U.S. CDC RWANDA

U.S. CENTERS FOR DISEASE CONTROL AND PREVENTION - RWANDA

2024

Annual Report


HIV EARLY
DETECT SET

CONTENTS

ACRONYMS

AFENET: Africa Field Epidemiology Network

AIDS: Acquired immunodeficiency syndrome

ARV: Antiretroviral

ART: Antiretroviral Treatment

CAB-LA: Cabotegravir Long-Acting

CBS: Case Based Surveillance

CDC: U.S. Centers for Disease Control and Prevention

CFHR: Center for Family Health Research

CoAg: Cooperative Agreement

DGHT:Division of Global HIV and TB

EMR: Electronic Medical Record

EOC: Emergency Operations Center

FETP: Field Epidemiology Training Program

FY: Financial Year

GHC: Global Health Center

GHS: Global Health Security

GHSA: Global Health Security Agenda

HCW: Health Care Workers

HIE: Health Information Exchange

HIV: Human Immunodeficiency Virus

HTS: HIV Testing Services

IBBS: Integrated Bio-Behavioral Survey

ICAP: The International Center for AIDS Care and Treatment Programs at Columbia University

IMS: Incident Management System

LIS: Laboratory Information System

MoH: Ministry of Health

MVD: Marburg Virus Disease

NRL: National Reference Laboratory

PEP: Post-Exposure Prophylaxis

PEPFAR: U.S. President's Emergency Plan for AIDS Relief

PLHIV: People Living with HIV

PMI: President's Malaria Initiative

PMTCT: Prevention of Mother-to-Child HIV transmission

PrEP: Pre-Exposure Prophylaxis

PSE: Population Size Estimation

PT: Proficiency Testing

RBC: Rwanda Biomedical Center

RHIE: Rwandan Health Information Exchange

SFH: Society for Family Health

SNS: Social Networking Strategy

STI: Sexually Transmitted Infections

TAT: Turnaround Time

TB: Tuberculosis

THN: Travel Health Notice

TPT: TB Preventive Therapy

U.S. : United States

VLSTS: Viral load sample tracking system

U.S. CDC IN RWANDA

CDC Rwanda was established in 2002 with support from the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) and the CDC Global AIDS Program (GAP), now referred to as the Division of Global HIV/AIDS & TB (DGHT). Since then, CDC has supported the Rwanda Ministry of Health in comprehensive activities to combat HIV in Rwanda, strengthen public health systems and ensure global health security.

In 2006, the President's Malaria Initiative (PMI) was added to the portfolio through CDC's co-implementation of the program with the former U.S. Agency of International Development (USAID). In 2007, CDC began a new program for preparedness and response to avian and pandemic influenza in Rwanda. In 2009, the Field Epidemiology Training Program (FETP) was initiated in Rwanda with an aim to strengthen Rwanda's capacity for timely prevention, detection, and response to public health emergencies. CDC support further expanded to include the Ebola Virus Disease Preparedness Program in 2018, COVID-19 preparedness and response in 2020, and Marburg Virus Disease (MVD) response in 2024.

Currently, CDC Rwanda operates with an organizational structure comprising 39 permanent staff members. This team consists of 33 locally employed staff and 6 U.S. assignees. Key partners involved in implementing CDC Rwanda's mission include Rwanda Biomedical Center (RBC), Center for Family Health Research (CFHR) and the International Center for AIDS Care and Treatment Programs at Columbia University (ICAP).

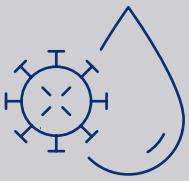
Areas of support to the Government of Rwanda in 2024 include prevention of mother-to-child HIV transmission (PMTCT), HIV testing services (HTS), antiretroviral treatment (ART) and adherence, TB/HIV integration, laboratory systems strengthening, health workforce capacity building, health informatics, and surveillance. As part of the global health security, CDC Rwanda also supported the government response to disease outbreaks such as MVD and monkeypox, and the establishment of provincial public health emergency operations centers which serve as command and coordination hubs to monitor and manage response to public health threat on a daily basis.

Goals & Objectives

SUPPORT RWANDA TO MAINTAIN HIV EPIDEMIC CONTROL AND IMPLEMENT QUALITY INTEGRATED CARE SOLUTIONS FOR PEOPLE LIVING WITH HIV (PLHIV)

1

Strengthen in care health systems and workforce to better deliver and sustain quality services for PLHIV



SUPPORT RWANDA TO INDEPENDENTLY SUSTAIN QUALITY HIV/TB PROGRAMS IN THE LONG TERM

2

Increase the capacity of the health system to deliver quality services and reduce morbidity/mortality

STRENGTHEN THE CAPACITY OF RWANDA'S PUBLIC HEALTH INSTITUTIONS, SYSTEMS, AND HEALTHCARE WORKFORCE TO TIMELY PREVENT, DETECT, AND RESPOND TO PUBLIC HEALTH THREATS

3

Build institutional capacity to prevent, detect, and respond to public health threats promptly.

Foreword

I am pleased to present the 2024 annual report, showcasing the U.S. CDC's substantial contributions to fostering healthier, safer, and longer lives for the people of Rwanda. The year 2024 was marked by significant achievements in Rwanda's fight against HIV and the strengthening of the health sector's capacity to respond to, mitigate, and prevent disease outbreaks. We take great pride in our collaboration with the Rwandan government as well as our implementing partners.

Thanks to PEPFAR funding, our interventions in Rwanda focused on provision of clinical treatment to people living with HIV, prevention of new HIV infections focusing on the most exposed or vulnerable individuals, and specifically mother- to-child HIV transmission. Through these focused interventions, we strive to create a sustainable impact on Rwanda's fight against HIV/AIDS while enhancing overall community health. We also prioritized support to strengthening surveillance and lab systems to ensure that accurate and timely data guide decision making. The Field Epidemiology Training Program (FETP) has trained more disease detectives, enhancing Rwanda's ability to respond swiftly and effectively to emerging health threats. By the end of the year, we had a total of 435 graduates, and we expect that more will be trained during the upcoming year.

2024 was full of wonderful achievements but also had some challenging situations. The Marburg Virus Disease (MVD) outbreak infected 66 people and claimed the lives of 15. From the first day of the outbreak, the CDC assisted the Ministry of Health (MOH) with its investigation and response. CDC staff applied their response experience from previous Marburg outbreaks and similar diseases in other countries to help strengthen surveillance and improve infection prevention and control. Efforts made by the Rwandan government in addressing this outbreak, and the level of openness to collaboration and partnership in fighting the disease were commendable.

This report sheds a light on achievements that could not have been realized without the contribution of our implementing partners through our cooperative agreements (CoAgs). I want to acknowledge the tremendous work done by our funded partners including the MoH, Rwanda Biomedical Center (RBC) and Society for Family Health (SFH). Specifically, for the last 5 years, SFH implemented activities targeting people at higher risk for HIV, but since October, these activities are being implemented by our new partner, the Center for Family Health Research (CFHR). I would like to reiterate my heartfelt gratitude to the staff of SFH for their dedicated and excellent work over the past five years, producing remarkable results. Moreover, our clinical services CoAg, previously managed by the MOH, was transitioned to the RBC. We remain grateful for the tremendous work done by the MoH and their continued collaboration.

I would like to take a moment to express my heartfelt appreciation for our esteemed colleagues who have taken on new roles within CDC and beyond in 2024. They include our former Deputy Country Director, Commander Alberta Mirambeau, PhD, MPH, who is now serving at CDC Côte d'Ivoire; Canisious Musoni, MD, MSc, who previously led the care and treatment team and is currently working with CDC Malawi; and Elysee Tuyishime, PhD, MSc, who is now in Atlanta as a Public Health Informatics Fellow. Additionally, we recognize Olivier Ndahiriwe, MSc, our former Laboratory Assistant; Placidie Mugwaneza, MD, the former Prevention Team Lead; and Wassila Niwemahoro, MBA, our former Budget and Finance Specialist—all of whom are pursuing new opportunities outside of CDC. Their contributions have been invaluable, and we wish them all the best in their future endeavors.

We remain committed in our partnership with the Government of Rwanda in the fight against HIV and other public health threats. As the saying goes, "a disease threat somewhere is a disease threat everywhere". As we join hands in ensuring a healthier life in Rwanda, we also contribute to a safer, stronger and more prosperous America.

Thierry Roels, MD, MSc
Country Director
U.S. CDC Rwanda

Making America Safer, Stronger and More Prosperous

SAFER

Interventions of the U.S. Centers for Disease Control and Prevention (CDC) in Rwanda strengthen U.S. global health security programs prioritizing prevention of infectious diseases before they reach American soil. Through PEPFAR funding, CDC facilitates the delivery of HIV prevention and treatment services, aiming to reduce new infections and prevent the emergence of drug-resistant strains in Rwanda. Furthermore, CDC support enhances national laboratory capabilities for early disease detection and bolsters outbreak preparedness and response through the FETP, which trains Rwanda's public health workforce. These efforts not only safeguard American lives but also contribute to the development of a sustainable health system in Rwanda, benefiting both Rwandans and U.S. citizens.

STRONGER

CDC Rwanda's lifesaving programs have significantly improved health outcomes in the country, fostering strong diplomatic ties and goodwill toward the U.S. This, in turn, enhances America's global influence. By providing targeted funding and technical support, CDC Rwanda bolsters impactful health initiatives and collaborative partnerships, positioning the U.S. as a leader in addressing global health challenges. These efforts contribute to a more resilient international community that aligns with American interests and values.

MORE PROSPEROUS

CDC's partnership with Rwanda's Ministry of Health has led to a healthier, more productive and stable Rwandan population, which in turn benefits the U.S. economy through increased purchasing of American goods and services. Additionally, supported laboratory development programs foster international collaboration that contributes to American prosperity. By preventing and addressing health crises before they reach the American soil, CDC Rwanda does not only save American lives but also maximize the return on investment for U.S. health programs.

OUR PARTNERSHIP IMPACT IN RWANDA

210
sites supported providing HIV treatment services

90
sites supported to provide HIV prevention services

410,806
people tested for HIV

130,238
people provided with antiretrovial HIV treatment

73%
of all viral load testing hubs supported

2,025
health care providers trained through E-Learning

$4.36
Million fund to support MVD response

8,775
doses of a new long acting PrEP (CAB LA) introduced in Rwanda

435
disease detectives trained under the FETP program

RWANDA'S PROGRESS TOWARDS ACHIEVING UNAIDS 95-95-95 GOALS BY 2024

94% of PLHIV know their HIV+ status

99% of PLHIV are on ART

97% of PLHIV are virally suppressed

Source: EPP-Spectrum May 2023

U.S. CDC RWANDA'S KEY CONTRIBUTIONS OVER 5 YEARS

Indicator (at CDC supported sites)	2020	2021	2022	2023	2024
# of people tested for HIV	74,594	275,379	357,923	345,364	410,806
# of pregnant women who know their HIV status	N/A[1]	113,865	114,551	106,515	108,220
# of people at higher risk for HIV benefiting from prevention services	31,062	41,114	41,284	36,559	39,614
# of people receiving HIV preventive treatment (PrEP)	2,769	13,928	10,822	18,151	18,898
# of PLHIV receiving HIV treatment at CDC supported sites	118,701	122,383	124,694	127,580	130,238
# of HIV positive pregnant women initiated on treatment to prevent HIV transmission to babies	2,732	2,816	2,517	2,120	2,129
% PLHIV receiving treatment at CDC supported sites who suppressed their HIV viral load	96%	96%	98%	98%	98%

[1] *PEPFAR support to PMTCT was paused in 2020 and resumed in 2021 to sustain efforts to prevent mother-to-child transmission of HIV.*

CDC RWANDA PROGRAMS

GLOBAL HEALTH SECURITY

Since 2002, the U.S. Centers for Disease Control and Prevention (CDC) has supported the Rwandan Ministry of Health (MOH) to strengthen its capacity to prevent and detect diseases and respond to public health threats. CDC has been a key partner in activities that include strategic planning, national outbreak preparedness, establishment of national and provincial Emergency Operations Centers (EOCs), and emergency management training.

HIV & TB PROGRAMS

Together, we address HIV and tuberculosis (TB) by enhancing workforce capacity, improving case finding and treatment, and strengthening laboratory infrastructure, surveillance and health information systems.

Preventing New HIV Infections

CDC provides MOH with financial support and technical assistance in the prevention of mother-to-child HIV transmission (PMTCT), pre- and post-exposure prophylaxis (PrEP and PEP), comprehensive HIV services, and targeted HIV case finding and linkage across the continuum of HIV services.

Using the Power of Social Networks to Increase HIV Testing

Social Network Testing Strategy known as SNS, is a recruitment strategy used to reach and provide HIV counseling, testing and referral services (HTS) to individuals who are unaware of their HIV status. The model uses social network connections to locate individuals at the highest risk for HIV and may not be willing to seek routine HIV Testing services at health facilities. SNS can be particularly useful in finding most at risk populations.

SNS assumes that people in the same social network share similar risky behaviors exposing them to HIV infections. Therefore, it consists of enlisting HIV high-risk people to recruit individuals from their social or sexual networks for HIV testing services. Once tested, they become recruiters and refer other members of their networks for testing. This process continues, creating chains of recruitment that can penetrate hidden networks.

At the outset of the model's implementation in 2023, the SNS was utilized in just 10 sites. However, by 2024, the model had expanded to 90 PEPFAR/ CDC-supported sites in Rwanda.

Routine program data from March 2023 to June 2024 indicate that a total of 12,046 coupons were distributed, resulting in 7,557 recruited participants who visited their respective health facilities and got tested. Among the tests conducted, 288 new HIV cases were identified, averaging a yield of 3.9%. All participants who were diagnosed with HIV immediately began treatment.

Compared to other HIV testing modalities, SNS has the third highest testing yield following community mobile and index testing. Particularly, when it comes to identifying HIV infections among men, the model has even a higher yield.

How the Model Works

SNS consists of several phases starting with recruiters' identification and instruction, followed by recruitment of network members, testing them and inviting them to become recruiters themselves. The final phase involves tracking to record and report on outcomes.

Recruiter Identification & Coaching: The first step involves identifying "seeds," or individuals who are either HIV positive or at high risk of contracting HIV, and who are open to referring members of their network for HTS. Seeds can be identified during HTS at health facilities or among community peers who possess traits that enable them to effectively recruit members of their social networks. Following their engagement, recruiters are trained on how SNS works, their role as recruiters, and how to discuss HIV testing and counseling with their peers.

Recruitment Process: Recruiters connect with their peers by sharing their HIV status and encouraging them to get tested. They are provided with SNS cards which facilitate the connection between network members and recruiters. These cards include important details such as the testing date, recruiter ID, and initials of the health facility and healthcare provider. The number of SNS cards distributed are based on the reported number of social or sexual contacts that the recruiters identify within their network. Every network member is required to present the card to the HTS provider when she/he goes for testing.

HIV Testing: Recruiters present various options for testing to members of their social networks. When a social network member tests HIV negative, the HTS provider offers prevention services in accordance with the designated comprehensive package of HIV prevention services. Conversely, when a social network member is diagnosed as HIV positive, the HTS provider ensures that she/ he is connected to appropriate HIV care and treatment. Additionally, the HTS provider encourages individuals who are HIV positive or at high risk the opportunity to recruit their social and sexual network members for HTS.

For proper documentation and tracking, data are collected through SNS registers and coupon tracking tools. This helps to track participation but also reinforce accountability within the process.

Through this structured approach, the SNS process complement current multiple case finding strategies and promotes healthier communities by leveraging personal networks for support and education.

Moonlight Testing and Counseling

Innovative approaches always yield greater impacts. Moonlight testing was designed as a strategy to reach people at a higher risk for HIV, with an aim to make HIV testing and counseling more accessible and convenient.

Moonlighting involves setting up a temporary site during evening and night hours to offer HIV testing and counseling services. Individuals are encouraged to visit the site for a focused conversation, where they receive appropriate counseling on reducing their risk of HIV. They are also offered a rapid test which takes approximately 30 minutes to determine their HIV status. The site is conveniently located near their neighborhood or in "hot spots" (areas known to be frequented by individuals who are at a higher risk of transmitting or contracting HIV).

Moonlight testing is specifically designed to cater to individuals who often struggle to find time for HIV testing and counseling during regular business hours at health facilities.

Health facilities collaborate with peer educators to reach out to the targeted populations and encourage them to participate in the services. The process includes engaging in targeted conversations with attending individuals and providing them with appropriate counseling on HIV risk reduction and prevention.

Pre-Exposure Prophylaxis (PrEP)

A total of 9,909 individuals were initiated on pre-exposure prophylaxis (PrEP) in 2024. This activity specifically targets people who are at heightened risk for HIV infection. Additionally, serodiscordant couples—where one partner is living with HIV and the other is not—are a significant focus of this program. Another critical group targeted in this initiative includes high-risk adolescent girls and young women, who may face unique vulnerabilities such as exposure to sexual violence.

Long-Acting Cabotegravir (CAB-LA) – A New HIV Preventive Therapy

CAB-LA is an intramuscular injectable form of Pre-Exposure Prophylaxis (PrEP), that provides extended protection against HIV transmission. It involves two initial injections, administered four weeks apart, followed by subsequent injections every eight weeks.

Randomized trials have demonstrated that CAB-LA is a more effective PrEP option compared to daily oral versions. Clinical trials showed that CAB-LA reduced the risk of HIV by approximately 66% and 88% more than the usual oral PrEP pills. In 2023, PEPFAR began assisting countries in integrating CAB-LA into their HIV prevention programs. In December 2024, Rwanda received a supply of 8,775 doses. This falls short of meeting the significant demand, particularly among the most at risk populations who require access to this critical intervention.

Initial implementation of CAB-LA focused on people at a higher risk for HIV already eligible for oral PrEP including among others, women who engage in commercial sex, at-risk adolescent girls and young women, HIV negative partners in serodiscordant couples, and sexual partners of index cases.

With CDC Rwanda's technical support, the Rwanda Biomedical Centre (RBC) leads implementation and works closely with the Center for Family Health Research (CFHR) and health facilities.

HIV Care and Treatment

CDC provides direct support and technical assistance to build expertise for HIV and TB clinical services. This support aims to deliver comprehensive, integrated HIV prevention and treatment, including TB Preventive Treatment and a six-month dispensation of optimized antiretroviral therapy for both adults and children at all 197 care and treatment sites in Rwanda. CDC supports the integration of HIV within the health system as well as for managing advanced HIV disease among people living with HIV.

Healthy Generations: Breaking the HIV Transmission Chain

Through PEPFAR funding, CDC Rwanda supports initiatives and services to prevent mother to child HIV transmission (PMTCT). This support has empowered the Rwandan government to expand PMTCT services across all public health facilities and reduce the rate of HIV infections among newborns.

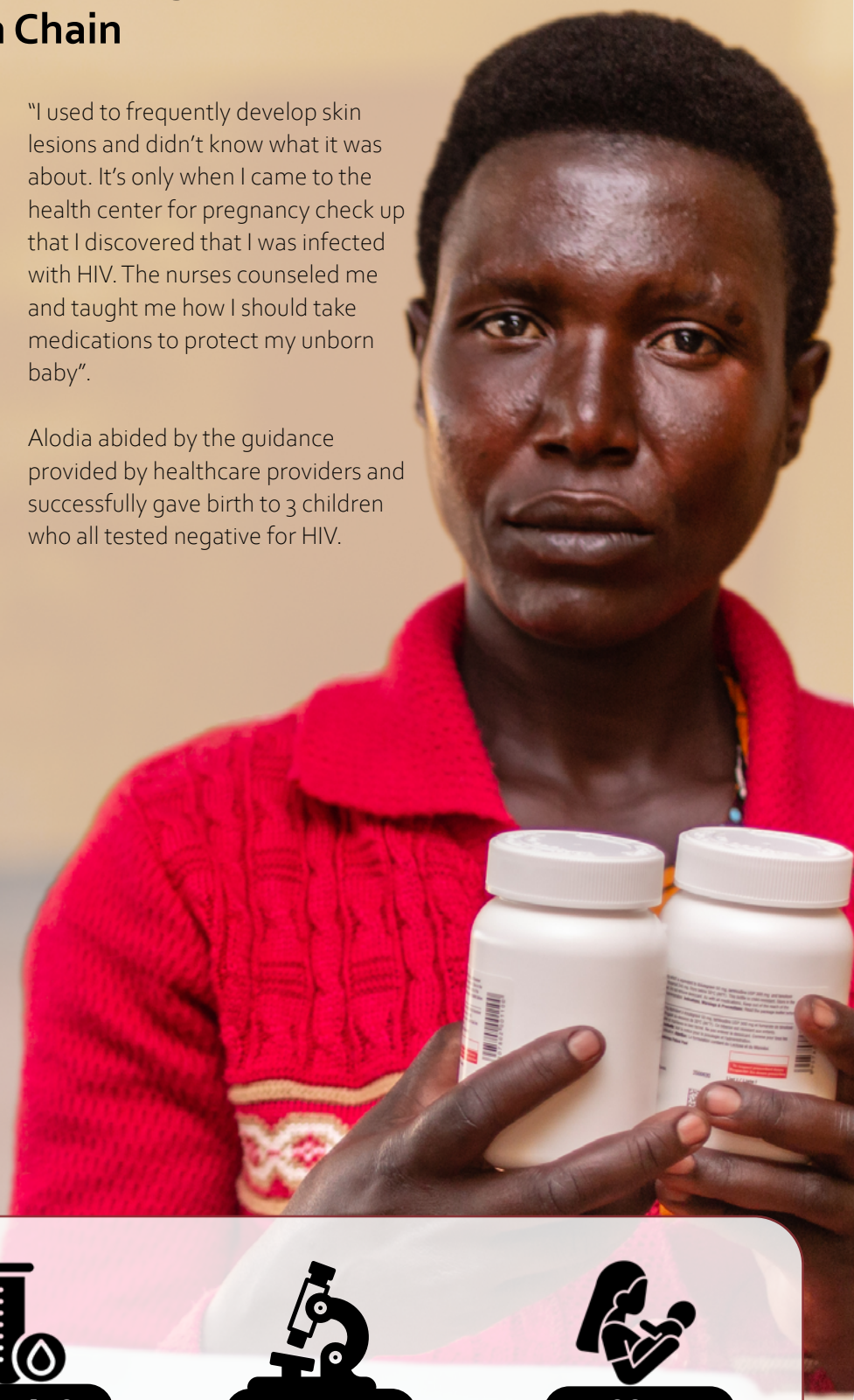
The PMTCT program offers a comprehensive range of services, including counseling and testing for pregnant and breastfeeding women, antiretroviral (ARV) treatment to avert mother-to-child transmission, and guidance on safe infant feeding practices.

According to the Ministry of Health's National HIV Report for 2023, the estimated HIV prevalence among women receiving antenatal care was 1.79%. National statistics reveal that in 2024, about 99% of infants exposed to HIV who were tested at 24 months were found to be HIV negative.

Alodia Nyirarukundo, is a mother living with HIV. She only discovered that she had HIV during her pregnancy check-up.

"I used to frequently develop skin lesions and didn't know what it was about. It's only when I came to the health center for pregnancy check up that I discovered that I was infected with HIV. The nurses counseled me and taught me how I should take medications to protect my unborn baby".

Alodia abided by the guidance provided by healthcare providers and successfully gave birth to 3 children who all tested negative for HIV.



4,273

Pregnant & Breastfeeding women on ART enrolled in the program

215,452

Pregnant women tested for HIV

4,440

Babies born from HIV positive mothers tested

99%

of babies born from mothers living with HIV were HIV free

All babies born with HIV were immediately initiated on antiretroviral therapy

Creating a TB-free Future for People Living with HIV

Tuberculosis (TB) remains the top cause of death for people living with HIV in Rwanda, but the country has made great strides in preventing and treating TB. The 2023 Global TB Report shows that the number of TB cases in Rwanda has decreased from 96 per 100,000 people in 2000 to 56 per 100,000 people in 2022.

Through PEPFAR funding, CDC Rwanda, continues to partner with the Government of Rwanda to scale up TB preventive treatment (TPT) to people living with HIV. The partnership mainly focuses on programs related to intensification of TB case finding through screening and diagnosis among people living with HIV, TB preventive treatment and monitoring of treatment outcome.

As a result of this collaboration, TPT services have been scaled up to all HIV care and treatment health facilities nationally. Additionally, CDC Rwanda supports training and mentorship programs for healthcare providers to improve their skills.

To help reduce the burden of TB among people living with HIV who are on antiretroviral therapy (ART), routine screenings for TB are conducted. Those diagnosed with TB receive appropriate treatment, while those without TB are given TPT to lower their risk of developing the disease.

Since launching the TPT program for people living with HIV in Rwanda, there has been a significant drop in co-infection rates of TB and HIV from 18% in 2021 to 14% in 2024.

Moreover, successful treatment rates for TB among people living with HIV have risen from just 58% in 2003 to an impressive 90% in 2024.

99%
of People living with HIV screened for TB

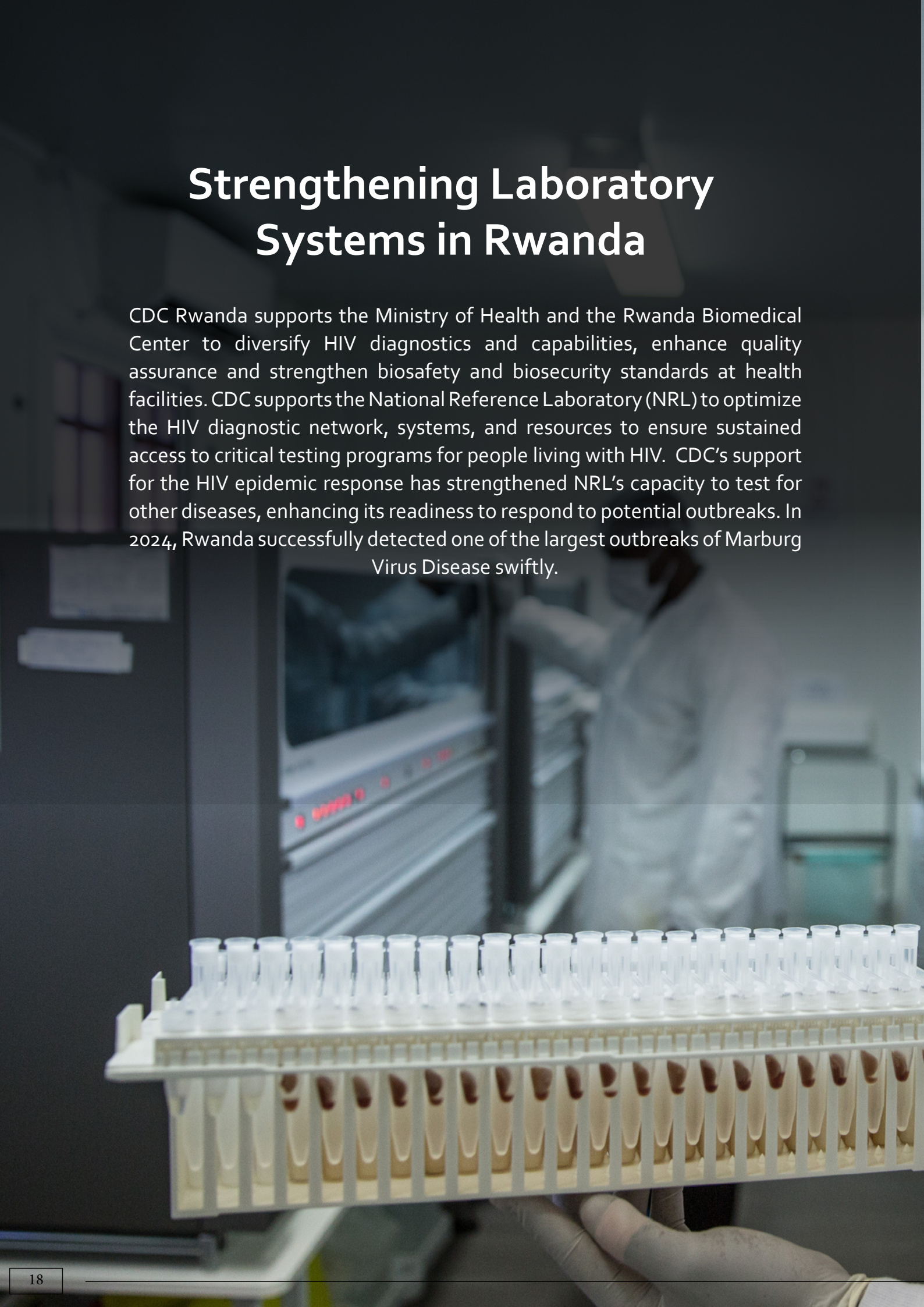
90%
Rwanda's treatment success rate for all forms of TB at CDC supported sites

UNDETECTABLE = UNTRANSMISSIBLE

When people living with HIV remain on treatment as required, their viral load levels in the body can become undetectable, and consequently they cannot transmit HIV to their sexual partners. By supporting provision of antiretroviral therapy (ART), CDC Rwanda has been playing a vital role in preventing transmission of HIV. As of 2024, more than 130,238 individuals living with HIV were on ART in CDC supported sites. One of the most encouraging outcomes of these efforts is highlighted by data showing that the viral load suppression among those on ART at CDC supported sites is an impressive 98%.

Strengthening Laboratory Systems in Rwanda

CDC Rwanda supports the Ministry of Health and the Rwanda Biomedical Center to diversify HIV diagnostics and capabilities, enhance quality assurance and strengthen biosafety and biosecurity standards at health facilities. CDC supports the National Reference Laboratory (NRL) to optimize the HIV diagnostic network, systems, and resources to ensure sustained access to critical testing programs for people living with HIV. CDC's support for the HIV epidemic response has strengthened NRL's capacity to test for other diseases, enhancing its readiness to respond to potential outbreaks. In 2024, Rwanda successfully detected one of the largest outbreaks of Marburg Virus Disease swiftly.



Improving access to specialized testing services

Across the country, CDC Rwanda supports the national specimen referral system. The system allows health facilities with limited testing capability to refer patient samples for specialized testing like HIV viral load, early infant diagnosis (EID), CD_4 count, and tuberculosis (TB) to advanced testing hubs. This arrangement rationalizes testing while ensuring that patients receive all necessarily tests without the burden of traveling to multiple testing facilities. CDC Rwanda's support includes the capacity building of laboratorians, implementation of lab quality assurance programs, provision and maintenance of lab equipment and establishing a reliable specimen referral system for speciliazed testing services.

Enhancing the quality of HIV and related testing services

To achieve HIV epidemic control, there is need to ensure every individual seeking HIV testing receives an accurate result. However, Rwanda, like other countries with limited resources faces enormous challenges to adequately ensure the accuracy of test results. With CDC support, through PEPFAR funding, Rwanda has made significant strides in attaining the 95-95-95 HIV testing, treatment and viral suppression targets set by UNAIDS. To sustain the gains, CDC Rwanda provides technical support to the NRL to acquire sufficient commodities for HIV testing, help laboratorians and other healthcare providers to keep abreast with current HIV related testing protocols, participate in international testing programs, and to implement local proficiency testing (PT) schemes. This enables the NRL to evaluate testing skills among testers including non-laboratorians. Annually, the NRL produces and distributes blinded samples to testers in more than 600 health facilities across the country and evaluates tester performance. Also, the NRL participates in external PT programs for HIV viral load, early infant diagnosis (EID), TB and CD_4.

Digitizing Rwanda laboratory network

Availability of test results is critical in ensuring that patients are rapidly initiated on treatment and their response to treatment is monitored. Through CDC, PEPFAR supports NRL efforts to establish and/or enhance Laboratory Information Systems (LIS) and facilitates a "lab-clinic" interface. With the viral load sample tracking system (VLSTS), clinicians can track the status of samples sent to the lab for testing and retrieve test results. As a result, the turnaround time (TAT) of critical test results like EID is one day and less than seven days for HIV viral load. Moreover, VLSTS supports other test results like CD_4 and EID. This electronic system has significantly shortened the TAT of test results and supported efforts to improve patient care. Other laboratory electronic systems supported by CDC include electronic proficiency testing (ePT) which supports PT program and the "recency app" which supports HIV recency testing used to determine whether an HIV infection is recent or not.

Strengthening Health Information Systems & Surveillance

CDC has been providing technical assistance to MoH in setting up and using electronic health information systems to collect, analyze, and disseminate data for HIV prevention, care & treatment, and reporting purposes. Using the data from multiple digital systems, CDC Rwanda, in collaboration with the MOH, improves decision-making regarding HIV prevention and treatment program performance and individual health outcomes.

The existing HIV case-based surveillance (CBS) system provides patient level data on newly identified individuals with HIV infection and treatment outcomes of PLHIV. In addition, CDC has been supporting Rwanda's MOH to conduct Bio-Behavioral Surveillance Surveys and Population Size Estimation for selected people at higher risk for HIV.

Using Hackathons to Improve HIV Patient Data Records System

Since 2005, CDC Rwanda, with funding from PEPFAR, has been actively supporting the implementation of the electronic medical records (EMR) system in health centers and district hospitals to enhance the documentation of HIV and tuberculosis (TB) patient data. The activity aims to establish a comprehensive and efficient healthcare information system that operates independently of time and location of service delivery.

Rwanda's EMR had been successfully deployed at all 192 health facilities that receive PEPFAR support. While this marks significant progress, we have also identified several gaps during the implementation process that need to be addressed to ensure seamless health information exchanges (HIE) between existing systems.

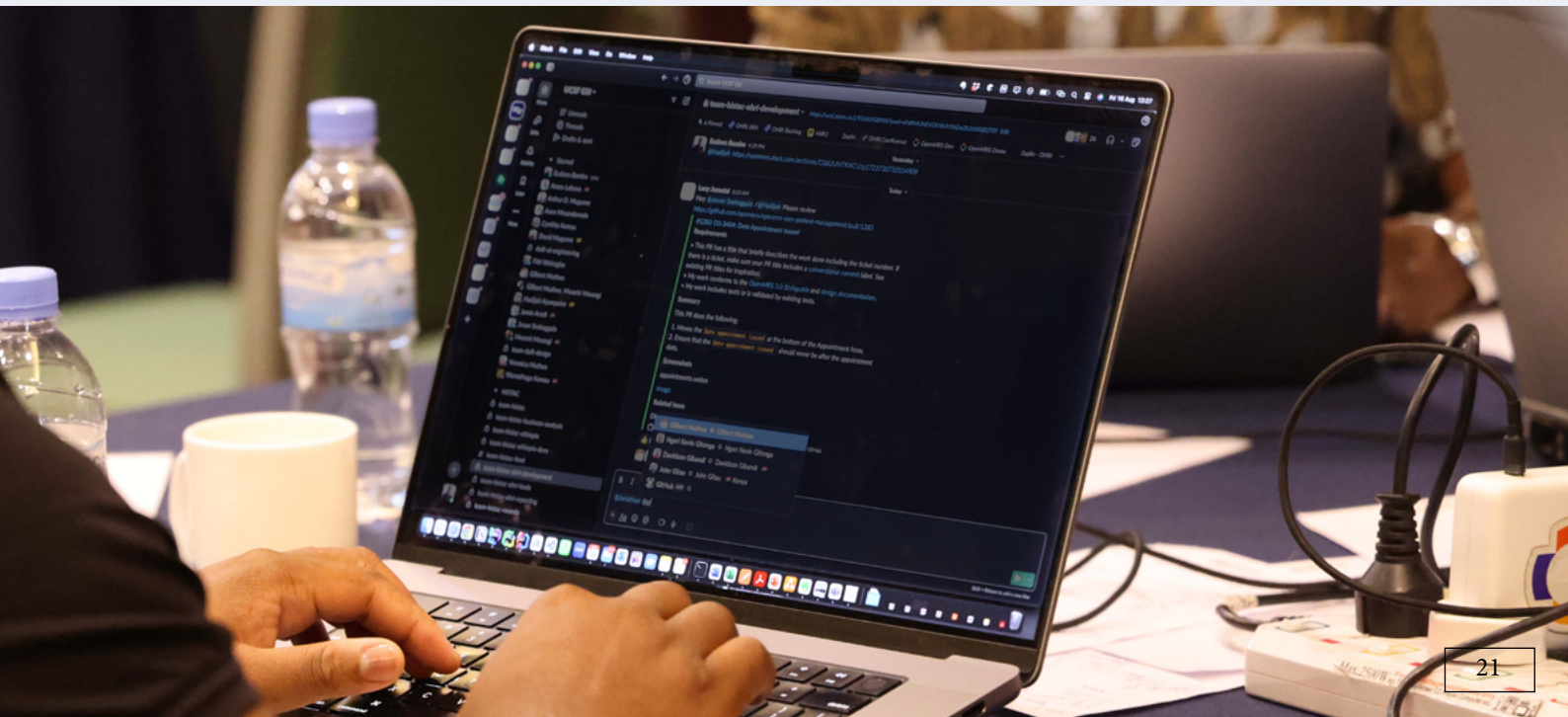
The Rwanda health information exchange (RHIE) platform represents a significant advancement in healthcare technology. Its primary goal is to establish a secure platform for the electronic sharing of patient health records among medical facilities, health information organizations, and healthcare providers, thereby revolutionizing the access, sharing, coordination and use of healthcare data.

PEPFAR, through CDC, has supported the implementation of the OpenMRS EMR at 192 health facilities in Rwanda's five provinces. Of these, the facilities with EMR systems that can exchange data with other systems through the RHIE has now increased to 166 across 30 districts.

To tackle the systems integration challenges, the MoH, with the support from CDC, adopted the use of hackathons. This involves bringing local software developers together with global experts to collaboratively develop solutions to identified issues. The targeted problem(s) are articulated ahead of the hackathon week and tools made available to "hack" the problem and provide a working solution by the end of the week.

The 4th Hackathon took place from August 12th to 16th, 2024. Hackers relentlessly worked on the following tasks:

- Establishing seamless integration that enabled interoperability and sharing of data between the patient clinical data and the laboratory data through one medical record system known as "Open MRS".
- Enhancing data visualization by reviewing and improving the data visualization capabilities of the system and particularly focused on lab data exchange.
- Optimizing system performance within the OpenMRS system to enhance overall efficiency.



Strengthening Global Health Security

In line with the global health security agenda, CDC collaborated with the MoH in responding to various disease outbreaks including monkeypox and Marburg Virus Disease (MVD), building capacities of the healthcare workforce and strengthening disease surveillance.

Carrie Eggers, one of CDC Rwanda epidemiologists, training Rwanda's healthcare workers on Marburg disease surveillance, case investigation, and contact tracing.

From Crisis to Control: Hand in Hand Against the Marburg Virus

In 2024, Rwanda experienced its first outbreak of Marburg virus disease (MVD), one of the largest ever recorded with 66 confirmed cases and 15 deaths, primarily among healthcare workers, resulting in a case-fatality ratio of 22.7%.

Following the Ministry of Health (MOH) 's declaration of the outbreak on 27 September 2024, the Rwandan Biomedical Center (RBC) quickly established the Incident Management System (IMS) structure as an emergency response and to coordinate outbreak control activities.

CDC, being a historic partner, was first notified alongside WHO, and 12 CDC staff were engaged in the response and provided essential technical assistance that strengthened the government's response earlier than all other partners. These staff helped to strengthen surveillance, supported laboratory biosecurity, and biosafety measures, provided expertise for infection prevention and control, and improved patient management by monitoring sequalae of events following patients' recovery and discharge.

Following the visit of CDC's Principal Deputy Director on November 16th, the Travel Health Notice (THN) was de-escalated to level 2, and redirection and screening of Rwanda travelers in the US was halted on December 4th, consequent to satisfactory response effort of the country team and other stakeholders.

The outbreak ended on December 20th with 66 cases, 51 recovered patients, and 15 deaths. CDC, through the Infectious Disease Rapid Response Reserve Fund (IDRRF), was awarded a total of $4.36 million to support post-MVD recovery activities - strengthen the health system, and build adequate resilient measures to improve the country's readiness to control imported cases of Marburg and other VHFs from across the region or the re-emergence within Rwanda.

MVD can easily spread between and across borders, so it is critical to support these post-outbreak control activities to prevent the re-emergence of the outbreak and potential transmission to the US.

From left to Right, Eric Kneedler, the U.S. Ambassador to Rwanda, Keisha Effiom, former USAID Mission Director to Rwanda and Burundi, and Dr. Thierry Roels, CDC Rwanda Country Director visiting the MVD Command Center in Kigali in October 2024

CDC's investments in and partnerships with RBC and partners continue to play a critical role in Rwanda's public health space, especially in the prevention, detection, and response to infectious disease outbreaks and other TB/HIV and malaria interventions. CDC's ongoing coordination across the U.S. government includes collaboration with the U.S. Ambassador to Rwanda, and a highly skilled team of in-country experts, working to address critical public health challenges in the country.

- **$4.36 Million CDC funding to support post MVD recovery activities**
- **CDC co-led partner surveillance pillar including sub-pillars (case investigation, and contact tracing).**
- **12 CDC Rwanda staff and 10 CDC Headquarters staff engaged in the response to provide technical assistance to MOH**

Field Epidemiology Training Program (FETP)

Effective public health systems are essential for countries to proactively prevent, detect, and respond to disease threats before they escalate into epidemics. Recognizing this, CDC launched the Field Epidemiology Training Program (FETP) in Rwanda in 2009, with the aim to establish a self-sustaining institutionalized public health workforce.

FETP is a training program that builds and strengthens the capacity of public health leaders in field epidemiology and other essential public health competencies. It consists of three different tiers including an advanced program culminating into a master's degree, a 9-month intermediate program and a 3-month basic level frontline tier.

15 Years of Action

This multi-layered approach has significantly increased the number of field epidemiologists trained and the number of public health threats investigated. As of December 2024, a total of 435 residents from all tiers have been trained. Trainees have led and supported responses to over 80 outbreaks.

To ensure success of the FETP in Rwanda, CDC implements the program in partnership with the Ministry of Health (MoH), University of Rwanda, and the Africa Field Epidemiology Network (AFENET).

MoH plays a role in program ownership and facilitates various aspects of field placements for the FETP trainees. The University of Rwanda, through its School of Public Health, takes charge of coordinating and implementing the academic component of the advanced program. AFENET serves as CDC's implementing partner for FETP and facilitates with providing mentorship to FETP residents.

CDC provides financial support to the FETP program using funding from PEPFAR and the President's Malaria Initiative.

Since the inception of the program, FETP trainees have responded to over 80 outbreaks, including COVID-19, measles, cholera, malaria, epidemic typhus fever, Ebola, monkeypox, and MVD among others.

Contribution to Scientific Communication

Graduates have also demonstrated their commitment to scientific communication through the development and delivery of over 55 presentations at national, regional, and international conferences and scientific events. Additionally, they have authored over 50 scientific publications in peer-reviewed journals, providing for a rich and applicable perspective to the evidence-based medical literature. In June 2024, the Journal of International Epidemiology & Public Health published 11 supplements of Rwanda FETP graduates. The publications present significant findings and recommendations on a diverse range of topics including risk factors for hypertension among people living with HIV, neonatal mortality, viral load suppression, stillbirths, tuberculosis mortality, stunting, and COVID-19.

FETP Residents and Alumni Support in MVD Response

On Friday, September 27th, Rwanda's Ministry of Health (MoH) officially declared an outbreak of the Marburg virus disease (MVD), one of the deadliest diseases known to humanity. The day before this announcement, rumors had begun to spread, leading to widespread anxiety and panic among the population.

This situation was reminiscent of the COVID-19 pandemic when all attention was directed toward healthcare providers in search of solutions. The public eagerly awaited information from the MoH about the developing crisis. The thought of lacking the capacity to test or respond effectively to such a serious threat would have been both unimaginable and catastrophic.

Given the skills and expertise of FETP graduates, all past and current residents were mobilized to provide support at the onset of the outbreak, with a total of 182 responding. This group comprised of 103 individuals from the Frontline Tier, 27 from the Intermediate Tier, and 52 from the Advanced Tier.

These alumni were integrated into various response pillars, including case management, data management, vaccination efforts, risk communication and community engagement, laboratory services, infection prevention and control, surveillance, as well as leadership and coordination.

Residents and alumni put into practice skills that they gained in the program, such as outbreak response, surveillance and data analysis, scientific communication, and leadership. They played a key role in the success of the country's response. The MVD response surveillance pillar lead was an FETP alumni, who is also the current FETP director.

Graduation ceremony of the 2nd FETP intermediate cohort

Leveraging Technology to Elevate Healthcare Workers' Skills

Despite significant progress in expanding health services across the country, there remains a pressing need to build local medical expertise. As technologies and guidelines—especially those related to HIV prevention, care, and treatment—continue to evolve, it's crucial for healthcare workers (HCWs) to stay updated.

However, the demanding nature of their roles often leaves HCWs with little time for professional development. Traditional training methods can pull them away from their patients, creating gaps in care when it's needed most. The lessons learned during the COVID-19 pandemic highlighted the potential of virtual tools for conducting meetings and organize. Moreover, in-person training can be expensive, and budgets for capacity building have been shrinking in recent years.

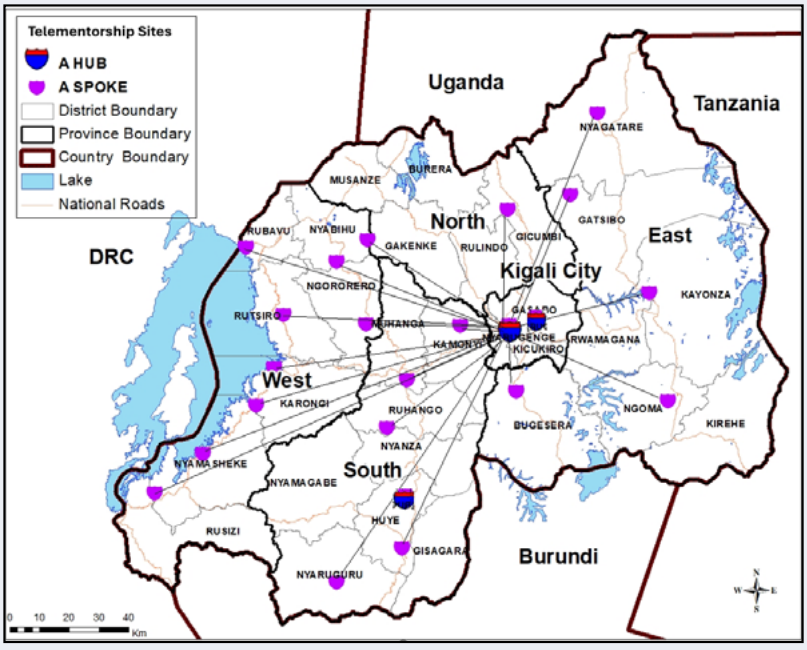
To address these challenges, CDC Rwanda in partnership with the International Center for AIDS Care and Treatment Programs at Columbia University (ICAP) and the Ministry of Health (MOH) introduced two innovative technology-based models to train and mentor HCWs: tele-mentorship and e-learning systems. These approaches not only enhance accessibility but also ensure that healthcare professionals can continue to provide the best care possible without compromising their time with patients.

The e-learning model, which was introduced in Rwanda's in 2018, consists of a virtual repository of curricula and courses that can be accessed using a computer or a smart phone. The model provides flexibility to HCWs to complete courses in their own pace and in the most convenient location and time.

Tele-mentorship was introduced in 2022. It operates on a hub-and-spoke model whereby health specialists at a central "hub" mentor HCWs at various "spoke" sites through tele-conferencing systems. It enhances peer learning and collaboration among different levels of the healthcare system and allows real-time interaction between experienced mentors and healthcare providers for timely support, technical assistance, and knowledge sharing.

At the outset, the tele-mentorship system consisted of three hubs and 23 spokes. By the end of 2024, a total of 135 spokes had been installed at CDC-supported facilities. The number of trained HCWs through tele-mentorship program increased from 928 in 2023 to 2,025 in 2024 while 18 courses were provided through the e-learning platforms.

Trained HCWs mainly include, nurses, lab technicians, data managers, social workers and other public health professionals. Courses offered cover a wide range of topics aimed at enhancing healthcare services and data management in HIV services. Key areas include a HIV Testing, laboratory information systems, HIV prevention service delivery, implementation of electronic medical records (EMR), data quality, mental health, TB, patient care, medical equipment and devices processing and many more others aimed at improving quality of health care.



Scale up of Tele-mentorship capacity at District level

2,025 Trained HCWs

29 Training sessions

18 Courses provided

135 Spokes in use

CDC RWANDA TEAM

COUNTRY DIRECTOR
Thierry Roels

DEPUTY COUNTRY DIRECTOR
Sherene Cora

ASSOCIATE DIRECTOR FOR PROGRAMS
Eugenie Kayirangwa

S.I. BRANCH CHIEF
Tom Oluoch

S.I. DEPUTY BRANCH CHIEF
Hailegiorgis Moges

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Caroline Stamatakis

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Carrie Eggers

SENIOR RESEARCH & EVALUATION SPECIALIST (Contractor)
Samuel Malamba

COAG ANDFINANCE z BRANCH CHIEF
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Celestine Nyagatare

PH SPECIALIST ADOLESCENT & PEDIATRIC
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M&E SPECIALIST
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DRIVER
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DRIVER
Xavier Ntidendereza

Implementing Partners in 2024

Partner	Program Area
Ministry of Health (MOH) ***Note**: From October 2024, all activities implemented by the MoH were transitioned to the Rwanda Biomedical Center.*	HIV Care & Treatment
	Tuberculosis and HIV integration
	HIV Testing and Counseling Services
	Prevention of Mother to Child Transmission (PMTCT)
Rwanda Biomedical Center (RBC)	HIV Policy guideline development
	Capacity building of Health Care Providers
	HIV Health Systems Strengthening
	Laboratory network and capacity strengthening
	Field Epidemiology Training Program (FETP)
	Surveillance and Strategic Information
	COVID-19 Response
	Ebola Preparedness and Response
ICAP	Surveillance and Strategic Information
	HIV Health Systems Strengthening
	Support National Reference Lab Services
	Continuous Quality Improvement (CQI) of services
	E-learning and Tele-mentoring
Society for Family Health (SFH) ***Note**: Since October 2024, all activities implemented by SFH were transitioned to the* **Center for Family Health Research (CFHR)**	HIV Prevention Services targeting the most at risk populations
	HIV Testing and Counseling Services
African Field Epidemiology Network (AFENET)	Field Epidemiology Training Program (FETP)
JEMBI and UCSF (University of California, San Francisco)	Technical Support for Digital Health

Key Publications

Publications where CDC staff are co-authors (bolded)

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2. **Tuyishime E**, Remera E, Kayitesi C, **Malamba S., Sangwayire B.**, Habimana Kabano I, Ruisenor-Escudero H, **Oluoch T**, Unna Chukwu A. Estimation of the Population Size of Street- and Venue-Based Female Sex Workers and Sexually Exploited Minors in Rwanda in 2022: 3-Source Capture-Recapture. JMIR Public Health Surveill 2024;10:e50743

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7. Benemariya N., Ntirenganya F., Ruseesa E., Ntawuyirusha E., **Omolo J.**, Rwagasore E. Factors associated with COVID-19 infection in southern province Rwanda, June 2020-January 2021. Journal of Intervention Epidemiology and Public Health. 27 June 2024. 7(3): 10

8. Niragire E., Rugema L., Kamayirese E.N., **Omolo J.**, Mutabazi V., Sinayobye J.A., Ntaganira J., Factors associated with stillbirths in Kibogora District Hospital catchment area, Rwanda, 2015. Journal of Intervention Epidemiology and Public Health. 27 June 2024. 7(3): 9

9. Hagabimana A., Ndagijimana A., El-Khatib Z., Musafili A., **Omolo J.**, Nzabonimana E., Kaneza K., Birungi F. Prevalence of hypertension and associated risk factors among people living with HIV/AIDS in Kigeme, Rwanda 2020. Journal of Intervention Epidemiology and Public Health. 21 June 2024. 7(3): 1

Other publications mentored by CDC staff to support FETP

1. Emmerance Hirwa Igihozo, Francoise Mukanyangezi, Emile Abimana, Eric Matsiko. Factors associated with stunting among children aged 6 to 59 months in Nyabihu District, Rwanda 2023, Journal of Intervention Epidemiology and Public Health. 27 June 2024. 7(3): 8

2. Kamayirese Eric Noël, Mukamurigo Judith, Birungi Francine, Sinayobye Jean d'Amour, Ntabanganyimana Daniel. Assessment of factors associated with mortality among tuberculosis patients attending Muhima District Hospital, Rwanda, 2015-2018. Journal of Intervention Epidemiology and Public Health. 27 June 2024. 7(3): 7

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4. Olivier Nsekuye, Jared Omolo, Ziad El-Khatib, Eric Matsiko, Henri Desire Uwayo, Fabrice Ndicunguye, Moise Tuyishimire, Jean Claude Niyoyita, Thomas Muyombo. Risk factors associated with transfusion transmissible infections among blood donors at Karongi Regional Centre for Blood Transfusion-Western Province of Rwanda. Journal of Intervention Epidemiology and Public Health. 21 June 2024. 7(3): 2

5. Christophe Nkundabaza, Gilbert Rukundo, Jean d'Amour Sinayobye, Joseph Ntaganira, Judith Mukamurigo. Neonatal mortality and associated factors at a provincial hospital, Western Province of Rwanda: A facility based cross-sectional study, 2019-2021. Journal of Intervention Epidemiology and Public Health. 21 June 2024. 7(3): 3

6. Metuschelah Habimana, Rachel Niyogushimwa, Vedaste Ndahindwa, Theoneste Ntakirutimana. Level of viral load suppression in Rwinkwavu District Hospital: A cross-sectional study. Journal of Intervention Epidemiology and Public Health. 21 June 2024. 7(3): 4

7. Hagabimana Aphrodis, Nzabonimana Ephraim, Kagimbangabo Jean Marie Vianney, Musafili Aimable, Ndagijimana Albert. Risk factors associated with stillbirth in Kigeme district hospital, Rwanda: A case-control study. Journal of Intervention Epidemiology and Public Health. 21 June 2024. 7(3): 5

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