

HIV Testing Services in Africa: Are They Sustainable?

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Abstract HIV testing services (HTS) are an essential component of a national response to the HIV epidemic, and in lower and middle income countries, at least 150 million persons are tested annually. HIV testing is necessary to identify persons in need of antiretroviral treatment, which has been documented to be highly effective not only for treatment but also for prevention of HIV transmission to both adults and children. An assessment of the recent literature on sustainability of health and HIV services suggests that organizational performance, flexibility, and integration with other health interventions contribute to sustainability of HIV services and programs. This article describes the experiences of two HIV testing service providers in Uganda and Zambia as well as the track record of services to prevent mother-to-child HIV transmission to illustrate the factors of performance, flexibility, adaptability, and integration which are key to the sustainability of HIV testing services.

Keywords HIV tests · HIV testing services · Sustainability · Integration · Africa

Introduction

Almost as soon as the first HIV testing project in Africa opened its doors in 1990 in Kampala, Uganda, there were concerns about the sustainability of the project, and since then, the question of sustainability has been a constant concern for HIV testing services and programs [1]. In this article, we will briefly describe the historical context of HIV testing services in Africa, we will explore the issue of sustainability in relation to HIV testing services, and we will describe three programs that illustrate essential components of sustainability. HIV testing services in the context of this review comprise a comprehensive package which includes obtaining consent, ensuring that testing is voluntary, providing pre-test health education and post-test counseling, conducting HIV testing, and providing the client or patients the results of testing.

Beginning in 1990, numerous non-governmental organizations (NGOs) began offering HIV testing in many countries, and Ministries of Health throughout Africa began exploring how to integrate HIV testing into routine services such as for pregnant women and into specialty medical services, such as clinics to care for patients with sexually transmitted infections or TB [2]. However, there was great uncertainty about whether donors would continue supporting HIV testing and whether government-funded services could or should continue to offer this service. For example, during the 1996 International AIDS Conference, when the promising results of HAART trials were announced, there was a plenary debate on the topic of whether public funds should be spent on HIV testing services. Since 2003, with the introduction of the President's Emergency Plan for AIDS Relief (PEPFAR) and the Global Fund to Fight

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AIDS, Tuberculosis and Malaria and substantial increases in both donor and domestic funding of the HIV response, HIV testing service delivery has greatly expanded, and almost every year, WHO and UNAIDS report more and more adults and children being tested, at least 150 million annually, though many persons living with HIV remain undiagnosed. The Joint United Nations Programme on HIV/AIDS (UNAIDS) published estimates in 2015 that 46 % of persons living with HIV do not know their status, suggesting that over half know their status [3]. Other UNAIDS documents indicate that at least 41 % of adults living with HIV are on antiretrovirals [4, 5]. Although the percent of persons who do not know their status is no doubt declining due to the availability of treatment, there remain many people, especially in Africa, who do not know their correct HIV status, and those who are HIV infected but not tested are not able to access life-saving treatment. There is increasing research evidence that treatment of persons with HIV infection with antiretrovirals is not only beneficial for the patient but also for prevention of new infections [6]. In spite of the clear need for continued expansion of HIV testing services, the question still persists—are HIV testing services sustainable?

What Does Sustainability Mean?

Numerous writers and organizations have explored the concept of sustainability and have identified various steps and elements of sustainability. For example, the World Bank defines sustainability as: “the ability of the country to maintain key programs, delivery capacity and health benefits for an extended period of time after the major reduction in domestic financing, or in the financial, managerial or technical assistance provided by an external donor” [7]. Although financial sustainability is often emphasized, it is widely recognized that sustainability goes beyond financial support, and often involves a transition from external donor support to domestic funding and local technical and managerial support. The World Bank defines “transition” in terms of three levels: (1) government or institutional transition, (2) service delivery transition or changes in the service delivery modalities, and (3) financing transition or changes in the source or level of financing available [7].

In a review of donor transitions in the Eastern Caribbean, Vogus and Graff recommend engaging civil society and the private sector, building the capacity of non-governmental organizations to perform essential services and functions, monitoring targeted capacity building, and long-term monitoring and evaluation activities. Based on their review, they define six key steps to achieve sustainability: (1) developing a road map for transition, (2) stakeholder participation, (3) high level diplomacy, (4) mid-term evaluations and flexibility based on

findings, (5) technical support for the road map, and (6) on-going support for monitoring and support [8].

In an analysis of health systems and HIV treatment in sub-Saharan Africa, Bärnighausen, Bloom, and Humair describe several key shifts in HIV treatment and care, from vertically structured programs to more integrated services and from program monitoring and evaluation to broader efforts to evaluate the impact of programs and services [9]. Oberth and Whiteside in 2016 present a review of the meanings of sustainability in the HIV response. They discuss six domains relating to sustainability: financial, epidemiological, political, structural, programmatic, and human rights [10]. Other writers, such as Shigayeva and Coker, published a 2015 manuscript proposing an alternate approach to assessing sustainability, by examining five programmatic characteristics to explore potential for sustainability of communicable disease control programs. These are leadership, capacity, interactions and integration, flexibility and adaptability, and performance [11]. In an analysis of six national HIV programs, Katz et al. suggest that well-managed local and national NGOs should be able to continue to receive resources from a number of sources, including donors, national governments, and fund raising from the private sector [12].

Are HIV Testing Services Sustainable?

In this review, the programmatic aspect of sustainability in terms of consistent service delivery will be the major focus of analysis, with some discussion of the issue of financial sustainability. It is important to stress that when an HIV test was first developed 30 years ago, although testing of blood donors was considered essential, other HIV testing was viewed as an optional, and perhaps risky, personal step and was also considered too costly for implementation in lower and middle income countries. HIV testing services are now an essential component of a comprehensive response to the HIV epidemic, and thus, it is important to assess the long-term sustainability of this intervention in a comprehensive response to the AIDS epidemic [13, 14].

In the years prior to the availability of antiretroviral treatment (ART), HIV prevention was the primary focus of many national programs, and personal knowledge of HIV status was often one of the key goals or objectives of these prevention programs. Once people were educated about the modes of transmission and understood their potential risk of infection, would they engage in the final step of going for a test? Many studies have been conducted to assess the behavioral impact of learning one’s HIV status; in general, these studies often found that persons who learned they were HIV infected changed their behavior to reduce risk of onward transmission, especially in terms of reducing the number of sexual partners [15, 16]. Behavior change to reduce risk of future acquisition

was less well documented among those who learned they were not infected.

Once ART became available, and especially after the publication of research results showing that persons on ART were very unlikely to transmit the virus to their sexual partners or infants, the focus changed. HIV testing has now become the first step in the process of diagnosis and enrollment in care and treatment, rather than the last step in terms of HIV education and behavior change. In 2014, UNAIDS and WHO declared the global goals of “90-90-90,” with the goals that 90 % of people with HIV know their status, 90 % of those with HIV are receiving ART, and 90 % of those on ART should be virally suppressed [17]. Whether HIV testing is the first or last step in the complex processes of HIV education, awareness, behavior change, diagnosis, and treatment, HIV testing remains a critical component of an effective HIV response.

In summary, financial resources are often the focus in discussions relating to sustainability, and the record of the last 25 years since 1990 supports the conclusion that as long as governments and the international community remain concerned about the AIDS epidemic in Africa, funds will continue to be available for HIV testing. An exploration of programmatic sustainability in terms of consistent service delivery may be useful to examine the past, present, and future of HIV testing services. In this manuscript, we will distill these various discussions and explore sustainability in terms of (1) performance and capacity, (2) flexibility and adaptability, and (3) integration with other health services. For each aspect, we will present a case study to illustrate these characteristics.

Performance and Capacity: AIDS Information Centre, Uganda

As described earlier, the AIDS Information Centre (AIC) in Uganda was established in 1990 as a “stand-alone” testing site in downtown Kampala. As Ugandans requested testing in increasing numbers, offices of the AIC were established in seven additional urban sites throughout the country. The AIDS Information Centre has a consistent history of programmatic service delivery and capacity that have supported over 25 years of un-interrupted service delivery. In the 1990s, the AIC pioneered programmatic innovations that have contributed to sustainability of services. In particular, the introduction of rapid tests, which made possible “same-day results,” had the impact of reducing the need for a second visit to collect results, as well as increasing the percent of persons tested who actually received their results from approximately 75 % to almost 100 %. Both of these improvements in service delivery have contributed to efficiency of service delivery, which in turn contributes to sustainability [1, 18].

Program records and statistics maintained by AIC document that by the end of 2015, a cumulative total of over 4.2

million testing events have been recorded; since 2004, over 200,000 Ugandans have received HIV testing services annually supported by the AIDS Information Centre. When the AIC first opened its doors in 1990, more men than women accessed services and this trend continued until 1997, when women began accounting for more than 50 % of clients annually. Possibly related to the increasing availability of testing for women during pregnancy care in health facilities in Uganda in the 2000s, by 2012, men again represented more than 50 % of AIC clients, which has remained a consistent trend at the AIC through 2015, though other HIV testing programs in Uganda generally test more women than men [19].

In addition to this remarkable record of consistent service delivery, AIC has also maintained financial sustainability. A registered non-governmental organization (NGO), AIC has been supported financially by external donors including the governments of the USA, Denmark, the UK, Japan, Ireland, and the European Union. Multi-lateral organizations including UNAIDS, UNICEF, WHO, and UNFPA have also provided support to the AIC. Between 1990 and 2015, over US \$15 million was contributed by external donors to support service delivery throughout the country. External support, though very generous and consistent, is not the only source of funding. In 1995, the AIC introduced a modest co-payment for services, about US \$1 per person, and the funds generated by client fees financed the building of the AIC headquarters in Kampala and other urban sites. In addition, the AIC has received financial support from the Uganda Ministry of Health as well as local government institutions.

To support the development of national capacity, the AIC has trained over 5500 counselors and service providers to deliver HIV testing services throughout the country. In addition, since its foundation, AIC has collaborated with government health services at the national and local level to deliver HIV testing services in publicly supported health care facilities. As early as 1993, the AIC was supporting HIV testing services in twenty government health facilities [1]. At the end of 2015, over 200 health facilities in 53 districts in the country have delivered HIV testing services to their clients and patients with the support of the AIC [19].

Over the 25 years since its founding, the AIC has weathered many challenges to its sustainability. The founder and first director, a charismatic leader, died unexpectedly in 1992, creating an institutional crisis. Since then, there have been ten executive directors, supported by a Board of Directors. External donor support has at times been hard for the management of the AIC to predict and has often been channeled through international organizations, some of which have not consistently supported AIC as an independent national organization. Donors who fund selected staff positions have challenged a smooth transition and stable management when project specific funding has ended. Relationships with the Ministry of Health have been strained at times, especially

when it appeared that the AIC, a non-governmental organization, was receiving more donor support than governmental institutions. Changes in donor priorities and government guidelines, such as the growing emphasis on HIV testing services in health facilities rather than stand-alone testing centers, have also been a challenge for consistent operations and uninterrupted service delivery.

Flexibility and Adaptability: Development AID from People to People (DAPP) in Zambia

Lessons relating to flexibility, creativity, and adaptability are illustrated by the experience of Development AID from People to People (DAPP), which has delivered HIV testing services in Zambia since 2006, funded primarily by PEPFAR through the US Centers for Disease Control and Prevention (CDC), as well as other donors including the Global Fund to Fight AIDS, Tuberculosis and Malaria, UNICEF, private donors, and the Government of Zambia. In addition to funding, CDC Zambia has provided technical assistance and has worked closely with DAPP to strengthen accuracy and quality of testing services. DAPP Zambia has developed a unique approach to HIV prevention and HIV testing services for over 10 years. Selecting specific districts in which to work, DAPP implements an approach called “total control of the epidemic,” whereby local leaders are selected and trained with the mandate to reach every person over the age of 12 in a prescribed geographic area. A holistic program tailored to each family continues for 3 years in the chosen district, providing every person an education about HIV along with encouraging them to develop a personal plan for HIV prevention and a commitment to avoiding either transmission or acquisition. Learning one’s own HIV status is a critical component of this personal plan. DAPP has trained these community outreach workers to provide HIV testing services in the community, including door-to-door and home-based HIV testing. Between October 2006 and February 2016, DAPP provided HIV testing services to over 530,000 adults and children in Zambia, with an estimated coverage of over 90 % of adults in targeted communities [20]. HIV positivity rates have varied from 2 % in rural districts to nearly 8 % in urban settings.

In addition to this door to door community approach, DAPP has also extended services to key populations, including over 2400 sex workers, of whom more than 30 % received HIV testing services, and has provided testing services for over 1500 prisoners in two Zambian prisons. DAPP has enabled migrant workers to access HIV testing services, and for all persons tested, there is a very strong emphasis on linkage to care for those who test HIV+ and close coordination with local medical services, including ART and PMTCT services for pregnant women [20]. ART adherence support is also built into the program through the formation of “trios” that consist

of the HIV+ individual, a family member, and a community volunteer trained to assist their neighbor. The patient and family agree to disclosure of HIV status with the community volunteer.

At a national level, DAPP has a creative approach to financial sustainability, as DAPP has established 27 shops where people can purchase clothes, shoes, and other items donated in Europe and shipped to Zambia. The income generated from these stores contributes an estimated 10 % of DAPP’s operating expenses, and these shops also provide jobs for over 100 employees. DAPP has also found that community volunteers continue educating their communities about HIV even after the end of project supported activities in the area, thereby sustaining community HIV prevention efforts [20].

Integration With Other Health Services: Prevention of Mother-to-Child HIV Transmission

Trials conducted in the 1990s in Uganda, Tanzania, and elsewhere in sub-Saharan Africa documented that when HIV+ mothers were treated with an antiretroviral the percentage of infants who also became infected with HIV declined [21–23]. Very soon there were multiple calls by the World Health Organization, UNAIDS, and panels of experts to implement interventions designed to prevent mother-to-child HIV transmission (PMTCT) [22, 24–28]. There were concerns about the costs of these interventions though generally authors concluded that these interventions were cost effective [29]. Concerns were also raised about the role of breast-feeding in mother-to-child transmission and the challenges associated with substitute feeding in developing countries [30]. In reviewing these early manuscripts describing the imperative to implement PMTCT services, it is noteworthy that most authors assumed that these services would be integrated with routine maternal health care [22, 23, 25, 27, 31, 32]. Within a few years, there was an increasing literature describing the experience of implementing HIV testing and treatment of mothers found to be HIV+, typically with services integrated within the context of care for pregnant women [33–35].

By 2012, it was estimated that testing uptake during pregnancy in antenatal sites was 85 % or more, and by 2014, WHO estimated that over 150 million children and adults in 129 low and middle income countries had received HIV testing services in 2014 [3]. By 2015, UNAIDS estimated that at least 73 % of pregnant women living with HIV had access to retroviral medicines to prevent HIV transmission to their infants [3]. In June 2015, WHO announced the elimination of mother-to-child HIV transmission in Cuba, where services for HIV testing of pregnant women were integrated in routine antenatal care [36]. Many authors and organizations are now calling for the integration of syphilis testing with HIV testing for pregnant women to eliminate both diseases [37, 38]. The question

of the financial sustainability of integrated HIV testing for pregnant women is rarely mentioned, and in a move to further expand testing of pregnant women, a new report in 2016 describes providing financial incentives to pregnant women who accept HIV testing and are retained in care [39, 40].

In summary, in the 20 years between 1996 and 2016, HIV testing of pregnant women has transitioned from being questioned as potentially too expensive to now being a routine part of integrated care of pregnant women. The sustainability of these services is broadly supported by their success in reducing HIV in children by at least 58 % or more, and the goal of elimination of pediatric AIDS is within sight [3, 41].

Conclusions

These three examples illustrate the significance of a sustained record of HIV testing service provision, the value of creativity and innovation, and the importance of integration of HIV testing services with other health care services. Achieving long-term sustainability of HIV testing services will continue to depend on these critical elements of service delivery, integration, and innovation. Although the future of global funding to respond to the HIV epidemic is unknown, HIV testing services are a core component of international goals in the response to HIV, are necessary to control the HIV epidemic, and are highly likely to be sustained in the future.

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Compliance with Ethical Standards

Conflict of Interest Elizabeth Marum, Martha Conkling, Jabez Kanyanda, Sheila Birungi, Robert Byaruhanga, and Mary Grace Alwano declare that they have no conflict of interest.

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