



Uganda

Country Context

Uganda is home to some 39.5 million people and has been experiencing rapid population growth at a rate of 3.4 percent, largely due to a combination of high fertility rate, short birth intervals, and high levels of teenage pregnancy. This has resulted in high maternal and infant mortality rates. The country's healthcare system is decentralized and burdened by a severe shortage of trained health workers and very high risk of infectious diseases. Physician density is low at 0.12 per 1,000 people, while frontline mid-level health workers such as nurses and midwives are also stretched too thin.

According to UNAIDS, Uganda's HIV epidemic has not changed pattern over the past 30 years and remains generalized, though HIV prevalence has consistently been higher among women than men. During the 1990s, the country achieved impressive success controlling the spread of the virus, reducing the adult prevalence rate from a national average of 18.5 percent in 1992 to just 6.4 percent in 2005.

This success was compromised during the 2000s when the country's response shifted direction and HIV prevalence rates ticked up. As of 2016, Uganda's adult HIV prevalence rate is 6.5 percent, the country is home to some 1.4 million PLHIV, and roughly 800,000 children under the age of 17 who have been orphaned or made otherwise vulnerable by HIV/AIDS. An estimated 28,000 Ugandans have died of AIDS-related causes.

With support from the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), the American International Health Alliance (AIHA) is currently implementing a partnership to strengthen national capacity in biomedical engineering and technology with support from the U.S. Centers for Disease Control and Prevention (CDC) in Kampala. Our previous work in country focused on palliative care.

Strengthening In-country Capacity to Train Biomedical Engineers and Technicians

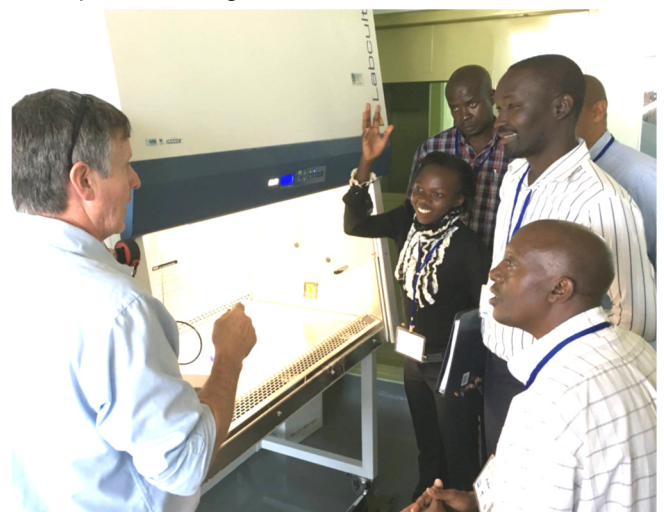
Biomedical technology is broadly defined as the application of technology to the solution of medical problems. This technology includes more basic equipment, such as a microscope or centrifuge, as well as high-tech automated equipment, such as machines to diagnose TB or determine viral load for patients living with HIV or AIDS.

Like many other low-income countries around the globe, Uganda faces a severe shortage of healthcare workers, including qualified biomedical engineers and technicians who play a crucial role in today's technology-driven health systems.

There is a critical need for biomedical engineers and equipment technicians (biomed) capable of conducting preventive maintenance and repair on laboratory equipment, including HIV diagnostic equipment.

A recent gap analysis revealed that most current Ugandan biomed and laboratory technicians lack the skills they need to properly conduct routine preventive maintenance, repair, and safety calibration of lab equipment. As a result, a large percentage of the country's lab equipment not currently under service contract is either malfunctioning or not working at all.

To address this challenge, in late 2015 AIHA launched a twinning partnership linking the Uganda Ministry of Health's Health Infrastructure Division (HID) and Central Public Health Laboratories (CPHL) with the Lorma Consortium, a group of technical experts from the United States, Canada, and the



In Uganda, most biomedical engineers, equipment technicians, and lab technicians lack many of the skills they need to effectively maintain and repair critical lab equipment. AIHA has been working with the Ministry of Health to address training needs since 2015.

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Philippines led by Lorma Colleges and Medical Center. In early 2017, AIHA graduated the Lorma Consortium and AIHA started direct implementation of the project.

AIHA biomedical technology project in Uganda currently has four objectives: 1) Training biomedes in the maintenance of laboratory equipment which directly supports HIV and TB service delivery; 2) Building the capacity of biomedes who will directly support the establishment of a national laboratory equipment calibration center; 3) Supporting biomedes in servicing, maintenance, and certification of biosafety cabinets; and 4) Supporting biomedes to achieve knowledge and skills to the level of certification to maintain automated equipment supporting viral load testing and early infant diagnosis used for monitoring the suppression of HIV.

“This partnership focuses on improving the human resource capacity in Uganda's regional medical equipment workshops to better manage and maintain laboratory equipment. Activities conducted through the partnership provide a basis for the Ministry's in-service training and capacity development for our biomedical technicians.”

*— Sitra Mulepo, Senior Engineer for Medical Equipment,
Uganda Ministry of Health, Health Infrastructure Division*



AIHA employs a comprehensive, multi-faceted approach to strengthening the capacity of biomedes through targeted in-service training, starting with non-automated lab equipment and working toward more sophisticated equipment critical to the HIV clinical cascade.

To date, AIHA and our partners have developed two training curricula covering both non-automated and automated lab equipment that directly supports HIV and TB diagnosis and treatment, as well as refrigeration and air-conditioning training to better support routine viral load testing. In addition, we've trained 30 biomedes on non-automated equipment, identifying seven of these as leaders, who have completed a training-of-trainers course to enable them to step down trainings in their respective regions.

Eight biomedes went through a comprehensive two-week training on refrigeration and air conditioning equipment, which becomes ever more important as Uganda's labs shift to routine viral load testing. In August 2017, four biomedes completed a year-long, three-phase biosafety cabinet calibration and certification (BSCC) course conducted in partnership with Eagleson Institute in Maine. This trained BSCC team has to date assessed nearly 100 BSCs across the country. AIHA and our partners worked with a local vendor in June and July 2017 to conduct the first GeneXpert training in East Africa, with 24 biomedes completing this initial two-phased course. GeneXpert is currently the main point of care equipment used for TB testing and is expected to become one of the main diagnostics for viral load testing in the future.

The project team has also developed national laboratory equipment maintenance guidelines, which are currently under final review, and — in 2017 — established and commissioned a national laboratory equipment calibration center on the UNHLS campus. AIHA is supporting the center to attain ISO17025:2017 accreditation. With limited capacity to conduct this crucial training throughout Africa, AIHA is working to empower Uganda's biomedes to address the need in their own country and to serve as a model for the continent. The four biomedes participating in the course are currently conducting monthly assessments as required of the program.

Strengthening the Capacity of a Nascent Pan-African Leader in Palliative Care

The African Palliative Care Association (APCA) was established in 2004 in Kampala, Uganda. With funding from PEPFAR, AIHA provided technical assistance to APCA from 2005 to 2009, largely in the form of organizational develop-

WHO estimates that 40 million people are in need of palliative care each year yet only about 14 percent of them receive it.

ment and staffing support to empower the nascent association as a leading pan-African association capable of helping scale up local and national palliative care associations and programs across the continent.

AIHA supported APCA's efforts to gather African stakeholders and health providers from 10 countries in April 2005 to develop a strategy that would build donor relations and develop key palliative care policies across Africa. The workshop emphasized priorities set forth by the World Health Organization to advance palliative care, including expanded palliative care drug access, policy development, and training and education.

With this support, African stakeholders and providers were able to more effectively leverage other support and address key policy gaps in their countries. This includes appropriate symptom management for people living with HIV (PLHIV) who are on ART and pain management for PLHIV during the end-of-life stage of the disease.

AIHA provided direct funding to APCA to support palliative care associations in Kenya, Tanzania, and Uganda and, through our HRSA-supported HIV/AIDS Twinning Center Program, established and managed four south-south partnerships involving APCA:

- **Botswana Institute of Health Sciences (2007 – Present)**
This south-south partnership is strengthening the Institute's capacity to provide pre- and in-service training on palliative care and helping integrate palliative care concepts into existing pharmacy technology, health education, and dental therapy programs.
- **Hope Worldwide (2007 – 2011)**
This south-south partnership advocated for increased availability to appropriate palliative care medicines and working to improve the overall provision of palliative care services available in Cote d'Ivoire.
- **Mozambican National Nursing Association (2006 – 2008)**
This south-south partnership focused on building the institutional capacity of ANEMO, strengthening its capacity as a member organization to help improve HIV-related nursing care throughout Mozambique.
- **Palliative Care Alliance of Zambia (2005 – 2010)**
This south-south partnership worked to develop institutional and human resource capacity at PCAZ and position the organization as a leading advocate for national palliative care policies and standards throughout Zambia. Based on the success of this twinning partnership, AIHA was able to graduate APCA and provide direct support to PCAZ from 2010 to 2014.



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