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FOR TREATING AIDS NATIONALLY

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# Using Targeted Interventions to Improve the Quality of and Access to Laboratory Services in Uganda

Fort Portal Regional Referral Hospital (RRH), located in the Kabarole District in western Uganda, provides general and specialized healthcare services to the Rwenzori region, which is comprised of seven districts. The hospital has a bed occupancy of 351, an annual inpatient admission of 25,216, and an annual out-patient department attendance of 163,046. The HIV clinic at the hospital provides comprehensive services to an estimated 6,907 HIV-positive clients per quarter, including 5,558 clients on antiretroviral therapy (ART). As per the Uganda Ministry of Health (MOH) guidelines, the hospital also plays an important role as a referral center for specialized healthcare services, including advanced laboratory testing services, for neighboring health centers and district hospitals.

Laboratory testing is an essential component of care and treatment services, particularly for HIV and AIDS-related services. However, in June 2010 at the start of the United States Agency for International Development (USAID)-funded Strengthening Uganda's Systems for Treating AIDS Nationally (SUSTAIN) project, managed by University Research Co., LLC (URC), the Fort Portal RRH laboratory was unable to meet the testing needs of clients receiving services at the hospital and at lower-level health units referring samples to the hospital. Housed in an old, poorly-maintained building with limited space, most of the equipment, including the CD4/8 and hematology analyzers used for monitoring clinical outcomes for clients with HIV and AIDS, was not working. The hospital lacked sufficient qualified laboratory personnel with the skills to operate automated equipment and conduct routine laboratory tests. Supply chain systems for laboratory materials and reagents were also weak, leading to frequent stock-outs of commodities that are necessary to conduct laboratory tests. Finally, no quality assurance processes were in place, and preventive maintenance for the equipment was not consistent. As a result of these conditions within the



*Before:* Shown here is a non-functional hematology analyzer, an inappropriate worktop (that does not meet CPHL specifications), and a poorly organized workspace at Fort Portal RRH prior to laboratory interventions.



*After:* A laboratory technician at Fort Portal RRH conducts CD4 count analysis using the newly-procured FACS Calibur machine installed in the renovated space.

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laboratory from June 2010 to June 2012, tests required for routine HIV and AIDS management and monitoring, including CD4 count, complete blood count, and chemistry analysis, were conducted through referrals to Joint Clinical Research Center (JCRC) Laboratories supported by the USAID Targeted HIV/AIDS and Laboratory Services (THALAS) Project.

To strengthen HIV/AIDS laboratory services, particularly at RRHs across the country, SUSTAIN, together with the MOH, the Central Public Health Laboratories (CPHL), and the THALAS project, conducted a laboratory strengthening needs assessment exercise at SUSTAIN-supported hospitals in November/December 2010. The purpose of the assessment was to document the status and functionality of the laboratories and to inform an improvement and strengthening plan. The needs assessment found major gaps in three key areas: infrastructure, equipment and human resources (including both number and competency of personnel), at all laboratories assessed, including Fort Portal RRH.

In collaboration with CPHL, the MOH infrastructure division, and hospital management teams, SUSTAIN developed a comprehensive improvement plan aimed at strengthening the capacity of 18 laboratories across the country, including 12 RRH and six general hospitals. The plans were implemented in a phased approach, with improvement activities for nine laboratories completed by June 2012.

Based on the client load in the HIV clinic and the level of limited capacity to conduct laboratory testing, the laboratory at Fort Portal RRH was one of the first to receive SUSTAIN support for improvements. In May 2012, the Fort Portal RRH laboratory renovations were completed, and the site was deemed fit for occupational use with full capacity to conduct both HIV/AIDS- and non-HIV/AIDS-related laboratory tests, following the implementation of improvements listed below:

- **Physical Infrastructure:** The hospital management identified the former physiotherapy wing to be renovated into a new space for laboratory services and the HIV clinic. SUSTAIN funded infrastructure improvements including expansion and remodeling of the space and installation of improved ventilation, back-up power, a toilet block for patients, and a water reservoir.
- **Equipment:** SUSTAIN signed service contracts for viable, previously-installed CD4 and hematology analyzers to ensure functionality of existing equipment. A high-volume CD4/8 analyzer and other supportive

equipment, including a biosafety cabinet, a power back-up system, a centrifuge, a microscope, incubators, and roller mixers, were procured and installed. SUSTAIN also supported MOH efforts to coordinate the upgrade of a low-volume chemistry analyzer to a more robust, high-volume analyzer through an agreement with the supplier, Roche Diagnostics.

- **Human Resources:** In addition to seconding two laboratory technicians to address critical gaps in human resources for laboratory services, SUSTAIN provided staff with Good Clinical Laboratory Practice (GCLP) training and training on operation and maintenance of newly installed automated equipment. A team for quality improvement was formed to improve laboratory systems and processes.

In June 2012, HIV and AIDS-related laboratory services were transitioned from JCRC to the public Fort Portal RRH laboratory. Improved capacity of the hospital laboratory as a result of interventions in infrastructure improvement, equipment installation, and staff skills building enabled the hospital to conduct 2,604 CD4 count, 1,503 complete blood count, 212 liver function, and 212 renal function tests from July to September 2012, an increase of 56% from the same period in 2011.

SUSTAIN's interventions have impacted not only the health system, but also the lives of those providing and receiving the services. Regarding the quality of services before and after the SUSTAIN intervention at Fort Portal RRH, a 43 year-old male client living with HIV and receiving services at the hospital explained, "Currently we receive very good services from the doctors; there is no congestion like at the former clinic where there were very many people in a very small area."

In collaboration with the MOH, SUSTAIN will continue efforts to improve laboratory services at Fort Portal RRH in years three to five of program implementation, with a focus on quality improvement, hospital leadership for management of laboratory services, routine maintenance to ensure functionality of equipment, staff skills development, and external quality assurance for various testing processes. Laboratory improvement efforts will also be coordinated with clinical strengthening efforts, such as promotion of client participation in care by informing them about the importance of laboratory testing and monitoring CD4 count results over time and improvement of clinical decision making through access to laboratory test results.