global Health Protection (DGHP) Kenya supports efforts to protect the public's health by developing and strengthening Kenya's ability to rapidly detect and effectively respond to disease outbreaks and emerging infectious diseases. The division relies on expertise in emerging infectious diseases; field epidemiology training; pandemic preparedness; diagnostic laboratory systems and biosafety; zoonotic disease research; emergency preparedness; and immigrant and refugee health. This capacity has been developed locally and is strengthened by support from CDC Headquarters subject matter experts, academia, and other key partners.

Ebola Response

As of April 15, 2015, a total of 25,791 Ebola virus disease cases including over 10,600 deaths have been reported from Guinea, Liberia, Mali, Nigeria, Senegal and Sierra Leone (<http://apps.who.int/ebola/current-situation/ebola-situation-report-15-april-2015>). Since the onset of the Ebola outbreak in West Africa, ten CDC Kenya staff were deployed to Liberia or Sierra Leone to support the Ebola outbreak response.

The team has contributed to all parts of the response including strengthening data management and epidemiologic investigation; supporting case management and isolation; conducting contact tracing; and establishing and coordinating Ebola diagnostic capacity.

CDC staff helped transport a mobile Biosafety Level (BSL)-3 laboratory and portable PCR units to establish

the first Ebola laboratory in Monrovia to support the three Ebola Treatment Units at the Eternal Love Winning Africa (ELWA) hospital grounds. Working with colleagues from NIH, the team provided much needed diagnostic capacity at the height of Liberia's epidemic.

CDC Kenya has served on the Kenya National Ebola Task Force to develop a national Ebola contingency plan. CDC Kenya provided technical assistance for the development of case definitions and surveillance strategies to detect and diagnose people potentially infected with Ebola and trained MOH Rapid Response Teams on the principles of rapid case investigation and contact tracing. To date, 26 suspected cases that met the case definition for suspect viral hemorrhagic fever cases have been reported and investigated. All were confirmed negative for Ebola and Marburg viruses.

In the absence of an identified and designated patient isolation facility in Kenya, CDC Kenya assisted in setting up a portable patient isolation unit at Kenyatta National Hospital (KNH). A permanent facility has been constructed at KNH, which continues to be improved, while a permanent isolation unit is under construction. CDC Kenya continues to provide technical guidance for the establishment of additional larger hospital and airport-based patient isolation facilities in key locations in Kenya.



Emily Zielinski, one of the CDC Kenya staff deployed as part of the Ebola response.

Diagnostic Laboratory and Systems Program

Development and Implementation of Syndromic Taqman Array Card Technology

The Diagnostic and Laboratory and Systems Program (DLSP) developed and validated a Taqman Array Card (TAC) for diagnosing acute febrile illness (AFI) in collaboration with the University of Virginia. The AFI card can detect fifteen viruses, eight bacteria, and three protozoa on eight patient specimens in 2.5 hours. The card will be used in the upcoming AFI sentinel surveillance project with the Kenya Medical Research Institute (KEMRI) and MOH.



Entrance to the newly accredited laboratory in Kisumu.

CDC Kenya Supported Laboratory Attains International ISO Accreditation

The KEMRI microbiology laboratory supported by CDC Kenya received International Organization for Standardization (ISO) accreditation 15189 in 2014. With the ISO 15189 accreditation received, DLSP is now recognized as a reference laboratory in the region.

DLSP also tested specimens for major infectious disease syndromes including those compatible with Ebola and Marburg viruses, diarrheal diseases at the Industrial Area Remand prison, and jaundice in South Sudan. DLSP received funding to establish next generation sequencing and bioinformatics analysis in Kenya.

Capacity Building for Ministry of Health Staff

DLSP trained and evaluated the Kenya MOH laboratory staff for competency in molecular techniques (real-time PCR) in pathogen detection. DLSP established the National influenza Center in the MOH for influenza surveillance. DLSP also conducted training for representatives from eight African countries on methods for testing human specimens for Middle East respiratory syndrome coronavirus (MERS CoV).

Risk Communication and Emergency Response

Support for Ebola Standard Operating Procedures

CDC Kenya's Risk Communication and Emergency Response (RCER) team organized and supported the development of standard operating procedures (SOPs) for Ebola outbreak response and preparedness for the MOH and Kenyatta National Hospital. The SOPs included 1) transport of a patient to an appropriate health facility; 2) contact tracing; 3) contact management; 4) decontamination of reusable contaminated material; 5) cleaning of isolation wards; 6) disposal of deceased patients; and 7) record keeping. RCER also donated 10 personal protective equipment boxes to the Management Science for Health organization in readiness for an Ebola Biosafety training.



Participants in action during Kenya's first mass casualty incident simulation exercise.

Coordination of Kenya's First Mass Casualty Incidence Exercise

RCER, in conjunction with the Johns Hopkins Bloomberg School of Public Health, helped coordinate Kenya's first Mass Casualty Incident Protocol Simulation Exercise. The exercise included a controlled interagency disaster response simulation as well as a practical session on how to improve emergency response in Kenya. Lessons learned from the exercise will be incorporated into the development of a national interagency response plan for mass casualty events.

Formation of a Technical Working Group for Emergency Medical Services Policy

RCER was part of the team selected by the MOH to participate in the development of the strategic plan for

the new emergency and disaster management unit in the MOH. The RCER team formed a technical working group for Emergency Medical Services (EMS) with various stakeholders including the MOH, Johns Hopkins Bloomberg School of Public Health, WHO, and the Kenya Red Cross. The group has worked on and developed a draft EMS policy that is in the draft stage and has been shared with counties for their input.

Participation in Hospital Surge Capacity Drill

The RCER team participated as a lead observer and evaluator in the KNH surge capacity drill. This was to test the hospital's ability to handle a large volume of mass casualties in the event of an emergency.

Influenza Program

Building Evidence to Support New Influenza Vaccine Policy

CDC Kenya's Influenza Program continues to collaborate with the Kenya MOH to develop and implement a national influenza vaccination policy. In February 2014, the MOH released its first immunization guidelines, which included the first official influenza vaccine policy in Kenya. As a result, project goals will now focus on implementing an influenza vaccine demonstration project and on developing a sustainable mechanism to integrate influenza vaccine into vaccination schedules.

Participation in the African Network for Influenza Surveillance and Epidemiology Meeting

The Influenza Program staff had leadership roles in the African Network for Influenza Surveillance and Epidemiology (ANISE) meeting in Cape Town, South Africa held in August 2014. This included chairing plenary sessions and multiple scientific presentations. Influenza Program staff also served as consultants to WHO in meetings held in Geneva, Switzerland, December 11-12, 2014 on strategies to estimate the burden of influenza in tropical settings.



Participants from the influenza team and MOH during an infection control meeting at Kenyatta National Hospital.

Evaluation of the Becton Dickinson and Company (BD) Rapid Diagnostic Test and Other Studies

The Influenza Program, in collaboration with KEMRI, completed a large multisite evaluation of the BD Veritor™ System Rapid Diagnostic Test that confirms infection with influenza types A and B.

Support of the Development of the National Infection Prevention and Control Strategic Plan 2014-2017

The Influenza Program supported the Kenya MOH with the development and release of its National Infection Prevention and Control (IPC) Strategic Plan 2014-2017. The 4-year plan is a guide for the implementation of infection control activities in Kenya and is critical in guiding the implementation of IPC in the county health systems. The Influenza Program continues to support the

Kenyan MOH in pandemic early warning preparedness—including for influenza and the Middle East respiratory syndrome coronavirus (MERS-CoV)—and in the operation of ongoing sentinel surveillance for severe acute respiratory illness associated with influenza and other respiratory pathogens in Kenya.

The program also concluded data collection on a study to estimate the economic burden of influenza in Kenya. Findings from these studies are being prepared for peer-reviewed publications in 2015.

GDD—EPIDEMIOLOGY

Initiation of Global Health Security Activities in Kenya

On February 13, 2014, CDC helped launch the U.S. Global Health Security (GHS) Agenda in Washington, DC, and Geneva, Switzerland. The GHS Agenda is aimed at improving the world's ability to prevent, detect, and respond to infectious disease outbreaks. CDC, in collaboration with the Kenya MOH, is expected to play a leading role in the implementation of the GHS Agenda to support the Government of Kenya (GOK) in achieving International Health Regulations compliance.

Rotavirus Vaccine Impact and Effectiveness Evaluations

CDC Kenya is participating in two collaborative efforts to evaluate the impact and effectiveness of the rotavirus vaccine, which was introduced in the Kenya routine infant immunization in July, 2014. Funding for the Rotavirus Vaccine Impact on Diarrhea in Africa (VIDA) study was awarded in 2014 through a grant from the Gates Foundation to University of Maryland. The study that will be conducted in Kenya, the Gambia and Mali is a multiyear, multimillion dollar vaccine impact study and is a continuation to the Global Enterics Multisite Study (GEMS).

The second study is the Rotavirus Vaccine Impact Evaluation in Kenya (RIPEK), which is led by Emory University and involves multiple sites and collaborators across Kenya. These include Kilifi (KEMRI- Wellcome Trust), Seme, Kisumu West (KEMRI- Walter Reed Program), Siaya and Kibera. Data from these activities will be useful for supporting and guiding vaccine policy decisions in Kenya and globally.

Acute Febrile Illness Surveillance in Kenya

CDC Kenya and KEMRI collaborators have developed a protocol that is currently under review for acute febrile illness surveillance in Kenya. The surveillance, which will be initiated in 2015 and run for five years, will examine causes of fever among all age groups at multiple sites across Kenya. The surveillance will initially be conducted



Kenya's First Lady, Margaret Kenyatta, gives a dose of rotavirus vaccine to a child in Machakos County. The rotavirus vaccine has been added to Kenya's Expanded Program on Immunization.

in six sentinel hospitals representing different regions, climates, and populations within Kenya. Diagnostic testing for patients hospitalized with fever without a source will include blood culture and testing by Taqman Array Cards designed for acute febrile illness. The findings of this surveillance can be used to guide prevention interventions, vaccine development and clinical management of patients with fever.

Implementation of Acute Febrile Illness surveillance in Tanzania

In June 2014, CDC Kenya launched the Tanzania Acute Febrile Illness (AFI) study which is a two phase study with each phase including a one month cross-sectional study followed by a yearlong longitudinal surveillance. This is a study aimed at examining the exposure and risk factors for emerging infectious diseases at the animal-human interface to determine the type and prevalence of emerging pathogens, risk factors and if there are correlations in the variety of viral zoonotic pathogens. The study is being conducted in Kilombero hospitals as collaboration between CDC, KEMRI and the National Institute Medical Research of Tanzania. This collaboration is a clear demonstration of CDC Kenya's effort to work with more partners even at a regional level. The research project has also provided an opportunity to build capacity including onsite culture capability training which will enhance diagnostic ability and consequently patient management. Diagnostic testing includes PCR, blood culture and testing by Taqman Array Cards designed for acute febrile illness and for respiratory illness. Findings of this surveillance could be used to guide prevention activities and intervention studies whose impact can be measured.

Distribution of Survey Results from Dengue Fever Investigation

In 2013, CDC Kenya assisted the MOH in its response to detect, characterize, and implement mitigation activities for the dengue outbreak in Kenya's coastal region. Of the specimens collected from 1500 participants in 701 households during the sero-incidence survey, 104 (6.9) % were positive by PCR and 101 (6.7%) were anti-dengue IgM positive. DGHP distributed the sero-incidence survey results for dengue fever to the community participants

in Coast Province. The team followed up with the private hospitals (Pandya, Mombasa, Mewa, and Bomu) to obtain results from the rapid diagnostic test (RDT) kits that were supplied last year. The results of the RDT kits used in the communities and associated samples were sent to the Arbovirus Laboratory in Fort Collins for validation.

Strategic Consultations on Deworming Strategies

CDC Kenya held consultations with the MOH, CDC's Division of Parasitic Diseases and Malaria in Atlanta, and Nairobi County health officials to deliberate on the second phase of the soil-transmitted helminths study. The first phase was conducted in Kenya's Kibera slum and demonstrated a high burden of soil-transmitted helminth infection among children living in this urban informal settlement. The second phase is aimed at evaluating the existing WHO deworming strategy and helping inform better future methods of deworming.

Response to the Aflatoxicosis Outbreak in Eastern Kenya

The Aflatoxin Team responded to an aflatoxicosis outbreak in Oloitokitok District of Kajiado County, Kenya. A total of twenty-seven suspected aflatoxicosis case patients were reported, ten of whom died, for a case fatality rate of 40%. Findings from this investigation indicated a high case-fatality rate similar to that observed in the most extreme aflatoxicosis outbreak in Eastern Kenya in 2014. Cases were also reported in Lenkitem Division; however, they were suggestive of a point source exposure as the affected cases reported having consumed maize which had been rained on during transportation from the market.

CDC Kenya also conducted a clinical trial in July 2014 to assess the feasibility, acceptability and palatability of a heat processed calcium dioctahedral smectite clay (Air Classified Calcium Silicate [ACCS] 100) in decreasing aflatoxin bioavailability. This clinical trial was the first of its kind in the country and in the East African region. CDC's aflatoxin team partnered with Texas A&M University, KEMRI and the MOH. ACCS100 has been found to be one practical and innovative approach to prevent sickness from acute aflatoxin exposure.



A dog gets vaccinated during the World Rabies Day event in Makeni county.

Launch of National Strategy for Controlling and Eliminating Rabies

CDC Kenya in collaboration with the Zoonotic Disease Unit (ZDU) in the Kenya MOH developed a strategic plan for elimination of human rabies in Kenya by the year 2030. The plan was launched during World Rabies Day on September 28, 2014 in Makeni County. Kenya became the first country in Africa to launch a national strategy for controlling and eliminating rabies. Additional information is available at http://caninerabiesblueprint.org/IMG/pdf/national-rabies-elimination-strategy_sept-20141_kenya.pdf.

Revision of the Rift Valley Fever Preparedness and Response Plan

CDC Kenya supported revision of the Rift Valley Fever (RVF) preparedness and response plan for Kenya. This was done through organizing a tabletop simulation exercise for RVF Contingency Plans in a meeting that

highlighted the gaps and proposed changes. One of the main revisions was the integration of the public health and animal health response into one document that addresses preparedness and response activities towards RVF prevention and control in the county.

Response to Zoonotic Disease Outbreaks in 2014

In 2014 CDC Kenya in collaboration with FELTP and Kenya ZDU responded to four outbreaks of zoonotic disease including an anthrax outbreak in Nakuru County where two adults were reported

to have died, a rabies outbreak in which a rabid hyena attacked seven family members in Laikipia County, an RVF outbreak in Murang'a County where animal and human cases were reported, and a Q-Fever outbreak in humans in Baringo County.

Mentorship of FELTP Residents

DGHP-Epi staff provided mentorship to two Field Epidemiology and Laboratory Training Program (FELTP) second-year and two first-year residents attached to ZDU. The residents have been engaged in preparation of proposals and grant applications, design and implementation of studies, training programs, and participating in outbreak response activities that have been carried out jointly by FELTP and ZDU. DGHP-Epi supported two MOH staff, one from ZDU and a surveillance officer based at the county level, to present surveillance and outbreak investigation findings at CDC's 2014 Epidemic Intelligence Service conference.

Global Immunization

Improving Surveillance through Capacity Building of Integrated Disease Surveillance and Response, Acute Flaccid Paralysis Surveillance, and Supporting Community-based Disease Surveillance

CDC's Global Immunization Division (GID) supported training efforts and sensitization activities to improve surveillance in several high-risk locations in Kenya in 2014. This included a Nairobi County Integrated Disease Surveillance and Response (IDSR) and acute flaccid paralysis (AFP) surveillance sensitization training for nine district surveillance coordinators and other partners, a training on IDSR and AFP at Kayole Hospital for 14 hospital surveillance and health care providers, and a training in Garissa County for IDSR and community-based disease surveillance (CBDS) for 48 participants from seven districts and five refugee camps. Since March 2014, GID, through MOH, has been implementing CBDS and distributing CBDS tools in Garissa, Wajir, and Nairobi. GID also participated in capacity building on immunization and vaccine introduction and in lot quality assurance sampling training for monitoring immunization coverage performance in the polio campaign in October 2014. Nomadic study tools review, pilot testing, and training of the research assistant, was done in November 2014.

Participation in the 10th Polio Horn of Africa Technical Advisory Group

GID staff participated in the 10th Polio Horn of Africa (HOA) Technical Advisory Group (TAG) meeting held on February 5, 2014 in Nairobi, and the 11th Polio HOA TAG meeting on 12-14 August, 2014, in Jordan. The meeting was attended by representatives from the MOHs in Kenya, Somalia, Djibouti, Yemen, Tanzania, Uganda, South Sudan, Sudan, and Ethiopia. Polio partners present included CDC, WHO, Red Cross, United Nations High Commissioner for Refugees (UNHCR), U. S. Agency for International Development (USAID), NGOs, and Rotary International. The meeting reviewed each country's implementation status on the previous TAG recommendations and discussed how to complete polio eradication efforts in the HOA region. GID staff presented at the 11th HOA TAG on the role of CBDS for detecting possible polio cases.

Assessments of Polio Outbreak Response

In April 2014, GID staff collaborated with WHO, USAID, the United Nations Children's Fund, the Bill and Melinda Gates Foundation (BMGF), and Rotary International to assess the quality and adequacy of polio outbreak response efforts to sufficiently interrupt polio within six months of detection of the first case in Turkana, Nairobi, and Garissa. The assessment mission recommended that the Kenya MOH improve on preparedness. In June and September 2014, GID staff participated in outbreak review assessment missions in Addis Ababa, Ethiopia, and in October 2014, GID staff participated in a similar outbreak assessment mission in Somalia. GID staff monitored the quality of polio vaccination campaigns in high risk counties in Kenya during July and November 2014.

Other Areas of Technical Assistance on Polio Eradication and Immunization Efforts



Children affected by polio perform during the launch of the Polio National Immunization Day in Kitui County.

GID staff participated in other ongoing efforts to eradicate polio and improve routine immunization. In August 2014 GID staff assisted partners in developing the GAVI, the Vaccine Alliance, application for funding implementing inactivated polio vaccine introduction in Somalia during 2015. In October 2014, GID staff participated in the East and South African regional workshop for all countries for the programmatic planning of successful inactivated polio vaccine

introduction during 2015. Throughout 2014 GID collaborated with the Refugee Health Unit on a study of vaccination among nomadic and pastoralist families living in eastern Kenya. In December 2014, GID staff

met with Kenya MOH officials to discuss potential future collaborations on strengthening routine immunization systems and improving vaccination data quality.

Field Epidemiology and Laboratory Training Program

New Approach to Building Epidemiology Capacity

The Kenya FELTP began implementing a full pyramidal approach to build field epidemiology capacity in Kenya. This approach includes training epidemiologists within the MOH at the national and sub-national level through three levels of training: advanced, intermediate and basic. The advanced level training was started in 2004, and to date has trained over 100 officers. The basic level was started in May 2014 and to date has trained 65 officers across the country. Kenya FELTP expects to launch the Intermediate level training in 2015.

Signing of a New Memorandum of Understanding for FELTP Training



The Vice Chancellor of Moi University, Professor Richard Mibey, and the Principal Secretary for Health, Professor Fred Segor, hold the newly signed MOU to support the advanced level FELTP training. Looking on from L-R are Doctors Maina, DeCock and Boru.

In June 2014, a new Memorandum of Understanding was signed between the MOH and Kenya's Moi University in support of FELTP training as part of building epidemiologic workforce capacity through the MOH at national and county levels.

Outbreak Investigations by FELTP Residents

FELTP deployed residents to multiple locations in Kenya to conduct outbreak and mortality assessments. Two residents went to Meru County to conduct an outbreak investigation after a foodborne illness linked to consumption of beef from an ill cow was reported. Two residents were deployed to Siaya County to investigate an outbreak of ceftriaxone resistant non-typhoidal salmonella in western parts of Kenya. Five residents conducted a rapid assessment of maternal and neonatal mortality in various parts of Kenya. FELTP also deployed two residents to investigate an outbreak of an unknown disease that killed four people in East Pokot County. It was suspected that the outbreak was Q-fever, a zoonotic disease.

Training on Surveillance and Field Epidemiology

FELTP trained 25 participants from three birthing hospitals in Kenya and MOH officers from the MOH Division of Maternal and Child Health on surveillance for birth defects. A plan for implementation of birth defect surveillance in Kenya was drafted and a technical committee was formed to follow up on its implementation. FELTP also trained 45 medical students from the University of Nairobi on surveillance and offered an introduction to field epidemiology. This is the third year this training has been offered as an elective among fourth year medical students. Twenty FELTP residents began their advanced level Field Epidemiology Training. The students will cover topics in basic epidemiology, surveillance, outbreak investigations, and on Epi Info, a statistical software tool for a statistical software tool for management and analysis of epidemiologic data.

Refugee Health Program

Technical Assistance to the Rwanda National Reference Laboratory

Following the completion of the CDC and International Organization for Migration (IOM) Rapid Health Assessment among Congolese refugees in Rwanda in 2013, the Rwanda MOH requested CDC technical assistance for enhancing laboratory capacity within the Rwanda National Reference Laboratory (RNRL). Representatives from CDC Kenya's DLSP visited the RNRL to make an assessment of its capacity to perform enzyme-linked immunosorbent assay (ELISA) and PCR testing which had been identified as a priority by RNRL. Subsequently, CDC DLSP staff trained RNRL staff on ELISA techniques to identify parasitic pathogens in human stool samples. This training facilitated RNRL's analysis of stool samples collected from the participants in the Congolese Rapid Health Assessment for *Entamoeba histolytica*, *Cryptosporidium*, and *Giardia*, and built long-term capacity within Rwanda to conduct ELISA testing for parasitic pathogens.

Field Effectiveness of Rotavirus Rapid Test Kits in Dadaab Refugee Camp



U.S. Ambassador Robert F. Godec puts a Band-Aid on 12-year-old Halima's arm who, together with her family, received vaccination at the IOM screening facility in Kakuma.

In 2014, the Refugee Health Program (RHP), together with the rotavirus teams in KEMRI and at CDC Headquarters in Atlanta, implemented a study to assess the field effectiveness of rotavirus RDT kits in

Dadaab refugee camp. RDTs are potentially feasible alternatives for confirming cases of suspected rotavirus infections in refugee camps with inadequate laboratory capacity. One hundred ninety-two suspected rotavirus patients (hospitalized children aged <5 years with acute diarrhea) were prospectively enrolled and their stool specimens tested using the ImmunoCard STAT!® Rotavirus (ICS-RV) rapid diagnostic kit. RDTs were compared with the gold standard of immunoassay for rotavirus (Premier™ Rotaclone® Enzyme Immunoassay) and also evaluated for their user acceptability. The sensitivity, specificity, and positive and negative predictive values of ICS-RV were high, and users found the kits easy to use. ICS-RV can be useful in detecting rotavirus outbreaks since it has high sensitivity, specificity and predictive values under field conditions.

Innovative Approach to Sanitation in Kakuma Refugee Camp

In 2014 RHP teamed with Sanivation and the Norwegian Refugee Council to conduct focus group discussions (FGDs) among Kakuma refugee camp's residents to understand their practices and perceptions of sanitation. These discussions informed the development of an innovative fecal sludge management system which was implemented in the refugee camp on a pilot basis. The implementation phase featured the installation of user-friendly latrines/toilets in up to 32 refugee households, which included households headed by women and elderly residents of Kakuma. Following implementation, FGDs were used to evaluate residents' experiences using the new sanitation design. The feedback from the participants demonstrated strong demand for an improved household 'sit toilet' that is paired with a regular collection service to prevent latrines from being filled and to keep toilets hygienic.

Renovation of the International Rescue Committee Laboratory in Kakuma Refugee Camp

In the last two years, CDC Kenya and WHO funded the renovation of the laboratory in the International Rescue Committee hospital compound in Kakuma refugee camp. The laboratory has been serving the population in the camp and the surrounding host community for

over 20 years, but was in need of renovation. With the increased capacity in the newly refurbished laboratory, more tests can now be conducted, including cultures for bacterial pathogens and biochemistry analyses including liver tests. This will accelerate the turnaround time for test results, thereby improving patient management, as well as improving surveillance of communicable diseases as most pathogens will be identified at the hospital laboratory.

Insecticide Donated to Protect Kakuma Refugee Camp Population from Malaria

In 2014 the President's Malaria Initiative (PMI) Kenya team, in consultation with RHP, UNHCR, and the

Norwegian Refugee Council (NRC) collaborated to donate sachets of the pyrethroid insecticide K-Othrine for use in Kakuma refugee camp. In June 2014 NRC implemented a successful indoor residual spraying program prior to the onset of seasonal rains. Seventy trained operators sprayed over 34,000 structures inside the camp, protecting an estimated 143,000 people. In addition NRC prioritized 27 schools in the camp and 10 schools in the surrounding host community for spraying.

CDC Kenya Staff Support the Ebola Outbreak Response



Clayton Onyango at work in a temporary lab in Liberia.

Clayton Onyango is the Deputy Laboratory Director at CDC Kenya's Division of Global Health Protection. He was in Liberia between August 16 and September 14, 2014, as part of the Ebola Outbreak Response team and shared his experience.

What was your role in the Ebola Response?

Initially, CDC had planned to deploy us to Foya (a remote Liberian location bordering Guinea) with a role in setting up an Ebola diagnostic laboratory in that location. Our team was, however, unable to get to Foya due to a couple of reasons including heavy rains that made roads inaccessible as well as lack of air flights. There was also a greater need of supporting a newly established Ebola Treatment Unit (ETU) in Monrovia by Médecins Sans Frontières (MSF). Discussions between CDC, MSF and Liberian health officials resolved that our laboratory be set up at the Eternal

Love Winning Africa (ELWA) hospital grounds to support the new ETU. When we arrived the ETU was relatively small but it expanded to a capacity of 120 beds in a few days and it continued to expand.

What was your first impression of the situation?

My first impression was that the situation was grave. But I was glad that MSF and other healthcare providers were there to help. MSF had highly trained staff to deal with the outbreak, and they did this by setting up this ETU. In general, MSF handle infection control, care for the ill and offer counselling to the affected, and I think this is very useful.

How did the deployment of the lab there help?

It helped a lot because it ensured timely diagnosis. Just before we set up our laboratory, MSF was faced with diagnostic turnaround issues since the samples were sent to the Liberian Institute of Biomedical Research (LIBR) which was one hour out of Monrovia. The diagnostic facility at the LIBR was run by the Liberian Ministry of Health staff alongside United States Department of Defense (DOD) and the US National Institutes of Health (NIH). The DOD personnel had been mandated to train the local staff in diagnosis thus slow turn-around time. We set up our lab and were able to give back results within 3 hours of sample collection. Our laboratory team consisted of both CDC and NIH staff. Both teams (CDC

and NIH) performed independent assays, thus giving both screening and confirmatory results within a short period of time.

In your opinion, what do you think still needs to be done?

I think there is great need to deploy more skilled personnel to help contain the outbreak. There is even a greater need to train more Liberians on how to respond to the Ebola outbreak. Also importantly, I believe we do not need to isolate West Africa- I think having the airspace open will assist in responding to the outbreak by ensuring that medical supplies, drugs and personnel that are direly needed are able to reach the affected communities. I know Ebola is a big concern to other African governments but I believe if we tighten our surveillance at the port of entry for all arriving travelers, then African governments alleviate fears of Ebola spread into new territories.

Will you go back?

Yes, if I am asked to go back I definitely will. However, I may not want to volunteer as I would also like to give other staff an opportunity to have the experience.

Global HIV/AIDS Accomplishments



In support of the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), CDC's Division of Global HIV/AIDS Kenya (DGHA) assisted the Kenya MOH and other partners in developing and implementing national HIV policies and HIV/AIDS prevention, care and treatment programs; providing other HIV clinical services; conducting HIV surveillance and research; monitoring and evaluating HIV programs; building capacity among the Kenya health workforce; and strength-ening laboratory and other health systems.

HIV Care and Treatment

Progress in Prevention of Mother-to-Child Transmission

There was high uptake of HIV testing for women in Kenya attending antenatal care, labor and delivery, and postnatal clinics, reaching nearly 1.3 million women in 2014, which represents 96% of all women attending these services. CDC Kenya programs contributed to HIV testing of over 423,000 of the 1.3 million women tested. Additionally, there was improved uptake of antiretroviral (ARV) prophylaxis for prevention of mother-to-child transmission (PMTCT), from an estimated 69% of PMTCT clients receiving ARV prophylaxis in 2013 to 89% in 2014.

The GOK's revised antiretroviral therapy (ART) guidelines include a recommendation that all HIV positive pregnant women start lifelong ART regardless

of CD4 count, an approach referred to as Option B+. This guidance came with a notable increase in the use of highly active antiretroviral therapy (HAART) among HIV-positive pregnant women, from 36% in 2013 to 64% in 2014.

Through these activities mother-to-child transmission of HIV steadily declined. In 2014 4% of infants tested DNA PCR-positive at six weeks, less than half the prevalence found in 2010.

Ongoing Scale-up of HIV Treatment

Overall, there was a substantial scale-up of ART in Kenya, reaching 740,000 patients by September 2014, up from 630,000 patients in 2013. CDC contributed to 57% (425,000) of the national-level PEPFAR achievements in

Kenya. Viral suppression among ART patients was estimated at 75% in the 2012 Kenya AIDS Indicator Survey (KAIS 2012).

Increased Identification and Treatment of Tuberculosis/HIV Coinfected Persons

Tuberculosis (TB) and HIV are strongly interlinked, with approximately 36% of all TB patients in Kenya coinfecting with HIV. In 2014 TB/HIV services continued to be scaled up, with over 95% of TB patients having received an HIV test and 85% of the TB/HIV coinfecting patients provided with ART.

Enhanced TB diagnostics and identification of drug resistance in



A nurse at Eastern Deanery AIDS Relief Programme, a CDC Kenya partner, discusses HIV prevention and care with a mother living with HIV.

patients are critical to improving outcomes of persons coinfecting with TB and HIV. The GeneXpert® test is a highly sensitive, rapid molecular TB diagnostic test capable of detecting TB and identifying resistance to rifampicin, a key TB treatment drug. A sample referral system has been established so that sites without a GeneXpert® machine can send samples to another site for testing.

Testing activity is centrally monitored electronically and enables the MOH to detect inactive sites, and monitor quality control volume across the entire country. National guidelines and the GeneXpert® algorithm were revised to make GeneXpert® the initial test for people with HIV and prisoners with presumptive TB. A total of 17,000 tests were done, and CDC continues to offer technical assistance to optimize the specimen referral network.

Support for HIV Care and Treatment Strategic Planning

CDC Kenya staff supported the National AIDS & Sexually Transmitted Infection (STI) Control Programme (NAS COP); the National TB, Leprosy and Lung Diseases Unit; and other relevant MOH units to ensure MOH and CDC technical priorities were addressed. Notable achievements included revision and dissemination of the national ART Guidelines in line with the 2013 WHO recommendations; development of the Kenya AIDS Strategic Framework 2014/15–2018/19.

Additionally, CDC Kenya staff helped plan for the rollout of Option B+ for PMTCT, the TB National Strategic Plan 2015–2018, the National Viral Load Strategy, and the Joint TB / HIV Concept note for the Global Fund; served as a member of the Technical Advisory Team for the Kenya First Lady's Beyond Zero campaign to reduce newborn and maternal mortality; and helped conduct a mid-term review of the TB National Strategic Plan 2011–2015.

HIV Prevention

Increasing Voluntary Medical Male Circumcision Coverage

Voluntary medical male circumcision (VMMC) has been shown to be effective in reducing a man's risk for HIV infection and has been an important PEPFAR HIV prevention strategy. In 2014, nearly 148,000 VMMC procedures were conducted through CDC Kenya programs. This represented over 70% of all the VMMC procedures conducted in the country.

CDC Kenya staff provided technical input to the MOH and the National AIDS Control Council (NACC) in the development of the Second National VMMC Strategy 2014/15–2018/19, the VMMC communication strategy roadmap, the Kenya Clinical Manual for Early Infant Male Circumcision under Local Anesthesia, and the PrePex Active Adverse Event surveillance protocol. CDC staff engaged with and supported County Health Teams to implement VMMC.

Ensuring Kenyans Know Their HIV Status

Ensuring Kenyans know their HIV status and linking those who test positive to HIV care and treatment are critical to HIV prevention efforts. In 2014 DGHA Kenya facilitated more than 3.3 million HIV testing and counseling (HTC) service visits and provided technical input for the updated Kenya HTC guideline.



A boy visits a prevention of mother-to-child transmission clinic with his mother.

With the change in Kenya's national HIV testing algorithm, there was a need to retrain HTC service providers. Since training began in April 2014, CDC partners have trained nearly 3,300 HTC service providers, nearly half of the service providers in the country.



Young people in Korogocho slum participate in the PEPFAR-supported Healthy Choices II, an evidence-based HIV prevention program targeting adolescents.

Addressing Needs of Key Populations and People with HIV

Key populations include those groups of people who are particularly vulnerable to becoming HIV-infected and, in many cases, have challenges in accessing HIV prevention, care, and treatment services. To address the needs of key populations, CDC Kenya supported comprehensive HIV prevention services to over 82,000 sex workers; more than 1,900 men who have sex with men; and 121 people who inject drugs.

CDC Kenya provided technical input into the development of the new key population cohort register and the National Guidelines for HIV/STI Programming with Key Populations. The cohort register will be very useful in ensuring that the program retains key populations long-term and will be used to monitor incidence on a quarterly basis. Additionally, in support of programs to reduce infection among injecting drug users, CDC Kenya and its partners completed the renovation of the Mathari and Malindi methadone treatment sites.

Positive Health Dignity and Prevention (PHDP) or “positive prevention” services for people living with HIV include interventions that ensure that people with HIV are healthy and are engaged in preventing transmission of HIV to other people. PHDP services were offered to over 211,000 clients in health facilities and over

78,000 at the community level. CDC Kenya also supported the development of a PHDP cohort register and the new PHDP implementation strategy.

Prevention Needs of Youth and Women

CDC has worked to develop and implement HIV prevention interventions targeting youth that have been proven to delay the age at which they first have sex. In 2014 more than 313,000 youths received HIV

prevention skills through evidence-based programs using small group discussions.

CDC Kenya staff supported the development of prevention interventions for girls and young women in collaboration with Kenya’s NACC and ensuring gender issues are considered in implementation of HIV programs.

Support for HIV Prevention Strategic Planning and Guidance

CDC Kenya staff provided technical support to the MOH and NACC to develop two key national strategy documents that impact HIV prevention programs: the Kenya AIDS Strategic Framework 2014/15–2018/19 and the Kenya HIV Prevention Roadmap 2030.

Research in HIV Prevention

CDC Kenya, working in collaboration with the MOH and with support from the University of California, San Francisco (UCSF), completed three HIV prevention studies in 2014: (1) Qualitative assessment with health care providers to improve STI management, (2) Urethral pathogens and antimicrobial susceptibilities of gonococcal isolates obtained from men presenting with urethral discharge in Nairobi, Kenya, and (3) a fisherfolk formative assessment.

Health Systems and Evaluation

Roll-out of Electronic Medical Records Systems

Through CDC Kenya support, the MOH completed the roll-out of electronic medical records (EMR) systems at 615 health facilities owned by the MOH and faith-based organizations. These are high volume facilities which serve nearly 70% of HIV clients receiving HIV care and treatment in Kenya.

Support for National Monitoring and Evaluation Conference

CDC Kenya assisted NASCOP with holding the second national monitoring and evaluation (M&E) best practice conference. Over 140 abstracts were submitted. The quality of abstracts presented in 2014 had significantly improved compared to the previous year due to the feedback provided on previous abstracts by reviewers from CDC-Kenya and other partner institutions. In addition to reviewing abstracts, CDC Kenya staff chaired sessions at the conference.

Transition of Health Workers to County Governments

As part of PEPFAR's broader plan to support sustainability and increase country ownership, CDC Kenya helped initiate the plan to transition health workers previously hired through PEPFAR implementing partners to the county government. This activity was conducted jointly with USAID Kenya's health systems team and DoD, and with the support of CDC headquarters' human resources for health staff. Decisions made in implementing the transition were informed by a robust human resources information system supported by CDC and USAID

Building Capacity in HIV Program Management

CDC Kenya supported the University of Nairobi HIV Fellowship program which graduated 16 long-term (two years) and 69 medium-term (six months) fellows. The fellows were equipped with competency-based training in HIV program management, health economics, health informatics, M&E, and quality improvement and are expected to work in the country's HIV programs.

Laboratory, Blood Safety, and Infection Control

Expansion of Laboratory Support

In addition to care and treatment services for people coinfecting with HIV and TB, CDC Kenya supports the need to address TB among persons living with HIV through support for improved TB/HIV laboratory services. The number of clinical laboratories supported by CDC Kenya for TB/HIV diagnosis and ART monitoring increased six-fold, from 277 laboratories supported in 2013 to 1,806 in 2014.

To increase access to laboratory testing services for TB/HIV, CDC Kenya supported the introduction of 35 GeneXpert® machines and 44 PIMA™ CD4 analyzers at HIV care and treatment sites.

Additionally, CDC Kenya provided technical input and facilitated the construction of the new PEPFAR-funded Kisumu East District Hospital Laboratory. The building was handed over to Kenya's MOH in February 2014.



Through its cooperative agreement with the MOH, CDC provides resources like these autoclaves that sterilize laboratory infectious waste.

Ensuring Laboratory Quality Systems Improvement

By the end of 2014, 82 laboratories representing 37 of 47 counties in Kenya were enrolled in laboratory quality systems improvement through the Stepwise Laboratory Improvement Process Towards Accreditation (SLIPTA) framework.

- Thirty-nine (48%) of these laboratories have attained a minimum of one star or more (on a five star scale).
- Four (5%) of the laboratories have progressed to full ISO 15189 accreditation: the National HIV Reference Laboratory (NHRL), KEMRI TB Lab, AMPATH Laboratory, and Bungoma District Hospital.

To enhance quality of diagnostic testing:

- 7,300 HIV proficiency testing (PT) panels were distributed to 2,270 facilities across the Kenya's 47 counties
- The centralized External Quality Assessment (EQA) program run through the National Public Health Laboratory Services expanded to 60 laboratories
- All seven HIV molecular testing laboratories were enrolled in the Atlanta-based viral load and Early Infant Diagnosis PT scheme
- 45 GeneXpert® sites were registered on a PT scheme through CDC headquarters
- Smear microscopy EQA was supported at 1,800 facilities

Preventing HIV Transmission through Blood Safety and Infection Prevention and Control

CDC Kenya works closely with the MOH to ensure the safety of laboratory staff, health care workers, and the public through programs to improve blood safety and prevent and control infections in healthcare settings.

In 2014 over 182,000 units of blood were received from voluntary non-remunerated donors and 100% were screened for transfusion transmissible infections. HIV prevalence in donated blood remained low at 0.71%.

Eighty-one laboratory biosafety cabinets (BSC) were serviced and certified to support safe working environment for health care workers. This BSC certification work was done by four MOH and KEMRI engineers trained through CDC Kenya support. Additionally, these engineers trained 80% of BSC users in laboratories across Kenya.

Fifty-nine model Health Care Waste Management sites were established and equipped, and over 1,800 laboratory health facility personnel were trained in biosafety and medical waste management.

Scaling Up HIV Viral Load Testing

After the launch of Kenya's Guidelines on Use of Antiretroviral Drugs for Treating and Preventing HIV Infection: Rapid Advice, CDC Kenya laboratory staff assisted NHRL in preparing and implementing the scale-up of HIV viral load testing. Over 30,000 samples were tested each month.

Launch of the Labs for Life Public-Private Partnership

In July 2014 PEPFAR collaborated with the Becton Dickinson and Company (BD) and the MOH to officially launch the Labs for Life Public-Private Partnership (PPP). The PPP supports laboratory quality systems improvements at ten labs through the SLIPTA process.

Support for National Policies and Guidelines

In 2014, CDC Kenya provided technical input into three national laboratory and biosafety guidelines and policies, including the:

- National IPC Strategic Plan
- National Laboratory Biosafety Policy Guidelines and National Laboratory Biosafety Training Curriculum
- Occupational Safety and Health Guidelines for Health Care Workers

Surveillance and Epidemiology

Kenya AIDS Indicator Survey (KAIS 2012) Final Report Launched

On June 25, 2014 the final report of KAIS 2012 was released. CDC Kenya staff provided significant technical support throughout all stages of the national population-based household survey, laboratory work, data analysis, and report writing. CDC supported the MOH in analyzing and preparing scientific papers using KAIS 2012 data, including a supplement of the Journal of Acquired Immune Deficiency Syndrome (JAIDS), published in May 2014. CDC also worked with KEMRI to develop an innovative software package that allowed field teams to enter data into portable computers and to transfer data daily to a central server for real-time monitoring of the survey.

Initiation of a Fisherfolk Qualitative Study

A qualitative study was conducted among Lake Victoria fishing communities in August 2014 to understand perceptions of the HIV burden, risk factors in these communities, and, critically, their attitudes toward HIV

prevention, care, and treatment services. The study was conducted in 9 sites along the Kenyan shores of the Lake Victoria Basin, including KEMRI's Demographic and Health Surveillance site in Asembo.

The study was a joint collaboration between NASCOP, the Field Epidemiology Society of Kenya (FESK), FELTP, KEMRI, UCSF, and CDC Kenya. On-the-ground partners, including Impact Research and Development Organization (IRDO), International Medical Corps (IMC), the Elizabeth Glaser Pediatric AIDS Foundation, and Red Cross also provided key implementation support within their program areas during the study.

CDC Kenya staff provided technical assistance in protocol development, study tools development, training, data analysis and report writing. These data will contribute to prevention and treatment service scale-up for fishing communities, with a final report to be released in the first half of 2015.

Launch of HIV Case-Based Surveillance

The pilot phase of HIV case-based surveillance was launched in Kisumu and Siaya counties in December 2014. This surveillance platform will provide a longitudinal record that will track individuals beginning with their HIV diagnosis through HIV care and treatment to viral suppression, loss to follow-up, or death. The surveillance system will also track pregnancy among women with HIV. Shifting to this surveillance approach will produce higher quality data that allow regular monitoring of linkage to care, viral suppression, and mortality at the county level; provide clarity on gaps in the continuum of care; and address issues related to movement of patients and duplication. The effort is a collaboration among CDC Kenya and NASCOP, UCSF, KEMRI, Walter Reed Project (DoD), and Kisumu and Siaya county health departments.



A youth group performs a skit enacting a couple receiving their HIV test results during the launch of the second Kenya AIDS Indicator Survey.

Global HIV/AIDS in Western Kenya

Ensuring Timely Antenatal Care and Use of PMTCT Services

CDC Kenya initiated an effort with KEMRI, Columbia University's ICAP program, and Siaya County's health management team to improve timely ANC and use of PMTCT in the KEMRI Health and Demographic Surveillance System area. Activities included utilizing KEMRI village reporters to refer women to ANC and PMTCT and to improve documentation of linkage to care.

Implementing Drop-In Centers for Key Populations

In western Kenya CDC Kenya collaborated with IMC and IRDO to support 13 drop-in centers (DICES) for key populations which offer services in an environment that is friendly to key populations and employs peer-educators to improve outreach. The 13 DICES have enrolled nearly 7,300 persons, of whom 28% were HIV positive and enrolled in HIV care/ART.

Support for the Fisherfolk Community

In 2014, the key population programs supported by CDC in western Kenya reached over 68,000 fisherfolk, achieving service coverage of 66% of the fisherfolk population.

To assess HIV prevalence, care utilization, and other program needs among fisherfolk and the surrounding community, CDC Kenya and KEMRI, in collaboration with

CDC's Division of HIV/AIDS Prevention, carried out the "HIV SubStudy," an integrated bio-behavioral survey in two areas of Siaya County: the Gem sub-county and the villages bordering Lake Victoria in Asembo.

Establishing a Gender-Based Violence Recovery Center

PEPFAR is committed to programs to reduce and mitigate gender-based violence (GBV) and the associated risk of HIV transmission. In early 2014, a comprehensive gender-based violence recovery center (GBVRC) at the Jaramogi Oginga Odinga Teaching and Referral Hospital in Kisumu opened and has served 196 GBV survivors, 73% of whom were less than 18 years of age.

Studying Feasibility of Minimally Invasive Autopsies for Improved Mortality Data

To improve information about the impact of HIV on mortality in Kenya, DGHA Western Kenya collaborated with KEMRI to implement the Cause of Death Using Minimally Invasive Autopsy (CADMIA) study in western Kenya to evaluate the acceptability and feasibility of the minimally invasive autopsy (MIA). This multicountry study has conducted interviews with next-of-kin of recently deceased persons, community key informants, and health professionals. The objective is to assess barriers and facilitating factors to the routine use of MIA as a surveillance tool. Analysis is ongoing.



In a tent on the shores of Lake Victoria, members of the fishing community are provided with mobile HIV testing and counseling services.

CDC Kenya's Contribution to 2014 PEPFAR Indicators

The tables below include the results for CDC Kenya and its implementing partners for each PEPFAR indicator (CDC Kenya) and the total results for all PEPFAR implementing agencies (CDC, USAID, DoD, and the Peace Corps) for each PEPFAR indicator (Total PEPFAR Kenya).

HIV Care and Treatment

PEPFAR Indicator	CDC Kenya	Total PEPFAR Kenya
HIV Care and Treatment		
# of HIV-positive adults and children receiving at least one clinical service	517,183	952,074
# of adults and children newly enrolled on antiretroviral therapy (ART) ²	87,3631	148,2991
# of adults and children currently enrolled on ART	425,348	740,698
Percentage of adults and children known to be alive and on treatment 12 months after initiation of ART	95%	89%
TB/HIV		
Percentage of HIV-positive patients who were screened for TB in a HIV care or treatment setting	71%	71%
Prevention of Mother-to-Child Transmission		
# of pregnant women who know their HIV status	423,587	1,323,816
# of HIV positive pregnant women who received antiretroviral prophylaxis to reduce risk of mother-to-child transmission of HIV	30,987	57,152
Percentage of HIV positive pregnant women who received antiretroviral prophylaxis	90%	86%
Percentage of infants born to HIV-positive women who received an HIV test within 12 months of birth	90%	83%

Laboratory

PEPFAR Indicator	CDC Kenya	Total PEPFAR Kenya
# of testing facilities with the capacity to perform clinical laboratory tests	1,800	2,147
# of PEPFAR-supported testing facilities (laboratories) that are recognized by national, regional, or international standards for accreditation or have achieved a minimal acceptable level towards attainment of such accreditation	42	47

HIV Prevention

PEPFAR Indicator	CDC Kenya	Total PEPFAR Kenya
Voluntary Medical Male Circumcision		
# of males circumcised as part of a minimum package of voluntary male medical circumcision services	154,776	229,390
# of circumcised males experiencing at least one moderate or severe adverse event	139	280
Evidence-Based Behavioral Interventions		
# of target population who completed a standardized HIV prevention intervention	251,9492	1,001,6602
# of key populations who received evidence-based HIV prevention interventions	90,262	187,904
HIV Testing and Counseling		
# of people who received HIV testing and counseling and received their results	3,387,228	6,514,027

²Data from Direct Service Delivery

Health System Strengthening

PEPFAR Indicator	CDC Kenya	Total PEPFAR Kenya
# of new health care workers who graduated from a preservice training institution as a result of PEPFAR-supported strengthening efforts	3,849	7,380

Kenya Exceeds Goals to Address TB and HIV Coinfection

Among persons living with HIV in Kenya, tuberculosis (TB) is the single leading cause of death. With more than 35% of those with TB infected with HIV, TB and HIV coinfection creates a substantial burden on Kenya's health system and among patients, their families, and local communities.

Dr. Herman Weyenga, TB/HIV technical advisor for CDC Kenya, works closely with the Ministry of Health in Kenya. "To address the challenge of TB among people with HIV, the government of Kenya, with support from partners like CDC, has made changes to public health programs and policies that have helped the country exceed its goals of identifying and treating people with TB/HIV coinfection."

Leading many other high burden countries, Kenya now tests over 95% of TB patients for HIV and provides antiretroviral therapy (ART) to over 86% of people who have both TB and HIV. With support of the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), Kenya is addressing the quality of TB screening, expanding access to new TB diagnostics, and is launching a national program to provide a drug called isoniazid to prevent TB among people living with HIV.



A clinician meets with a TB patient to discuss the treatment progress.

Detecting TB among HIV patients is essential to reducing illness and death. In 2005, Kenya implemented HIV testing for all TB patients. By 2013, HIV testing had been scaled up to reach over 95% of all TB patients who are in care. Then in 2009, with PEPFAR support, the country began intensified TB case finding among people living with HIV. They used symptom-based screening and, by 2014, over 90% of HIV patients were screened for TB on their last clinical visit.

When a person with HIV has TB, getting treatment for HIV can significantly improve health outcomes. In 2014, Kenya implemented the World Health Organization's revised ART guidelines, which included the recommendation to immediately begin ART for people living with HIV who are diagnosed with TB.

In addition to policy change, CDC and other U.S. agencies implementing PEPFAR assisted Kenya with improving TB/HIV coordination and oversight, increasing health provider training on TB care and treatment, and ensuring that the country prioritized acquiring drugs and supplies that are necessary to prevent and treat TB.

Changing the way TB and HIV programs were implemented improved the ability of clinics to support TB/HIV patients. More than 75% of PEPFAR-supported clinics have fully integrated their TB and HIV services.

By 2014, nearly 2,000 clinic sites that provided ART also provided TB treatment.

Still, more work needs to be done. In 2013, there were nearly 90,000 cases of TB disease reported in Kenya, of which nearly 32,000 cases were estimated to be patients co-infected with HIV. While this presents a considerable challenge, the policy and program changes that Kenya has implemented and the addition of new tools like isoniazid preventive therapy will go a long way in addressing TB/HIV coinfection and helping people living with HIV remain healthy and live longer.

Western Kenya Accomplishments



Western Kenya programs are implemented in close collaboration with KEMRI. This collaboration of more than 30 years has developed into a sophisticated and comprehensive platform for scientific study and service delivery. Malaria Research and the PMI focus on prevention and monitoring as well as evaluation of interventions such as vaccines, drugs, and insecticide-treated bednets. HIV research evaluates new tools to prevent the spread of the epidemic and to improve the health of persons infected with HIV. TB research measures the burden of TB and helps develop new ways to prevent and treat the disease.

Through KEMRI, CDC supports the Health and Demographic Surveillance System, which allows scientists to monitor the health and demographic information for over 225,000 people. Surveillance data are used to inform policy and plan public health interventions. In addition, CDC supports research on neglected tropical diseases. DGHA has staff located in Kisumu to provide technical support and management of its program activities in Western Kenya. In addition to KEMRI, CDC Kenya's DGHA works through additional implementing partners in the Western Kenya region.

HIV Research Program

Designation as a Clinical Trials Site

In 2014 CDC worked collaboratively with KEMRI to develop capacity in becoming a clinical trials unit (CTU). In July 2014 KEMRI's Kisumu field station was approved as a new research and laboratory site in the AIDS Clinical Trials Group (ACTG) worldwide network that is sponsored by the NIH.

Participation in Multisite HIV Studies

The CDC Kenya and KEMRI HIV Research Laboratory is the only site in East Africa and the only CDC-affiliated site participating in the HIV Prevention Trials Network (HPTN) 052 clinical trial, an ongoing multicountry NIH-sponsored randomized clinical trial.

The CDC Kenya and KEMRI HIV research site was selected by NIH as the only East African site to implement protocol HPTN 075, which is a study assessing the "Feasibility of HIV prevention cohort studies among men who have sex with men in sub-Saharan Africa", which is sponsored by the NIH Division of AIDS.



Staff at work at the National HIV Reference Laboratory in Kisumu.

New Clinical Trial to Assess Effects of Contraceptive

CDC Kenya, in collaboration with KEMRI, began enrolling women into a new clinical trial assessing the acceptability, adherence, and biologic effects of an intravaginal hormonal contraceptive ring (NuvaRing®). This study will support assessment of the hypothetical use of a prototype combination antiretroviral-contraceptive intravaginal ring.

Initiation of a Study to Increase Virologic Control of HIV

The NIH-funded KEMRI and CDC clinical research site has completed all preparatory steps and plans to begin enrollment for study ACTG A528, which will test the use of novel agents and contemporary management tools to achieve a $\geq 65\%$ rate of virologic control of HIV at 48 weeks of follow-up among persons living with HIV. This includes standard genotyping to select an appropriate third-line HIV regimen, interventions to improve adherence to HIV treatment, and plasma viral load monitoring.

Malaria Research Program and the President's Malaria Initiative

Intermittent Mass Screen and Treat Study

CDC Kenya's Malaria Research Program began the second year of a large, randomized community-based intermittent mass screen and treat study encompassing a catchment area of 90,000 individuals. The study is designed to evaluate whether three intermittent rounds per year of screening with a malaria rapid diagnostic tests and treatment with an appropriate antimalarial for those who test positive could further reduce the burden of malaria in Siaya County—an area known as one of the most biologically complex for malaria transmission in sub-Saharan Africa and the source of malaria transmission to the rest of western Kenya and urban slums in Nairobi. Over 27,000 people have been included in the intervention arm of the study, which is delivered by community health workers.

Entomological and Insecticide Resistance Monitoring to assess Indoor Residual Spray Program Effectiveness

CDC Kenya's Malaria Research Program, in collaboration with PMI, conducted insecticide-resistance monitoring in 15 sites in Indoor Residual Spray (IRS) program counties and 10 sites in non-IRS counties as part of the national malaria control program's (NMCP) vector control plan. In addition, the program conducted entomological monitoring in 16 sites and residual-insecticide monitoring in IRS counties.

Support of an Insecticide-Resistance Project in Siaya, Kisumu and Homa Bay Counties

In 2014, CDC Kenya's Malaria research program together with PMI, the Innovative Vector Control Consortium, Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) and Malaria Control and Elimination Partnership in Africa (PATH-MACEPA), collaborated on the Next Generation Indoor Residual Spray partnership (NgenIRS), for expanding and accelerating uptake of novel, long-lasting insecticides for IRS in counties with pyrethroid resistance.

Epidemiologic Surveillance in IRS Districts to Determine Malaria Burden

Together with partners in the Western Kenya Malaria Elimination Consortium, CDC Kenya's Malaria Research Program began strengthening surveillance platforms in Siaya County through numerous activities, including mapping of three of Siaya's six sub-counties (Rarieda, Siaya, and Gem) and facilitating rapid reporting of facility-level malaria-specific information to the national Health Management Information System via Android-platform mobile phones at all health facilities in the three sub-counties.

A baseline survey for a continuous malaria indicator survey (cMIS) at the household level was also completed in late 2014. The cMIS will be conducted in the catchment areas of 23 health facilities in the three sub-counties of Siaya every working day of the year to collect



A patient undergoes malaria testing.

and extract data from the newly printed health registers for Siaya County.

Participation in Kenya National Malaria Forum

Over 250 participants attended the 2-day 2014 Kenya National Malaria Forum held in Nairobi, Kenya, on October 13–14, 2014. The theme was “Malaria Control in Devolved Kenya: Sustaining Gains towards Pre-elimination.” The workshop was hosted by the National Malaria Control Unit with support of partners, including PMI. Five KEMRI staff and a FELTP program resident were selected to give eight presentations during scientific sessions.

real-time information on intervention coverage and use including data on insecticide-treated nets, integrated community case management, intermittent preventive treatment in pregnancy, and indoor residual spraying. Information is also collected on anemia and malaria infection prevalence detected by RDT, PCR, and malaria serology.

By the end of 2014, preparations were completed for the implementation of an enhanced routine surveillance system in the three sub-counties, which will allow for more granular data of the same health-facility indicators but at the village (and in the future at the household level) and to capture anonymous individual patient-level ‘case-based’ data instead of aggregated data. This was accomplished through redesigning all health registers (i.e., those for community health workers at village level, children over 5 years of age, children under 5 years of age, and antenatal care clinic) using HP-Teleform software to automatically capture, classify,

Successful Securing of New Cutting-edge Research Grants

The CDC Kenya Malaria Research Program and KEMRI were successful in securing three new cutting-edge research grants: Spatial Repellent Products for Control of Vector Borne Diseases - Malaria (funded by the University of Notre Dame through a grant from the Bill and Melinda Gates Foundation); Malaria Chemoprevention with monthly treatment with dihydroartemisinin-piperaquine for the post-discharge management of severe anaemia in children aged less than 5 years in Uganda and Kenya; a 3-year, multi-centre, parallel-group, two-arm randomised placebo controlled superiority trial (funded by The Research Council of Norway, Global Health and Vaccination Research (GLOBVAC)); and Efficacy and safety of high-dose ivermectin in reducing malaria transmission (funded by the Malaria Elimination Scientific Alliance through the BMGF). All three studies are expected to begin in the second quarter of 2015.

Neglected Tropical Diseases

Ongoing Studies aimed at Identifying Most Cost-Effective Approach to Reduce Schistosomiasis

2014 marked the 20th anniversary of work on neglected tropical diseases (NTDs) in Western Kenya, primarily with respect to schistosomiasis and soil transmitted helminths (STHs). In 2014, work continued on two large schistosomiasis Consortium for Operational Research and Evaluation (SCORE) projects designed to identify the most cost-effective approach for mass drug administration of praziquantel to reduce prevalence and intensity of *Schistosoma mansoni* infections in areas with either a moderate (10-24%) or high ($\geq 25\%$) initial prevalence in school age children. These studies provide treatment for schistosomiasis in villages within 10km of Lake Victoria from Bondo to Homa Bay. Final results will be collected in 2015 and will, in combination with results from SCORE projects in other African countries, have immediate impact on treatment recommendations.

Significant Reduction of Schistosomiasis Following Community Based Treatment

Recent recognition of the prevalence and health impact of schistosomiasis in young children has led to a parallel study in the Mbita area focusing on pre-school age children. Two rounds of community based treatment with praziquantel has led to a significant reduction in incidence of schistosomiasis in 1 to 2 year olds, suggesting the intervention has effectively reduced the force of transmission in this area. This project has also employed new multiplex technology, which has been transferred to Kenya and is capable of simultaneously detecting antibodies to NTDs, malaria, bacterial and viral pathogens, as well as monitor vaccine coverage from as little as 10 microliters of blood stored as a dried blood spot.

Other projects focus on development and testing of better diagnostic tools for schistosomiasis, including evaluating the accuracy and best utilization of a commercially available point-of-contact test for *S. mansoni* as well as development of a pre- and post-treatment serum bank for both *S. mansoni* and *S. haematobium*.

Tuberculosis Research Program

NIH Designates Kenya Site as an Emory-CDC Clinical Trials Unit

NIH selected the Emory-CDC HIV/AIDS Clinical Trials Unit as one of 37 CTUs responsible for implementing the scientific agenda of the NIH international HIV/AIDS clinical research network. The NIH CTU effort is directed and funded by the National Institute of Allergy and Infectious Diseases at NIH. The seven-year designation, with expected core funding of more than \$12.5 million and significant additional protocol-specific funding, includes Emory and CDC, with two clinical research sites in Atlanta and one each in Kenya and Thailand. In August 2014 the NIH-funded KEMRI/CDC Clinical Research site completed all preparatory steps and began enrollment in their first ACTG study, ACTG 5279. This study will test a very short treatment of latent TB infection in people with HIV.



U.S. Ambassador to Kenya Robert F. Godec visits a child who was part of the pediatric TB diagnosis study at the Jaramogi Oginga Odinga Teaching and Referral Hospital.

Field Station Selected as a Global TB Research Unit

In July 2014 the Kisumu field station was selected as part of a broader collaboration as one of four TB research units globally and as the only site in Africa. This is a seven-year activity funded by NIH and will focus on the immunology of latent TB infection activating to TB disease. In addition to CDC and KEMRI, the collaboration includes Emory University, New York University, Tulane, and Aeras. Enrollment into the study began in November 2014.

KEMRI and CDC Laboratory Attains International ISO Accreditation

In early 2014, the KEMRI and CDC TB Research Laboratory was awarded ISO accreditation. It is the only ISO accredited laboratory in Kenya handling TB procedures. The accreditation is a mark of achievement and recognition that the laboratory follows

internationally accepted standards in its procedures and thereby instills confidence in the laboratory tests and reports it produces.

TB Program Considered One of the Best Performing in Africa

CDC Kenya provides technical assistance to the Kenya National Tuberculosis and Leprosy Program and in 2014 participated in a large external review of the program. An international review of the Kenya National Tuberculosis and Leprosy Program found that the program is one of the strongest and best performing in Africa. Since 2009 there has been a decline in the TB epidemic by 4% annually, and an even more significant decline among HIV-infected TB patients. This is likely a result of improved TB control efforts and increased ART coverage in the country. However, TB incidence remains high and a leading cause of death in Kenya, which means that further efforts are needed to accelerate its decline.

Key Visits

Deputy Secretary of State Heather Higginbottom Visits HIV Care and Treatment Site



Dr. Jared Mecha (L) of University of Nairobi, discusses maternal and child health data with U.S. Deputy Secretary Higginbottom while CDC's Dr. Abraham Katana looks on.

On June 18, 2014 U.S. Deputy Secretary of State for Management and Resources Heather Higginbottom visited the Karuri Sub-County Hospital, Kiambu County, a CDC Kenya PEPFAR-funded site for HIV care and treatment and PMTCT activities.

Ambassador Godec Visit to Kakuma Refugee Camp

U.S. Ambassador Robert F. Godec visited Kakuma refugee camp from June 19-20, 2014 for the observance of World Refugee Day 2014. While in Kakuma the Ambassador visited CDC-supported activities including the newly renovated IRC laboratory where he participated in a ribbon cutting ceremony; the IOM screening facility which provides cost-effective public health interventions, improves refugee health, and limits the number of vaccinations refugees will need after they arrive in the United States. The Ambassador also visited the Norwegian Refugee Council's Sanivation site where the project team has identified a strong demand for improved household toilets that are paired with a regular



U.S. Ambassador to Kenya Robert F. Godec and Turkana County Health Minister Hon. Jane Agele shake hands after officially opening the newly renovated International Rescue Committee laboratory.

collection service to prevent latrines from being filled and to keep toilets hygienic.

Ambassador to the Office of the U.S. Global AIDS Coordinator and Health Diplomacy Coordinator Visits Kenya and CDC Partner



Representatives from PEPFAR, CDC Kenya USAID Kenya, the U.S. Military HIV Research Program, the University of Washington and Coptic Hospital pose for a photo with Ambassador Bix at the end of her tour of Coptic Hospital.

The U.S. Global AIDS Coordinator, Ambassador Deborah Bix, visited PEPFAR programs in Kenya from October 1-3, 2014, which included a meeting with long-time CDC partner Coptic Hospital and a tour of its facilities. She was accompanied by PEPFAR's Principal Deputy Coordinator, Sandy Thurman, and PEPFAR's Chief Medical Officer, Dr. Doug Shaffer. Ambassador Bix also had meetings with the Government of Kenya and U.S. Ambassador to Kenya, Robert F. Godec, and participated in a town hall with the PEPFAR Interagency team.

Congressional Staff Ebola Preparedness



Congressional Staff Member Paul Grove tours the temporary isolation unit set up as part of Kenya's Ebola preparedness at Kenyatta National Hospital in Nairobi.

Congressional staffer Paul Grove visited Kenya from October 29-30, 2014 and met with Kenya's MOH officials including the Cabinet Secretary, James Macharia, to discuss Kenya's Ebola preparedness. Mr. Grove toured the isolation unit set up at Kenyatta National Hospital as part of Kenya's Ebola preparedness. Mr. Grove also

toured the almost-completed reference laboratory where he received an overview of the testing capabilities in HIV and potentially other viruses, how USG training of Kenyan staff has saved GOK at least \$50,000 per visit

for the certification of biosafety cabinets, and how completion of the laboratory will provide space for a cancer laboratory for GOK.

CDC Kenya Publications

DGHP Publications 2014

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