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SUSTAINABILITY ANALYSIS OF HIV/AIDS SERVICES HAPSAT SIERRA LEONE

NATIONAL HIV/AIDS SECRETARIAT

HEALTH SYSTEMS 20/20

March 2011

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SUSTAINABILITY ANALYSIS OF HIV/AIDS SERVICES HAPSAT SIERRA LEONE

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ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
ARG	AIDS Response Group
ARVs	Antiretrovirals
ART	Antiretroviral Therapy
BCC	Behavioral Change Communication
CHO	Community health officer
CDC	Centers for Disease Control
CHA	Community Health Assistant
CHO	Community Health Officer
CHW	Community Health Worker
CSW	Commercial Sex Worker
EPP	Estimation and Projection Package
FBO	Faith-based Organizations
FTE	Full-Time Equivalent
HACSA	HIV and AIDS Care and Support Association
HAPSAT	HIV/AIDS Program Sustainability Analysis Tool
HARA	HIV and AIDS Reporters Association
HCT	HIV counseling and testing
HIV	Human Immunodeficiency Virus
HRH	Human Resources for Health
HSS	Health System Strengthening
IDU	Injecting Drug User
IT	Information technology
KfW	Kreditanstalt für Wiederaufbau (the German Development Bank)
M&E	Monitoring and Evaluation
MAP	Multi-country HIV/AIDS Program
MARPs	Most-at-risk populations
MCH	Maternal and Child Health
MoH	Ministry of Health
MSM	Men having sex with men

NAC	National AIDS Council
NACP	National AIDS Control Program
NAS	National HIV/AIDS Secretariat
NETHIPS	Network of HIV Positives in Sierra Leone
NSP	National Strategic Plan
NGO	nongovernmental organization
OI	Opportunistic Infections
OVC	Orphans and Vulnerable Children
PEPFAR	President's Emergency Plan for AIDS Relief
PLWH	People Living with HIV
PMTCT	Prevention of Mother-to-Child Transmission of HIV
SEN	State-Enrolled Nurse
SLBS	Sierra Leone Broadcasting Service
SLDHS	Sierra Leone Demographic Health Survey
SS	Supportive Supervision
SSF	Single Stream Financing
SRN	State-Registered Nurse
STI	Sexually Transmitted Infection
SWAASL	Society for Women and AIDS in Africa, Sierra Leone Chapter
TB	Tuberculosis
ToT	Training of trainers
UNAIDS	United Nations AIDS Program
UNFPA	United Nations Population Fund
UNGASS	United Nations General Assembly Special Session
UNICEF	United Nations International Children's Emergency Fund
U.S.	United States
USAID	United States Agency for International Development
WHO	World Health Organization

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EXECUTIVE SUMMARY

BACKGROUND

The national HIV prevalence among 15–49 year olds in Sierra Leone was 1.54 percent in 2008 (Statistics Sierra Leone (SSL) and ICF Macro 2009). Overall HIV prevalence has declined since 2007, including instances among youth. However, the HIV prevalence among the rural population may be on the incline. The transmission of the HIV epidemic in Sierra Leone can be largely attributed to commercial sex activity (Kenya et al. 2010).

In recent years a substantial scale-up of HIV services has occurred, including providing antiretroviral treatment (ART) for 5,552 people as of the end of 2010; however, universal access to key services such as ART and prevention of mother-to-child transmission of HIV (PMTCT) treatment is yet to be achieved. The aim of this document is to provide Sierra Leone's National HIV/AIDS Secretariat (NAS) with an analysis of the unit costs, as well as the financial and human resources available and needed to sustain and scale up Sierra Leone's HIV/AIDS program through 2015. In addition, the report focuses on activities that a broad group of stakeholders involved in Sierra Leone's national response to HIV/AIDS identified as being critical to the sustainability of the country's HIV/AIDS program.

METHODOLOGY

The analysis and recommendations presented in this document are a result of the analysis of epidemiological, programmatic, contextual, and financial findings regarding the response to HIV in Sierra Leone. The methodology for this assessment is similar to that applied in other sustainability analyses that have been carried out by the USAID-supported Health Systems 20/20 project, using the HIV/AIDS Program Sustainability Analysis Tool (HAPSAT). The methodology was adapted to the Sierra Leonean context and implemented as a four-step process:

1. An intensive stakeholder workshop was conducted to determine the key sustainability issues facing Sierra Leone's HIV/AIDS program. Workshop attendees were asked to identify specific issues present in the current program that reduced the program's capacity for sustainability. The stakeholders were placed in topic-specific groups (e.g., prevention, treatment) and then asked to determine what activities could feasibly address these sustainability issues. They were guided by the facilitators of NAS and the HAPSAT team to ensure that the HAPSAT methodology could appropriately assess the feasibility of these activities. To conclude the workshop, the stakeholders were asked to prioritize these activities.
2. Funding availability and unit costs were formulated from information obtained through interviews, financial document review, and primary data collection. Unit costs from the costing exercise of the National Strategic Plan (NSP) of 2011–15 were used as well.
3. National resource requirements and targets for the HIV/AIDS program from 2011–2015 were determined. Two scenarios for scaling up services were formulated: (1) scaling up based on programmatic performance increase in recent years, and (2) scaling up to universal access, which for most services translates to 80-percent coverage of the target population by 2015. The decision for applying these two scenarios, as well as the formulation of the target population per service, was done jointly with NAS.

4. In the fourth and final step, the HAPSAT team developed recommendations, taking into consideration unit cost findings, stakeholder priorities, the review of literature not limited to the HIV epidemic in Sierra Leone, and other relevant contextual factors. These recommendations were presented in a second stakeholder meeting, and a set of predefined recommendations were discussed in detail, revised, and turned into a set of workplans.

FINDINGS AND RECOMMENDATIONS

Scaling up the coverage of HIV services

For Sierra Leone to provide universal access to HIV services by 2015, a substantial scale-up will be needed. If scale-up continues at the rate of recent years, the coverage of PMTCT treatment and HIV counseling and testing (HCT) will exceed the target population (pregnant women, sexually experienced youth aged 15–24, and 25–49 year olds engaged in high-risk sex), but will cover 21 percent of the adult population. The coverage of ART based on past performance will reach 60 percent of those in need of ART, while the coverage of sexually transmitted infection (STI) case management will reach 32 percent.

Prevention outreach among youth and the most-at-risk population (MARPs) were below 5 percent coverage in 2009. The proposed universal targets presented in this report include reaching 100 percent of in-school 6–19 year olds with HIV education over a five-year period, reaching 80 percent of the commercial sex workers (CSWs) and men having sex with men (MSM) with behavioral change communication (BCC) in 2015, reaching 50 percent of injecting drug users (IDUs) with BCC in 2015, and reaching one-third of the fishermen, miners, transporters, and uniformed personnel with BCC every year. This scale-up also includes support groups for CSWs, MSM, and IDUs. For IDUs, needle exchange was further budgeted.

No scale-up in the use of mass media is recommended, as Sierra Leone's HIV response makes adequate use of radio, TV, and billboards for HIV awareness. The radio is a major source of information in Sierra Leone and the TV is widely viewed in the western region, where HIV prevalence is highest. The unit costs of all these media are relatively low, in particular, billboards. The program should routinely review its campaigns through focus groups to ensure the target population is in favor of the messages.

The funding allocation for MARPs is 66 percent based on past performance scenario and 62 percent for reaching universal access by 2015. This funding allocation is in line with the 61.5-percent contribution by MARPs to the country's HIV incidence.

Resource mobilization

The budget required for scaling up major HIV services over 2011–15 totals US$68 million if scale-up targets are based on past performance, or US$119 million if scale-up is to achieve universal access by 2015 (these figures are lower than the entire cost of the NSP of 2011–15, given the wider budgetary scope of the NSP). Both budget figures are higher than the budget expected to be available for HIV services in those years: the total HIV funding currently available for 2011–15 is US$101 million (but this budget includes certain HIV services not included in the above estimates such as blood safety). More importantly, approximately one-third will be invested in health systems strengthening (HSS).

Support for OVC has the highest costs, budgeted at nearly US$36 million if Sierra Leone is to achieve universal access by 2015. Behavioral prevention through outreach activities was costed at US$17 million if scale-up is based on past performance, and US$20.7 million if Sierra Leone is to achieve universal access by 2015.

Participants of the HAPSAT stakeholder meeting identified stigma reduction among health workers as a priority. Stigma reduction among health workers can be conducted through training a subset of the health workers, who would then train their colleagues on the subject. The estimated cost of such training is US$200,000 for the first year and US$61,000 thereafter.

ART will require the second highest amount of funding, costed at US$23.3 million in the scale-up scenario based on universal access by 2015. Despite the relatively large sum, the unit cost of ART of US$351 per patient per year in Sierra Leone (a combination of the price of first- and second-line treatment) is lower than the median cost of first-line ART in low-income countries at US$526 per patient per year (interquartile range of US$513–US$543) (Addai E. et al. 2010).

Human resources for health need

The human resource requirements for ART, PMTCT, HCT, and STI case management are significant for the scale-up towards universal access by 2015. The HAPSAT analysis projects a need in 2015 for 18 doctors, 33 community health officers (CHOs), 344 nurses [including maternal and child health (MCH) aides], and 141 HIV counselors. This is an increase from seven doctors, 12 CHOs, 170 nurses, and 78 HIV counselors needed to provide the 2011 level of services.

Although Sierra Leone already implements task shifting informally, during field visits to health facilities the HAPSAT team observed instances where task shifting could have been implemented in order to provide more efficient services and increase the clinical availability of higher skilled health workers. This suggests a need to move toward a more structured task-shifting strategy, not only to ensure effective implementation, but also to monitor the quality of services being provided. With these considerations the HAPSAT team recommends and have formulated workplans with stakeholders to implement the following (detailed in Chapter 4):

1. Integrating task-shifting procedures into clinical service guidelines and training for implementers.
2. Implementing supportive supervision for quality assurance of services to enable health workers and supervisors to proactively engage in constant improvement of service provision.
3. Developing a clinical mentoring program as a means for ongoing supervision of service quality, which would complement the supportive supervision activity.
4. Establishing a medical consultation call center. This recommendation would make medical expertise more accessible to patients receiving treatment in remote areas by allowing low-skilled health workers to reach experts on-call.

It is also advised that an STI training module that includes HCT training be developed. By ensuring that every STI clinic can also provide HCT services, the national response would drastically increase the number of HCT testing sites and be able to better target groups at high risk of contracting HIV.

Furthermore, in the interest of sustaining human resources currently funded by external resources, compensation for externally funded health workers through incentives or salaries should not exceed Ministry of Health (MoH) compensation for health workers. This is to prevent health worker attrition if and when health workers transition to a MoH payroll.

It is critical that these approaches for increasing the sustainability of human resources are integrated across all health services as the health workforce for HIV services is dependent on the health workforce for the entire health system. This suggests a critical need for an integrated human resources for health (HRH) strategy that includes workforce planning, development, and management, which should be coordinated with and led by the MoH in Sierra Leone.

Enhancing the monitoring and evaluation system

Sierra Leone's HIV response can strengthen the program by enhancing the collection of key program information, for example logistics, quality of service delivery, and service coverage, to effectively handle issues such as stock-outs and duplication of efforts. Based on consultation with NAS and international experts, we recommend the following:

1. Implement a supportive supervision tool, which will standardize the supportive supervision of clinically-based services. This will enable performing analysis on-site for priority setting and action planning. The central monitoring and evaluation (M&E) unit will be able to follow up on the action plans agreed by the service providers and the regional M&E officers. A workplan for supportive supervision has been developed with NAS. Supportive supervision could be enhanced by using mobile devices, yet due to technological challenges, it is likely to succeed more in major urban cities rather than nationwide.
2. Establish HIV response mobile units that will provide primary health care consultations and testing, prevention services, educational materials, and essential pharmaceuticals for common health problems. In addition to regular visits in villages, the mobile clinic will be able to respond to issues identified through data from the supportive supervision system and from the communication system with community health workers (CHWs). For example, if through the supportive supervision data, an increase in HIV prevalence is reported in a given facility, the mobile clinic will visit surrounding villages and offer HIV testing to identify more PLWH and assess where prevention efforts need to be scaled up. The total cost of 13 mobile clinics, one per district, will be US$1.4 million in the first year and US$600,000 per year thereafter.

Implementing the above recommendations to most or all districts and effectively using the data for constant improvement of the program will substantially benefit the HIV response and the overall health system.

Laboratory strengthening

The low HIV-prevalence in Sierra Leone does not justify stand-alone HIV laboratories in most of the facilities, yet laboratory strengthening is required for monitoring ART and opportunistic infections (OI) and STI diagnosis, and is fundamental for HSS.

The Centers for Disease Control estimates a need for strengthening the laboratory capacity of four regional hospitals, 12 district hospitals, and 19 primary clinics. The total cost with overheads will be slightly more than US$4 million for 35 labs. An additional US$450,000 will be required to train 15 lab technicians to become lab technologists and to cover annual attendance of five lab workers at international conferences.

CONCLUSIONS

Sierra Leone's HIV program has made major strides in recent years, and through the NSP for 2011–15, it is examining how to further scale up HIV services and achieve universal access by 2015. The findings of this report indicate that despite the increase in funding, further resource mobilization is required along with careful planning of the available funding and capacity building of the HRH. Furthermore, careful planning requires accurate, timely, comprehensive, and reliable M&E data, and approaches for collecting such data are presented in this report. Specifically, the implementation of the recommended supportive supervision and the HIV response mobile units will enable decision makers to manage the available resources and respond to the need and challenges in a timely manner.

1. INTRODUCTION

1.1 HIV IN SIERRA LEONE

The national HIV prevalence among 15–49 year olds in Sierra Leone was 1.54 percent in 2008 (Statistics Sierra Leone (SSL) and ICF Macro 2009), this figure being slightly, though insignificantly, higher than the 2001 estimate of 1.1 percent (range of 0.6–1.7 percent) (UNAIDS 2010). The relatively low prevalence is partially attributed to the large proportion of circumcised males (Kenya et al. 2010). It is estimated that there were 47,000 (range of 40,000–63,000) people living with HIV (PLWH) in Sierra Leone by December 2009 (UNAIDS 2010). The recently concluded Mode of Transmission study (UNAIDS 2010) summarizes the major trends in the epidemic:

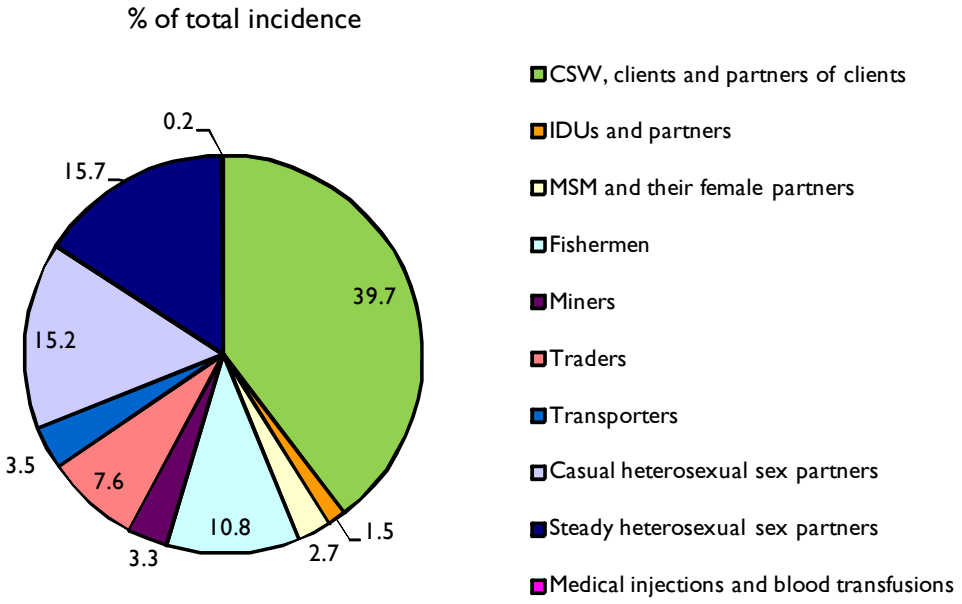
- HIV prevalence in pregnant mothers who received antenatal care (ANC) rose from 3.1 percent in 2003 to 4.4 percent in 2007 and declined to 3.5 percent in 2008. The Sierra Leone 2008 Demographic Health Survey (SLDHS) reported HIV prevalence of 1.5 percent. It is probable that HIV prevalence among pregnant women who have received ANC is overestimated considering the overrepresentation of urban ANC sites and the higher prevalence of HIV among the urban population.
- Another indication the epidemic might have peaked is the HIV prevalence in the 15–19 age group, which peaked in 2007, and has since slowly declined, while the prevalence in the 20–24 age group has stabilized.
- The risk factors and contextual factors driving the HIV epidemic in Sierra Leone are summarized in Table 1. Commercial sex seems to be of particular concern as it is estimated to contribute to almost 40 percent of HIV infections, as detailed in Figure 1.

TABLE 1: RISK FACTORS AND CONTEXTUAL FACTORS DRIVING THE HIV EPIDEMIC IN SIERRA LEONE

Risk Factors for HIV Transmission	Contextual Factors of the HIV/AIDS Epidemic
• Commercial sex networks	• Human rights, stigma & discrimination
• Multiple partnerships and casual sex	• Wealth and poverty
• Discordance and nondisclosure	• Low status of girls & women
• Lack of condom use	• Sociocultural factors
• Presence of STIs	• Inequity and access to prevention
• Transactional sex	• Care and treatment
• Cross-generational sex	

Source: (Kenya et al. 2010)

FIGURE 1: DISTRIBUTION OF HIV INCIDENCE, BY POPULATION



Source: (Kenya et al. 2010)

1.2 NATIONAL RESPONSE TO HIV

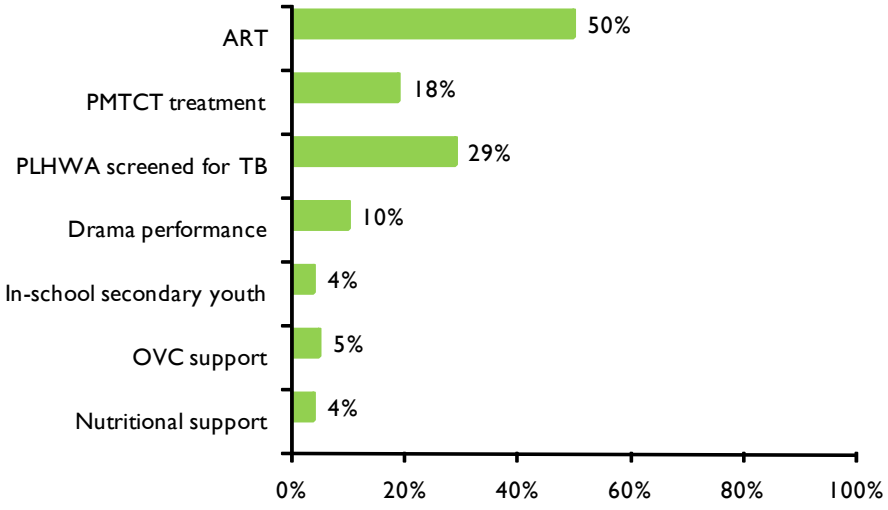
The first recorded case of AIDS in Sierra Leone was reported in 1987 by the Ministry of Health and Sanitation (Kenya et al. 2010). By 2002, the government of Sierra Leone established the National AIDS Council (Nachega et al.), which is responsible for overall policy and management of HIV/AIDS in the health sector's technical arm, and the National AIDS Control Program (NACP), which focuses on surveillance, prevention, care, and capacity building. To ensure that policy recommendations are successfully implemented, the government established the National HIV/AIDS Secretariat (NAS) in 2005, which has defined HIV/AIDS prevention and treatment goals through its National Strategic Plan (NSP) established in 2006. To facilitate faster and more suitable decision making about HIV/AIDS programs at the facility level, the government of Sierra Leone began decentralizing its provision of HIV services to 19 district AIDS committees (National HIV/AIDS Secretariat 2010).

The government of Sierra Leone has also responded to the human rights aspects of HIV/AIDS by creating the Prevention and Control of HIV and AIDS Act of 2007, which provides antidiscriminatory regulations for PLWH in the workplace. In addition, the government has ratified the International Human Rights Protocol, which has clear provisions for gender-related violence and abuse (National AIDS Secretariat and UNAIDS 2010).

The government's response has been complemented by a multipartner response of more than 300 agencies and organizations, including international bilateral and multilateral development organizations, PLWH advocacy groups, faith-based organizations, civil society organizations, private sector partners, and media, to help combat HIV/AIDS. In 2008, to better organize civil society organizations, the government coordinated advocacy groups of PLWH through an umbrella organization called Network of HIV Positives in Sierra Leone (NETHIPS) and media organizations through the HIV and AIDS Reporters Association (HARA) (National HIV/AIDS Secretariat 2010).

The 2009 coverage of key HIV services (Figure 2) suggests that clinical services had a coverage level of 18–50 percent. Prevention and support services had a lower coverage level in 2009, ranging from 4 to 10 percent. Clinical services have seen a large increase in recent years: the number of people on ART increased from 1,950 to 5,552 between 2008 and 2010; PMTCT coverage increased from 18 percent in 2009 to 54 percent in 2010.

FIGURE 2: COVERAGE LEVELS OF KEY HIV SERVICES, 2009



Sources: Target setting consultation of the HAPSAT team with NAS and (National HIV/AIDS Secretariat 2010)

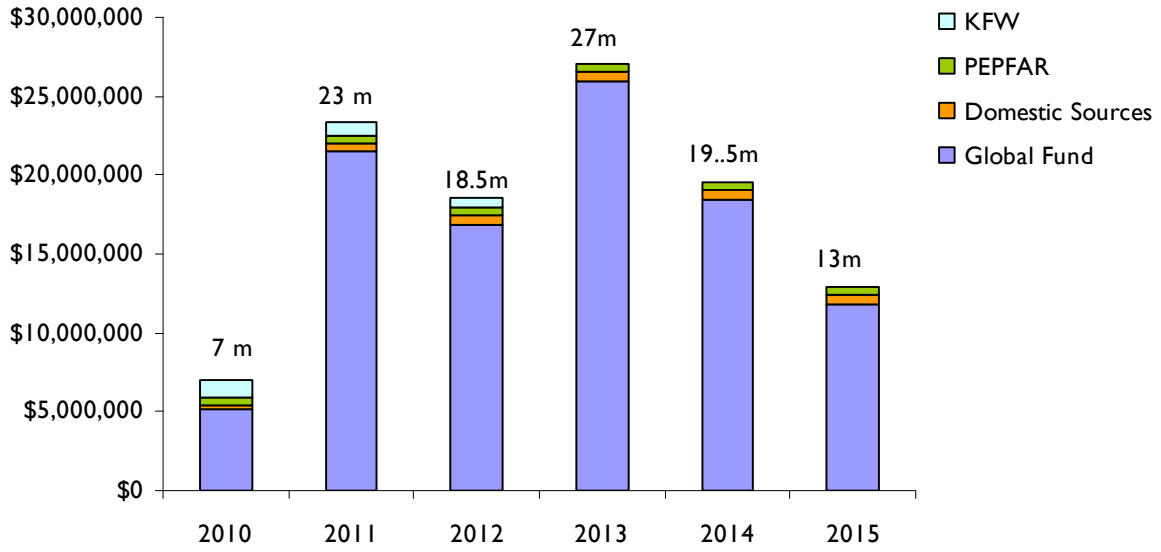
1.3 FUNDING THE HIV EPIDEMIC RESPONSE

The major source of funding of the HIV response in Sierra Leone is the Global Fund, which, beginning in 2011, will be provided through a single stream financing (SSF) grant, the consolidation of Rounds 6 and 9 of the HIV and health system strengthening (HSS) proposals. Funding levels in 2011–14 will range from US$18.5 million to US$27 million (Figure 3). In 2015, funding will decrease to US$13 million, still higher than the 2010 figure of US$7 million. Funding levels for 2011–15 are substantially higher than those in 2006–10, when funding did not exceed US$9.2 million in any one year (Kenya et al. 2010) (preliminary 2008–09 National AIDS Spending Accounts figures). As detailed later in chapter 3, the increase in funding is still short of the estimated need.

Figure 3 includes the funding of only two bilateral agencies: the German Kreditanstalt für Wiederaufbau (KfW) and the President's Emergency Plan for AIDS Relief (PEPFAR). Funding from other bilateral and multilateral organizations to the HIV response in 2011–15 was not publicly available.

The funding levels presented in Figure 3, a total of US$101 million for 2011–15, may increase if new resource mobilization efforts are successful. However, global resources for the HIV response are already flattening (UNAIDS 2010), increasing the competition to attain them. Funding levels may decrease if the performance of the program or certain elements of it are unsatisfactory.

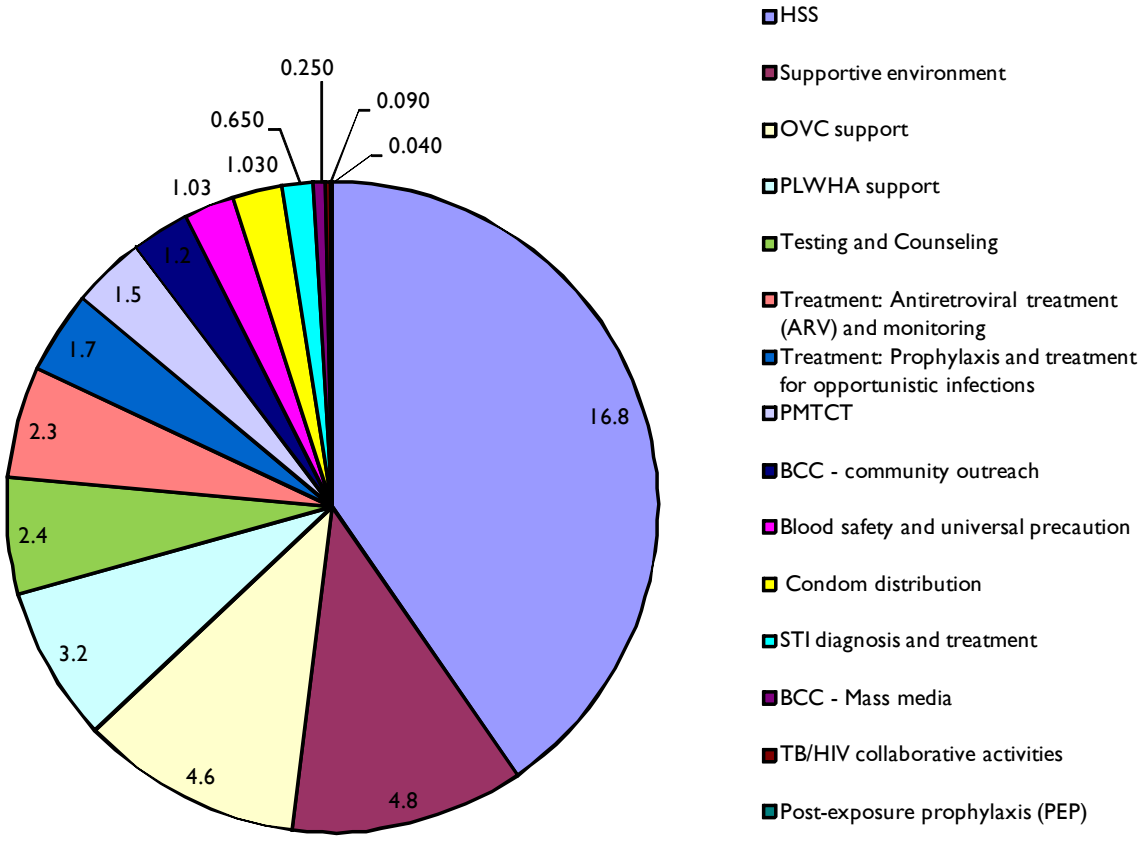
FIGURE 3: SIERRA LEONE HIV FUNDING BY DONOR, 2009–15



The allocation of the Global Fund budget for the HIV response in 2011–12 is detailed in Figure 4. Nearly US$17 million of the US$41.6 million will be invested in HSS, of which US$12.4 million will be for human resources strengthening. The allocation of 40 percent of the budget for HSS is much higher than the Global Fund's average allocation of 16 percent (Figure 5) (Addai E. et al. 2010). Large investment of HIV funding in HSS is in line with the need to use HIV funding to strengthen the health system in a country with a low generalized HIV prevalence. An additional US$4.8 million will be allocated for the supportive environment, mainly for program management, but also for policy development, stigma reduction, strengthening of civil society, and institutional capacity building.

Support for PLWH and orphans and vulnerable children (OVC) has been allocated at US$7.8 million, 19 percent of the 2011–12 budget, compared to the global average of 10 percent in HIV funds from Global Fund, as of 2008 (Figure 5). For 2011–12, Sierra Leone allocated 19 percent and 10 percent of the HIV funding to treatment and prevention, respectively, both amounts substantially lower than the global average of HIV grants in 2008 (30 percent and 27 percent, respectively).

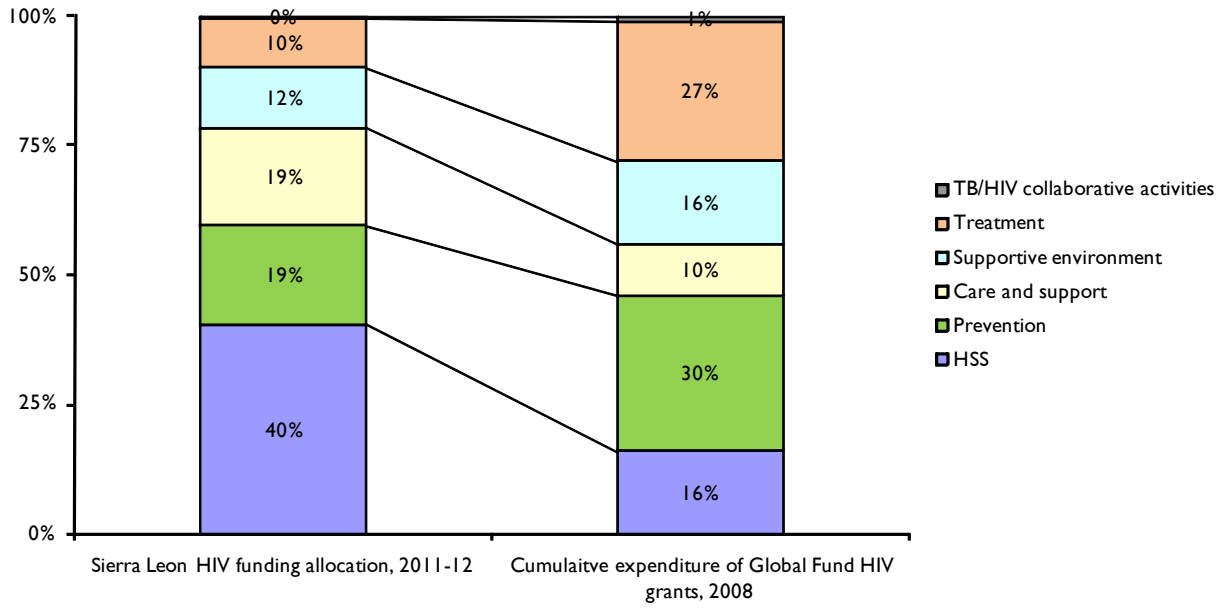
FIGURE 4: DISTRIBUTION OF GLOBAL FUND HIV BUDGET IN SIERRA LEONE FOR OCTOBER 2010 THROUGH 2012 (MILLION US$)



Figures in million US$

Source: SSF Performance Framework 2011–12

FIGURE 5: SIERRA LEONE HIV FUNDING ALLOCATION, 2011–12 (SSF PERFORMANCE FRAMEWORK 2011–12) VERSUS CUMULATIVE EXPENDITURE OF GLOBAL FUND HIV GRANTS, 2008 (ADDAI E. ET AL. 2010)



1.4 EMERGING CHALLENGES

Sierra Leone's HIV response shares many of the challenges that other HIV programs in developing countries encounter (National HIV/AIDS Secretariat 2010). Stigma reduction poses a challenge for prevention, treatment, and care and support activities. Cultural perceptions of HIV/AIDS have been noted to negatively influence the impact and coverage of HIV/AIDS services. For example, stigma in the workplace undermines the access that workers have to HIV services and can also result in low male involvement in prevention of mother-to-child transmission of HIV (PMTCT) activities.

Another challenge is translating knowledge into behavioral change to address issues in several HIV/AIDS programmatic areas. For prevention activities, education's positive impact on behavior could mitigate the identified issues of low usage of condoms, the general population's low-risk perception of contracting HIV, the risks of sexual promiscuity in contracting HIV, and misconceptions about HIV transmission.

Moreover, coordinating funding sources and activities is required to eliminate the risk of duplicate programs and inefficiency in the national response. A thorough and comprehensive list of challenges for the HIV/AIDS program areas, along with suggested remedial actions, is provided by the 2010 United Nations General Assembly Special Session (UNGASS) report for Sierra Leone (National HIV/AIDS Secretariat 2010).

1.5 HIV/AIDS PROGRAM SUSTAINABILITY ANALYSIS

Health Systems 20/20 is a five-year (2006–2011) cooperative agreement (no. GHS-A00-06-000-00) led by Abt Associates Inc. and funded by USAID. The project addresses the financing, governance, operational, and capacity-building constraints that block people in developing countries' access to and use of priority population, health, and nutrition services.

The HIV/AIDS Program Sustainability Analysis Tool (HAPSAT) is composed of a core analysis and a country-specific analysis, which is defined through a stakeholder process. The core analysis estimates the financial and human resources required to sustain and/or scale up a comprehensive portfolio of HIV/AIDS services, using a computer-based tool. The tool was developed by Health Systems 20/20 for forecasting and analyzing the sustainability of HIV/AIDS programs. HAPSAT synthesizes detailed epidemiological, demographic, and economic data to generate a country-specific HIV policy model that can be used to simulate alternative policy scenarios. The analysis estimates resource requirements for a core set of HIV/AIDS services, including antiretroviral therapy (ART), HIV counseling and testing (HCT), PMTCT treatment, behavioral prevention, care and support services for PLWHs (e.g., home-based care, palliative care, psychosocial support), and support for OVC. The country-specific analysis examines topics of particular interest to the stakeholders of the HIV program, such as the costs and benefits of the decentralization.

The HAPSAT model was specifically designed to be flexible so that it can be used in any country setting. The model has been applied in 10 countries and put to a range of uses. In Zambia, HAPSAT was used to inform a Global Fund application. In Nigeria, it supported a World Bank's Multi-Country HIV/AIDS Program (Maposa) application. Kenya is using its HAPSAT analysis to help define the PEPFAR partnership framework between the U.S. government and the Kenyan government. In Cote d'Ivoire, HAPSAT informed USAID's Country Operational Plan and the development of a PEPFAR partnership framework.

1.6 HAPSAT IN SIERRA LEONE

The core analysis of Sierra Leone HAPSAT estimates the financial and human resources required to provide HIV/AIDS-related services in order to analyze the sustainability of the HIV/AIDS programs from 2011 through 2015. The country-specific analysis of Sierra Leone HAPSAT further examines the following areas in scaling up coverage of services and cross-cutting activities that have been identified and prioritized through a stakeholder engagement process:

1. Scaling up the following services: HCT through mobile clinics, sexually transmitted infection (STI) case management, and men having sex with men (MSM) outreach.
2. Strengthening the laboratory capacity and capabilities.
3. Costing the pediatric form versus the adult form of ARV.
4. Providing training to health workers in stigma reduction and training to district monitoring and evaluation (M&E) officers in M&E of HIV services. The stakeholders further requested examining the costing of long-term training for health workers.
5. Strengthening the coordination of implementing care and support services, to ensure the right population receives the right services.
6. Strengthening the supply management system.

Some of these areas are addressed individually; others are combined into a broader analysis. For example, training district M&E officers on M&E of HIV and strengthening the supply management system were addressed through a recommendation for implementing a supportive supervision system, detailed in chapter 4.

A topic the stakeholders prioritized was costing the United Nations Population Fund (UNFPA) communication strategy on HIV/AIDS with Sexual Reproductive Health and Family Planning. This strategy is expected to be costed by another team. As such, it was decided not to proceed with this requested analysis.

The recommendations in this report were presented in a second stakeholder meeting in February 2011, and a set of predefined recommendations were discussed in detail, revised, and turned into a set of workplans.

The Sierra Leone HAPSAT is designed to be an informative tool to help guide Sierra Leone's strategy and funding proposals for its national response to HIV/AIDS.

2. METHODOLOGY

2.1 HAPSAT METHODOLOGY

Resources required to deliver HIV/AIDS services in Sierra Leone in 2011–15 are broken down into two categories: financial resources (donor and government funding) and human resources for service delivery (e.g., medical doctors, nurses, pharmacists). The sustainability analysis is performed using the HAPSAT by examining the measured gap between the resources available and the resources needed to implement the major HIV services. Table 2 details the elements of service delivery that were costed and analyzed in Sierra Leone's HAPSAT and those that were not.

TABLE 2: ELEMENTS OF SERVICE DELIVERY COSTED VS. NOT COSTED IN SIERRA LEONE HAPSAT

Elements costed directly with data from Sierra Leone	Elements not costed (outside HAPSAT scope)
• Drugs and commodities for ART, STI case management and PMTCT treatment • HIV-related laboratory reagents and consumables for testing and monitoring • Professional health worker labor for HIV/AIDS clinical services • Costs for prevention and care and support services • Cost of strengthening of laboratory and certain elements of the health information systems	• New facility infrastructure or renovation • Studies, research • Donor overheads • Administration and support staff in regions and lower tiers of the health system • Non-health staff salaries • Health system strengthening other than laboratory and certain elements of the health information systems

Each service in Sierra Leone's HIV/AIDS program has a defined unit of service by which the program's direct output (service volume) can be measured and reported. For example, a unit of ART service is ART per person per year. Using country-specific data, unit costs were estimated for each service, through one of the following costing methods:

1. Bottom-up costing: an ingredient approach that quantifies the level of inputs required to produce a service and the cost of each of these inputs.
2. Top-down costing: a division of the budget of a given service by the number of people reached by the service.

The bottom-up costing could be considered more suitable for projections as it can exclude capital costs and can be controlled for fixed versus variable costs. However, top-down costing incorporates indirect costs, which may account for a significant proportion of costs that are hard to quantify in a bottom-up costing. Bottom-up costing was the preferred method when possible.

Many of the unit costs were obtained from the team developing the HIV program's NSP 2011–15. The HAPSAT model was used for applying bottom-up costing of ART, HCT, PMTCT treatment, and STI case management. Both costing methods were utilized for the costing of prevention and care and support, depending on the data that partners made available to the costing team. When detailed data were provided, a bottom-up approach was used to cost an intervention. However, when only 'high-level' data

were made available, a top-down approach was used. Neither of the methods includes donors' overhead in the analysis presented here.

2.2 DATA COLLECTION

Country-specific data were collected from NAS; UNAIDS; the Centers for Disease Control (CDC); World Food Program; nongovernmental organizations (NGOs) such as AIDS Response Group (ARG), Dignity, HIV and AIDS Care and Support Association (HACSA), NETHIPS, and Society for Women and AIDS in Africa, Sierra Leone Chapter (SWAASL); and 12 health facilities (Table 4) involved in Sierra Leone's HIV response. Secondary data sources providing relevant input for the HAPSAT were provided by the sources interviewed and by released reports and data from NAS and from the Global Fund.

2.2.1 SERVICE UTILIZATION AND EPIDEMIOLOGICAL DATA

Current service utilization was obtained mainly from the 2010 Sierra Leone UNGASS report (National HIV/AIDS Secretariat 2010), NAS programmatic data, and the drug quantification data of the Global Fund Round 9 proposal. The coverage of prevention outreach, as well as care and support services, is more limited due to the lack of a central strategic information system.

The epidemiological projections of the HAPSAT model were calibrated with those of the Sierra Leone Estimation and Projection Package (EPP), 2010. The EPP modeling was conducted by NAS and UNAIDS, and was used in the HAPSAT to determine both the current and forecasted number of people in need of HIV services over the examined period, 2011–15. The data are presented in Table 3.

TABLE 3: EPIDEMIOLOGICAL PROJECTIONS OF HIV/AIDS, 2011–15

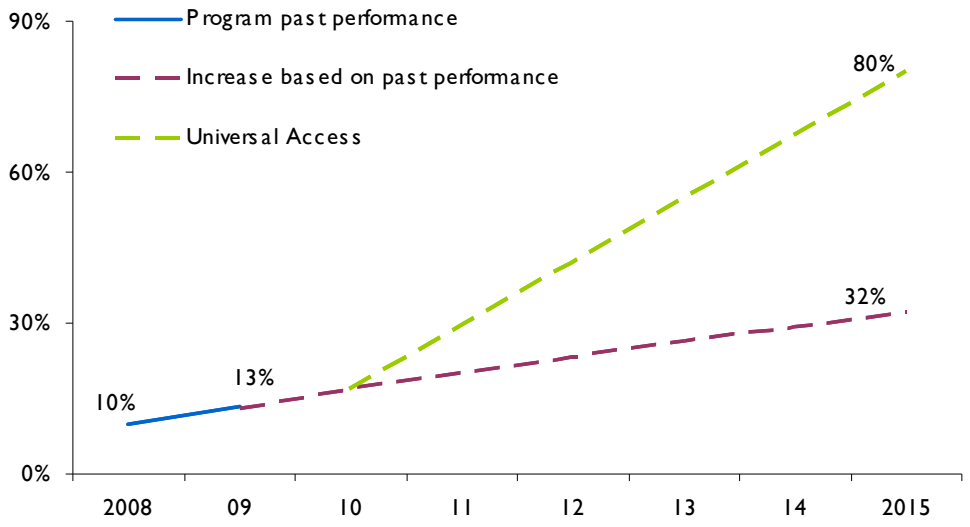
Projections	2011	2012	2013	2014	2015
HIV prevalence	50,710	51,413	52,061	52,746	53,694
New infections	4,517	4,487	4,492	4,560	4,649
AIDS deaths	3,307	3,362	3,412	3,444	3,269
Need for ART (including PLWH needing to start ART)	20,470	21,359	22,111	22,765	23,504
PLWH needing to start ART	3,024	3,005	2,995	2,998	3,019

Note: All data except "PLWH needing to start ART" are from Sierra Leone EPP, 2010. The number of PLWH needing to start ART is calculated as 10 percent of those PLWH not needing ART in the previous year.

2.2.2 SETTING TARGETS

NAS assisted in formulating targets for 2011–15, and these targets are to be used in the NSP. For each activity, two scenarios were set (Figure 6): the first, aiming to achieve universal access to services or treatment by 2015, is a linear interpolation between the latest coverage and 80-percent coverage by 2015. The second scenario was based on past performance, where targets were based on increases in the preceding years, usually between 2008 and 2009. The methodology used for identifying the size of the target population varied from one service to another and is detailed in chapter 3 and in Annex A.

FIGURE 6: SCENARIOS USED FOR SETTING TARGETS FOR STI CASE MANAGEMENT FOR SIERRA LEONE NSP 2011–2015



2.2.3 UNIT PRICE AND LABOR COST

Costs are required for both the consumables and labor that the program uses. The main consumables in this analysis are drugs, nutritional supplies, and laboratory supplies. Drug costs for ART, PMTCT treatment, and STI case management were taken from the drug quantification data of Global Fund Round 9 proposal.

Determining the cost of labor requires data on how much labor by skill type is currently being used to provide each unit of service being delivered. First, it is necessary to determine how much of the health worker's time, broken down by cadre, is required to produce one unit of service, and second, the cost of health workers must be calculated by examining their annual salary. Health worker salaries were taken from the 2010 government salary, which included allowances. For PMTCT treatment, the unit of cost determined is the cost per pregnancy treatment, which includes an 18-month postnatal period, and for HCT, it is the cost per counseling and testing session. The unit cost of ART was per person per year of treatment. The annual number of clinic visits an ART patient made was determined by analyzing ART guidelines. The labor required for the provision of treatment to one ART patient was calculated using data the HAPSAT team collected at sites, detailed below.

To reduce duplication of efforts, the HAPSAT team obtained some of the unit costs from the team developing the HIV program's NSP 2011–15. Additional costing data were obtained from NAS, CDC, and several NGOs (ARG, Dignity, HACSA, and NETHIPS). For prevention and care and support services, no estimates were calculated for human resource needs because of the wide variation in the types of care and cadres required for nonclinical services compared to clinical care, which is delivered according to protocol and by a relatively limited set of cadres.

2.2.4 FACILITY-LEVEL PARAMETERS

Seven government hospitals, two government peripheral health clinics, and three hospitals run by faith-based organizations (FBO) in three different regions (Table 4) were surveyed to determine the human resources currently required to deliver ART, PMTCT, HCT, and STI management. Data collectors interviewed providers of HIV services in these facilities and obtained supplementary information from

service delivery reports. The selected 12 facilities, all providing HIV services and detailed in Table 4, were chosen to incorporate the different characteristics of health facilities in terms of type (e.g., hospital, clinic), settlement type (e.g., urban, rural), and operators (e.g., public sector, FBOs).

TABLE 4: SITES FROM WHICH FACILITY-BASED DATA WERE COLLECTED

Facility	Type of Facility	District
Connaught Government Hospital	Government	Freetown
Rokupa Hospital	Government	Freetown
United Methodist Church General Hospital	Faith-based organization	Freetown
Princess Christian Maternity Hospital	Government	Freetown
Ola During Children's Hospital	Government	Freetown
Makeni Government Hospital	Government	Bombali
Binkolo Community Health Center	Government	Bombali
Kamakie Wesleyan Hospital	Faith-based organization	Bombali
Kenema Government Hospital	Government	Kenema
Panguma Catholic Mission Hospital	Faith-based organization	Kenema
Tongo Field Community Health Center	Government	Kenema
Marie Stopes Hospital	Non-governmental organization	Freetown
St. Anthony Hospital	Faith-based organization	Freetown

2.2.5 RESOURCE EXPENDITURE

Data on the Global Fund budget for HIV/AIDS services from 2011–15 were obtained from the performance framework of the SSF grant, the consolidation of Rounds 6 and 9 of the HIV and HSS proposals. The Round 9 HIV and HSS proposal was used to identify domestic funding and other external resources for the HIV response, though it included only KfW contributions. Regarding the Round 7 Tuberculosis (TB) grant, only the budgets allocated to HIV/TB service delivery areas were used in the HAPSAT analysis.

A range of bilateral and multilateral organizations work in Sierra Leone, including the World Health Organization (WHO), United Nations AIDS Program, the European Union, IrishAID, UNAIDS, UNICEF, United Kingdom Department for International Development, PEPFAR, U.S. Department of Defense, and UNFPA. Funding from these organizations to the HIV response in 2011–15 was not publicly available. Only the potential financial contribution of PEPFAR and CDC were assessed, though these projections may change overtime.

3. CURRENT AND TARGET SERVICE DELIVERY LEVELS AND THEIR PROJECTED COSTS

Chapter 3 reviews the targets and budgets required for scaling up the major HIV services from 2011–15. The chapter provides details on the unit costs of the various activities as well as the need, current coverage, required scale-up, and funding needed. The chapter is divided into the following sections:

1. Service delivery and projection for clinically based HIV services, including ART, PMTCT treatment, HCT, and STI case management.
2. Prevention services, including HIV awareness through mass media, condom distribution, outreach activities for most-at-risk populations (MARPs) and the wider population, and HIV education for youth.
3. Care and support services for OVC and PLWH.
4. Required financial resources for scale-up of major HIV services.

3.1 SERVICE DELIVERY AND PROJECTION FOR CLINICALLY BASED HIV SERVICES

The unit costs of clinically based HIV services, including ART, PMTCT treatment, HCT, and STI case management, are presented in Table 5, and the five-year targets and budgets are presented in Figure 7. Costing data for PMTCT treatment, HCT, and STI case management were collected through facility-based interviews and document review (for drug, laboratory, and regimen distribution parameters), which were then input into the HAPSAT model.

TABLE 5: ESTIMATED UNIT COSTS FOR 2011–15 OF CLINICALLY BASED HIV SERVICES

Services	Annual unit cost (US$)	Method/source
ART	$351	NSP 2011–15 costing & HAPSAT 2010 costing
PMTCT treatment	$202	HAPSAT 2010 costing
HCT	$2.6	HAPSAT 2010 costing
STI cases treated	$10.3	HAPSAT 2010 costing

Note: The unit cost includes costs of labor, drugs (not applicable for HCT), diagnostic tests, training, supply chain management, and overhead.

ART treatment — the treatment to prolong lives of PLWH — has the highest unit cost, at US$351 per person per year. However, the unit cost of ART at US$351 per patient per year in Sierra Leone (a combination of the price of first- and second-line treatment) is lower than the median cost of first-line ART in low-income countries of US$526 (interquartile range US$513–US$543) (Addai E. et al. 2010). If the scale-up of this service is based on past performance, the coverage will be 60 percent of the PLWH population needing ART by 2015 and will cost US$18.8 million. Universal coverage by 2015 will cost US$23.3 million.

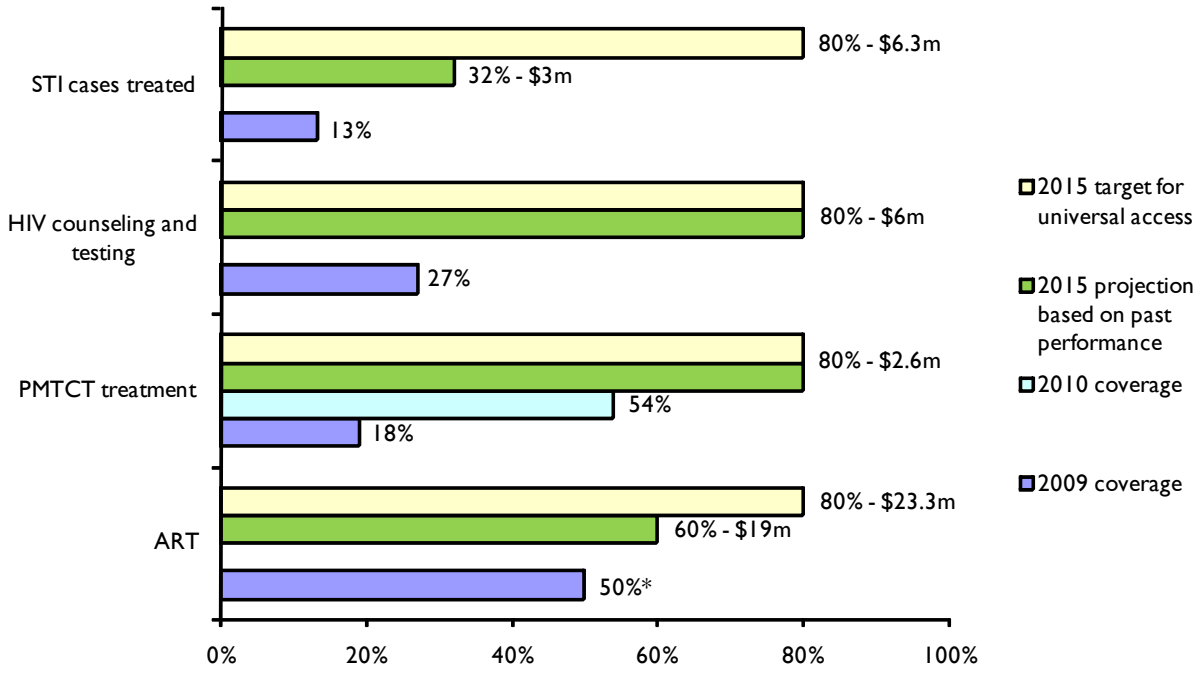
The scale-up of PMTCT services in Sierra Leone, as elsewhere, faces major challenges in its expansion, due to AIDS stigma, as well as other reasons. However, between 2009 and 2010, the proportion of HIV-

positive pregnant women receiving PMTCT treatment has seen a large increase, from 18 percent to 54 percent. If this trend continues, this service is likely to reach universal access by 2015.

Based on past scale-up of HCT services, it will be possible to provide universal coverage of HCT to the target population (i.e., sexually experienced individuals among 15–24 year olds; 25–49 year olds who have two or more partners and/or have sexual intercourse with a non-marital, non-cohabiting partner; and pregnant women — see notes of Figure 7 and Table A-1). However, the HCT registers need to be modified to enable monitoring of the extent the target population is covered by HCT. While the above target population should be the focus of HCT, the wider adult population should also be encouraged to be tested for HIV. The HCT coverage of the entire adult population will reach 21 percent.

Scale-up of STI case management services, based on past performance, is expected to reach relatively low coverage by 2015 (32 percent). Given the limited capacity of the laboratories, for the unit cost it was assumed that STI case management will gradually convert from syndromic observation to lab diagnosis.

FIGURE 7: 2009 REPORTED COVERAGE AND 2015 PROJECTED COVERAGE AND BUDGET NEED OF CLINICALLY BASED HIV SERVICES, BASED ON SCALE-UP OF PAST PERFORMANCE AND UNIVERSAL ACCESS



Notes: Target group of HCT: Pregnant women, sexually experienced youth aged 15–24 years old, and 25–49 year olds engaged in high-risk sex. The coverage among the entire adult population will be 7 percent in 2009 and 21 percent in 2015.

* The estimated number of people in need of ART is taken from 2009 EPP estimates (National HIV/AIDS Secretariat 2010).

3.1.1 PEDIATRIC FORMULATIONS OF ANTIRETROVIRAL REGIMENS

Pediatric formulations of antiretroviral (ARVs) regimens procured in Sierra Leone are limited in providing the range of quality treatment necessary to treat children with AIDS. The current procurement for pediatric formulations includes liquid formulations for infants and fixed dose regimens containing Stavudine. Common pediatric regimens that are not procured in pediatric formulations result in administering to children the higher dosed adult formulations. These higher dosed ARV pills for adults

are usually split into various proportions to provide children with an approximation of the appropriate dosage.

Without the availability of pediatric formulations, the likelihood of over- or under-dosing pediatric ART patients with adult formulations of ARV regimens is high and can put the child at risk of treatment failure. In addition to the risk of improper dosing, splitting pills incurs a waste of drugs from imperfect breakage.

With these considerations, it is recommended that pediatric formulations of the ARV regimens shown in Table 6 be procured in addition to those already procured, to enhance the quality of ART for children with AIDS in Sierra Leone:

TABLE 6: PEDIATRIC FORMULATIONS CURRENTLY NOT PROCURED AND THEIR PRIORITY LEVEL FOR PROCUREMENT IN SIERRA LEONE

Drug	Priority
Lamivudine + Zidovudine	High
Lamivudine + Zidovudine + Nevirapine	High
Zidovudine	Medium
Abacavir	Low
Efivarenz	High
Tenofovir	High

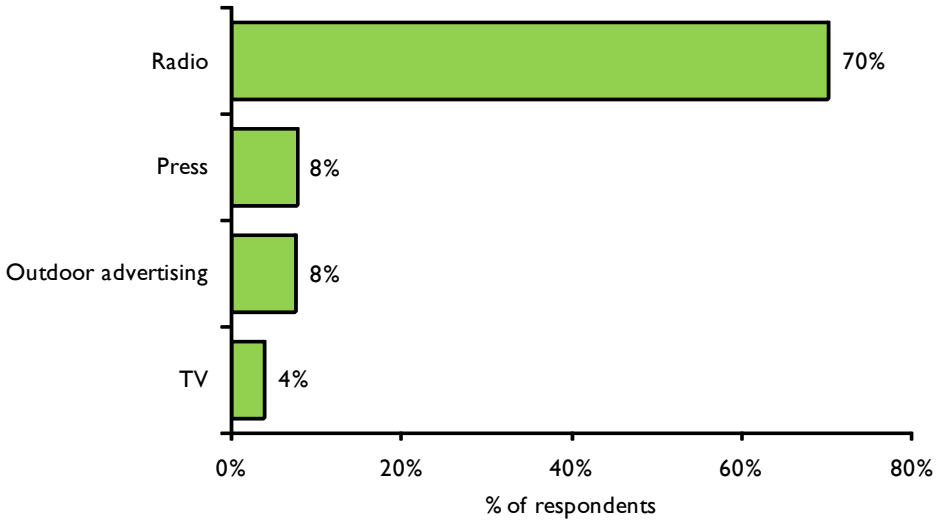
3.2 PREVENTION SERVICES

3.2.1 HIV AWARENESS THROUGH MASS MEDIA

In 2010, NAS and implementing partners used three forms of mass media for HIV awareness: radio, TV, and billboards. The press was used only twice a month for HIV awareness. A nationally representative media survey conducted in 2008 in Sierra Leone (Mytton 2008) provides some insight on the population exposed to the various media. As shown in Figure 8, the main source of information was the local radio, with 70 percent of the respondents reporting radio as a source of their information. Listenership varied by region, with the highest level reported in the western region (93 percent) and the lowest in the south region (62 percent).

Newspapers and outdoor advertising each were reported by 8 percent of the population as their source of information, while 4 percent of the population reported TV as their main source. As with radio listenership, TV viewership differed by region — with up to 42 percent of the respondents in the western region reporting ever having watched TV, compared to 5 percent in the east region.

FIGURE 8: LOCAL MASS MEDIA AS SOURCE OF INFORMATION FOR SIERRA LEONEANS, BY MEDIUM (MYTTON 2008)



Note: International mass media excluded.

Based on the cost and exposure, the unit costs of radio and TV are US$0.014 and US$0.039 per exposure, respectively (Table 7). To ensure national coverage, NAS utilizes 13 district radio stations and broadcasts messages in four languages (Krio, Mende, Temne, and Limba), and uses only one television station, Sierra Leone Broadcasting Service (SLBS). Sierra Leona has approximately 20 billboards, and NAS aims to increase the number to 100 by 2015. Billboards have the cheapest cost per single exposure: US$0.002.

TABLE 7: COST, EXPOSURE, AND UNIT COST OF MASS MEDIA FOR HIV AWARENESS

Medium	TV (SLBS)	Radio (14 stations)	Billboards
Production cost	$10,500	$214,200	$2,600 for a new billboard, $867 for maintaining an existing billboard
Planning cost	$17,000	$17,000	$17,000
Overhead	15%	15%	15%
Total cost	$32,500	$272,000	Ranges from $101,000 to $162,000, annually
Frequency	52 episodes of a TV program and 1,092 ads	15,288 ads	Additional 20 billboards per year, 100 cumulatively
Exposure (rounded figures)	840,000	19.7 million	64 million
Unit cost per exposure	$0.039	$0.014	$0.002

(Source of cost data: Abu Bakarr Koroma, pers. Comm., November 17, 2010, and March 1, 2011)

Note: For TV and radio, we established the number of people that might be exposed to a given medium (potential population) by multiplying Sierra Leone's adult population in the proportion for which this medium was a source of information (Figure 8). For radio, we also factored that the national station was SLBS, with 33 percent exposure. We then multiplied this figure by the frequency of the medium and by 0.5 percent, assuming only 0.5 percent of the potential population would actually be exposed per frequency. For billboards, due to lack of data, we used estimates from another HAPSAT study and assumed 2,300 persons view each billboard per day.

NAS uses additional promotional material such as posters, stickers, t-shirts, and brochures. Posters are placed in public offices such as banks, hospitals, registries, communities, and schools. Brochures are mainly distributed through educational institutions. In 2010, NAS invested US$81,500 in these types of materials, and an estimated 9,000 posters, 10,000 brochures, and 3,000 stickers were distributed per quarter. To avoid overproduction or shortage of promotional materials, inventory should be taken of the materials distributed in the previous quarter and the needs of the upcoming media campaign should be reassessed.

Exposure, as costed in the above paragraphs, is a prerequisite for attracting favorable interest in a product or advertisement — the ultimate goal of an advertisement (Lilien et al. 1992). In the commercial industry, advertising agencies frequently organize focus groups before and during a campaign to evaluate whether the target population favors the evaluated ad, and, if necessary, to modify it. The planning cost in Table 7 factors the cost of conducting four focus groups per campaign, assuming four campaigns per year.

Sierra Leone's HIV response aims to make adequate use of radio, TV, and billboards for HIV awareness: four campaigns a year are aired through a comprehensive use of radio and TV, and the former is a major source of information in Sierra Leone; TV is widely viewed in the western region, where HIV prevalence is highest; and the location and message of billboards are routinely changed. The program should routinely review its campaigns through focus groups to ensure the target population is in favor of the messages it portrays.

3.2.2 CONDOM DISTRIBUTION AND OUTREACH ACTIVITIES

Outreach activities, in which the target population is reached in person, are considered to be more effective than HIV awareness through mass media. Condom distribution, in particular, enables the recipient to practice one of the major safe sex behaviors.

Table 8 presents various unit costs of prevention outreach, both for MARPs and for the wider population. Table 9 provides targets and budgets for these activities. The unit cost of condom distribution is low, yet the target population is high, and with it, the required funding to reach this population will be high. For example, distribution of male condoms will cost US$1.1 million if scale-up is based on past performance, yet universal access (defined here as 70 percent of the target population, as it is assumed that other programs will provide the remaining 10 percent) will cost US$4.3 million. Detailed figures on the need, coverage, and cost per activity are provided in Annex A.

TABLE 8: ESTIMATED UNIT COSTS OF OUTREACH ACTIVITIES

Target population	Unit service	Annual unit cost (US$)	Method/source
General population	Male condoms distributed	$0.0353	Drug quantification data of Round 9 proposal plus 15% overhead
	Female condoms distributed	$1.18	
Most-at-risk-populations	Support groups	$85 (additional $5 for needle exchange for IDUs)	Triangulation of data from NAS (Abu Bakarr Koroma, pers. comm., Feb 25 2011), and the NGOs SWAASL and Dignity
	Outreach activities (Monthly meeting, one-to-one and one to-many)	$8.4 (additional $5 for needle exchange for IDUs)	
	Number of MSM tested for HIV	$1,080 for HCT training; $2.6 per provision of test	Dignity NGO and HAPSAT 2010 costing
	Number of sex workers enrolled in vocational training for alternative careers	$508	2010 costing of Global Fund-supported vocational training for OVCs

In a country with a low HIV prevalence such as Sierra Leone, focusing on MARPs (including commercial sex workers (CSWs), MSM, miners, fishermen, injecting drug users (IDUs), transporters, and uniformed personnel), from which 61.5 percent of the infections derive (see section 1.1), is a priority (Kenya et al. 2010). Table 9 provides the targets and budgets for activities targeting these populations. Of particular importance are the CSWs, MSM, and IDUs, who have the highest incidence rate in Sierra Leone (Kenya et al. 2010).

Very little is known about MSM in Sierra Leone because this sexual activity is illegal. In 2010, through NAS political support, a study was conducted among 400 MSM in four urban settings. The study found the HIV prevalence among MSM to be 7.5 percent (National HIV/AIDS Control Programme and Ministry of Health and Sanitation 2010). NAS' political support further enabled Dignity, formerly known as Sierra Leone Lesbian and Gay Association, to scale up its reach of MSM for HIV prevention activities: from 150 in 2008, to 350 in 2009, and to 600 by October 2010. All activities took place in Makeni, Bo, Kenema, and the western area. Three interventions among MSM were costed: support groups, outreach intervention, and HIV testing (Table 8). HCT among MSM can be scaled up by training peer educators on HCT and providing them with test kits.

TABLE 9: 2009 REPORTED COVERAGE AND 2015 PROJECTED COVERAGE OF OUTREACH HIV SERVICES, BASED ON SCALE-UP OF PAST PERFORMANCE AND UNIVERSAL ACCESS PROJECTIONS

Service	2009 coverage	2015 projection based on past performance	Five-year budget required based on past performance ($US millions)	2015 target for universal access	Five-year budget required for universal access ($US millions)	Notes
Male condoms distributed	4%	16%	$1.1	70%	$4.3	The remaining 10% are expected to be funded and distributed by other programs
Female condoms distributed	10%	50%	$0.42	70%	$0.49	
MSM participating in support groups				20%	$0.124	
MSM reached with BCC	15%	80%	$0.069	80%	$0.069	
MSM tested for HIV				80%	$0.021	
CSWs participating in support groups				20%	$6.5	
CSWs reached with BCC				80%	$1.7	
CSWs enrolled in vocational training for alternative careers	0.30%	1.80%	$2.7	4%	$5.8	
IDUs reached with BCC				50%	$0.025	
IDUs reached with support groups				20%	$0.098	
Fishermen, miners, transporters, and uniformed personnel reached with BCC	Under the universal access scenario, each of the fishermen, miner, transporters, and uniformed personnel will be reached with an HIV awareness activity every third year, at a total cost of US$2.9 million.					

3.2.3 HIV EDUCATION FOR CHILDREN AND YOUTH

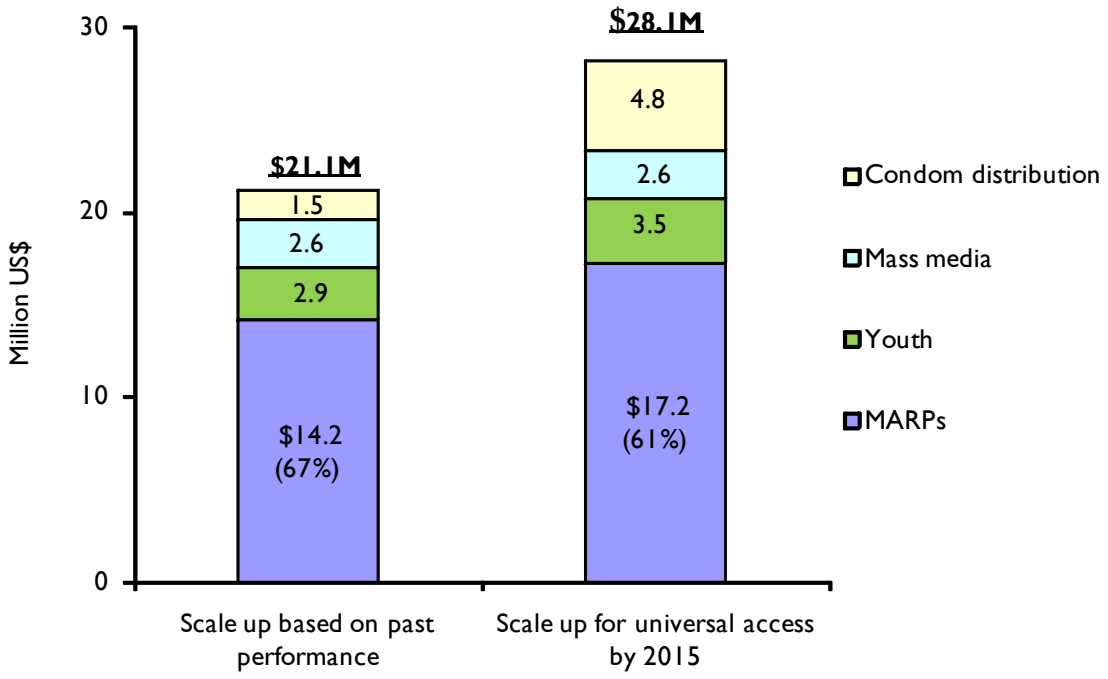
A priority for the Sierra Leone HIV response is providing in-school youth with HIV prevention. Targeting this population, the majority of whom are sexually inexperienced, increases the probability they will adopt safe sex practices, which in turn will stabilize or even decrease the HIV prevalence in the mid and long term. When setting targets, NAS decided to set a target of 100 percent cumulatively over five years. In other words, all in-school children and adolescents will be reached once during the 2011–15 period with a comprehensive HIV prevention program. This includes both primary school children and secondary school youth.

Targets are ambitious: in 2009, only 4 percent of secondary in-school youth had been reached with HIV prevention, compared with the required 20-percent annual target in order to achieve a 100-percent reach over five years. The cost of training a teacher in HIV prevention is US$75, according to the costing of the NSP 2011–15. Assuming 30 pupils per teacher, the unit cost of reaching one in-school child/youth is US$2.5. Reaching 100 percent of school-age children and youth over a five-year period will cost US$3.5 million, with the following breakdown: US$2 million for primary school-age children in school; US$1.5 million for secondary school-age youth in school. Detailed figures on the need, coverage, and cost per activity are provided in Annex A.

3.2.4 OVERALL FUNDING FOR BEHAVIORAL HIV PREVENTION SERVICES

Figure 9 details the funding distribution for behavioral HIV prevention services. The allocation for MARPs is 67 percent based on past performance scenario and 61 percent for reaching universal access by 2015. This funding allocation is in line with the contribution of the targeted MARPs of 61.5 percent of the HIV incidence (Figure 1).

FIGURE 9: DISTRIBUTION OF FUNDING FOR BEHAVIORAL HIV PREVENTION SERVICES, BY SCALE-UP SCENARIO



3.3 CARE AND SUPPORT SERVICES

3.3.1 SUPPORT FOR OVC

The unit cost for care and support for OVC was calculated per unit package of education, health care support, family/home support, and community support per OVC, as costed by the 2011–15 NSP team (Table 10). Each beneficiary will not necessarily be provided with all services. For example, there are different unit costs for health and education for the different age groups, as shown in Table 10. The costs of these items were weighted by the distribution of the age groups. Other activities such as skills

training and outreach for street children are likely to be given to a very small proportion of the OVC. After weighing for these factors, the unit cost of a comprehensive package of support for OVC is US$553.

TABLE 10: UNIT COST OF OVC SUPPORT ACTIVITIES

Service	Cost per service	Proportion of OVC to be reached	Weighted cost per service
Education			
Primary school			
School fees	$1.90	20%	$0.38
Uniforms and pair of shoes	$23.81	20%	$4.82
Books and supplies, including school bag	$28.57	20%	$5.79
Lunch	$42.90	20%	$8.68
Transportation	$35.71	20%	$7.23
Secondary school			
School fees	$18.00	32%	$5.67
Uniforms and pair of shoes	$23.81	32%	$7.50
Books and supplies, including school bag	$28.57	32%	$9.00
Skills training	$779.20	10%	$77.92
Lunch	$42.86	32%	$13.50
Transportation	$35.71	32%	$11.25
Health care support			
Child 0–4	Entitled to free health care		
Child 5–9			
Routine health care	$31.70	27%	$8.56
Child 10–18			
Routine health care	$28.10	42%	$11.80
Reproductive health and HIV prevention information and services	$40.60	42%	$17.05
Family/home support			
Bednet	$7.10	63%	$4.44
Clothes	$28.30	63%	$17.69
Shoes	$15.60	63%	$9.75
Blanket and bedding	$6.00	63%	$3.75
Food	$142.86	63%	$89.29
Income-generating activities	$65.70	63%	$41.06
Seed for food crops	$65.70	63%	$41.06
Self-support grants	$2.00	63%	$1.25
Psychosocial support	$71.00	63%	$44.38
Community support			
Identification of OVC in the community	$9.70	10%	$0.97

Service	Cost per service	Proportion of OVC to be reached	Weighted cost per service
Outreach for street children	$50.00	20%	$10.00
Train and support one full-time community worker	$345.00	5%	$17.25
Total cost for OVC package (including 15% overhead)	$2,332		$553

Notes:

1. Unit costs were obtained from the NSP 2011–15 costing and (National HIV and AIDS Secretariat (Sierra Leone) 2009).
2. Weight for education is composed of the proportion of the age group among the entire OVC age group and the NSP 2011–15 target of 60 percent for this service.
3. The weight of 63 percent for family support was based on NSP 2011–15 target of 50 percent for this service. The weight was further adjusted to factor that universal access aims at 80 percent, coverage, not 100 percent.
4. Most OVC are identified by nurses, hence the low weight of 10 percent of identification of OVC in the community.

Two target-setting scenarios were costed: (1) past performance and (2) responding to need (Table 11). The first scenario provided coverage for 4 percent of the OVC by 2015, costed at US$2.7 million. The scenario of universal access by 2015 was costed at US$36 million.

TABLE 11: TARGETS AND BUDGETS FOR OVC PROVIDED WITH EXTERNAL CARE AND SUPPORT

Target scenario		Targets					Five-year cost (US$)
		2011	2012	2013	2014	2015	
Need		20,233	22,506	24,690	26,734	28,366	
Past performance	Reach	902	935	968	1,001	1,034	$2.7 million
	Coverage	4%	4%	4%	4%	4%	
	Cost (US$)	$498,806	$517,055	$535,304	$553,553	$571,802	
Universal access	Reach	4,100	7,922	12,378	17,395	22,693	$36 million
	Coverage	20%	35%	50%	65%	80%	
	Cost (US$)	$2,267,487	$4,380,828	$6,844,917	$9,619,353	$12,549,118	

3.3.2 CARE AND SUPPORT FOR PEOPLE LIVING WITH HIV

PLWH, including those on ART and those waiting for treatment, have a range of care and support needs, including psychosocial, physical, socioeconomic, and legal care and support. There is a lack of clarity about what comprises comprehensive care and support (UNAIDS 2010), and with it, who is entitled to what. An exception is nutritional support, where some guidance exists, as detailed in Table 12 (World Health Organisation (WHO) 2009).

TABLE 12: NUTRITIONAL CARE AND SUPPORT FOCUS AT DIFFERENT STAGES OF HIV AND AIDS (WORLD HEALTH ORGANISATION (WHO) 2009)

Stages	Signs	Nutritional care and support
Asymptomatic	No physical sign or symptoms	• Educating PLWH about the importance of nutrition. • Eating a variety of foods • Storing and preparing foods safely.
Symptomatic (acute)	Acute infections, fever, night sweats, fatigue, headache, loss of appetite, loss of <10 percent of body weight	• Continuing with earlier activities. • Addressing food and eating-related symptom • Preventing weight loss • Ensuring sufficient access to food
Symptomatic (chronic)/AIDS	Chronic infections, prolonged fever, diarrhea, TB, pneumonia, loss of >10 percent of body weight	• Continuing with earlier activities. • Providing adequate energy to reduce effects of malnutrition • Managing drug-nutrient interactions.
Palliative care	Severe wasting syndrome	• Alleviating symptoms and providing support to the client and caregiver.

Various services are provided to PLWH. Each service contributes to the quality of life of the recipient, the ultimate aim of support services. Some have additional benefits. Support groups, where PLWH meet on a routine basis to discuss issues related to their HIV status, assist PLWH to manage HIV self-stigma — a factor in ART adherence (Dlamini et al. 2009). Nutritional support is essential for successful treatment and, like support groups, is critical for treatment adherence. Furthermore, adherence is reported to be linked to the number of self-reported slimming symptoms and, as such, it is important to provide nutritional support to people on ART to minimize slimming (Marcellin et al. 2008). Treatment interruption often leads to resistance to ARV, at both the first- and second-line regimens (Oyugi et al. 2007). In addition to complicating the treatment, second- and third-line regimens are substantially more expensive than first-line regimens.

In Table 13, the entitlement for the different types of support is mapped by disease stage, the main criteria for providing support services for PLWH. All PLWH, regardless of the stage of their disease, may require legal support, and all will need nutritional advice, which is frequently provided by their health provider. PLWH in the various stages may benefit from psychosocial support, though the more symptoms a person has, the more likely the person will require such support. In stages 1 and 2, people are expected to be able to work, yet in stage 3, and even more so in stage 4, they may require training in income-generating activities if they are not healthy enough to support themselves with their current skills. If they are not able to support themselves, they may require palliative care, nutritional support, and/or home-based care.

In 2010, the NAS formulated program entry and exit criteria for provision of support for OVC and PLWH (National HIV/AIDS Secretariat (Sierra Leone) 2010). These criteria are of extreme importance as they ensure the sustainability by determining not only who should benefit from these costly support services, but also who should cease dependency on them.

TABLE 13: ENTITLEMENT FOR DIFFERENT TYPES OF SUPPORT, BY STAGE

Type of support	Stage				Rationale
	1	2	3	4	
Legal					
Nutritional advice					
Psychosocial (incl. Support groups)					
Income-generating activities					
Palliative care					
Nutritional support					As per Table 12
Home-based care					

Not entitled | | | | | | Most entitled

The unit cost for care and support for PLWH was calculated per comprehensive package of psychological and financial support, as well as for palliative and home-based care, with a unit cost of US$168 (Table 14). As with OVC support, not every PLWH will be given all these services. Nutritional support was budgeted separately at a unit cost of US$360 per person per year, based on costing of 2010 Global Fund activities.

TABLE 14: UNIT COST OF PLWH SUPPORT ACTIVITIES

Service	Cost per service	Proportion of targeted PLWH to be reached	Weighted cost per service
Support groups	$85	100%	$85
Income-generating activities with seed capital	$131	25%	$33
Palliative care for adults	$ 90	20%	$18
Home-based care	$35	20%	$7
Support services, excluding nutritional support (including 15% overhead)			$168
Nutritional support	$360	Not integrated into the unit cost of the above	

Note: Unit costs were obtained from the NSP 2011–15 costing and 2010 Global Fund's activities.

Universal access of support services (excluding nutritional support) will cost US$10 million (Table 15). Based on past performance scenarios, coverage of nutritional support will reach 11 percent of the PLWH and will cost US$3.7 million. A much more ambitious target of 80-percent coverage was also calculated and costed at US$7.3 million. The nutritional support universal access target was set to 27.5 percent, rather than 80 percent, as the entry and exit criteria for support services mentioned above will limit the number of PLWH eligible for such support. In 2008, the national prevalence of global acute malnutrition was 10 percent, while Sierra Leone's prevalence of chronic malnutrition or stunting was 36.4 percent (Statistics Sierra Leone (SSL) and ICF Macro 2009).

TABLE 15: TARGETS AND BUDGETS FOR PLWH PROVIDED WITH EXTERNAL CARE AND SUPPORT

Target scenario		Targets					Five-year cost (US$)
		2011	2012	2013	2014	2015	
Need		20,470	21,359	22,111	22,765	23,504	
Support services (excluding nutritional support)							
Universal access	Reach	3,866	9,684	12,579	15,582	18,803	US$10 million
	Coverage	19%	45%	57%	68%	80%	
	Cost (US$)	$649,488	$1,626,844	$2,113,321	$2,617,722	$3,158,938	
Nutritional support							
Past performance	Reach	1,352	1,689	2,026	2,363	2,700	US$3.7 million
	Coverage	6.6%	7.9%	9.2%	10.4%	11.5%	
	Cost (US$)	$486,720	$608,040	$729,360	$850,680	$972,000	
Responding to estimated need of 27.5%	Reach	1,737	2,828	3,979	5,178	6,464	UD$7.3 million
	Coverage	8%	13%	18%	23%	27.5%	
	Cost (US$)	$625,396	$1,018,053	$1,432,260	$1,864,179	$2,326,896	

Note: The 2011 reach of 3,866 reflects the minimum number of PLWH reached receiving training and home-based care between May 2009 and May 2010; no past performance scenario was projected for support services (excluding nutritional support) due to lack of trend data.

BOX 1: STIGMA REDUCTION AMONG HEALTH WORKERS

Stigma reduction was identified in the 2010 UNGASS Report of Sierra Leone as a major challenge (National HIV/AIDS Secretariat 2010). The care and support activities detailed above are tailored for reducing HIV self-stigma. Stigma reduction among health workers was prioritized by the participants of the HAPSAT stakeholder meeting.

Stigma reduction among health workers can be conducted through training. The large number of health workers needed to be trained can make training very expensive, if experts on the subject train all health workers. A more efficient way to handle training would be to equip a subset of the health workers with stigma-reduction training skills, and they would then train their colleagues on the subject. The training of trainers (ToT) can be conducted in two days. These two days can be split into two sessions, each one-day long, within an interval of one month, to enable the trainees to reflect on the course material. The first session can include an overview of the subject and its importance as well as role plays, while the second session can be used for participants to discuss their thoughts and experiences since the first session and to assess the extent trainers trained their colleagues.

A total of 400 health professionals will need to be trained to reach the approximately 8,000 health workers of Sierra Leone (one trainer per 20 health workers). With a two-day ToT cost of US$192, the total cost would be US$78,400 for the first year. The training will need to be conducted annually. After the first year, the majority of trainings in a given year would be a one-day refresher course. The minority of trainings would be for new trainees, which would involve a two-day training. Assuming a 15-percent attrition rate, new recruits filling the vacant positions would need to be fully trained and those remaining would require a one-day refresher course (US$96 per person); the annual cost of stigma reduction would be US$43,000 after the first year. The trained trainers would be required to provide workshops on stigma and discrimination to their colleagues. The cost per trainee is estimated to be US$15, which includes snacks, materials, and transportation for those arriving from the health posts. Conducting these workshops will require US$120,000 in 2011 and, assuming an attrition rate of 15 percent of health workers, US$18,000 annually thereafter.

Services	Annual unit cost (US$)
Training of trainers for health professionals	US$196 (2 days); US$92 (1-day refresher)
1-day training for health professionals	US$15
Unit Cost of Stigma-reduction Training for Health Workers	

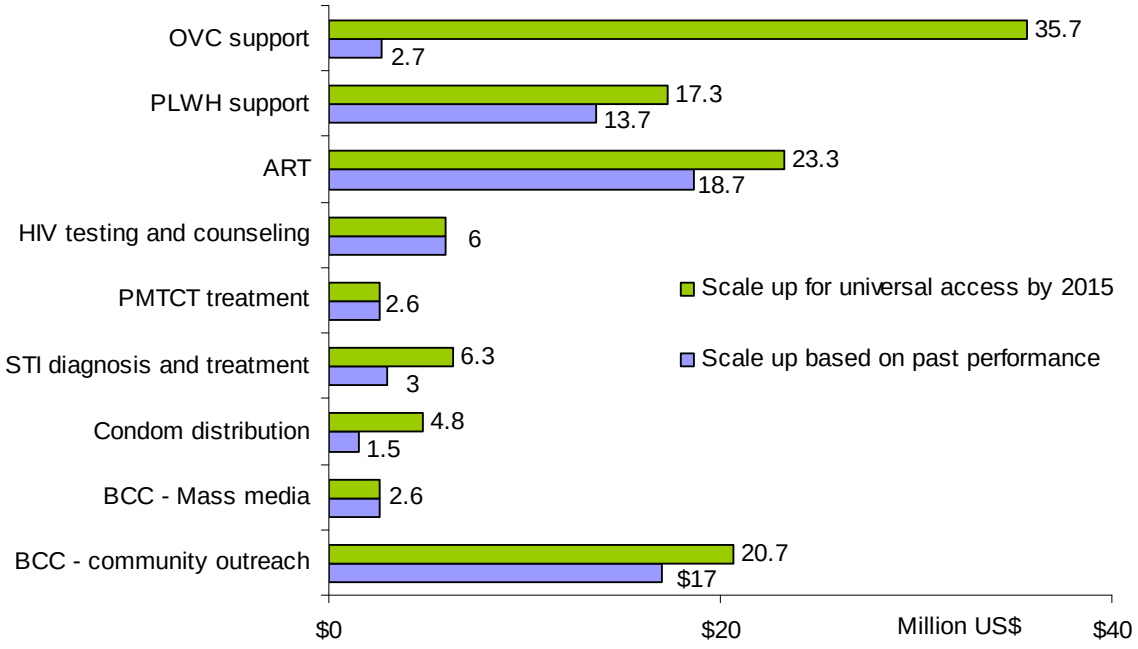
Service		2011	2012	2013	2014	2015
Training of trainers for health professionals	Annual target	400 new trainees	85 percent (340) past trainees, 15 percent (60) new trainees			
	Annual budget (US$)	US$78,400	US$43,000			
Training health professionals	Annual target	8,000 trainees	1,200 (assuming attrition rate of 15 percent)			
	Annual budget (US$)	US$120,000	US$18,000			
Target for Stigma-reduction Training for Health Workers						

3.4 REQUIRED FINANCIAL RESOURCES FOR SCALE-UP OF MAJOR HIV SERVICES

Figure 10 details the cost of each of the reviewed services, totaling US$68 million and US$119 million in scale-ups by 2015, based on past performance and universal access, respectively. This is well beyond the budget expected to be available for HIV services in those years: the total HIV funding is expected to reach US$101 million, yet a large proportion will be invested in HSS. Furthermore, this report, and with it the above estimates, exclude certain services included in the Global Fund budget, such as blood safety and universal precaution.

Support for OVC has the highest costs, budgeted at nearly US$36 million, if Sierra Leone is to achieve universal access by 2015. The HIV service with the second largest funding need is ART, costed at US$23 million in the scale-up based on universal access by 2015. As detailed above, despite the relatively large sum, the unit cost of US$351 of ART per patient per year in Sierra Leone is relatively low. Behavioral prevention outreach was budgeted at US$17 million if scale-up is based on past performance, and at US$20.7 million if Sierra Leone is to achieve universal access by 2015. The prevention outreach reviewed here covered MARPs, youth, and the wider population. The benefits of outreach in prevention activities include education, stigma reduction, and empowerment of marginalized populations.

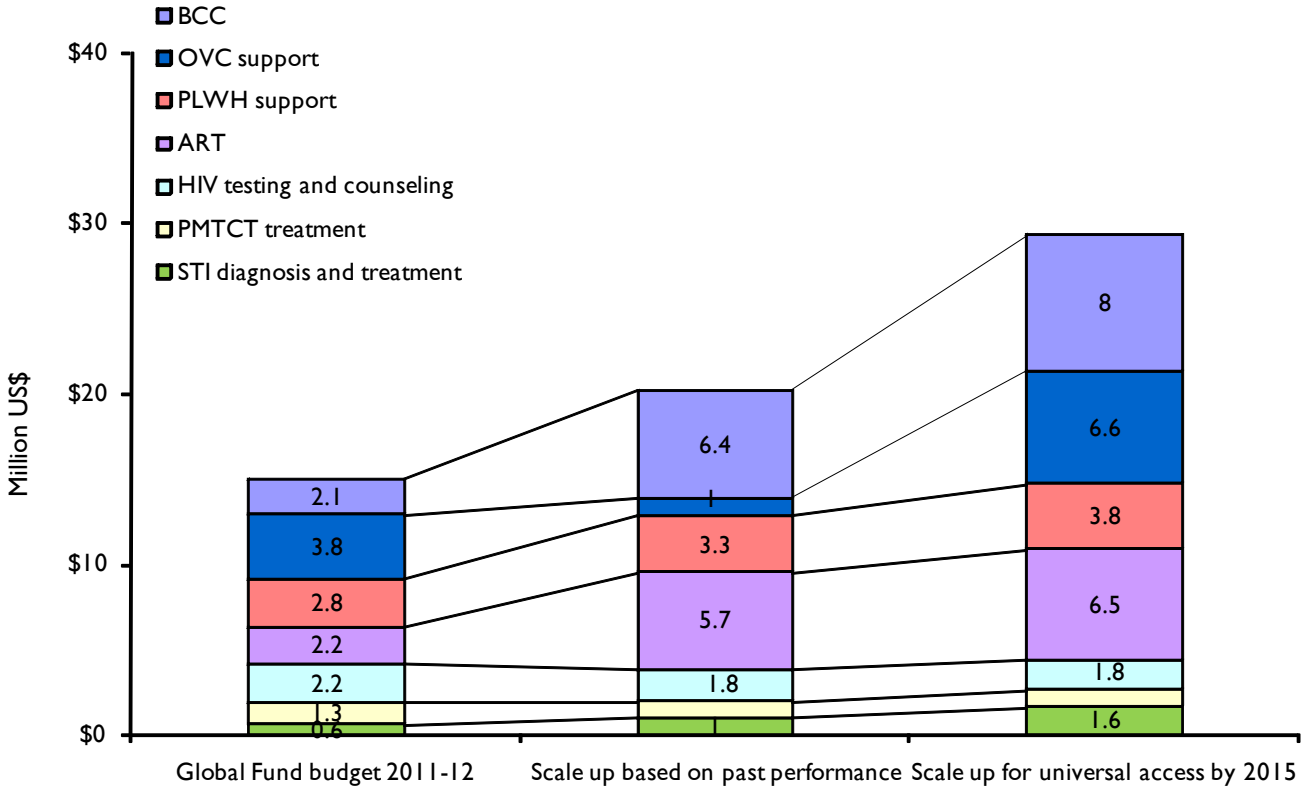
FIGURE 10: TOTAL COST (MILLION US$) OF REVIEWED HIV SERVICES, 2011–2015



Note: If, for a given service, no past performance scenario existed, the universal access scenario was used.

A comparison of allocations of the Global Fund 2011–12 budget with the 2011-12 funding required for scale-up based on past performance and universal access by 2015 (Figure 11) shows that the Global Fund budget of major HIV services for 2011–12 is US$17 million, substantially lower than the estimated need of US$20 million and US$30 million of the scale-ups based on past performance and universal access by 2015, respectively. The biggest gaps are in ART and BCC, both requiring a substantial amount of additional funding based on the budget estimates for past performance (US$3.5 million for ART and US$4.4 million for BCC) and universal access (US$4.3 million for ART and US$6 million for BCC). Figure 11 shows that limited reallocation of funds might be considered. Notably, the Global Fund budget for HCT is higher than the equivalent budget in both scale up scenarios, and as such might be reprogrammed.

FIGURE 11: BUDGET ALLOCATION OF GLOBAL FUND BUDGET FOR 2011–12 VERSUS 2011-12 FUNDING REQUIRED FOR SCALE-UP BASED ON PAST PERFORMANCE AND UNIVERSAL ACCESS BY 2015



4. PROJECTING HEALTH WORKFORCE AVAILABILITY FOR HIV/AIDS

4.1 HEALTH WORKERS NEEDED FOR CLINICALLY BASED HIV SERVICES

The health workforce availability in Sierra Leone has had a limiting effect on the country's national response to HIV/AIDS. Since the civil war, the country has suffered from a severe attrition of skilled medical personnel and is still in the beginning stages of the recovery process in closing the gap on the number of health workers needed for the public health sector. According to the NSP 2006–2010 Joint Review, the health worker (doctors, nurses, and midwives) to population ratio in Sierra Leone is 1:7,507, about 19 times below the WHO threshold of 1:400 health worker (doctors, nurses, and midwives) to population ratio to achieve an 80-percent coverage for deliveries by skilled birth attendants or for measles immunization, two key health services (Chen et al. 2004; World Health Organisation (WHO) 2006).

The impact of the human resources gap on the provision of HIV services over the next five years is a key concern for the national response in Sierra Leone. To determine the amount of human resources required for HIV services from 2011–15, the HAPSAT model incorporated epidemiological data from the most recent EPP, information from government guidelines on the provision of HIV services, and facility-based data collected by the HAPSAT research team.

At health facilities, data were collected on the amount of time health workers spent on clinically based HIV services in Sierra Leone. The data were then used to estimate the amount of full-time equivalent (FTE) staff members needed per year, by each cadre, according to each of the following HIV services: HCT, PMTCT treatment, ART, and STI case management. An FTE staff member for a given service (e.g., ART) is a health professional who spends all his/her working time allocated for patients to provide that service. Since FTE is measured in terms of time, one FTE supplied by a single full-time employee is the same as the combined FTE of two part-time workers who work 50 percent each. For example, a doctor has 220 working days per year and is assumed to spend six hours each working day attending to patients. If a doctor spends, on average, 20 minutes per ART patient visit and each ART patient makes six visits to the doctor per year, then one doctor FTE for ART can see 660 patients per year. The remainder of this chapter presents the HAPSAT findings on the need for human resources for HIV/AIDS services in Sierra Leone from 2011–15.

HAPSAT estimations of human resources required for HCT, ART, PMTCT, and STI case management in Sierra Leone from 2011–15 are presented in Table 16 below and in Annex B. The need for HIV/AIDS services is predicted to remain quite stable from 2011–15; however, the targeted coverage is expected to increase with an aim for universal access by 2015. The number of medical doctors and community health officers required for monitoring and treating ART patients will increase from 10 in 2011 to 23 in 2015, when the target for total patients on ART is 18,803. This assumes these physicians will receive about 13 patients during one working day of six hours (the additional two hours are for management tasks) and that they will work 44 weeks per year. The analysis further assumes patients' visits are evenly distributed during the working hours. The number of nurses required for providing ART services is 12

in 2011, increasing to 28 in 2015. The highest need for all services is for maternal and child health aides, a low-skilled nurse, since about 50 percent of the human resources required will be needed for scaling up HCT services, as seen in Figure 12, a service that does not require heavy clinical skills.

FIGURE 12: TOTAL HRH REQUIRED FOR CLINICALLY BASED HIV SERVICES WITH DISTRIBUTION BY SERVICE

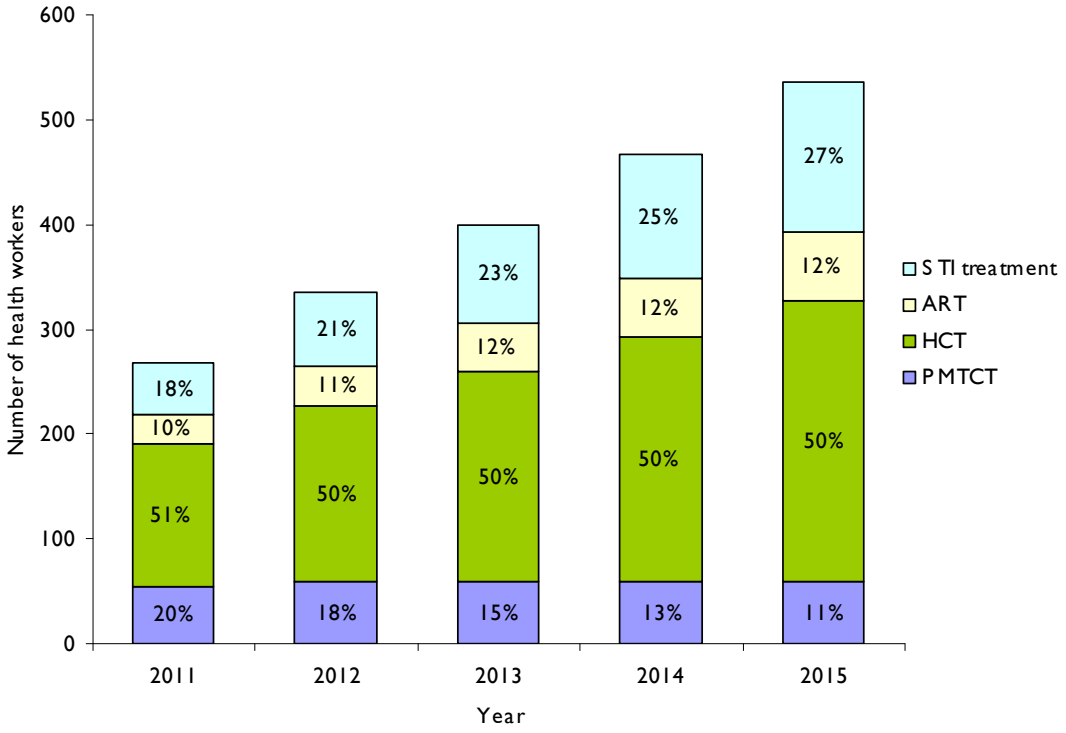


TABLE 16: FTE OF HEALTH WORKERS REQUIRED FOR ART, PMTCT TREATMENT, HCT, AND STI CASE MANAGEMENT.

Cadre	2011	2012	2013	2014	2015
1. Medical doctor	7	9	12	15	18
2. Community health officer	12	17	22	27	33
3. Nurse (all categories)	170	213	255	299	344
• State-Enrolled Nurse (SEN)	46	57	66	76	86
• MCH aide	113	143	173	204	236
4. Counselor	78	94	109	125	141

Note:

1. Table represents figures for reaching universal access by 2015.
2. These numbers reflect health workers required, provided that ART patients are seen by doctors/CHOs as per the ART treatment guidelines and that 20 percent of STI patients are seen by doctors/CHOs as well. However, studies have shown that task shifting from doctors to nurses who are trained properly do not necessarily detriment the quality of services received by ART or STI patients.

4.2 CAPACITY BUILDING OF THE HEALTH WORKFORCE THROUGH WORKFORCE MANAGEMENT

To reduce the burden of HIV on the entire health system, some tasks can be shifted to cadres with lower medical skills. As studies have shown, task-shifting strategies are effective options in the scale-up of HIV services while maintaining quality service provision (Morris et al. 2009).

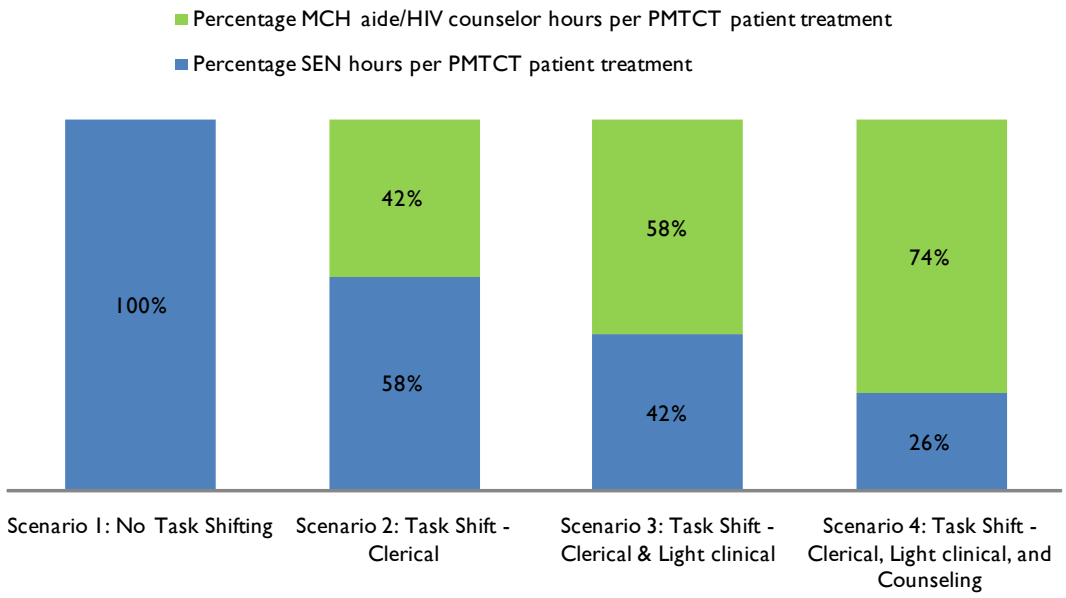
Although Sierra Leone already implements task shifting informally, various instances were observed during field visits to health facilities where task shifting could have been implemented in order to provide more efficient services and increase the clinical availability of higher skilled health workers. Suggested task-shifting scenarios include the following:

Complete task shifting of HCT services from state-enrolled nurse to MCH aide or HIV counselor: HCT services are typically provided by a state-enrolled nurse (SEN) or HIV counselor. In practice, the provision of HCT services has also been extended to MCH aides, CHOs, state-registered nurses (SRNs), and laboratory technicians. Implementing a task-shifting strategy to have HCT provided only by MCH aides or HIV counselors would not only make use of the greater number of MCH aides available, it would also allow the SEN more time to provide wider patient coverage for mostly heavy clinical services. Based on data collected from health facilities, a typical HCT session lasts about 30 minutes. In six of 10 clinics where HCT was observed, an SEN, SRN, or CHO provided the services. If task shifting were implemented, HCT patients would only see the counselor or the MCH aide. Task shifting would substantially reduce the burden of providing HIV-related services on SENs, SRNs, or CHOs, since about 50 percent of the health workers' time for the major clinically based HIV services is spent on providing HCT.

Task shifting of light clinical, clerical, and counseling PMTCT tasks to MCH aide or HIV counselor, and shifting of heavy clinical PMTCT tasks to SEN: Currently PMTCT treatment is usually provided by an SEN, MCH aide, or HIV counselor. Some PMTCT clinics in Sierra Leone are run completely by an HIV counselor, when, in actuality, a nurse should be available to provide the clinical services. Given the scarcity of nurses, an increase in nurse time with patients would be required to scale up coverage of adequate PMTCT treatment. Implementation of a task-shifting strategy could help to increase nurses' clinical time.

Based on a task-shifting strategy implemented in rural Malawi (Tjoa et al. 2010), a nurse's clinical time can be increased by shifting clerical, light clinical, and counseling tasks to less skilled cadres. In the case of Sierra Leone, shifting the less clinical tasks of PMTCT treatment from an SEN to an MCH aide or HIV counselor would increase the clinic's ability to provide wider coverage of adequate PMTCT services. In addition, a task-shifting strategy in which MCH aides expend more time per PMTCT patient would make use of existing human resources, as MCH aides are currently the most widely available health cadre and more evenly distributed geographically, including in rural areas. Figure 13 shows the change in amount of time PMTCT health workers would spend per PMTCT patient under various task-shifting scenarios. The more tasks shift, the greater the amount of time an SEN would have to provide wider coverage of heavy clinical services to PMTCT patients.

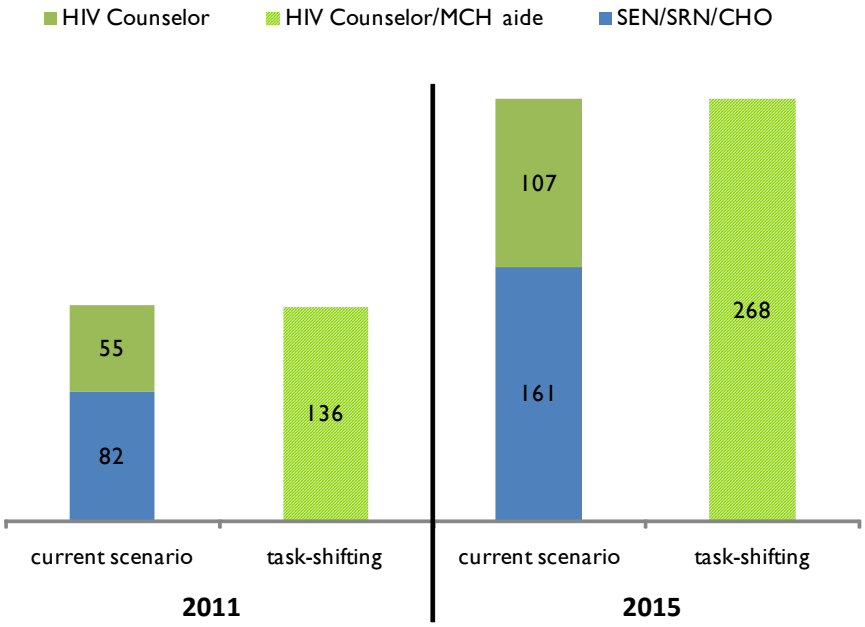
FIGURE 13: HEALTH PROVIDER HOURS PER PMTCT PATIENT TREATMENT



Note: Proportion of tasks in task-shifting scenarios extrapolated from Tjoa et al. 2010

It is important that time freed from health workers following task shifting be allocated to other HIV services or non-HIV medical services in which a human resource need exists. Figure 14 reflects the changes in human resources required following the implementation of a task-shifting strategy for HCT.

FIGURE 14: FTE HEALTH CADRES REQUIRED FOR HCT FOR CURRENT AND TASK-SHIFTING SCENARIOS FOR 2011 AND 2015



BOX 2: MONITORING OF PATIENTS ON ART BY A DOCTOR OR NURSE

According to the national guidelines for ART, a patient starting on ART treatment should visit the clinic eight times a year and see the nurse for each visit and the counselor as needed. For five of those visits, the patient is to be seen by the doctor or CHO. A patient continuing ART treatment is required by the guidelines to visit the clinic four times a year and will be seen by a doctor or CHO and nurse each time. The table below shows the number of FTE doctors and CHOs needed to treat the targeted number of ART patients from 2011–15, as per the national guidelines.

NUMBER OF MEDICAL DOCTORS, CHOS, AND SENS NEEDED FROM 2011–15 TO SCALE UP TO UNIVERSAL ACCESS OF ART SERVICES BY 2015

Cadre	2011	2012	2013	2014	2015
Medical doctor	3	4	5	6	7
CHO	7	9	11	14	16
SEN	12	16	19	24	28

The facility-based surveys reflect that SENs, midwives, and counselors are typically the only cadres seeing ART patients in practice (with the exception of patients at Connaught Government Hospital). Studies on nurse versus doctor management of patients continuing ART (Sanne I et al. 2010) have shown, however, that nurse management is not necessarily inferior to doctor management. Furthermore, nurse management of patients already takes place in ART clinics in Sierra Leone. Although the current situation of health workers providing ART services is suboptimal according to the guidelines, it is not necessarily detrimental to the quality of service if the nurse cadre is properly trained and qualified to provide ART treatment management. The table below represents the number of FTE doctors, CHOs, and SENs needed for the ART program if a continuing ART patient is seen only by a nurse.

NUMBER OF MEDICAL DOCTORS, CHOS, AND SENS NEEDED FROM 2011–15 TO SCALE UP TO UNIVERSAL ACCESS OF ART SERVICES BY 2015 IF SENS MANAGE TREATMENT OF CONTINUING ART PATIENTS

Cadre	2011	2012	2013	2014	2015
Medical doctor	1	1	1	1	2
CHO	2	2	2	3	4
SEN	21	28	34	42	49

Researchers observed the quality of service for PMTCT treatment at health facilities and found that PMTCT service providers in a few Freetown clinics either were unable or neglected to determine the WHO clinical stage of their HIV-positive patient. This led to misdiagnosis of some patients, and consequently those patients were being administered the incorrect treatment. This suggests a need to move toward a more structured task-shifting strategy, not only to ensure effective implementation, but also to monitor the quality of services being provided. Based on these considerations, we recommend including a task-shifting procedure into clinical service guidelines and employing mechanisms of quality assurance through supportive supervision, clinical mentoring, and a medical consultation call center for health workers in need of treatment advice.

4.2.1 INTEGRATING TASK-SHIFTING PROCEDURES INTO CLINICAL SERVICE GUIDELINES AND TRAINING FOR IMPLEMENTERS

It is recommended that a defined procedure for task shifting of clinically based HIV services be integrated into clinical service guidelines and training for implementers. A workplan for this recommendation is shown in Table 17. These task-shifting procedures should serve as an informational tool for providers on specific task capabilities of HIV service providers to maximize work efficiency and service quality. These procedures will set the service standard that is to be achieved and monitored.

The WHO task-shifting guidelines provide a list of detailed tasks performed for HIV services and designates types of health cadres capable of performing the identified tasks (World Health Organisation (WHO) et al. 2007). During the HAPSAT Sierra Leone stakeholder meeting for the dissemination of findings and recommendation, a workplan was formulated with stakeholders on adapting this list from the WHO task-shifting guidelines to the Sierra Leone context and moving forward to integrate it into clinical service guidelines and training for implementers.

TABLE 17: WORKPLAN FOR DEVELOPING AND INTEGRATING A STRENGTHENED TASK-SHIFTING STRATEGY

Action	Timeline of Action (from start of project)	Action Leader
Adapt WHO task-shifting guidelines to SL context	One month	NACP/Dr. Sesay and national coordinators
Review and validate task-shifting procedures for integration into HIV clinical service guidelines, include non-health workers for counseling	Two months	NACP/Dr. Sesay
Assess clinics for task shifting, including a pilot: implement where task shifting doesn't exist	Six months	NACP/Dr. Sesay
Conduct sensitization workshop by district: task-shifting implementation strategy, clinical mentoring, supportive supervision	Seven months	NACP/National coordinators
Adapt task-shifting guidelines to individual clinics specifying health worker names and clinical capabilities in order to strengthen referral system	Nine months	NACP/National coordinators
Coordinate with WHO to take part in development of HRH policy	Ongoing	NACP/Dr. Sesay

4.2.2 IMPLEMENTING SUPPORTIVE SUPERVISION FOR QUALITY ASSURANCE OF SERVICES

Supportive supervision would initiate ongoing monitoring of the quality of services. The supportive supervision cycle enables health workers and supervisors to proactively engage in constant improvement of service provision, and this would help ensure the effectiveness of the task-shifting strategy and enforce the standards being set. Details and benefits of implementing supportive supervision are discussed in greater depth in chapter 5.1.

To monitor the quality of services of human resources, stakeholders developed a workplan, as shown in Table 18, to supplement the launch of the supportive supervision activity detailed in the next chapter:

TABLE 18: WORKPLAN FOR DEVELOPING SS GRID FOR QUALITY ASSURANCE OF SERVICES COMPONENT FOR SUPPORTIVE SUPERVISION RECOMMENDATION IN TABLE 22

Action	Timeline of Action (from start of project)	Action Leader
Identify measures of quality for HIV services to integrate into supportive supervision (SS) grid	Launch of activity	NACP/Nat'l coordinators
Coordinate with M&E officers to integrate into SS grid	Ongoing	NACP/Nat'l coordinators

4.2.3 DEVELOPING CLINICAL MENTORING PROGRAM AS MEANS FOR ONGOING SUPERVISION OF SERVICE QUALITY

To complement the use of supportive supervision for quality assurance, it is recommended with stakeholder approval that a clinical mentoring program be put in place to allow skilled medical practitioners to enter the quality assurance process. Such mentors would include higher skilled health workers, such as physicians or SENs, who have the advantage of working with their mentees on a regular basis to pinpoint deficiencies in quality and areas needing improvement. Stakeholders suggested that mentors could be stationed at the district level and could mentor lower skilled health workers at the district and lower levels.

Stakeholders determined that the integration of this mentoring program into the job descriptions of health workers would require the advocacy of this policy as standard practice. Synchronizing this program with supportive supervision should also be explored, because mentors who have the necessary technical expertise can help strengthen supportive supervision in ways M&E officers cannot. A detailed workplan for moving this program forward is presented in Table 23.

TABLE 19: WORKPLAN FOR DEVELOPING CLINICAL MENTORING PROGRAM

Action	Timeline of Action (from start of project)	Action Leader
Develop program and integrate into training guidelines	One month	NACP/TBD
Support policy advocacy for including clinical mentoring into job description of higher skilled health workers	Ongoing	TBD
Conduct validation and dissemination of clinical mentoring program	Two months	NACP/TBD
Develop schedule and assignments for clinical mentoring program (national --> district --> peripheral health unit)	Three month	NACP/TBD
Pilot clinical mentoring program in selected facilities; modify program accordingly	Nine months	NACP/TBD
Launch program across all facilities	Twelve months	NACP/TBD

4.2.4 ESTABLISHING A MEDICAL CONSULTATION CALL CENTER

Establishing a medical consultation call center would make medical expertise more accessible to patients receiving treatment in remote areas. Such a call center would be targeted toward low-skilled health workers providing services in remote, rural areas, giving them phone access to an on-call medical expert prepared to provide treatment advice. This call center would be a method for ensuring immediate provision of quality services, as the quality of a patient's treatment should not be sacrificed due to the

implementation of short- and long-term service improvements. A workplan for developing a medical consultation call center is presented in Table 24.

TABLE 20: WORKPLAN FOR DEVELOPING MEDICAL CONSULTATION CALL CENTER

Action	Timeline of Action (from start of project)	Action Leader
Compile list of medical experts	One month	NACP/Dr. Sesay
Set up toll-free phone number	Two months	Business Coalition coordinator
Provide technical setup of toll-free line	Two months	NAS/IT Ibrahim
Manage shifts and coordinate medical experts	Ongoing	NACP/Dr. Conteh
Develop communication plan for advertising this service	Three months	TBD
Conduct one-day sensitization workshop: communicate purpose and operation of call center to all clinics	Five months	NACP/Dr. Sesay

BOX 3: DEVELOPING STI TRAINING MODULE WITH INCLUSION OF TRAINING ON HCT

STI case management trainings will benefit from including a module on providing HCT. This would strengthen the knowledge and skills of health workers providing these services and allow for the integration of HCT with STI services. The training should serve as a pre- and in-service training for new and existing health workers.

Equipping STI case management providers with the skills to conduct HCT would allow the national response to drastically increase access to HCT services in Sierra Leone. In 2009, the coverage of HCT and STI case management services was 27 percent and 13 percent, respectively. HCT services are generally provided for STI patients only if an HCT clinic is available within the same facility. Stakeholders explained that if STI patients are referred to receive HCT in another health facility, it is unlikely patients will follow up.

If scale-up of STI case management includes the integration of receiving HCT with basic STI services, the national response would also be better able to target groups at high risk of contracting HIV by making HCT readily available.

After consultation with stakeholders, a workplan was developed to carry this recommendation forward, and this plan is documented in the table below.

WORKPLAN TO DEVELOP STI TRAINING MODULE THAT INCLUDES HCT TRAINING

Action	Timeline of Action (from start of project)	Action Leader
Develop training module for STI case management providers with HCT training	Two months	Consultant
Validate training material	Three months	NACP/Dr. Sesay
Pilot training in selected facilities with both STI and HCT services, and modify accordingly	Eight months	Consultant
Identify STI sites w/o HCT services and training on module	12 months	NACP/Dr. Sesay

The recommendations for a structured task-shifting strategy, quality assurance, and strengthened training programs all work toward management of the health workforce. It is critical that these approaches for increasing the sustainability of human resources are integrated across all health services as the health workforce for HIV services is dependent on the health workforce available for the entire health system. This suggests a critical need for an integrated HRH strategy that includes workforce planning, development, and management, and this should be coordinated with and led by the MoH in Sierra Leone.

Stakeholders raised the following topics they would like to see discussed for an integrated HRH strategy:

- Comprehensive M&E system, including resource management (drugs, finances, information)
- Structured task-shifting strategy
- Development of a sustainable compensation strategy and investment in career development
- Quality assurance mechanisms
- Strengthening of health workforce training
  - Pre-service training (short-term)
  - Integrated training for all health services by health cadre (long-term goal)
- Compliance system
- Sustainable management of volunteers as a resource

4.3 SUSTAINABILITY OF HUMAN RESOURCES FOR HEALTH FUNDED BY DONOR FUNDING

Growing experience from other HIV programs suggests that salaries and incentives for public sector health workers funded by external resources should be less than or equal to what the government would provide. As the national response continues to receive donor funding to support its programs, some funds may go toward providing compensation for health workers. It is important to ensure that salaries or incentives funded through external resources are less than or equal to what the MoH would provide. For instance, an HIV counselor's salary paid by NAS should not exceed a counselor's salary provided by the MoH. At the stage when donor funding decreases, health workers funded by donors may be transitioned onto the MoH payroll. If these health workers' salaries are higher than the equivalent in the MoH payroll, dissatisfaction and attrition are likely to occur. Attrition results in risk of losing the investment made in recruitment and training as well as the loss of institutional knowledge.

Externally funded health workers working at HIV/AIDS clinics that do not require an FTE should have a work distribution that includes health care provision beyond HIV/AIDS-related services. Given the low HIV prevalence in Sierra Leone, many clinics will not require an FTE of a health worker dedicated to HIV services. In such cases, especially if the health worker is supported with donor funding, the health worker's time should be effectively managed and distributed among other health services, unless there is further demand for providing HIV services. Expanding the service coverage of these HIV health workers by integrating them into the wider health system strengthens the health system and increases the likelihood that future funding for their salaries will be secured by resources not necessarily dedicated to HIV/AIDS.

BOX 4: SPECIALIZED LONG-TERM TRAINING FOR HEALTH WORKERS

One of the outcomes of the stakeholders' meeting was to provide a costing analysis of specialized long-term training for 5 percent of the health workers annually. Such training, the participants argued, would increase both the capacity and the motivation of the trainee. In most cases, specialized training will require studying abroad for the duration of the training — at least six months — and will prevent the trainee from fulfilling his/her routine tasks during this period. In addition, the cost is high, as it will include airfare, tuition fees, and living expenses. These costs will vary from one country to another. On the higher end, a yearlong study in the United Kingdom may range between US$31,000 and US$42,500. If such training is to be provided to 5 percent of the health workers, the cost could be as high as US$6.5 million. Such a high cost is hard to justify as the benefits may not outweigh the costs. Some institutions do pay for such training, yet for a very small proportion of their employees. To secure their investment, these institutions require the trainee to repay the cost of the training if he or she fails to work for a certain number of years for the institution following the training.

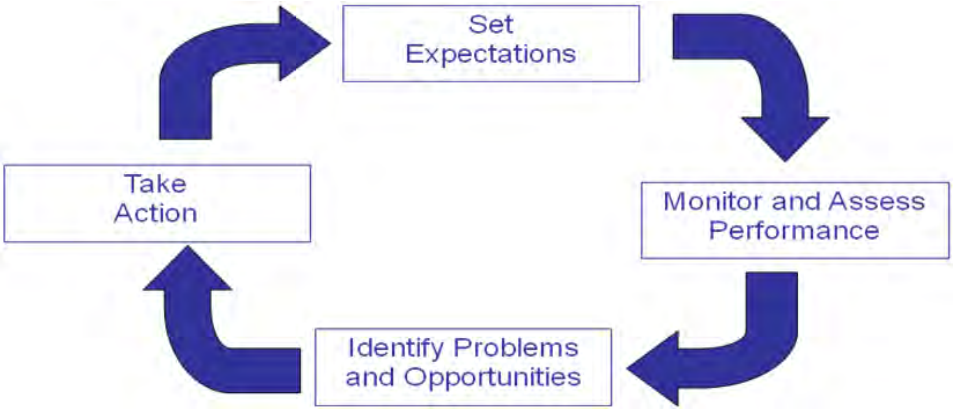
5. STRENGTHENING THE MONITORING AND EVALUATION SYSTEM

This chapter reviews two mechanisms: one to improve the supervision of services to ensure their quality and adequate coverage, and another to effectively respond to the needs and challenges of providing adequate HIV services in a timely manner.

5.1 SUPPORTIVE SUPERVISION FOR CLINICALLY BASED HIV SERVICES

Participants at the stakeholders' meeting prioritized the need to strengthen the M&E system in collection of HIV data and supervision tasks. Data collection of health services, including HIV-related services, requires continuous supervision at all levels. A major trend in efforts to improve supervision has been to shift the focus of supervision encounters away from simply inspecting facilities and gathering service statistics to concentrate on the performance of clinical tasks and resolution of problems experienced by the health worker, as well as to increase feedback from supervisors (Figure 15). A supportive supervision (SS) process for TB care has improved program performance and treatment outcomes in India (Khatri and Frieden 2002) and in Ethiopia. In the latter country, an SS tool solved stock-out issues, identified human resources gap, and improved treatment outcomes.

FIGURE 15 : SUPPORTIVE SUPERVISION CYCLE



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Implementing a standardized SS tool provides benefits to all levels of supervision, as well as to service providers, as noted by the following:

- The M&E HIV officers and the service providers will benefit from the ability to perform analysis on-site for priority setting and action planning. Some examples are detailed in Table 21.
- The central M&E unit will be able to follow up on the action plans agreed by the service providers and the regional M&E officers. The collected data will be useful for reporting purposes, planning, and identifying a wide range of potential issues in service delivery. Supportive supervision in Ethiopia enabled the following:

- Resolved a drug expiry and shortage problem by producing solid programwide data on drug stocks, expiry status.
- Identified labor gaps by showing staff attrition rate and type, enabling identification of corrective actions for training and recruitment needs.
- Increased accuracy and completeness of facility reporting for trend data by ensuring consistent and objective measures across clinics.

TABLE 21: EXAMPLES OF RECOMMENDATIONS AND FOLLOW-UP ACTIONS DERIVED THROUGH SUPPORTIVE SUPERVISION

Problem	Causes (why problem exists)	Solution	Steps already taken on site	Steps for follow-up	By whom	By when
Incorrect treatment regimen prescribed	Insufficient knowledge of ART	Provide training	None	Progressively, send all HIV service providers in the clinic for one-week training on HIV	NAS	June 2011
Attrition rate is >20 percent	Distances to clinics are large	Implement CHW	None	Identify and train CHW in communities far from the clinic	Clinic and district M&E officer	Sep 2011
Between 50 and 80 percent of pregnant women accepted HIV testing	Moderate HIV stigma	Implement stigma-reduction activities	HIV stigma-reduction brochures in clinic	Prepare comm. materials and broadcast on local radio	NAS	Dec 2011
Facility has lost up to one trained HIV staff in the last six mo	The nurse reached retirement age	Recruit a new nurse	Recruitment ad was advertised	Ensure a nurse has been recruited and provide him/her with HIV training	Clinic and MoH	June 2011

Based on discussion with NAS and NACP, a paper-based supportive supervision tool can be developed by the NAS' M&E. The timeline in Table 22 suggests that if the activity is to start in March 2011, the SS paper-based tool can be used as early as January 2012.

TABLE 22: WORKPLAN FOR DEVELOPING PAPER-BASED SS TOOL FOR HIV M&E OFFICERS

Action	Timeline of action (from start of project)	Action leader
Provide existing SS material	Launch of activity	NAS/M&E Dr. Hangadoumbo Saidou and HAPSAT team
Develop an SS questionnaire	4 months	NAS/M&E Victor Kamara
Input the SS questionnaire into a user-friendly Excel	4 months	NAS/M&E TBD
Pilot the SS tool	7 months	NAS/M&E Dr. Hangadoumbo Saidou
Train on the SS tool	10 months	NAS/M&E TBD
Launch the SS tool, including communication to stakeholders	10 months	NAS/M&E Victor Kamara

Mobile devices are increasingly used for communication of health data, a technology known as m-Health. Health programs can use m-Health not only for collecting data, but also for advising patients on

diagnosis and treatment. There is a wide range of m-Health applications, both for collecting data and for advising health workers on diagnosis and treatment.

The use of m-Health in Sierra Leone is very limited, and it is known to be used only for distributing training materials to midwives through mobile phones (Marsden and Christie 2010). WHO and Health Poverty Action are advocating for the increased use of m-Health in Sierra Leone[1] .

Supportive supervision can be automated to great extent by using mobile devices for the collection of data during supervision. In comparison to a paper-based system, a mobile device will provide the ability to include more questions in the SS questionnaire, process the data faster and more accurately, and share the data with the central MoH in a more timely manner.

Technological challenges exist in implementing this solution nationwide; however, in the major urban areas, where most of the HIV services are provided, SS will likely be implemented successfully. The initial costing of implementing SS is US$520,000 (Table 23). For the activity to be sustainable, the HIV program or the MoH will need to be able to maintain the database and the tools and provide training to new supervisors, which are all included in the estimated cost. Establishment of this solution is expected to last 20 months.

Implementation of such a project will involve conducting a situation analysis of current HIV supervision, identifying challenges, and initiating a pilot to implement the tool in a small number of districts. During this stage the challenges in implementing such a solution in Sierra Leone will be identified and addressed.

TABLE 23: COST OF IMPLEMENTATION OF SS IN SIERRA LEONE

Category	Cost (US$)	Notes
Scoping	$ 125,000	o Conduct situation analysis of the current HIV supervision o Identify challenges o Formulate recommendations o Develop a pilot SS tool
Training	$ 100,000	o Train local trainers o Train IT experts o Train supervisors
Equipment	$ 10,000	15 software packages and 30 SmartPhones
Database constructions	$ 115,000	
Supervision	$120,000	Supervise the pilot and the implementing process
Project management	$ 50,000	
Total	$ 520,000	

An SS tool, whether paper-based or mobile-based, will enable the HIV program to substantially strengthen the M&E of the HIV program and beyond by identifying and handling HIV-specific issues, such as high attrition rates, and systemwide issues, such as stock-outs of medicines and human resources.

5.2 MOBILE CLINICS AS RESPONSE UNITS

A priority of the Sierra Leone MoH is to increase HCT, especially in under-reached rural populations. Most clinics providing HCT services are already engaged in mobile outreach, and NAS estimates this

[1] For more details, see:
WHO poster http://www.who.int/reproductivehealth/publications/poster_using_mobile_phones.pdf
Health Poverty Action: http://www.rcm.org.uk/midwives/blog/communication-luxury-or-necessity/

outreach provides 20–25 percent of the HCT coverage (Sulaiman Conteh, pers. comm., January 4, 2010). Frequency of outreach depends on the transportation resources available.

Health care in rural areas is limited because of the lack of health facilities available in the immediate area and the unreliable transportation options. Because the low HIV prevalence rates in rural areas do not justify stand-alone HIV services, NAS has recommended expanding mobile clinics that could provide a wide range of primary health care, including HCT. By going beyond the provision of HCT, such mobile clinics will not be associated with the stigma of HIV. The suggested mobile clinic will be equipped with basic diagnostic equipment (e.g., blood pressure machine, thermometer) and staffed with a nurse or an HIV counselor and a driver. The mobile clinics will be able to provide primary health care consultations and testing and prevention services, distribute educational materials, and dispense essential pharmaceuticals for common health problems. The estimated cost of such a mobile clinic will be US$58,000 for the vehicle and US$46,100 for the diagnostic equipment, medicine, personnel, and commodities annually (Table 24).

The number of HCT sites and the size of the population in need will determine the number of mobile clinics required for each region. With the exception of the western region, the proportion of the rural population in the remaining regions is 77–88 percent. The population of sexually active people ranges from 60,000 in Bo to 240,000 in Kenema. Based on the data collected from facilities for the HASPAT, as presented in chapter 4, the number of people that can be tested by an FTE HIV counselor is 2,400 annually, and, as such, a mobile clinic is justified in each of the 13 districts (the actual number of people to be tested is projected to be less, given the amount of time the personnel will spend on the road and given the time they will also spend on the provision of other health services).

TABLE 24: COST OF MOBILE CLINIC

Cost type	Item	Unit cost	Units	Total cost
Capital cost (once off investment)	Vehicle cost	$58,000	1	$ 58,000
	Basic diagnostic equipment (blood pressure machine, thermometer, etc.)	$200	1	$200
Annual costs	Counselor	$1,756	1	$1,756
	Driver	$600	1	$600
	HIV test	$0.9	1,200	$1,056
	Condoms	$0.035	41,600	$1,448
	Soap	$0.3	41,600	$12,480
	Malaria Medicine	$1.6	13,000	$20,280
	Pain Killer	$ 0.3	13,000	$3,900
	Fuel			$4,476
	Stationery			$85
Total cost				$104,000

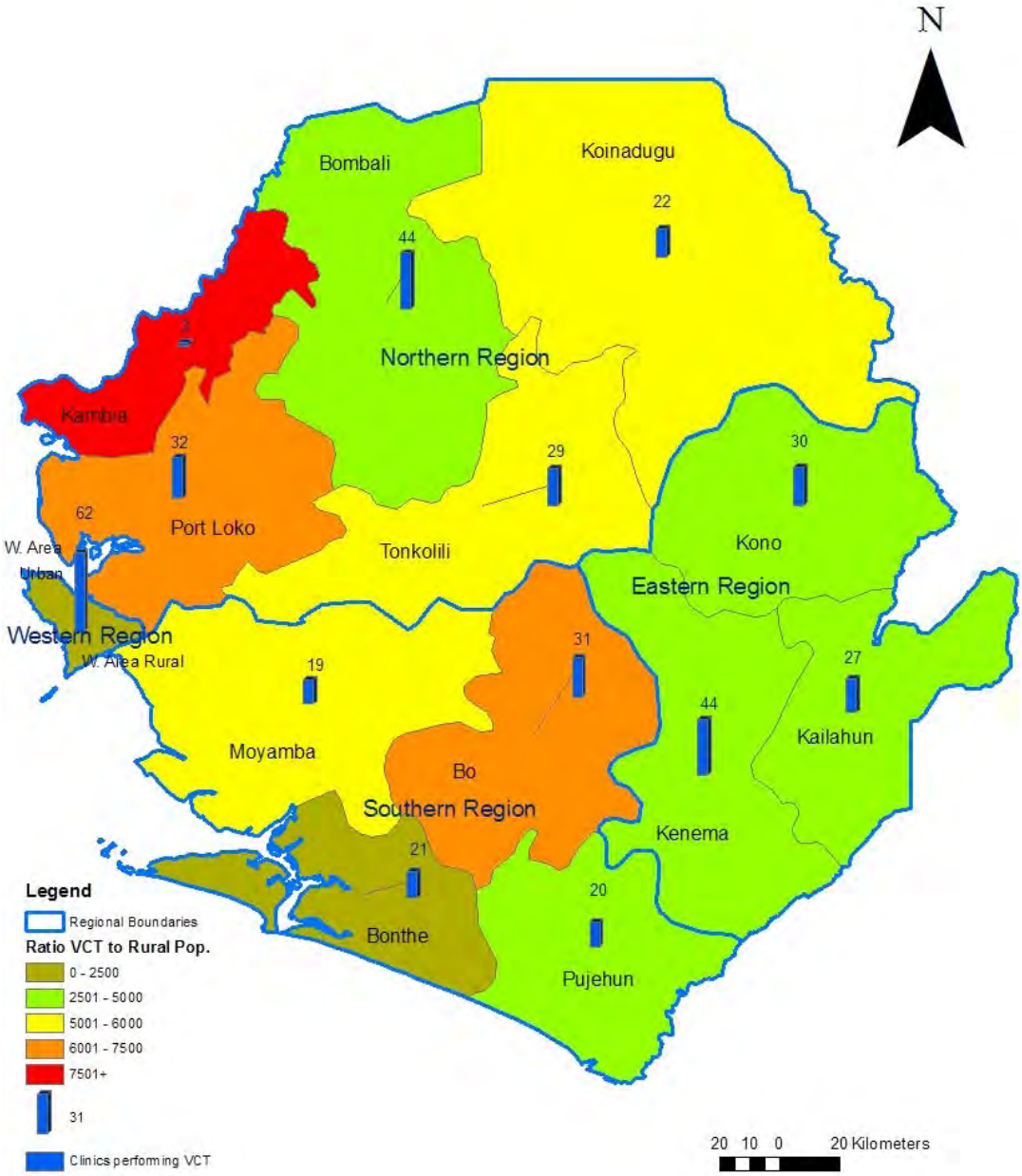
Sources: Tuker, Procurement Manager, NAS, personal comm., November 19, 2010; Alex Abugri, pers. comm., January 7, 2011; (Diap et al. 2010); HAPSAT software costing; drug quantification data of Round 9 proposal.

The number of HCT sites also varies, from as few as three sites in Kambia to as many as 62 sites in Freetown (Kenya et al. 2010). Dividing the number of 15–49 year olds living in rural areas by the number of HCT sites per district provides an indication of where mobile clinics are most needed, as shown in Figure 16. According to this figure, the ratio of adult population to HCT sites is lowest in Kambia, with one site per 38,000 people. In other districts the ratio is lower - below 7,500 people per site. Districts with a ratio of 5,000–7,500 people per site (colored yellow and orange in Figure 16), such as Port Loko and Bo, should also be prioritized. The Western region, despite its large number of HIV sites, will require a mobile clinic to reach its 80,000 rural residents.

The total cost of 13 mobile clinics, one per district, will be US$1.4 million in the first year and US$600,000 per year thereafter. Based on discussions with NAS and NACP, NACP will be responsible for carrying out this activity, including planning the precise scope of these mobile clinics, reviewing the reporting procedures, purchasing the equipment, and conducting ongoing management. Certain aspects such as staffing and incentives will be done with the chief medical officer and district medical officers.

The recommended mobile clinics will enable treatment for people with malaria, promote HIV awareness, and provide support for CHWs, yet the total annual number of HIV tests conducted by these mobile clinics will be only 16,000 across the 13 districts. If the mobile clinics are sent to areas where an influx of HIV cases are reported or where a clinic reports high attrition rates, then the notable importance of these mobile clinics will be their ability to react to geographical changes in the effect of the HIV/AIDS epidemic. These mobile units require the M&E unit to monitor and detect issues such as an influx in HIV infections or an increase in the rate of ART attrition. Effective use of the supportive supervision mechanism previously discussed and of the M&E data will assist in collecting and processing such data.

FIGURE 16: RATIO OF 15–49 YEAR OLDS IN RURAL AREAS VERSUS NUMBER OF HCT SITES, PER DISTRICT



6. LABORATORY STRENGTHENING

6.1 STRENGTHENING LABORATORY INFRASTRUCTURE

Integrating HIV services into the wider health system is a necessity in a country with low HIV prevalence such as Sierra Leone. A good example of such integration is the conversion of the HIV Reference Laboratory into a National Infectious Disease Public Health Laboratory that offers serology, molecular, and microbiology public health services. The initiative is led by Sierra Leone MoH Laboratory Services Unit and NAS, through collaboration with PEPFAR, CDC, the Global Fund, WHO, UNICEF, and the Association of Public Health Laboratories. The MoH's Laboratory Technical Working Group, which includes the nation's leading program and laboratory experts, is in the process of validating a five-year strategic plan aimed at developing an organizational structure for the national laboratory system (http://www.cdc.gov/globalaids/wad/sierraleone.html).

The use of vertical funding for strengthening health systems is increasingly encouraged by donors such as the Global Fund (Friedman et al. 2010), and includes the strengthening of the laboratory capacity, as it is required for providing ART and OI monitoring as well as STI diagnosis.

The CDC estimates that Sierra Leone has a need for strengthening the laboratory capacity of four regional hospitals, 12 district hospitals, and 19 primary clinics. Based on CDC data (Isatta Mmwurie and Laura Shelby, pers. comm., November 14, 2010), the cost can be divided into two types:

- Upgrading of general diagnostic lab: CDC has estimated the cost of upgrading a lab to be US$10,000, US$20,000, and US$70,000 for a primary clinic, district hospital, and regional hospital, respectively.
- Utilities: Basic utilities are required for a lab to function, including water supply (US$21,000 per lab), electricity (US$35,000 for generator, electricity, inverter, fuel, service cost), and health and safety measures (US$19,000 for biomedical waste management, including incinerator and autoclave).

The total cost of utilities is US$75,000 per lab. It is assumed that regional hospitals already have the relevant utilities. The total cost with overheads will be slightly more than US$4 million for 35 labs (Table 25). Potential annual targets and budgets are presented in Table 26.

TABLE 25: COST OF UPGRADING FOUR REGIONAL LABS, 12 DISTRICT LABS, AND 19 CLINIC LABS

Level	Count	Upgrade per lab	Utilities per lab	Total per lab	Total direct cost	Total cost with overheads
Regional	4	$70,000	-	$70,000	$280,000	$370,000
District	12	$20,000	$75,000	$ 95,000	$1,140,000	$1,520,000
Primary clinics	19	$10,000	$75,000	$ 85,000	$1,615,000	$2,150,000
Total	35				$3,035,000	$4,050,000

6.2 CAPACITY BUILDING OF HUMAN RESOURCES FOR LABORATORY SERVICES

Strengthening the lab capacity in Sierra Leone will require further investment in training. The ratio between lab scientists, lab technologists, and lab technicians should be 5-20-75 percent, respectively. According to CDC, Sierra Leone has lab technicians, yet no lab technologists or lab scientists.

To upgrade lab technologists to senior lab technologists, there is a need to train on topics such as lab management, strategic planning, and upgrading of lab methodology. The cost of providing training on one topic is US$5,000 per trainee in the CDC regional center, and each lab technician needs to be trained on four topics. One lab technologist per district and two in the reference lab will need to be trained, for a total of 15 people, at a total cost of US$350,000, including 15 percent overheads. The training should be provided over the course of four years (one topic per year). Providing training over a long period will reduce disruption of routine work, will ensure building the skills of a trainee parallel to practical work, and will act as a continuous incentive for the lab worker. Attendance at conferences at the cost of US$3,500 per person is also essential for five personnel per year. Potential annual targets and budgets for strengthening the human resources capacity of labs are presented in Table 26.

TABLE 26: POTENTIAL TARGETS FOR LAB STRENGTHENING

	2011	2012	2013	2014	2015
Number of regional labs	1	1	1	1	
Number of district labs	2	2	3	3	2
Number of primary clinic labs	3	4	4	4	4
Regional labs budget	$ 70,000	$ 70,000	$ 70,000	$ 70,000	-
District labs budget	$190,000	$ 190,000	$285,000	$285,000	$190,000
Primary clinic labs budget	$255,000	$ 340,000	$340,000	$340,000	$340,000
Total labs to be upgraded	**6**	**7**	**8**	**8**	**6**
Total lab upgrade budget, including 25 percent overheads	**$690,000**	**$800,000**	**$930,000**	**$930,000**	**$710,000**
Number of trainees (one topic per year)	15	15	15	15	
Training cost	$75,000	$75,000	$75,000	$75,000	
Number of conference attendees	5	5	5	5	5
Conference attendance cost	$17,500	$17,500	$17,500	$17,500	$17,500
Total HR capacity strengthening budget, including 15 percent overhead	**$106,000**	**$106,000**	**$106,000**	**$106,000**	**$ 20,000**

7. RECOMMENDATIONS AND CONCLUSIONS

This section includes the recommendations made throughout the report, listed by chapter, and a brief conclusion with important considerations to move toward a more sustainable HIV program.

7.1 RECOMMENDATIONS

Chapter 3: Current and Target Service Delivery Levels and Their Projected Costs

1. Most clinically based services need to be scaled up to a greater extent than in recent years to achieve universal access by 2015.
2. HCT needs to focus on the target population, namely sexually experienced youth 15–24 years old; 25–49 year olds who have two or more partners and/or have sexual intercourse with a non-marital, non-cohabiting partner; and pregnant women. This requires modifying the HCT registers to monitor the extent to which the target population is covered with HCT.
3. Sierra Leone's HIV response aims to make adequate use of radio, billboards, and TV for HIV awareness, with no need to scale up or down.
4. To avoid overproduction or shortage of promotional materials, inventory should be taken of the materials distributed in the previous quarter and the needs of the upcoming media campaign should be reassessed.
5. The program should routinely review its mass media campaigns through focus groups to ensure the target population is in favor of the messages represented.
6. There is a need to focus HIV prevention on MARPs, including CSWs, MSM, and IDUs as well as miners, fishermen, transporters, and uniformed personnel through outreach HIV prevention, support groups, and, for MSM, HCT services through peer educators.
7. There is a need to provide HIV education for each in-school child and young person, at least once in a five-year period.
8. It is important to fully implement the entry and exit criteria developed by NAS for provision of support for OVC and PLWH. The cost of support services to PLWH and OVCs is substantial, and it is important these services be provided only to those in need and for the duration they need it.
9. Stigma-reduction training among health workers is required to tackle the HIV stigma issue in Sierra Leone. The estimated cost of such training is US$200,000 for the first year and US$61,000 thereafter.
10. To achieve universal access by 2015, the following steps are needed:
    a. Mobilize additional resources from donors.
    b. Prioritize the outreach-prevention activities for MARPs and consider more cost-efficient methods, including mass media and condom distribution, to reach the wider population.
    c. Cost share with other programs that reach the same population with similar activities.

Chapter 4: Projecting Health Workforce Availability for HIV/AIDS

1. Move towards a more structured task-shifting and integrated HRH strategy in order to build capacity and sustainability of the health workforce by doing the following:
    a. Integrating task-shifting procedures into clinical service guidelines and training for implementers.
    b. Implementing supportive supervision for quality assurance of services to enable health workers and supervisors to proactively engage in constant improvement of service provision.
    c. Developing a clinical mentoring program as a means for ongoing supervision of service quality, which would complement the supportive supervision activity.
    d. Establishing a call center to which service providers, including CHWs, caregivers, and peer educators, can phone in and consult expert clinicians on provision of HIV services.
    e. Developing an STI training module that includes HCT training.
2. Donor funding, which is usually for time-limited projects, is best used for capital investments such as strengthening of labs, M&E capacity, and supply management systems, rather than ongoing costs. If they are used for funding of compensation of health workers, these salaries should not exceed MoH salaries in order to prevent health worker attrition if and when health workers transition to a MoH payroll.
3. Health workers working at HIV/AIDS clinics that do not require an FTE should have a work distribution that includes health services provision beyond HIV/AIDS-related services.

It is critical that these approaches for increasing the sustainability of human resources are integrated across all health services because the health workforce for HIV services is dependent on the health workforce for the entire health system. This suggests a critical need for an integrated HRH strategy that includes workforce planning, development, and management, and this should be coordinated with and led by the MoH in Sierra Leone.

Chapter 5: Strengthening the M&E System

1. Develop a supportive supervision tool to guide M&E officers in their supervision and to guide supervisors and service providers in priority setting and action planning.
2. Establish HIV response mobile units that will provide primary health care consultations and HIV testing, prevention services, educational materials, and essential pharmaceuticals for common health problems. In addition to regular visits in villages, the mobile clinic will be able to respond to issues identified through data from the supportive supervision system and from the call center system.

Chapter 6: Laboratory Strengthening

There is a need to strengthen the laboratory capacity of four regional hospitals, 12 district hospitals, and 19 primary clinics. The total cost with overheads will be slightly more than US$4 million for 35 labs. An additional US$450,000 will be required for training lab technicians to become lab technologists — a total of 15 people — as well as for the attendance of five lab workers at international conferences annually.

7.2 CONCLUSIONS

The 2011 Sierra Leone HAPSAT report provides findings on the programmatic and financial and human resources of Sierra Leone's HIV response. The HIV program of this post-conflict country has made

major strides in recent years, and now the program is examining how to achieve universal access for HIV services by 2015.

Increase in funding from the Global Fund has enabled the HIV program to continue the scale-up of HIV services, yet it is still short of the estimated need. Further resource mobilization is required as well as careful planning of the available funding and human resources for health. Prioritization and a structured task-shifting strategy are key for scale-up, yet this requires accurate, timely, comprehensive, and reliable M&E data. The report recommends standardizing the supportive supervision to enhance the M&E system. Effective use of the M&E data will enable decision makers to shift resources according to the need, since the low HIV prevalence of Sierra Leone will not justify expanding all HIV services to all facilities. As a result, NAS will need to regularly review whether the allocation of available resources is optimized to respond to the need.

Globally, HIV funding is leveling off and Sierra Leone's HIV response will benefit from taking the necessary measures to prevent the consequences of reduced donor funding. For this reason, this report recommends the use of donor funding for capital costs, such as strengthening the M&E systems and laboratory services. Where donor funding is used for ongoing costs, the consequences of a potential decrease in donor funding should be taken into account.

ANNEX A: DETAILED TARGETS AND BUDGETS OF MAJOR HIV SERVICES

TABLE A-1: TARGETS AND BUDGETS FOR CLINICALLY BASED HIV SERVICES

Target scenario		Targets					Five-year cost (US$)
		2011	2012	2013	2014	2015	
ART							
Need		20,470	21,359	22,111	22,765	23,504	
Past performance	Reach	7,262	8,972	10,682	12,392	14,102	$18.8 million
	Coverage	35%	42%	48%	54%	60%	
	Cost (US$)	$2,548,962	$3,149,172	$3,749,382	$4,349,592	$4,949,802	
Universal access (80%) by 2015	Reach	7,958	10,499	13,142	15,872	18,803	$23.3 million
	Coverage	39%	49.2%	59%	70%	80%	
	Cost (US$)	$2,793,227	$3,685,304	$4,612,959	$5,570,907	$6,599,923	
PMTCT treatment							
Need		3,335	3,308	3,280	3,247	3,205	
Universal access (80%) by 2015	Reach	2,418	2,646	2,624	2,598	2,564	$2.6 million
	Coverage	73%	80%	80%	80%	80%	
	Cost (US$)	$488,436	$534,573	$530,048	$524,715	$517,928	
HCT							
Need		710,383	726,584	742,917	759,058	774,744	
Universal access (80%) by 2015	Reach	316,258	387,919	462,537	539,917	619,795	$6.05 million
	Coverage of target population	45%	53%	62%	71%	80%	
	Coverage of the adult population	8%	11%	14%	17%	21%	
	Cost (US$)	$822,270	$1,008,590	$1,202,597	$1,403,784	$1,611,467	
STI case management							
Need		212,755	217,111	221,610	226,326	231,271	
Past performance	Reach	43,008	50,857	58,706	66,555	74,404	$3 million
	Coverage	20%	23%	26%	29%	32%	
	Cost (US$)	$442,982	$523,827	$604,672	$685,517	$766,361	
Universal access (80%) by 2015	Reach	62,748	91,447	121,324	152,483	185,017	$6.3 million
	Coverage	29%	42%	55%	67%	80%	
	Cost (US$)	$646,308	$941,903	$1,249,639	$1,570,577	$1,905,675	

Notes:

1.Assumed gradual increase in proportion of people on ART with access to lab facilities (from 20 percent in 2011 to 100 percent in 2015).

2.Estimated need of PMTCT treatment and ART obtained from Sierra Leone's 2010 spectrum data.

3.Estimated need of HCT was composed of sexually experienced youth among 15–24 year olds (70 percent) (Statistics Sierra Leone (SSL) and ICF Macro 2009)); 25–49 year olds who have two or more partners and/or sexual intercourse with a non-marital, non-cohabiting partner (approx. 24 percent) (Statistics Sierra Leone (SSL) and ICF Macro 2009) — applied weighted average; and pregnant women.

4.Only universal access was used for HCT and PMTCT treatment, because scale-up based on past performance exceeded universal access of target population; importantly, not all voluntary counseling and testing clients are part of the need population defined above.

5.Estimated need of STI prevalence is from the Sierra Leone Demographic Health Survey 2008 (Statistics Sierra Leone (SSL) and ICF Macro 2009).

TABLE A-2: TARGETS AND BUDGETS FOR CONDOM DISTRIBUTION

Target scenario		Targets					Five-year cost (US$)
		2011	2012	2013	2014	2015	
Male condoms distributed							
Need		51,946,315	53,066,584	54,225,423	55,441,621	56,717,891	
Past performance	Reach	3,798,485	4,748,106	5,935,133	7,418,916	9,273,645	$1.1 million
	Coverage	7%	9%	11%	13%	16%	
	Cost (US$)	$134,064	$167,580	$209,475	$261,844	$327,305	
Universal access	Reach	9,756,239	16,761,633	24,071,042	31,710,028	39,702,524	$4.3 million
	Coverage	19%	32%	44%	57%	70%	
	Cost (US$)	$344,338	$591,587	$849,566	$1,119,177	$1,401,266	
Female condoms distributed							
Need		161,603	164,740	167,976	171,362	174,911	
Past performance	Reach	39,696	51,444	63,192	74,940	86,688	$416,000
	Coverage	25%	31%	38%	44%	50%	
	Cost (US$)	$46,701	$60,522	$74,344	$88,165	$101,986	
Universal access	Reach	45,421	63,557	82,398	102,006	122,438	$490,000
	Coverage	28%	39%	49%	60%	70%	
	Cost (US$)	$53,437	$74,773	$96,939	$120,007	$144,044	

Notes:

1. To estimate the need for male condoms, it was assumed 22.1 percent of all those males 15–49 years old need 12 male condoms per month (Statistics Sierra Leone (SSL) and ICF Macro 2009), factoring 20 percent waste, based on UNFPA model.
2. The need for female condoms was estimated as follows: 0.2 percent of all those 15–49 years old need 12 condoms per month (Statistics Sierra Leone (SSL) and ICF Macro 2009), factoring 20 percent waste, based on UNFPA model.
3. For both female and male condoms, it was assumed that the national HIV response will need to finance 70 percent of the condoms, and other programs such as family planning will provide the remaining 10 percent of the need.

TABLE A-3: TARGETS AND BUDGETS FOR OUTREACH ACTIVITIES FOR MARPS

Target scenario		Targets					Five-year cost (US$)
		2011	2012	2013	2014	2015	
Number of MSM participating in support groups							
Need	Need	2,365	2,389	2,413	2,437	2,461	
Responding to estimated need	Reach	95	191	290	390	492	$124,000
	Coverage	4%	8%	12%	16%	20%	
	Cost (US$)	$ 8,041	$16,243	$24,608	$33,139	$41,837	
Number of MSM reached with BCC							
Need	Need	2,365	2,389	2,413	2,437	2,461	
Universal access	Reach	1,125	1,450	1,775	1,949	1,969	$69,500
	Coverage	48%	61%	74%	80%	80%	
	Cost (US$)	$9,450	$12,180	$14,910	$16,374	$16,538	
Number of MSM tested for HIV							
Need		2,365	2,389	2,413	2,437	2,461	
Universal access	Reach	378	764	1,158	1,559	1,969	$20,500
	Coverage	16%	32%	48%	64%	80%	
	Cost (US$)	$2,064	$3,067	$4,091	$5,135	$6,199	
Number of sex workers participating in support groups							
Need		82,779	83,607	84,443	85,287	86,140	
Responding to estimated need	Reach	16,556	16,721	16,889	17,057	17,228	$6.5 million
	Coverage	10%	20%	20%	20%	20%	
	Cost (US$)	$703,622	$1,421,315	$1,435,529	$1,449,884	$1,464,383	
Number of sex workers reached with BCC							
Need		82,779	83,607	84,443	85,287	86,140	
Universal access	Reach	13,245	26,754	40,533	54,584	68,912	$1.7 million
	Coverage	16%	32%	48%	64%	80%	
	Cost (US$)	$111,255	$224,735	$340,474	$458,504	$578,862	
Number of sex workers enrolled in vocational training for alternative careers							
Need		82,779	83,607	84,443	85,287	86,140	
Past performance	Reach	645	806	1,007	1,259	1,574	$2.7 million
	Coverage	0.8%	1%	1.2%	1.5%	1.8%	
	Cost (US$)	$327,422	$409,277	$511,597	$639,496	$799,370	
Responding to estimated need	Reach	3,311	3,344	3,378	3,411	3,446	$5.8 million
	Coverage	1.3%	2%	2.7%	3.4%	4%	
	Cost (US$)	$546,673	$849,445	$1,158,218	$1,473,082	$1,750,368	
Number of fishermen and miners reached with BCC							
Need		199,971	201,971	203,990	206,030	208,091	
Responding to estimated need	Reach	65,990	66,650	67,317	67,990	68,670	$2.2 million
	Coverage	10%	20%	33%	33%	33%	
	Cost (US$)	$167,976	$339,311	$565,461	$571,116	$576,827	

Target scenario		Targets					Five-year cost (US$)
		2011	2012	2013	2014	2015	
Number of IDUs reached with BCC							
Need		1,183	1,195	1,207	1,219	1,231	
Universal access	Reach	118	239	362	488	616	$25,000
	Coverage	10%	20%	30%	40%	50%	
	Cost (US$)	$1,585	$3,202	$4,851	$6,533	$8,248	
Number of IDUs participating in support groups							
Need		1,183	1,195	1,207	1,219	1,231	
Universal access	Reach	118	239	241	244	246	$98,000
	Coverage	10%	20%	20%	20%	20%	
	Cost (US$)	$10,647	$21,507	$21,722	$21,939	$22,159	
Number of transporters reached with BCC							
Need		42,454	42,879	43,307	43,740	44,178	
Universal access	Reach	4,245	8,576	14,291	14,434	14,579	$471,000
	Coverage	10%	20%	33%	33%	33%	
	Cost (US$)	$35,661	$72,036	$120,048	$121,248	$122,461	
Number of uniformed personnel reached with BCC							
Need		20,000	21,200	22,472	23,820	25,250	
Universal access	Reach	2,000	4,240	7,416	7,861	8,332	$251,000
	Coverage	10%	20%	33%	33%	33%	
	Cost (US$)	$16,800	$35,616	$62,292	$66,030	$69,992	

Notes:

1.The estimated size for most of the populations is based on a Sierra Leone HIV modes of transmission study (Kenya et al. 2010). The estimated number of uniformed estimates is from Abu Bakarr Koroma, pers. comm., February 25, 2011.

2.The proportion of CSWs, MSM, and IDUs that will be interested in support groups was considered to be 20 percent.

3.The proportion of CSWs that will be interested in vocational training was considered to be 4 percent. In addition, this is an expensive intervention that can benefit only a portion of the target population.

4.For fishermen, miners, transporters, and uniformed personnel, it may be sufficient to cover these populations every third year (one-third of these populations per year).

5.For IDUs, since they are a very high-risk group, it was assumed there is a need to reach as many as possible annually. Since they are hard to reach, the target was set at 50 percent.

TABLE A-4: TARGETS AND BUDGETS FOR HIV PREVENTION AMONG YOUTH

Target scenario		Targets					Five-year cost (US$)
		2011	2012	2013	2014	2015	
In-primary school children							
Need		764,730	777,439	788,819	799,878	810,713	$2 million
Universal access: 80% coverage over five years	Reach	152,946	155,488	157,764	159,976	162,143	
	Coverage	20%	20%	20%	20%	20%	
	Cost (US$)	$382,365	$388,720	$394,410	$399,939	$405,357	
In-secondary school youth							
Need		561,435	579,501	598,193	616,859	635,101	$885,000
Past performance	Reach	45,851.00	58,339.00	70,827.00	83,315.00	95,803.00	
	Coverage	8%	10%	12%	14%	15%	
	Cost (US$)	$ 114,628	$ 145,848	$ 177,068	$ 208,288	$ 239,508	
Universal access: 80% coverage over five years	Reach	112,287	115,900	119,639	123,372	127,020	$1.5 million
	Coverage	20%	20%	20%	20%	20%	
	Cost (US$)	$280,717	$289,751	$299,096	$308,430	$317,551	

ANNEX B: HUMAN RESOURCE REQUIREMENTS FOR CLINICALLY BASED HIV SERVICES

TABLE B-1: TOTAL HR REQUIREMENTS FOR ART, PMTCT, HCT, AND STI CASE MANAGEMENT FOR UNIVERSAL ACCESS BY 2015, CURRENT AND TASK-SHIFTING SCENARIOS

Total HR Requirements by Cadre	2011	2012	2013	2014	2015
Scenario: Universal access by 2015					
Doctor	7	9	12	15	18
Community Health Officer (CHO)	12	17	22	27	33
Community Health Assistant (CHA)	0	1	1	1	1
State-Registered Nurse (SRN)	1	1	1	1	2
State-Enrolled Nurse (SEN)	47	58	67	77	87
MCH aide	116	147	177	208	240
Midwife	2	2	3	4	4
Nursing aide	8	10	12	14	17
Counselors (paid)	81	97	112	128	144
Scenario: Universal access by 2015, task-shifting					
Doctor	4	6	8	10	13
Community Health Officer (CHO)	7	10	13	16	20
Community Health Assistant (CHA)	0	1	1	1	1
State-Registered Nurse (SRN)	0	0	0	0	1
State-Enrolled Nurse (SEN)	43	53	63	72	83
MCH aide	120	152	183	214	248
Midwife	0	1	1	1	1
Nursing aide	2	3	4	5	6
Counselors (paid)	96	115	134	153	172

Notes:

1. It was observed in the current scenarios for PMTCT, HCT, and STI case management that nurses of varying skills were providing these services. The HRH need projected for nurses for these current scenarios was weighted based on the current availability of various nurses in the health workforce.

2.It was observed in the current scenarios for STI case management that clinicians of varying skills (e.g., doctors, CHO, CHA) were providing these services. The HRH need projected for these clinicians for the current scenarios was weighted based on the current availability of various clinicians in the health workforce.

TABLE B-2: HR REQUIREMENTS FOR ART FOR UNIVERSAL ACCESS BY 2015, CURRENT AND TASK-SHIFTING SCENARIOS

ART HR Requirements by Cadre	2011	2012	2013	2014	2015
Scenario: Universal access by 2015					
Doctor	3	4	5	6	7
Community Health Officer (CHO)	7	9	11	14	16
State-Enrolled Nurse (SEN)	12	16	19	24	28
Counselors (paid)	6	8	10	13	15
Scenario: Universal access by 2015, task-shifting					
Doctor	1	1	1	1	2
Community Health Officer (CHO)	2	2	2	3	4
State-Enrolled Nurse (SEN)	21	28	34	42	49
Counselors (paid)	6	8	10	13	15

TABLE B-3: HR REQUIREMENTS FOR HCT FOR UNIVERSAL ACCESS BY 2015, CURRENT AND TASK-SHIFTING SCENARIOS

HCT HR Requirements by Cadre	2011	2012	2013	2014	2015
Scenario: Universal access by 2015					
State-Registered Nurse (SRN)	0	0	1	1	1
State-Enrolled Nurse (SEN)	12	15	17	20	23
MCH aide	65	80	95	111	127
Midwife	1	1	1	2	2
Nursing aide	4	5	6	7	8
Counselors (paid)	55	67	80	94	107
Scenario: Universal access by 2015, task-shifting					
MCH aide or HIV counselor	136	168	200	234	268

TABLE B-4: HR REQUIREMENTS FOR PMTCT FOR UNIVERSAL ACCESS BY 2015, CURRENT AND TASK-SHIFTING SCENARIOS

PMTCT HR Requirements by Cadre	2011	2012	2013	2014	2015
Scenario: Universal access by 2015					
State-Registered Nurse (SRN)	0	0	0	0	0
State-Enrolled Nurse (SEN)	17	19	19	19	18
MCH aide	17	19	19	19	18
Midwife	0	0	1	1	1
Nursing aide	2	2	2	3	3
Counselors (paid)	17	19	19	19	18
Scenario: Universal access by 2015, task-shifting					
State-Enrolled Nurse (SEN)	16	18	17	17	17
MCH aide	18	20	19	19	19
Counselors (paid)	18	20	19	19	19

TABLE B-5: HR REQUIREMENTS FOR STI CASE MANAGEMENT FOR UNIVERSAL ACCESS BY 2015, CURRENT SCENARIO

STI HR Requirements by Cadre	2011	2012	2013	2014	2015
Scenario: Universal access by 2015					
Doctor	4	6	7	9	11
Community Health Officer (CHO)	6	8	11	13	16
Community Health Assistant (CHA)	0	1	1	1	1
State-Registered Nurse (SRN)	0	0	0	0	1
State-Enrolled Nurse (SEN)	6	8	11	14	16
MCH aide	31	45	59	74	90
Midwife	0	1	1	1	1
Nursing aide	2	3	4	5	6

ANNEX C: REFERENCES

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