



CARES GLOBAL HEALTH INITIATIVE

SUPPORTING THE FIGHT AGAINST HIV/AIDS, RELATED
CO-INFECTIONS AND HEMATOLOGICAL MALIGNANCIES



EMPOWER
life-changing decisions.



BECKMAN COULTER LIFE SCIENCES

CARES Global Health Initiative

More than 30 years after HIV first appeared, there are an estimated 37 million cases worldwide with nearly 70% of HIV+ patients living in Sub Saharan Africa followed by Southeast Asia, Latin America and Eastern Europe. The vast majority of individuals affected by HIV are in low and middle income countries. More than 3 million children were infected by HIV positive mothers during pregnancy, childbirth or breastfeeding. ⁽¹⁾

A LEGACY OF SERVING HUMANITY

The worldwide need for effective assessment and treatment is more urgent than ever, and Beckman Coulter is part of the solution. Beckman Coulter helped pioneer the use of flow cytometry to confront the emerging threat of HIV in the 1980s. Beckman Coulter introduced the manual CD4 counting test for use with a microscope for labs without access to flow cytometry. At Beckman Coulter Life Sciences, we are moving healthcare forward by bringing more than 80 years of automation and innovation history in the clinical diagnostics laboratory from flow cytometry to the molecular diagnostics arena.

BECKMAN COULTER JOINS THE FIGHT

By focusing on innovative, yet affordable solutions for HIV patient management, Beckman Coulter supports the **UNAIDS 90-90-90 target** to ensure that by the year 2020, 90% of people living with HIV will know their HIV status, 90% of people with diagnosed HIV infection will receive sustained antiretroviral therapy, and 90% of all people receiving antiretroviral therapy will have viral suppression. ⁽²⁾

Our testing portfolio also supports the UN Sustainable Development Goal #3 for Wellness by providing better health for PLHIV, TB and hematological malignancies with improved diagnostics.

THE CARES GLOBAL HEALTH INITIATIVE

The CARES global health initiative was launched and driven by a social and civic responsibility to support the fight against HIV. Public and private partnerships are being explored to identify areas for Beckman Coulter Life Sciences to contribute for the global public health. We seek to develop alliances with non-governmental organizations (NGO's), implementing partners, and health policy organizations to align our efforts.



Beckman Coulter is meeting tomorrow's needs today by our commitment to leading the fight against HIV through the development of innovative solutions for immunophenotyping. Our simple, robust and sustainable tests have been made available to thousands of patients and allow the Health Departments to channel more funds towards better treatment programs.



Photo credit: Charles Kiyaga

TIERED LABORATORY NETWORKS

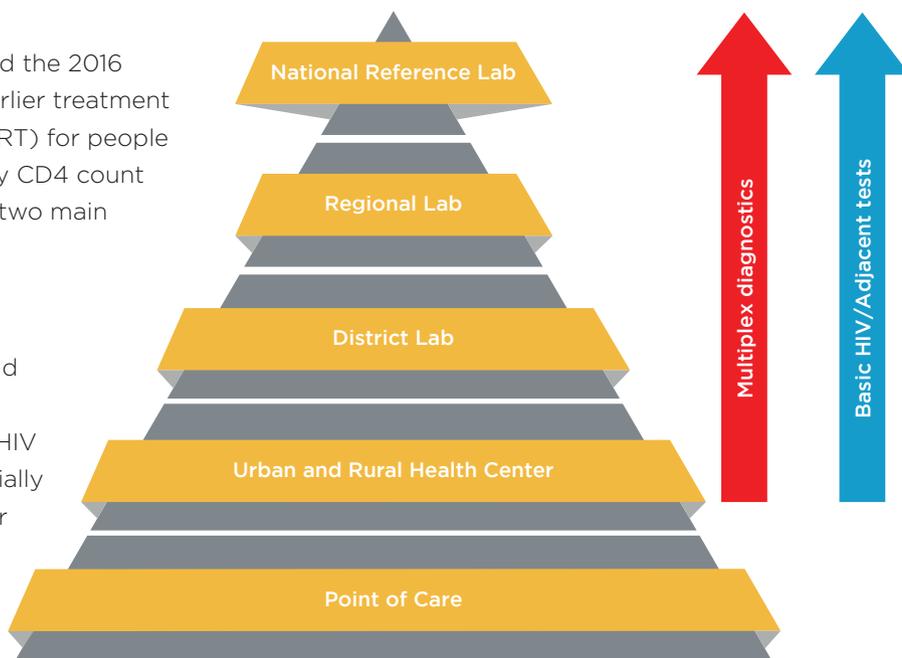
Laboratories are the backbone of the entire public health system, and standardization is the key to success in order to facilitate collaboration and communication between them. Within a tiered public healthcare system, near-patient testing in many cases still means high-throughput testing, combined with centralized data collection and storage requirements.

While basic peripheral testing sites usually need to rely on Point of Care testing due to infrastructural challenges, all other laboratory categories require state-of-the-art solutions that meet flexible workload requirements and automated integrated approaches.

WHO GUIDELINES

The 2013 WHO guidelines, and the 2016 revision thereof, call for an earlier treatment with antiretroviral therapy (ART) for people infected with HIV, and identify CD4 count and viral load analysis as the two main technologies to monitor ART treatment initiation and follow-up. (3; 6)

This requires countries to build capacity for the analysis of immune system integrity for HIV advanced disease, and especially for CD4 analysis platforms for lab based testing in District Level health facilities and above.



Tiered laboratory network and workload requirements.
Please see reference (4) for additional information.

INNOVATION IN HIV ADVANCED DISEASE MANAGEMENT

AFFORDABLE, RELIABLE TESTING

By focusing on the most essential parameters for monitoring HIV therapies, PLG CD4 addresses cost, complexity, and the time previously required by labor-intensive processes to provide busy laboratories with an affordable, high-performance monitoring solution that also offers standardization and simplicity. Its efficient operation takes CD4 testing to new places. ⁽⁵⁾

THE PLG CD4 TEST STORY

Monitoring CD4 lymphocyte counts is essential in providing critical information that impacts patient care. CD4 monitoring allows caregivers to know when the disease transforms and stage its progression so they can implement the most appropriate intervention.

Beckman Coulter Life Sciences has been providing cost effective solutions to monitor CD4 status in resource limited countries for several decades. The mounting HIV problem in these regions of the world has led to innovative solutions with a mission to deliver patient care. ⁽⁵⁾

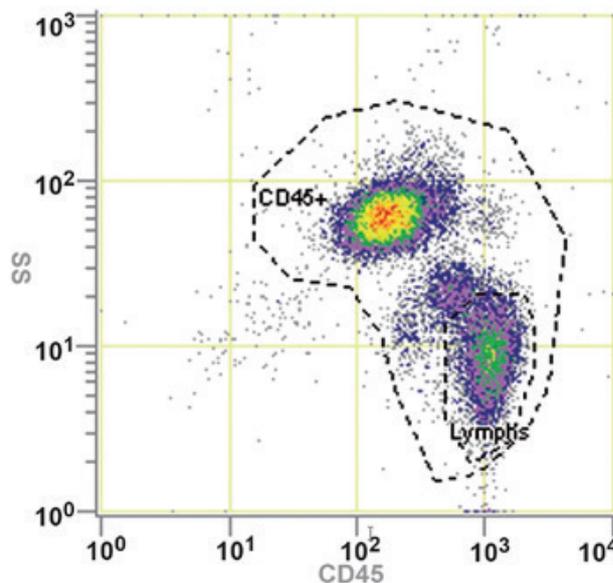
An example of innovative solutions driven by need is the breakthrough 'PanLeucoGating' (PLG) story from South Africa. Developed by the University of the Witwatersrand, a leading South African research institute, PLG CD4 was adopted in response to the urgent need for simple, rapid, accurate, and low-cost CD4 results in primarily centralized labs that monitor large numbers of HIV patients. The benefits were clear: According to the South African National Health Laboratory Service (NHLS), large-scale use of PLG CD4 has the potential to reduce the cost of HIV monitoring.

PLG CD4 was subsequently licensed to Beckman Coulter Life Sciences for manufacturing and worldwide distribution — with provision that the technology be priced affordably for resource limited countries. Beckman Coulter Life Sciences remains a proud partner to the NHLS. Today Beckman Coulter Life Sciences legacy and passion for science and innovation to improve healthcare manifests itself within the CARES Global Health Initiative.

Advantages of PLG CD4

- 2-colour pre-optimized reagent for PanLeucoGating (CD45/CD4)
- Provides both CD4% and absolute counts
- Extends to accommodate sample age up to 72 hours.

The PLG 'Africa Gate' that identifies lymphocytes, monocytes, and granulocytes based on CD45 expression and cell complexity (side scatter).



A sample plot from the peripheral blood of a normal donor is shown, depicting all white blood cells (CD45+), as well as a region to identify the lymphocyte (Lymphs) subpopulation for further analysis of CD4 cells. The name 'Africa Gate' stems from the form of the region that is used to identify all white blood cells.

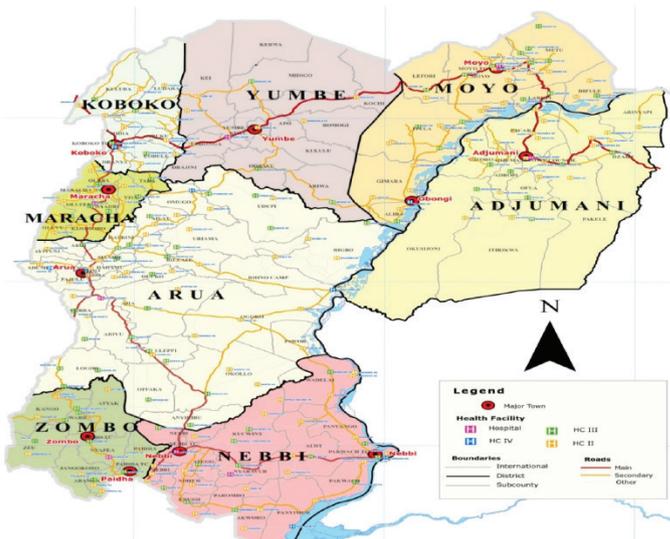
DEMONSTRATING HOW TO IMPROVE OPERATIONAL EFFICIENCY IN UGANDA'S OVERALL PATHOLOGY SERVICE

Uganda's strategy to improve laboratory services involved setting up more than 1500 clinical laboratories of different sizes. This was to ensure 90% of the country would be served either by larger clinical laboratories in major hospitals and health center IVs or smaller health centers. In 2011, 100 regional hubs were created in major hospitals and health center IVs to support the transport system, each serving 25 to 30 lower health facilities, resulting in 90% coverage. Laboratory capacity at the hubs was meant to support lower sites and only refer hi-tech tests to the Central Public Health Laboratories (CPHL).



However, many of these regional labs were either not functioning at all or operating to full capacity; further space capacity was not being used to support lower sites. The current system was suffering from a number of operational and governance challenges such as frequent stock out, poor equipment maintenance, lengthy downtime for instruments and slow turnaround times.

With CPHL support, a bold experiment was initiated which made a fundamental change to the way the regional laboratory service was managed. This focused on moving away from a centralized approach to handing responsibility for laboratory sample coordination to regional level. An integral part was the need to addressing flaws in the transport management of the physical collection and transportation of samples from the rural catchment areas.



- Created a reliable and efficient sample transportation system
- Improved overall laboratory inventory management
- Reduced laboratory turnaround time for all tests
- Developed an ethos of collaborative working and improving communication and reporting among stakeholders at all levels of the laboratory hub system
- Increased timely access for patients to diagnostics for HIV and opportunistic infections
- Illustrated the cost implications for implementing changes throughout the country.

The West Nile's Arua central referral laboratory was chosen as the test case because of the challenges it presents in terms of distance, existing health facilities and its high refugee population. The CPHL funded the placement for 12 months of an experienced lab scientist to take responsibility for sample coordination, including mentoring the hub laboratory team and engaging with stakeholders. Baseline performance and workflow data was collected prior to the start of the trial and then tracked on a quarterly basis throughout.

Before intervention, the hubs in the area averagely sent 38,534 viral load samples per quarter. This increased by 130,346 VL samples, an almost 350% rise. Before the intervention, lower sites under the hubs were sending 1,517 VL samples each quarter. This increased well over 800% to 13,958 samples. Other remarkable improvements in sample transport functioning were noted.



Photo courtesy of Charles Kiyaga

The pilot showed how delegating coordination to health facilities within the HUB system where patient demand is created resulted in more samples being transported and processed in a timely fashion, with bottlenecks reduced and overall workflow improved. They demonstrate how establishing a coordination resource at regional hub level - and empowering and mentoring local laboratory professionals in workflow management - has transformed the routine laboratory service in Arua.

The magnitude of the success of this approach sets down a clear and practical roadmap for delivering greater efficiencies to the country's overall laboratory services, if funding were to be made available to other regional hubs.

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The Life Science and Diagnostic segment consists of seven operating companies: Beckman Coulter Life Sciences, SCIEX, Leica Microsystems, Pall, Molecular Devices, Beckman Coulter Diagnostics, Leica Biosystems and Radiometer. We are global in reach, but local in service and support and in our collaborative approach to meeting your needs.



Choose Beckman Coulter for Benchmark Expertise and Innovation

For over 80 years Beckman Coulter has driven innovation. We remain committed to shaping flow cytometry technology to fit seamlessly into your lab's workflow and to provide an optimal user experience. When you choose a Beckman Coulter solution you receive the high level of expertise, innovation, and quality assurance.



To discuss a project collaboration or further information,
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<https://www.beckman.com/about-us/cares/initiative>



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