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RWANDA HUMAN RESOURCES ASSESSMENT FOR HIV/AIDS SERVICES SCALE-UP

SUMMARY REPORT

QUALITY
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OPERATIONS
RESEARCH
RESULTS

DECEMBER 2006

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OPERATIONS RESEARCH RESULTS

RWANDA HUMAN RESOURCES ASSESSMENT FOR HIV/AIDS SERVICES SCALE-UP

Summary Report

December 2006

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The views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	V
ABBREVIATIONS	VII
I. BACKGROUND	1
A. Country Context.....	1
B. National and International HIV/AIDS Human Resource Issues.....	1
C. Need for and Purpose of the Study and Objectives.....	2
II. METHODOLOGY	2
A. Assessment of Numbers and Types of Health Staff.....	2
B. Assessment of Employment Practices and Policies	3
C. Assessment of HIV/AIDS Services Being Provided	3
D. Assessment of HIV/AIDS Personnel Management	3
E. Assessment of Supervision and Motivation of HIV/AIDS Staff	4
F. Assessment of National Training Capacity.....	4
III. FINDINGS	4
A. National Health Human Resources	4
B. Employment Policies and Practices	4
C. HIV/AIDS Personnel Management	6
D. HIV/AIDS Services Provided at Sample Sites	7
E. Human Resources Now Providing HIV/AIDS Services.....	9
F. VCT and PMTCT Services.....	10
G. HIV/AIDS Care and Treatment Services.....	15
H. Supervision and Motivation of HIV/AIDS Staff	18
I. National Training Capacity.....	20
IV. MODELING OF HIV SERVICE PROVIDER NEEDS AND SOLUTIONS	24
A. Underlying Assumptions	24
B. VCT/PMTCT Staffing Scenarios/Options	25
C. VCT/PMTCT Cost Scenarios/Options.....	27
D. ART Services Scenarios/Options.....	28
E. ART Services Cost Scenarios/Options	30
F. Health Facility Staffing and Service Organization Options.....	31
G. Summary of FTE Requirements and Annual Staff Salary Costs All HIV/AIDS Services	33
V. RECOMMENDATIONS	34
BIBLIOGRAPHY	37
APPENDIX 1: HIV/AIDS CARE AND TREATMENT STAFFING AND COST TABLES FOR REACHING TARGETS IN FIVE YEARS AND THREE YEARS	40

LIST OF TABLES AND BOXES

Table 1: Number of Active Health Providers Nationwide.....	5
Table 2: Percentage of Staff by Cadre and Type of Facility.....	5
Table 3: Percentage of Staff by Employment Mechanism*.....	6
Table 4: Staffing at Selected Facilities by Cadre and Employment Mechanism.....	7
Table 5: Service Delivery at Sample Sites.....	8
Table 6: VCT and PMTCT Service Providers by Cadre and Site.....	10
Table 7: Average Number of VCT and PMTCT Clients Served per Day of Service.....	11
Table 8: VCT and PMTCT Service Completion Rates by Site.....	12
Table 9: Achievement Rates of VCT and PMTCT Standards by Cadre.....	13
Table 10: VCT and PMTCT Tasks Frequently Omitted.....	14
Table 11: Number of Patients Registered for Care and Treatment per FTE Service Provider.....	16
Table 12: Number of FTE Service Providers by Cadre and Site for ARV Services.....	17
Table 13: Achievement Rates of ART Standards.....	17
Table 14: ART Tasks Frequently Omitted.....	18
Table 15: Mean Times for Laboratory Investigations.....	18
Table 16: Factors that Motivate Service Providers.....	19
Table 17: Factors that Dissatisfy Service Providers.....	20
Table 18: HIV/AIDS Training Offered by Type and by Training Program Site.....	21
Table 19: Trainee Selection Criteria by Institution.....	22
Table 20: Capacity for In-service Training in HIV/AIDS.....	23
Table 21: Capacity for Pre-service Training.....	23
Table 22: Training Costs for In-service Training.....	24
Table 23: VCT FTE Requirements over the Next Five Years for Different Uptake Rates.....	26
Table 24: PMTCT FTE Requirements over the Next Five Years.....	26
Table 25: Effect of Actual Service Provision Days on FTE Staff Required for VCT and PMTCT.....	26
Table 26: Salary Costs for VCT and PMTCT, 2005.....	27
Table 27: In-service Training Costs for Integrated VCT and PMTCT Services.....	28
Table 28: FTE Counselors Needed per Health Center.....	31
Table 29: Continual Service Delivery Staffing (Five Days per Week).....	32
Table 30: Concentrated Service Delivery Staffing (Two Days per Week per Service).....	32
Table 31: Staff Salary Costs, All HIV/AIDS Services.....	33
Table A1: Task Time and FTE Care Providers Required for Different HIV/AIDS Care and Treatment Services, Assuming Five-year Targets.....	41
Table A2: Task Time and FTE Laboratory Staff Required for Different ART Testing Services, Assuming Five-year Targets.....	42
Table A3: Cost Scenarios for ART Care Providers (Five-year Analysis).....	43
Table A4: Annual Staffing and Salary Cost Scenarios for ART Laboratory Staff (Five-year Analysis) ...	43
Table A5: Task Time and FTE Care Providers Required for Different HIV/AIDS Care and Treatment Services, Assuming Three-year Targets.....	44
Table A6: Task Time and FTE Laboratory Staff Required for Different ART Testing Services, Assuming Three-year Targets.....	45
Table A7: Annual Salary Cost Scenarios for HIV Care and Treatment Providers (Three-year Analysis) .	46
Table A8: Annual Staffing and Salary Cost Scenarios for HIV Care and Treatment Laboratory Staff (Three-year Analysis).....	46
Box 1: Reaching Targets under Different Uptake and Treatment Assumptions.....	25
Box 2: Full-time Equivalent (FTE) Calculations.....	25
Box 3: Classification of ART Clients.....	29

EXECUTIVE SUMMARY

As the international community rallies funds to support the expansion of HIV/AIDS services in the developing world, the health human resources crisis presents a significant challenge to achieving HIV/AIDS service delivery goals. This is especially true of countries in sub-Saharan Africa where, in the last 30 years, the health workforce has declined relative to population growth, and the HIV/AIDS epidemic has intensified health service needs.

This report addresses health human resources issues related to HIV/AIDS services scale-up in Rwanda, but must be understood in the context of broader health human resources constraints. Any attempt to address HIV/AIDS service delivery needs will impact all health services. The staffing shortages identified in this report represent system-wide shortages, not only HIV/AIDS service delivery shortages.

The Government of Rwanda is committed to providing its population with required HIV/AIDS health services. At the time this study was conducted, HIV prevalence in Rwanda was estimated at 8.9%¹ of adults (UNAIDS/UNICEF/WHO 2002; TRAC 2004). To meet the urgent needs of Rwandans for HIV/AIDS prevention, care and treatment, the Ministry of Health aims to scale-up HIV/AIDS service provision to treat 100,000 clients with ART by 2007 (TRAC 2004). More than 15 donor agencies have contributed over \$100 million to assist the Government of Rwanda in financing and coordinating the rapid scale-up of HIV/AIDS services.

The availability of funds and technical support has strengthened Rwanda's ability to purchase drugs and expand activities, but for scale-up to be successful, Rwanda will need an adequate number of staff with the right training, qualifications, and support. Like many developing nations, Rwanda faces acute shortages in its health workforce. Its ratio of one physician to 41,000 population (2003) is four times lower than the 1:10,000 minimum mandated by the World Health Organization (WHO) (Kombe et al. 2005) and eight times lower than WHO's "Health for All" standard of one doctor per 5,000 population.

The aim of this human resources assessment for HIV/AIDS services scale-up was to assess the existing staffing situation in the country, document HIV/AIDS service provision practices and level of effort, and calculate staffing requirements for scale-up. The study examined current staffing in the health sector and identified categories of staff being used to provide HIV/AIDS services, what services this staff is actually performing, and how long it takes them to provide these services. By documenting current staffing levels and the level of effort necessary to provide HIV/AIDS services, the study assessed how many full-time equivalent staff will be needed, and at what costs, if the Government of Rwanda is to meet its HIV/AIDS service delivery objectives.

The report addresses staffing requirements for scaled-up VCT, PMTCT, and HIV/AIDS care and treatment services, detailing the time taken for different services, the number of full-time equivalent (FTE) staff required to fulfill service needs, and the salary and training costs of supporting these staff. The implications of different VCT uptake rates and of time periods of three versus five years to reach targets are explored, as are the implications of recent evidence suggesting that HIV prevalence in Rwanda may be lower than previously estimated. The analysis shows how the shorter the time set to reach targets, the greater the number of care providers and laboratory technicians required. Similarly, the lower the prevalence, the more difficult it will be to rapidly identify HIV-positive clients, requiring either a higher uptake of VCT, a longer time-line to reach treatment targets, or revised treatment targets. The analysis leads to the conclusion that an uptake rate for VCT services of at least 8% and testing of 100% of antenatal care clients are needed to identify 300,000 HIV-positive clients in three years, the volume of patients needed to produce 100,000 patients on ART, which has been cited as a target by the Treatment and Research AIDS Center (TRAC).

¹ Recent surveillance by UNAIDS/WHO puts the estimated prevalence at 5.1% (2004), and the Government of Rwanda is in the process of considering revising the officially accepted prevalence from 8.9% to 5.1%.

The report examines the costs of care and treatment services under different staffing scenarios and provides an illustrative example of staffing requirements at one health center under various prevalence and targeting conditions. The table is intended to help local and national planners understand how to analyze FTE requirements for individual health facilities based on their specific catchment populations.

Study findings indicate that the scale-up of HIV/AIDS service provision will demand a significant investment of human resources. To reach the national target of 100,000 clients receiving ART by 2007, approximately 985 FTE staff will be required. This number represents 20% of the current health workforce. The availability of contractual mechanisms for employing health personnel and the existence of over 1,000 unemployed nurses may help the Government of Rwanda rapidly integrate additional staff into the health workforce. To cope with the dearth of doctors, laboratory technicians and pharmacists, however, the careful division of tasks for different care and treatment-related services will be necessary. The use of lower level staff to perform selected tasks offers one possibility for reducing the work burden on more highly skilled employees.

The creation of the Treatment and Research AIDS Center (TRAC) and the National AIDS Control Commission (CNLS) have enabled Rwanda to rapidly address key policy issues, develop protocols and guidelines, and begin training health personnel. To ensure that the rapid scale-up of HIV/AIDS services is done in an effective and sustainable manner, greater coordination is required between CNLS, TRAC, the Directorate of Health Care (DSS), the Directorate of Health Planning, the Directorate of Human Resources and Support Services, and the Ministry of Public Services, Skills Development and Labor.

The organization and management of HIV/AIDS services will also have implications for staffing requirements at health facilities. The Government of Rwanda is committed to an integrated model of HIV/AIDS service delivery and aims to train all qualified staff in either VCT/PMTCT or HIV/AIDS care and treatment. Decisions about how services are organized – whether concentrated on particular days or offered continually on demand – will affect the number of staff required on any particular service day. Efficient service organization and use of staff time is critical to achieving HIV/AIDS targets without negatively affecting other health services.

As services are rapidly scaled up, quality assurance systems need to be in place. The study found that almost no HIV/AIDS service providers currently had access to simple job aids, such as posters, treatment algorithms, or pocket-sized technical resource manuals. Supervision was also found to be intermittent and lacking observation of service provision and feedback to individual providers. No clear system existed for identifying staff in need of refresher training. Finally, health facilities and districts also lacked skills in using data for decision-making and planning.

Training systems will also need to be strengthened and expanded to prepare the health workforce to provide HIV/AIDS services and to update and improve health workers' skills. TRAC has made significant strides in rapidly training staff in VCT, PMTCT, and HIV/AIDS care and treatment. However, systems for managing and monitoring training remain weak and, apart from the national medical school, pre-service training programs for all HIV/AIDS services are virtually non-existent. Pre-service training curricula need to be developed and implemented so that graduates are able and certified to provide HIV/AIDS services without additional training. Systems for updating staff knowledge of the latest treatment protocols, methods, and/or technologies also require further development.

Human resources issues must be addressed if the Government of Rwanda is to reach its ambitious HIV/AIDS prevention, care and treatment goals. Considerable thought, careful planning and creative strategies will be required in this effort. The coordination with donors and international technical support agencies, in which the Government of Rwanda is already engaged, will continue to be vital, but increased local capacity in human resources and health systems management are essential for the long-term success of the government's HIV/AIDS initiatives.

ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
ART	Antiretroviral Therapy
ARV	Antiretroviral
CAMERWA	Central Medical Store of Rwanda
CCM	Country Coordinating Mechanism (Global Fund)
CDC	Centers for Disease Control and Prevention (United States)
CEFOCK	Center for Continuing Medical Education, Kigali Health Institute
CHK	Central Hospital of Kigali
CNLS	<i>Commission Nationale de Lutte contre le SIDA</i> (National AIDS Control Commission)
DHS	Demographic and Health Survey
DSS	<i>Direction de Soins de Santé</i> (Directorate of Healthcare)
EGPAF	Elizabeth Glaser Pediatric AIDS Foundation
ESTHER	<i>Ensemble de Solidarité Thérapeutique Hospitalière en Réseau</i> (Lux Development)
EU	European Union
FOSA	<i>Formation Sanitaire</i> (Health Facility)
FR	<i>Francs Rwandais</i> (Rwandan Francs)
FTE	Full-time Equivalent
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GOR	Government of Rwanda
HC	Health Center
HIV	Human Immunodeficiency Virus
IEC	Information, Education, and Communication
IMPACT	Implementing AIDS Prevention and Care (Family Health International)
KHI	Kigali Health Institute
M&E	Monitoring and Evaluation
MINISANTE	<i>Ministère de la Santé</i> (Ministry of Health)
MOH	Ministry of Health
MIFOTRA	<i>Ministère de la Fonction Publique du Développement des Compétences et du Travail</i> (Ministry of Public Service, Skills Development and Labor)
NGO	Nongovernmental Organization
NRL	National Reference Laboratory
NUR	National University of Rwanda
OI	Opportunistic Infection
PEPFAR	President's Emergency Plan for HIV/AIDS Relief
PMTCT	Prevention of Mother-to-child Transmission
QAP	Quality Assurance Project
STI	Sexually Transmitted Infection
TB	Tuberculosis
TOT	Training of Trainers
TRAC	Treatment and Research AIDS Center
UNAIDS	Joint U.N. Programme on HIV/AIDS
UNDP	United Nations Development Program

UNICEF	United Nations Children’s Fund
US	United States
USAID	United States Agency for International Development
VCT	Voluntary Counseling and Testing
VCTI	VCT <i>Intégrée</i> – GFATM Initiative integrating VCT, PMTCT, and care for opportunistic infections
WHO	World Health Organization

I. BACKGROUND

A. Country Context

Ranking as one of the least developed countries in the world, Rwanda faces formidable challenges to providing quality health care to its population of 8.5 million. The spread of HIV/AIDS is further compounding problems of widespread poverty and economic instability, and intensifying health services delivery challenges in the country. An estimated 8.9% of adults in Rwanda are living with HIV/AIDS (UNAIDS/UNICEF/WHO 2002; TRAC 2004). The Government of Rwanda is committed to providing its population with required HIV/AIDS health services. To meet the urgent needs of Rwandans for HIV/AIDS prevention, care and treatment, the Ministry of Health aims to scale-up HIV/AIDS service provision to treat 100,000 antiretroviral therapy (ART) clients by 2007 (TRAC 2004).

More than 15 donor agencies are assisting the Government of Rwanda to finance and coordinate the rapid scale-up of HIV/AIDS services. Rwanda's 2003 application to the Global Fund to Fight AIDS, TB and Malaria states that donor agencies committed \$135 million² to support health programs for the period of 2001 to 2007, of which \$37 million was specifically designated for HIV/AIDS services (CCM-Rwanda 2003). In addition, the President's Emergency Plan for HIV/AIDS Relief (PEPFAR) contributed \$29.85 million dollars for HIV/AIDS and related health activities in 2004 (USAID-Rwanda 2005), Global Fund I granted Rwanda \$14.8 million for the years of 2004-2006 (GFATM 2004), and Global Fund III awarded Rwanda \$56 million for 2004-2008 (TRAC 2004).

Scale-up strategies for national HIV/AIDS services include the rapid training of health staff and decentralization of HIV/AIDS services. At the end of September 2004, a total of 6,230 clients had started ART. To serve these clients as well as those seeking voluntary counseling and testing (VCT) and prevention of mother-to-child transmission of HIV (PMTCT) services, roughly 659 providers had been trained in VCT and PMTCT counseling, 456 doctors and A1-level nurses had been trained in HIV/AIDS care and support, 146 A2-level nurses had been trained in the care of opportunistic infections (OI) and sexually transmitted infections (STI), and 200 laboratory staff had been trained in HIV-testing as of the end of December 2004. As of July 2004, 101 health facilities were offering VCT services, 101 facilities provided PMTCT services and 23 sites were providing care and treatment to HIV-positive clients. The number of health sites offering VCT, PMTCT and HIV/AIDS care and treatment was expected to grow to 147 VCT sites and 152 PMTCT sites by the end of 2005 (TRAC 2004). To reach its target of 100,000 clients receiving ART, the Ministry of Health also plans to expand HIV/AIDS care and support services delivery to three referral hospitals, 39 district hospitals, and 117 health centers by 2007 (TRAC 2004).

B. National and International HIV/AIDS Human Resource Issues

For scale-up to be successful, Rwanda will need an adequate number of staff with the right training and qualifications. In the last 30 years, the health workforce in sub-Saharan Africa has declined relative to population growth, reducing the availability of health services on the continent. At the same time, the HIV/AIDS epidemic is intensifying health service needs.

Like many developing nations in the region, Rwanda faces acute shortages in its health workforce. The ratio of physicians to the population, 1: 41,000 (2003), is four times lower than the WHO-mandated minimum of 1:10,000 (Kombe, Galaty et al. 2005) and eight times lower than WHO's "Health for All" standard of one doctor per 5,000 population. Existing staff shortages present Rwanda with the added challenge of rapidly increasing the number of staff providing HIV/AIDS services without negatively affecting the provision of other health services.

² All references to dollars in this report are to US dollars.

C. Need for and Purpose of the Study and Objectives

The Rwanda Human Resources Assessment for HIV/AIDS services scale-up was commissioned by the Government of Rwanda and the United States Agency for International Development (USAID) to assess the existing staffing situation in the country, document HIV/AIDS service provision practices and level of effort, and calculate staffing requirements for scale-up.

Assessment Objectives

1. To quantify the number and types of health workers providing services in Rwanda through an examination of payroll records and other relevant staffing documentation existing in the Rwandan civil service, *agrée* institutions, and other management organizations;
2. Estimate the number and types of health workers providing HIV/AIDS services through reviews of existing standards and plans for service provision; interviews with service managers at TRAC, the Centers for Disease Control and Prevention (CDC), and other coordinating organizations; and selected site visits;
3. Describe employment policies and practices that will facilitate or hinder HR scale-up for HIV/AIDS service delivery;
4. Describe models of care for VCT, PMTCT and ART, detailing the specific services provided;
5. Analyze the time it takes to carry out the tasks involved in each of the services and identify tasks that cannot be carried out due to lack of staff, time, or other resources;
6. Describe the present workforce involved in providing these services, covering their qualifications and additional training, supervision, and technical support provided;
7. Assess the adequacy of the present training capacity in the country and define the possible need for extra training facilities and trainers in qualitative and quantitative terms, including costs of increasing training capacity and courses;
8. Analyze the human resources costs associated with the present workforce arrangements for provision of services and project costs under different models of HIV/AIDS service provision planned for Rwanda.

II. METHODOLOGY

The assessment's broad scope required a variety of methods. These methods included record reviews at the central and health facility level; interviews with different support institution representatives, training site managers, district health directors, health facility managers, and HIV/AIDS service providers; observations and timing of VCT, PMTCT and HIV/AIDS care and treatment services; and modeling of staffing requirements and associated costs.

A. Assessment of Numbers and Types of Health Staff

To estimate the number of health workers providing health services in Rwanda, the research team focused on staff providing services at public and *agrée*³ health facilities. These facilities employ or contract most of the health workforce. Annual reports submitted by health facilities to the Ministry of Health (MOH) Directorate of Planning contain information about staff numbers, qualifications, and employment type. Of the 402 health sites, data from 142 reports submitted in 2003 were entered into an Excel database; reports from 2002 were included in the data collection to capture an additional 165 health facilities. Data for most of the remaining sites were gathered from a survey conducted by the Directorate of Planning for

³ *Agrée* health facilities are public health facilities managed by a religious institution, most often the Catholic Church. Employees at *agrée* facilities may be civil servants or contractual employees paid by the health facility or by *agrée* support institution.

the year 2003. The research team estimated staffing numbers for the remaining, undocumented, 14 sites based on the average staffing levels at the 352 health centers reporting actual data.

The data included in health facility reports represented staff providing all services; the team also attempted to document the numbers and types of staff providing HIV/AIDS services nationwide, but found that no data existed on which to base such an estimate. The best estimate of the number of staff providing HIV/AIDS services was gathered through information on the number of staff trained to provide VCT, PMTCT or HIV/AIDS care and treatment. Information on staff training was collected from reports of the Treatment and Research AIDS Center (TRAC) and documentation from different supporting institutions. Data on types of staff providing HIV/AIDS services were collected from manager and service provider interviews at 20 sample sites (see section III.D).

B. Assessment of Employment Practices and Policies

The assessment of employment practices and policies was gathered through analysis of information on payment sources included in health facility annual reports. Payment sources in Rwanda include the civil service, health facilities (a facility contracts with a provider and pays him or her using revenues collected from clients in the form of user fees), and supporting institutions (outside nongovernmental organizations [NGOs], *agrée* support agencies, or donors provide funds to facilities, which pay providers for hours worked). MOH staffing norms and labor policies were also used to identify employment and staffing practices and policies. Information on salaries was gathered from the November 2004 civil service payroll record, from a survey of Caritas-managed institutions, and from interviews with health facility heads.

C. Assessment of HIV/AIDS Services Being Provided

To assess the HIV/AIDS services being provided, 20 sites were selected from the TRAC registry of service sites for VCT/PMTCT and ART service provision. A number of criteria informed site selection, including: duration of HIV/AIDS service operation (12-month minimum), stratification of site type (public, *agrée*, NGO and private health center, district hospital and reference hospital), representation of donors or support organizations, representation of service structure and geographic distribution.

Data on service statistics were collected through reviews of site records (collected at the site, not from central records) for the previous 12 months (or for the months that the site had been providing services, if less than one year). Record reviews ensured that the data had been documented as part of the routine procedures at the site and any anomalies could be checked with staff that had completed the registers.

Data on tasks carried out during service delivery, including the time taken to complete each task, were collected through observations of client-provider interactions in cases where client consent was obtained. A total of 283 provider-client interactions were observed at the 20 sample sites. Observations were conducted to ensure objective information about what was done and how long it took to do. To assess the average time it takes for providers to provide high-quality counseling (defined as counseling that met 70% or greater of the TRAC standards), checklists were developed for each counseling session based on the TRAC guidelines. Checklists were completed for all observations, but only counseling sessions that met 70% or more of these TRAC standards were included in the time estimate for HIV/AIDS services.

D. Assessment of HIV/AIDS Personnel Management

Data concerning recruitment, deployment, support and supervision, and other issues related to human resources management were collected from interviews with District Health Management Teams. Data related to the services offered by the sites, the numbers and types of HIV/AIDS service providers, provider salaries, the training provided to these providers, and attrition of HIV/AIDS service providers were gathered through interviews with site managers and staff members. Training data were also collected directly from TRAC, supporting agencies, and training institutions.

E. Assessment of Supervision and Motivation of HIV/AIDS Staff

District Health Directorate staff, facility managers, and service providers were interviewed to gather information about the structure and regularity of supervision for HIV/AIDS services. Information concerning staff motivation was collected through interviews with individual service providers. Questions focused on why service providers are or are not motivated to provide HIV/AIDS services and the key factors that satisfy or dissatisfy them about their work. A total of 93 service-provider interviews were conducted to explore the factors that motivate or dissatisfy them about their HIV/AIDS work. To capture a range of staff and staff experience, the team interviewed five staff members at each sample site. Service providers were selected based on their involvement in HIV/AIDS service provision, their availability (service providers were not asked to interrupt care to speak with interviewers), their location, and their qualifications.

F. Assessment of National Training Capacity

An assessment of national training capacity was also conducted through interviews with managers and staff at 13 different training institutions providing either pre-service or in-service training. These sites represented all the major institutions known to be offering ongoing HIV/AIDS training, excluding some NGO and select donor-supported programs that may have private training for their own staff. The team gathered information on the type of training offered (VCT, PMTCT, HIV/AIDS care and treatment), the numbers of trainers, the numbers of trainees trained to date, the cost of the training, and trainee qualifications. Where possible, reviews of training site records were conducted to document the numbers and types of staff trained. An assessment of training curricula and materials was also conducted to determine if they were available, in use, up-to-date, and in line with TRAC standards.

III. FINDINGS

A. National Health Human Resources

Rwanda has an estimated 366 health centers, 33 district hospitals, and five referral hospitals. Data on numbers and cadres of staff were available on all except two referral sites. Table 1 presents these data by cadre and facility type and shows an estimated total of 4,889 active service providers. Nurses (2,595) and auxiliary staff (1,148) represent 77% of the workforce at health facilities.

In the Rwandan health system, healthcare providers are classified according to their level of training and experience. For example, at present, A3 nurses may have limited or no secondary education and minimal health training. They work primarily as aides and assistants. A2 nurses, who make up the bulk of the health workforce, have two years of secondary education and two of nursing training. A1 nurses are the most highly trained, having completed high school and taken two additional years of nursing training.

Table 2 shows the distribution of various cadres across the three types of facilities. As in many countries, the preponderance of doctors (97%) is concentrated in hospitals: 49% of doctors are posted at the three referral hospitals. Social workers, medical assistants, nutritionists (especially lower level ones), lab technicians, and auxiliary staff are concentrated in health centers, while hospitals have higher level staff and more clinical staff. The results also show that 44% of the health workforce is concentrated in district and referral hospitals. Of course, having more staff and more clinically trained staff at hospitals makes sense, but whether the proportions adequately relate to service usage, workload, patient waiting times, and timeliness of treatment requires further examination. Furthermore, the addition of VCT, PMTCT, and HIV/AIDS care and treatment services to health centers and hospitals will warrant a re-evaluation of staffing requirements at these facilities.

B. Employment Policies and Practices

Hiring and contracting practices will influence how rapidly additional staff can be hired to provide HIV/AIDS services. Rwanda's health sector has a varied employment structure; health workers can be employed by the civil service; through contracts with health centers in which they are paid with revenue

from user fees; or through contracts with NGOs, churches, districts, or other agencies. This system provides flexibility and may enable health centers to hire additional staff more quickly than if they had to make all requests through the civil service.

Table 1: Number of Active Health Providers Nationwide

	Health Centers (n = 366)	District Hospitals (n = 33)	Referral Hospitals (n = 3)	All Health Centers and Hospitals (n = 402)	Percentage of Total
Doctors	6	98	100	204	4.2
Medical assistants ⁴	53	6	4	63	1.3
Nurses A1 and A2	1168	672	474	2314	47.3
Nurses A3	135	66	39	240	4.9
Other doctors and nurses	11	3	27	41	0.8
Nutritionists A1	9	8	2	19	0.4
Nutritionists A2	34	14	2	50	1.0
Nutritionists A3	16	4	1	21	0.4
Social workers A1	7	1	2	10	0.2
Social workers A2	130	53	22	205	4.2
Social workers A3	40	3	0	43	0.9
Sanitation technicians	3	3	1	7	0.1
Others	67	27	13	107	2.2
Lab technicians A1	1	7	8	16	0.3
Lab technicians A2	85	48	29	162	3.3
Lab technicians A3	47	9	1	57	1.2
Other technicians	77	37	68	182	3.7
Auxiliary staff & nurse aides	833	281	34	1148	23.5
Total providers	2720	1340	827	4889	100

Table 2: Percentage of Staff by Cadre and Type of Facility

	Health Centers (n = 366)	District Hospitals (n = 33)	Referral Hospitals (n = 3)
Doctors	3%	48%	49%
Medical assistants	84%	10%	6%
Nurses A1 and A2	50%	29%	21%
Nurses A3	56%	28%	16%
Other doctors and nurses	27%	7%	66%
Nutritionists A1	47%	42%	11%
Nutritionists A2	68%	28%	4%
Nutritionists A3	76%	19%	5%
Social workers A1	70%	10%	20%
Social workers A2	63%	26%	11%
Social workers A3	93%	7%	0%
Sanitation technicians	43%	43%	14%
Others	63%	25%	12%
Lab technicians A1	6%	44%	50%
Lab technicians A2	52%	30%	18%
Lab technicians A3	82%	16%	2%
Other technicians	42%	20%	37%
Auxiliary staff and nurse aides	73%	24%	3%
Total staff	56%	27%	17%

⁴ Health center records documented medical assistants more clearly than hospital records. In the latter, the numbers of doctors and medical assistants were combined, so the numbers of medical assistants for the country and at hospitals may be slightly higher than represented here.

Civil service employment: The MOH employs approximately 43% of the health workforce stationed at health facilities (Table 3). These workers' salaries are paid directly by the central government and are not distributed through the district health offices. Based on estimates by District Health Directors, recruitment of civil service workers takes an average of 13 months.

Contract employment: The largest share (55%) of the workforce is employed through contracts with a health facility (38%) or through NGOs, donor organizations, or district contracts (17%). Salaries for staff contracted by health facilities are usually paid from funds accumulated from user fees and occasionally from contracts the facilities have with a supporting institution. District Health Directors reported recruitment of contractual employees to take, on average, between one and two months. Contractual employees can be identified by the health facility directly, but, in the case of public and *agrée* sites, their qualifications require the approval of the District Health Director.

Table 3: Percentage of Staff by Employment Mechanism*

Employment Mechanism	Percentage
Civil service	43%
Contracts: - Contracts with the health facility (38%) - Contracts with an NGO, voluntary organization, or the district (17%)	55%

* This represents 98% of the health providers listed in annual reports from the selected health centers and district hospitals for which employment data were available. For the remaining 2%, the payment sources could not be determined. Referral hospital records did not provide employment information. However, the data do suggest that a higher percentage of staff at referral and district hospitals are civil service employees, so the total percentage of civil service employees in the health workforce may be slightly higher than represented here.

Sites, provider skill level, and employment mechanism: More highly trained personnel are more likely to be employed by the civil service (see Table 4). As a lower ranking cadre, most auxiliary staff—86%—are employed through contracts. The employment of laboratory staff follows the same pattern: the lower the category of lab technician, the more likely he or she is employed through a contract. In addition, urban health facilities and hospitals tend to have greater numbers of civil service employees.

While the payment source may not be significant in and of itself, it does suggest that rural health centers will be less likely to have staff supported through the civil service and will have to arrange contractual mechanisms for supporting staff. For health centers that rely on user fees, this is particularly difficult since they generate the least revenue through user fees and have some of the greatest staffing needs.

C. HIV/AIDS Personnel Management

The effective management of personnel who provide HIV/AIDS services will contribute to staff morale, the quality of services, and the sustainability of service provision over the coming years. The study team was interested in learning more about the managers and supervisors who support HIV/AIDS service providers. The primary focus of the study was on District Health Management Team members, but some data were also collected from TRAC in order to assess some central level management staffing.

District managers and other technical staff expressed confusion over their roles and responsibilities in managing HIV/AIDS services. While districts are responsible for managing drugs and health activities related to almost all health services, HIV/AIDS services continue to be directed from the central level. In the districts interviewed, some district supervisors had been trained to supervise VCT and PMTCT, but none was an experienced HIV/AIDS counselor. HIV/AIDS service statistics were being routed to TRAC through the districts, but were not integrated into the national health information forms (*Système d'Information Sanitaire*). District managers were not tracking the information themselves, but merely passing on the forms. Moreover, district managers had not had any training in monitoring and interpreting HIV/AIDS statistics and in making data-driven action plans.

Table 4: Staffing at Selected Facilities by Cadre and Employment Mechanism

Health Centers and District Hospitals (n = 328)	Number of Staff	Civil Service	Contract by FOSA	Contract by Other	Unknown
Doctors	79	49%	22%	24%	5%
Medical assistants	45	80%	13%	4%	2%
Nurses A1 and A2	1427	61%	29%	7%	3%
Nurses A3	144	53%	31%	13%	3%
Other doctors and nurses	12	25%	33%	25%	17%
Nutritionists A1	11	73%	18%	0%	9%
Nutritionists A2	39	87%	10%	3%	0%
Nutritionists A3	20	40%	40%	20%	0%
Social workers A1	8	38%	63%	0%	0%
Social workers A2	149	64%	32%	3%	1%
Social workers A3	41	78%	22%	0%	0%
Sanitation technicians	6	67%	33%	0%	0%
Others	72	18%	47%	35%	0%
Lab technicians A1	6	50%	17%	33%	0%
Lab technicians A2	109	40%	53%	4%	3%
Lab technicians A3	51	10%	78%	12%	0%
Other technicians	101	10%	72%	17%	1%
Auxiliary staff/nurse aides	942	12%	48%	38%	2%
Total staff	3262	43%	38%	17%	2%

Note: FOSA = *formation sanitaire* or health facility.

None of the districts interviewed was receiving funds from donor agencies for managing HIV/AIDS services, although it was anticipated that VCT *Intégrée* (VCTI) would soon begin signing contracts with health districts for this purpose. Several agencies have entered into contracts directly with health facilities for the provision of HIV/AIDS services. These contracts provide valuable resources: they pay for equipment and materials, they sometimes provide salaries for additional staff, and they support staff training and skills development. However, without the integration of HIV/AIDS services into routine district activities and without proper support for the management of HIV/AIDS activities, staff at these health centers do not receive proper supervision and support. Several districts noted that although their staff was trained to supervise HIV/AIDS activities, transportation to conduct supervision was a serious problem as they were unable to get vehicles from the province when needed.

District Health Management Team members voiced a number of concerns about the scale-up of HIV/AIDS activities. Although grateful for financial and technical support offered by donor agencies, many districts felt that they were not included in the planning of HIV/AIDS activities in the districts. The requirements and demands of different donor agencies posed other problems for district staff who found completing the different documentation and reporting requirements of multiple agencies confusing. Perhaps most importantly, districts felt that they were being left out of the management of HIV/AIDS services and were concerned about the sustainability and quality of services.

D. HIV/AIDS Services Provided at Sample Sites

The study focused on three categories of service: VCT, PMTCT, and HIV/AIDS care and support, specifically antiretroviral therapy. The latter two categories involve the use of antiretroviral drugs, which are a major focus of the scale-up of HIV/AIDS services in Rwanda. As the “gateway” to HIV/AIDS care and support and the foundation of prevention and behavior change, VCT is critical to national objectives for antiretroviral treatment and HIV/AIDS prevention. Consequently, VCT must be scaled up if the government is to reach its objectives for ART service provision and decreasing the spread of the virus. Table 5 provides an overview of the HIV/AIDS services and models of service delivery in the 20 sample sites at which in-depth data were collected.

Table 5: Service Delivery at Sample Sites

Site No.	Site Type	Programs Offered at Site				All Dedicated Counselors/ Care Providers	All Integrated Counselors/ Care Providers	Dedicated and Integrated Counselors/ Care Providers
		VCT	PMTCT	ART	OI/ STI			
Integrated Service Delivery Sites								
1	Public Health Center	✓					✓	
2	Public Referral Hospital		✓	✓				✓
3	<i>Agréé</i>	✓	✓				✓	
4	<i>Agréé</i>	✓	✓					✓
5	<i>Agréé</i>	✓	✓	✓	✓			✓
7	Public	✓	✓		✓		✓	
8	<i>Agréé</i> District Hospital	✓		✓	✓			✓
9	Public	✓	✓				✓	
10	<i>Agréé</i>	✓	✓		✓		✓	
11	<i>Agréé</i>	✓	✓	✓	✓	✓		
12	<i>Agréé</i>	✓	✓	✓	✓	✓		
13	Public	✓	✓	✓				✓
14	Private Hospital	✓	✓	✓	✓			✓
15	Public		✓					✓
16	Public	✓		✓	✓			✓
18	Public	✓	✓		✓	✓		
19	Public	✓	✓				✓	
20	Public District Hospital	✓	✓	✓	✓			✓
Vertical Service Delivery Sites								
6	Private/NGO	✓				✓		
17	Public HIV/AIDS	✓	✓		✓	✓		

1. Models of Service Delivery

Vertical and integrated service delivery: Most HIV/AIDS services in Rwanda follow a similar model of service provision. A majority of VCT, PMTCT, and ART services are provided in *integrated* settings – settings in which HIV/AIDS services are provided as part of a larger health care package. Two sites in the study sample are uniquely focused on HIV/AIDS services. These sites are classified as *vertical* sites – sites that provide only HIV/AIDS services and no other health services.

Integrated and dedicated service delivery staff: Service delivery sites may have *dedicated* staff, *integrated* staff or a *mixture* of dedicated and integrated service providers. *Dedicated* staff are staff members who exclusively provide HIV/AIDS services. *Integrated* staff are staff members who provide HIV/AIDS services in addition to other health services. Some sites have both integrated and dedicated staff offering services. For example, site number 20, a district hospital, has one dedicated staff member who serves as the coordinator and main service provider at its VCT clinic and another 15 trained nurse/counselors who cycle in and out of the clinic at different times of the week and work on other wards on days they are not providing services at the VCT clinic.

VCT, PMTCT, and ART service provision: Following TRAC guidelines, counseling for VCT and PMTCT routinely begins with a group information, education, and communication session (IEC). Most sites wait until a majority of clients are in attendance before beginning the IEC; a few sites conduct successive small group IEC sessions followed by pre-test counseling. All sites provide individual, confidential, pre-test and post-test counseling for VCT and PMTCT clients.

The Government of Rwanda has a well-organized plan for the scale-up of VCT, PMTCT, and ART services. This plan includes making VCT and PMTCT available at health centers nationwide. The Global Fund, under its VCTI program, supports care for opportunistic infections at health center level as well. ART and specialized OI care will be made available at district hospitals and national referral hospitals, with a few large and well-equipped health centers also offering ART. Specialized testing for HIV-positive clients, such as CD4 count and routine liver function tests, will be carried out at selected district hospitals throughout the country. Currently, four hospitals have trained staff and equipment for routine ART testing.

The approach to client care varies by HIV/AIDS service. Counseling for VCT continues to be offered as a wholly voluntary service, whereas most PMTCT sites are now offering mandatory counseling with optional testing. ART services are voluntary. At most sites, HIV-positive clients are sent to the ARV clinic or service provider where they are given an exam and a CD4 count is ordered. Clients in need of ARVs are listed on a potential client list. Each site that offers ART has a facility committee in charge of selecting clients for the national ART program. Since ARVs provided in this program are free, clients' income, in addition to medical need, is a criterion for selection.

All ART sites visited only dispense one month's worth of ART supplies at a time. Clients are required to return each month to meet with the nurse or social worker to receive new supplies. Before re-supplying clients, providers take time to ask questions about adherence and usage. At some sites, physicians are also seeing clients during these routine monthly visits to assess any other needs, such as treatment of opportunistic infections.

E. Human Resources Now Providing HIV/AIDS Services

1. Categories of VCT and PMTCT Service Providers

Consistent with the staffing make-up of the Rwandan health system, the majority of VCT and PMTCT service providers are nurses (50%) (see Table 6). Social workers are the second largest category of VCT and PMTCT service providers, comprising 15% of the workforce. Auxiliary staff makes up a relatively small proportion of the VCT/PMTCT workforce at only 7%, a sum which is incongruous with their representation in the health workforce generally (23%). The low representation of auxiliary staff members was due principally to the prevailing belief in the public sector that, as "unqualified" medical staff, auxiliary staff is not competent to provide VCT and PMTCT services. A number of site managers and district supervisors expressed concern about the involvement of auxiliary staff in HIV/AIDS service provision. The only site in which non-health professionals were represented in large numbers as VCT counselors was site number 6, a vertical NGO service site dedicated to VCT service delivery. At this site lay counselors have been trained to offer VCT services.

Lab technicians were represented at all service sites. In many cases, staff classified as "laboratory technicians" were actually nurses or auxiliary staff who had received training in laboratory procedures.

2. Counselor Qualifications

Currently, about 59% of providers offering VCT and PMTCT counseling at public and *agrée* sites are A2 level nurses. Social workers represent 18% of VCT/PMTCT counselors. Although auxiliary staff represents 14% of staff trained in VCT and PMTCT counseling, they make up only 8% of staff actually providing VCT/PMTCT counseling services. Their role in HIV/AIDS service provision remains unclear, and funds used to train auxiliary staff may be wasted if their involvement in VCT/PMTCT counseling is not defined.

Table 6: VCT and PMTCT Service Providers by Cadre and Site

Site	Doctors	Medical Assistants	Nurses	Social Workers	Nutritionists	Aides and Auxiliary Staff	Other Medical Personnel	Lay Persons and Volunteers	Laboratory Technicians	Total	Service
1			0.4						0.4	0.7	VCT
2	0.6		5						1	6.6	PMTCT
3			4.2	1.4					2	7.6	VCT/PMTCT
4			1.9	1.9					1.9	5.7	VCT/PMTCT
5			0.9	1					0.9	2.8	VCT/PMTCT
6			1	2			1	12	1	17	VCT
7			3.6			0.8			0.1	4.5	VCT/PMTCT
8			4						0.1	4.1	VCT
9			0.5	0.1					0.2	0.8	PMTCT
10			0.7	0.2	0.2	1			0.3	2.3	VCT/PMTCT
11			2.5	2.5						5	PMTCT
12			8.6	1.9		2.9			0.8	14.2	VCT/PMTCT
13			4	0.8		1.6			1.8	8.2	VCT/PMTCT
14			1						0.2	1.2	PMTCT
15	0.9		1.8	0.5	1				1.8	5.9	PMTCT
16			0.8	0.3					0	1	VCT
17			7	3					0	10	VCT
18			3.8	1		1			1.9	7.7	VCT/PMTCT
19			0.5			0.5			0.2	1.2	VCT/PMTCT
20			3.8	0.3	0.4				0.6	4.3	VCT/PMTCT
Total FTE	1.5		55.9	16.8	1.5	7.8	1	12	14.9	111	
%	1%	0%	50%	15%	1%	7%	1%	11%	13%	100%	

F. VCT and PMTCT Services

Voluntary counseling and testing includes HIV/AIDS pre-test counseling, testing, and post-test counseling provided to general clients. Prevention of mother-to-child transmission includes the same steps as VCT, but is provided to pregnant women during ANC visits and includes additional information about reproductive health, infant feeding options, and prophylactic treatment to prevent transmission of HIV to the infant. All VCT and PMTCT sites in Rwanda are using rapid HIV tests and provide same-day result. Sites precede individual pre-test counseling for VCT and PMTCT with group IEC sessions. PMTCT services are generally offered two days per week at sites throughout Rwanda. VCT, on the other hand, may be offered two days per week or five days per week depending on the site.

1. Number of Clients Served

The study found a wide range in the average number of clients served per day of service (see Table 7). On average, *agrée* sites see a larger number of clients per service day than public sites: for VCT, 21.2 clients at *agrée* sites versus 16 clients at public sites, and for PMTCT, 14.9 clients at *agrée* sites versus 11.3 at public sites. *Agrée* sites have a reputation for better management and service delivery and are often preferred by clients; however, the data suggest that more efficient service provision and not just greater client loads account for this difference. With comparable client loads, each full-time equivalent (FTE) service provider at site 4, an *agrée* site, was able to see 192 clients per month, whereas each FTE service provider at site 20, a public site, was only able to serve 125 clients per month, suggesting a more efficient use of staff time or service organization at the *agrée* facility.

Table 7: Average Number of VCT and PMTCT Clients Served per Day of Service

Site Type	Number of Clients in Past Year	Average Number of Clients/Day of Service ⁵
VCT		
Average for <i>Agréé</i> Sites	2643	21.2
Average for Public Sites	2707	16.0
NGO VCT Clinic	3254	13.0
PMTCT		
Average for <i>Agréé</i> Sites	1557	14.9
Average for Public Sites	1171	11.3
Private Reference Hospital	325	3.0

2. Effectiveness of VCT and PMTCT Services

The number of clients who are tested and receive their test results (i.e., are given post-test counseling) is a measure of the effectiveness of VCT services. Such a measure is dependent on the quality of data available at service sites, which was somewhat questionable in Rwanda. The results of service effectiveness should be interpreted with an understanding that while reasonable, they are not exact.

For all VCT sites included in the study, a high percentage of clients who received pre-test counseling were tested and received post-test counseling (Table 8). Committed service providers were largely responsible for this remarkable throughput of clients. The team observed staff members going to great lengths to care for clients who requested services, including skipping lunch and staying late, sometimes by several hours, to complete post-test counseling.

Effectiveness of PMTCT was found to be slightly lower than that of VCT. Several sites noted that initially many pregnant women were unwilling to accept counseling and testing. To address the issue, sites 10 and 19 instituted mandatory counseling with optional testing, and the number of women accepting testing increased. Site number 19, a public health center, also suffered from a chronic shortage of test kits, which the manager linked to the negligence of the supporting agency. Site number 14, a private reference hospital, continues to offer PMTCT services on demand only and has only one PMTCT service provider, which may explain why only 12% of ANC clients receive HIV counseling and testing.

At most sites, a relatively high number of HIV-positive pregnant women (74%, on average) are also receiving Nevirapine. At many sites the team observed that HIV-positive pregnant women were not necessarily given Nevirapine on their initial visit, but were asked to return in their third trimester, and, if possible, in the last month of pregnancy. This fact makes the effectiveness of this service that much more impressive since only 69% of pregnant women normally attend for follow-up ANC care (DHS 2000).

⁵ A day of service is considered one full day (eight hours) in which VCT services are offered. For most integrated sites, VCT is offered two days per week. The average number of clients per day was thus calculated by dividing the number of clients seen in the last year by 104 (52 weeks x two days per week). For the two vertical site (17 and 6), which provide VCT services daily, and the two hospital sites with daily VCT clinics, days of operation were calculated as 251 days per year (365 days per year – 104 weekend days – 10 national holidays = 251 operational days per year).

Table 8: VCT and PMTCT Service Completion Rates by Site

VCT			PMTCT			
Site	Site Type	Percentage of Those Pre-test Counseled Who Were Also Post-test Counseled	Site	Site Type	Percentage of Women Tested Who Were Post-test Counseled	Percentage of All ANC Clients Who Were Post-test Counseled
1	Public Health Center	94%	2	Public Ref. Hosp.	99%	91%
3	Agréé Health Center	98%	3	Agréé Health Center	99%	98%
4	Agréé Health Center	97%	4	Agréé Health Center	96%	95%
5	Agréé District Hosp.	99%	5	Agréé District Hosp.	96%	89%
6	NGO VCT Clinic	99%	7	Public Health Center	100%	99%
7	Public Health Center	100%	9	Public Health Center	No data	No data
8	Agréé District Hosp.	100%	10	Agréé Health Center	93%	92%
10	Agréé Health Center	90%	11	Agréé Health Center	99%	94%
12	Agréé Health Center	100%	12	Agréé Health Center	99%	89%
13	Public Health Center	100%	13	Public Health Center	97%	98%
16	Public Referral Hosp.	No data	14	Private Referral Hosp.	100%	12%
17	Public HIV/AIDS	100%	15	Public Health Center	100%	100%
18	Public Health Center	No data	19	Public Health Center	74%	10%
19	Public Health Center	98%	20	Public District Hosp.	79%	96%
20	Public District Hosp.	100%				

3. Compliance with Standards for VCT and PMTCT Service Provision

Based on the observations conducted for pre-test counseling, post-test counseling for clients who test HIV-negative, and post-test counseling for clients who test HIV-positive, a calculation was made for each site detailing the proportion of the prescribed tasks (per TRAC guidelines) the counselor completed. The study divided the standards achieved into three categories. Observations of counseling that scored 0–39% were classified as *unacceptable*, those that scored 40–69% were classified as *needing improvement*, and those that scored 70% or higher were classified as *acceptable*.

Only 3 of the 14 sites in which VCT services were observed achieved the *acceptable* standard (70% or higher) for VCT service provision, and the average for all sites was 64%. Six sites achieved a standard of performance between 60% and 69%, and five sites showed achievement rates below 60%. Service provider performance in PMTCT was lower on average than that of VCT. Only two service sites achieved an acceptable standard of performance, and the average overall standard achieved across the 12 sites was only 57%.

The study also found surprising disparities in the performance of different cadres, as shown in Table 9. For VCT service provision, auxiliary staff demonstrated the highest level of performance, 76%, followed by social workers and then nurses. Similarly, in PMTCT, auxiliary staff members demonstrated the highest standard of performance at 80%, followed by doctors at 63%, social workers at 58%, and nurses at 56%.

Table 9: Achievement Rates of VCT and PMTCT Standards by Cadre

Cadre	Pre-test Counseling	Post-test Counseling for HIV-negative	Post-test Counseling for HIV-positive	Mean: All Stages of Counseling
VCT				
Doctor	No data	No data	No data	No data
Nurse	63%	60%	60%	61%
Social worker	57%	59%	69%	62%
Auxiliary staff*	73%	79%	No data	76%
Other	54%	54%	No data	54%
Mean All Cadres	62%	63%	62%	62%
PMTCT				
Doctor	60%	66%	No data	63%
Nurse	51%	56%	61%	56%
Social worker	51%	67%	55%	58%
Auxiliary staff	76%	94%	70%	80%
Other	40%	No data	72%	56%
Mean All Cadres	52%	64%	62%	59%

* Auxiliary staff is considered “unqualified” health personnel who are supposed to provide non-clinical assistance to health providers. Many, however, are informally trained by qualified staff to do particular clinical tasks – stitch wounds, counsel clients, and give medications. The government is seeking to phase out auxiliary staff, but many rural health centers continue to depend on them as care providers. They currently make up 23% of the health workforce

The results for both VCT and PMTCT are contrary to what one would expect. The achievement of auxiliary staff demonstrates that lower staff categories, including “un-qualified” staff, are capable of achieving high standards for VCT and PMTCT services. Categories of workers that are in high demand, such as nurses, tend to have less time and may compromise performance in order to accomplish tasks. The study team observed several instances in which staff organization and use placed providers in difficult situations, requiring that they counsel large numbers of clients, respond to continual interruptions and questions from other providers, and provide VCT/PMTCT service while addressing other client needs as well. Less qualified workers have a restricted number of tasks they are allowed to perform and thus have far fewer distractions and more time to provide VCT and PMTCT counseling services.

Tasks omitted: The moderate standard of performance achieved in VCT and PMTCT can be further investigated by reviewing the tasks omitted from VCT and PMTCT counseling sessions. Table 10 presents the three tasks most often omitted from counseling sessions.

Issues related to referral services were frequently omitted from VCT service provision. Other issues that were commonly omitted from VCT counseling included: discussion of the “window period” (omitted 40% of the time in IEC, 69% of the time in pre-test counseling sessions, and in 66% of post-test counseling sessions for HIV-negative clients); discussion of how results, positive or negative, might affect the client (omitted 67% of the time in IEC and 69% of the time on pre-test counseling); and client-centered risk reduction (omitted in 50% of IEC sessions and in 46% of pre-test counseling sessions). In general, VCT clients were given few opportunities to ask questions or discuss client-specific needs or issues. Providers did well, however, in greeting clients and treating them well, obtaining consent for the test, and explaining when and where test results would be available.

Several key tasks were also regularly omitted from PMTCT counseling sessions observed. Information on reproductive health was omitted 55% of the time from IEC, 77% in pre-test counseling, and 78% in

Table 10: VCT and PMTCT Tasks Frequently Omitted

Task Number	Task	Number of Observations	Number of Times Task Was Omitted	Percentage of Observations in Which Task Was Omitted
VCT group IEC				
11	Presents information about where to go for referral services and tells the client what to do for a consultation	14	10	71%
10	Discusses how a positive or negative result might affect the client	15	10	67%
9	Mentions reasons for referral (STI, OI, and other)	15	9	60%
Individual pre-test counseling				
9	Identifies referral needs (STI, OI, and other)	65	57	88%
11	Gives information about where to go for referral services and tells the client what to do for a consultation	63	52	83%
7	Explains the “window period”	67	46	69%
Post-test counseling for HIV-negative clients				
9	Helps the client identify problems and solutions or resources	41	33	80%
7	Re-explains the window period	41	27	66%
12	Identifies referral needs and gives guidance on what to do for referral	41	23	56%
Post-test counseling for HIV-positive clients				
8	Helps the client to identify problems and solutions or resources	21	15	71%
14	Identifies referral needs and gives guidance on what to do	21	13	62%
9	Discusses partner notification and testing with the client	17	10	59%
PMTCT pre-test IEC				
11	Completes the client record (register book)	3	2	67%
2	Provides general information on pregnancy	11	6	55%
8	Provides information on other reproductive health services including family planning	11	6	55%
PMTCT pre-test counseling				
8	Talks about the importance of choosing a feeding method if HIV-positive	48	39	81%
10	Provides information, discusses options for family planning	48	37	77%
12	Explains the window period	49	37	76%
PMTCT post-test counseling for HIV-negative clients				
8	Helps the client to identify problems and solutions or resources	27	25	93%
10	Identifies referral needs and gives guidance on what to do	25	20	80%
11	Summarizes and asks for any further question	28	12	43%
PMTCT post-test counseling for HIV-positive clients				
17	Explains to the mother about Cotrimoxazole prophylaxis for infants from 6 weeks to 12 months of age	9	9	100%*
9	Discusses family planning	9	7	78%
16	Tells mother she must bring her newborn child in for Nevirapine syrup within 72 hours after delivery	9	7	78%

* Although part of the national standard, implementation of cotrimoxazole prophylaxis for infants had not yet started at the time of the study.

post-test counseling for HIV-positive clients. In many cases this information related to family planning, which many health facilities and health providers were unwilling to address for religious reasons. Other issues frequently omitted from PMTCT counseling sessions included the discussion of infant feeding

options in pre-test counseling (omitted 81% of the time) and informing HIV-positive women to bring their infants in for Nevirapine prophylaxis within 72 hours of delivery (omitted 78% of the time). Discussion of the window period was omitted 76% of the time in PMTCT pre-test counseling.

4. Time Taken for VCT and PMTCT Service Delivery

VCT and PMTCT counseling: The TRAC guidelines currently state that a provider should counsel no more than 10 clients per day. The team found that counseling that met 70% or more of the TRAC standards for VCT and PMTCT, took, on average, a total of 32 minutes per client for VCT clients and 33 minutes per client for PMTCT clients. Given the time required for PMTCT and VCT counseling, ten clients would add up to roughly 5.5 hours of work/day, which allows adequate time for group counseling, service preparation, waiting, meetings, and other administrative tasks.

HIV testing: All sites are currently using rapid test kits for HIV testing. Abbott and Capillus are the most common brands in use. Assessing task-time for testing presents some challenges since several tests are usually analyzed simultaneously, and the time for the test to run (usually around 15 minutes) is the same for a single sample or multiple samples. In addition, lab staff often “multi-task” while conducting HIV tests. For example, they may begin filling out records when the tests are still running, they may take care of other lab tasks, or they may begin to set up and process confirmatory tests, even as the first test is still in process. Keeping these limitations in mind, the average time for running a group of 10 samples simultaneously, including confirmatory testing and record keeping, was 28 minutes.

G. HIV/AIDS Care and Treatment Services

Rwanda has made remarkable strides in antiretroviral therapy and care of opportunistic infections. As of July 2004, 23 sites were offering HIV/AIDS care and treatment services, and as of the end of September 2004, a total of 6,230 clients had started ARVs.

ART: The study team observed ARV initiation and ARV monitoring in eight of the nine sample sites which offer ART services. In Rwanda, ART services at most public and *agréé* facilities are provided at a particular location (an ART clinic, or the office of the doctor principally in charge of ART). Care is provided mainly by physicians and trained A1 (and a few A2) nurses and social workers. In most cases in which clients come in for scheduled visits, the physician conducts a short interview or examination of the client, writes a prescription or makes requests for laboratory tests, and refers the client to one of the attending nurses or social workers. The nurses and social workers provide counseling on preventive therapy, nutrition, drug administration and adherence, and discuss psychosocial issues with the clients.

Opportunistic infection care: OI care proved difficult to assess in part because the team found no outpatients presenting with OIs outside of those attending ART initiation or monitoring and was, therefore, unable to observe OI care, with the exception of a few in-patients in two major hospitals. In addition, the number of HIV-positive clients presenting for OI care was difficult to analyze because few records exist. One health center site in which nurses have been trained in OI and STI care through VCTI was able to provide some information about OI clients. Since this was done by looking through 12 months of records with the provider and counting the number of times HIV-positive clients came in for health services, it did not provide accurate information on whether these services were for OIs or other health needs.

Drug supply: Only two sites stated they had experienced no problems with drug supply. The most common problem cited was procurement. Site managers noted problems both getting drugs when needed and in obtaining the type/variety of drugs requested. To cope with procurement difficulties, most sites dispense ARVs on a monthly basis. This requires the clients see a provider every month, which, although practical, will require a large investment of staff time as client loads increase.

Laboratory testing: The three referral hospitals—Central Hospital of Kigali (CHK), King Faisal Hospital, and Butare University Hospital—are all equipped and operating as centers for HIV/AIDS testing, care, and treatment. King Faisal Hospital, a private facility, has high-tech automated equipment and trained staff. With a few exceptions, equipment at CHK and Butare Hospital is not automated and

takes a larger investment of staff time. TRAC plans to decentralize key laboratory testing to selected district hospitals throughout the nation. This will include making CD4 count testing, liver function, kidney function and possibly viral load testing available in these sites. The team visited one district-level laboratory but found that although new machines were in place, they were not yet operational. Inconsistent electricity supplies constrain laboratory testing at some district hospitals, although donors are working to ensure more reliable sources of electricity in selected laboratories.

1. Number of Clients Served

The average number of patients on ARV, the number of ART service providers, and the average number of clients per FTE provider are in Table 11. Table 12 shows FTE staffing available for ART service provision at each site by type of health worker.

Table 11: Number of Patients Registered for Care and Treatment per FTE Service Provider

Site Number	Site Type	ART		
		Average Number of Clients on ARV	Number of FTE Service Providers	Clients/FTE Service Provider
2	Public Ref. Hosp	348	8.6	40
5	<i>Agrée</i> Dist. Hosp	62	1.2	52
8	<i>Agrée</i> Dist. Hosp	324	3.0	108
11	Public Dist. Hosp	57	6.7	8.5
12	<i>Agrée</i> Health Center	438	5.7	77
14	Private Ref. Hosp	No data	4.4	No data
16	Public Ref. Hosp.	1242	5.8	216
17	Public HIV/AIDS	1459	17.0	86
20	Public District Hosp.	68	1.2	57
Average				80

2. Effectiveness of ARV Service Provision

ARV data were insufficient to calculate effectiveness. Client information at ARV sites is generally kept in individual client records provided by TRAC, but is rarely summarized in a computer record or register book. Because ART client information is kept in individual client records and is not entered into a general register, it was impossible to calculate the number of clients who have returned for routine monthly visits and had their CD4 count tests performed at six months. Site number 8, a district hospital, was a notable exception. With support from the IMPACT Project, this site developed a computerized database in which all clients are entered. As the client moves through the program, information about the next scheduled tests is entered and then the client's information is entered when the test results are received. This enables the staff to keep track of which clients are receiving appropriate follow-up care.

3. Compliance with ART Service Standards by Site

The quality of ART services was generally quite high. As shown in Table 13, only one site, number 11, performed below the acceptable performance standard of 70%. Yet as Table 14 shows, some key tasks are still being omitted from ART service provision. For example, the comprehensive exam that is supposed to be standard practice for patients initiating ART was omitted 33% of the time, and ensuring patient compliance with an ARV regimen was omitted 29% of the time.

Table 12: Number of FTE Service Providers by Cadre and Site for ARV Services

Site	Doctors	Medical Assistants	Nurses	Social Workers	Nutritionists	Aides and Auxiliary Staff	Other Medical Personnel	Lay Persons and Volunteers	Laboratory Technicians ⁶	Total
2	2		5	1.6					3	11.6
5	0.6		0.3	0.3					0.9	2.1
8	1			2					0.1	3.1
11	1.7		2.5	2.5					2.4	9.1
12	1.9	1.9	1.0	1.0					2.9	8.6
14	4.4								0.2	4.6
16	1.3		3	0.8			0.8		0	5.8
17	7		4	1	2		3		0	17.0
20	0.6		0.6						.6	1.8
Total	20.5	1.9	16.4	9.1	2		3.8		10.1	63.7
%	32%	3%	26%	14%	3%		6%		16%	100%

Table 13: Achievement Rates of ART Standards

Site	Site Type	ART Initiation	ART Monitoring
2	Public Ref. Hospital	78%	87%
5	<i>Agréé</i> District Hospital	88%	75%
8	<i>Agréé</i> District Hospital	100%	88%
11	Public District Hospital	No data	59%
12	<i>Agréé</i> Health Center	79%	No data
14	Private Referral Hospital	No data	80%
16	Public Referral Hospital	100%	97%
17	Public HIV/AIDS	81%	81%
20	Public District Hospital	No data	No data

4. Time Taken for ARV Service Delivery

Based on observations of service encounters where at least 70% of tasks were completed, the study found that it took staff an average of 20 minutes to initiate a client on ART, 14 minutes to monitor an ART patient during a follow-up visit, and 5 minutes to dispense ARVs. In a majority of sites, ART monitoring also included provision of ARV treatment and instruction on adherence. In only one site (site 16) were ARVs provided by a pharmacist (trained nurse) who counseled clients on how to take their medications. This counseling was provided in addition to counseling provided by trained nurses and social workers on drug usage, offered during routine ART monitoring sessions. In one other site (site 8) a social worker dispensed ARVs to clients who came for directly observed therapy. Table 15 presents the average time taken to perform various lab tests for HIV monitoring.

⁶ FTE for Laboratory Technicians covers all HIV/AIDS services.

Table 14: ART Tasks Frequently Omitted

Task Number	Task	Total Times Observed	Number of Times Omitted	Percentage of Times Omitted
For patients initiating ARV treatment				
2	Conducts a comprehensive exam and checks for current infection	15	5	33%
8	Seeks a way of ensuring patient compliance with the ARV regimen	14	4	29%
9	Asks if patient has any questions and answers any questions posed	16	4	25%
For patients on ARV treatment being monitored				
6	Explains any changes in drug regimen, if required, in response to blood analysis, other presenting factors, or patient response to medication	21	8	38%
7	Provides written dosing instructions for the new drug regimen to patients	15	5	33%
8	Stresses the importance of not missing a drug dosage since this can lead to resistance	21	7	33%

Table 15: Mean Times for Laboratory Investigations

Test	Site				
	2	8	14	16	17
CD4	62			45	6
Viral Load*					
Liver Function	12		3	7	
Renal Function	22		16		
Full Blood Count	22	22	16	37	
Blood Sugar	7	10	9		16
Rapid Plasma Reagin (RPR)	22		16		

* Viral load technology was not operational in Rwanda at the time of data collection.

H. Supervision and Motivation of HIV/AIDS Staff

District level supervision: Through TRAC and national level HIV/AIDS programs such as VCTI, a district level supervision system is in the process of being developed. In a few districts, selected supervisors have been trained to supervise VCT and PMTCT counselors. These supervisors are usually nominated by the district health office and are either staff members of the district health office or the district hospital. In many cases, these supervisors have no prior training or experience in delivering VCT or PMTCT services. As previously noted, district staff frequently complain that budget and transportation constraints limit their ability to conduct routine supervision visits.

Supervision of ART services is much more ambiguous; clinicians supervise lower-level staff at the service site, but it is not clear who, aside from TRAC, is responsible for supervising physicians at district and reference hospitals, or how this supervision should fit into the regular Directorate of Healthcare (DSS) supervisory system, if at all.

Facility level supervision: Overall, there is little supervision of HIV/AIDS services at the facility level. District supervisors and/or trainers are responsible for providing technical supervision and follow-up at the facility level. Only in the NGO VCT site did the team find an on-site supervisor. While a few VCT

and PMTCT counselors noted that they had been supervised and given feedback since training, many had not.

Factors that motivate service providers: The team interviewed 93 HIV/AIDS service providers to learn more about the factors that motivate them. Of the providers interviewed: 46% stated that they provided HIV/AIDS services full-time, meaning that they provided no other health services; 6% provided fewer than five hours of HIV/AIDS services per week; 24% provided between five and 10 hours of HIV/AIDS services a week; 8% spent 10 to 20 hours per week providing HIV/AIDS services; 12% spent between 10 and 30 hours providing HIV/AIDS services; and 5% spent more than 30 hours per week providing HIV/AIDS services. Of the providers interviewed, 91% had received training to provide HIV/AIDS services. Despite low salaries and heavy workloads, 69% of health workers interviewed stated that they were satisfied with their jobs, and 15% stated that they were very satisfied (see Table 16). While many workers are happy to have paid employment, 70% of workers interviewed said that the desire to help people living with HIV/AIDS keeps them motivated to do their job.

Table 16: Factors that Motivate Service Providers

Question/Response	Service Delivery Model		Site Ownership				All Staff
	Vertical	Integrated	Public	Agrée	NGO	Private	
Why did you apply for this job?							
Salary	10%	0%	0%	0%	20%	100%	1%
Benefits	0%	0%	0%	0%	0%	50%	0%
Work environment	0%	6%	6%	6%	0%	0%	5%
Work hours	0%	0%	0%	0%	0%	0%	0%
Work relationships	0%	0%	0%	0%	0%	0%	0%
Personal interest	20%	12%	10%	15%	40%	0%	13%
Desire to help PLWHA	60%	37%	35%	44%	60%	50%	40%
Appointed	30%	61%	62%	62%	20%	0%	58%
Don't know	0%	0%	0%	0%	0%	0%	0%
Other	20%	7%	6%	6%	20%	50%	9%
What keeps you going?							
Salary	20%	2%	6%	0%	20%	0%	4%
Benefits	0%	1%	2%	0%	0%	0%	1%
Work environment	20%	6%	10%	3%	20%	0%	8%
Work hours	0%	0%	0%	0%	0%	0%	0%
Work relationships	0%	6%	4%	9%	0%	0%	5%
Personal interest	30%	16%	21%	9%	40%	0%	17%
Desire to help PLWHA	90%	67%	63%	79%	80%	50%	70%
Don't know	0%	5%	4%	6%	0%	0%	4%
Other	20%	20%	23%	12%	40%	50%	20%
How satisfied are you in your job?							
Very satisfied	20%	14%	12%	12%	40%	100%	15%
Satisfied	70%	67%	77%	65%	40%	0%	69%
Neither satisfied nor unsatisfied	10%	8%	2%	18%	20%	0%	9%
Unsatisfied	0%	8%	10%	6%	0%	0%	8%
Very unsatisfied	0%	0%	0%	0%	0%	0%	0%

Factors that dissatisfy service providers: As shown in Table 17, HIV/AIDS service providers identified salary as the most common reason for dissatisfaction (61%). Although government workers began receiving a bonus in July 2004, most workers continue to feel that their salary is insufficient. The bonus was substantial enough to almost double the net pay of several categories of health workers and provided greater amounts to workers in rural areas as an incentive. According to representatives of the Civil Service Ministry, the bonus is a temporary measure which will eventually be rolled into permanent salary increases. While the increases in civil service pay are necessary, many health facility managers stated that they do not have the revenues to match the salary and bonus offered by the government. As a result, in many facilities large salary differences now exist between civil service and contractual health workers. Workers' frustration with salary differences is reflected in Table 17, where 71% of workers in *agrée*

facilities (where more contractual workers are employed) stated dissatisfaction with their salary as opposed to 61% of workers at government-run health facilities, which tend to have a smaller proportion of contractual workers.

Workload was the second most often-cited source of dissatisfaction, mentioned by 52% of HIV/AIDS service providers. Many complained that on HIV/AIDS service provision days they were obliged to skip lunch and work late in order to attend to all the clients requesting services. The study team witnessed several cases in which service providers worked through the day and stayed late in order to provide pre-test counseling, testing, and post-test counseling to clients. This occurred even in sites with more than 10 providers trained in VCT and PMTCT.

Table 17: Factors that Dissatisfy Service Providers

Reasons given for dissatisfaction	Service Delivery Model		Site Ownership				All Staff
	Vertical	Integrated	Public	Agrée	NGO	Private	
Salary	20%	66%	61%	71%	40%	0%	61%
Benefits	20%	22%	21%	24%	20%	0%	22%
Work environment	0%	14%	17%	6%	0%	50%	13%
Work hours	0%	12%	6%	21%	0%	0%	11%
Work load	40%	53%	42%	71%	40%	0%	52%
Treatment by management	10%	7%	4%	15%	0%	0%	8%
Work relationships	10%	2%	4%	3%	0%	0%	3%
Lack of personal interest	10%	1%	0%	0%	0%	0%	2%
Working with PLWHA	0%	2%	2%	6%	0%	0%	2%
Don't know	10%	2%	2%	6%	0%	0%	3%
Other	40%	30%	29%	29%	60%	50%	31%

I. National Training Capacity

Table 18 lists the main institutions providing HIV/AIDS training in Rwanda, by type of training provided. Most HIV/AIDS training in Rwanda is being done through in-service training programs managed by TRAC. These in-service training programs are designed to provide both theory and practical experience and include a knowledge test. The expected outcome of this training is that the provider should have both the requisite skills and knowledge to competently provide VCT, PMTCT, or ART services.

Overall, HIV in-service training programs address VCT, PMTCT, and HIV/AIDS care and treatment more effectively and systematically than do pre-service programs. Only the School of Medicine has a training program in which graduates leave with the skills to provide ART. Other pre-service training programs offer HIV/AIDS education and have general information about VCT, PMTCT and ART/OI care, but do not include counseling skills in the curricula, define how much practical experience the provider should have, or evaluate service provision skills.

Staff trained: Most training institutions focus their attention on nurses with a level of A2 or higher. Table 19 presents trainee selection criteria used by different institutions.

Table 18: HIV/AIDS Training Offered by Type and by Training Program Site

Training Institution	VCT	PMTCT	ART	Lab	TOT	Other	Pre-service	In-service	Vertical	Integrated
TRAC	✓	✓	✓		✓			✓	✓	
National Reference Laboratory				✓	Planned for 2005			✓	✓	
National University of Rwanda (NUR) School of Public Health								✓		✓
Kigali Health Institute (KHI) Evening Program for Nurses*						✓	✓	✓		✓
Center for Continuing Medical Education (CEFOCK) at KHI*						✓		✓		✓
CHK	✓	✓						✓	✓	✓
FHI IMPACT**	✓	✓		✓				✓	✓	
IntraHealth	✓	✓						✓	✓	
EGPAF	✓	✓						✓	✓	
NUR School of Medicine			✓	✓			✓			✓
Kigali Health Institute				✓		✓	✓			✓
Rwamagana School of Nursing*						✓	✓			✓
Gitwe Institute of Higher Education*						✓	✓			✓

* HIV module under development.

** FHI-IMPACT, IntraHealth, and EGPAF provide funds for all staff in their programs to be trained either by TRAC directly or by a TRAC-trained trainer. Other training provided by these institutions is in addition to this initial training.

Correspondence of curricula to TRAC curricula: All in-service training programs are either sending trainees to TRAC training programs for training, or are using the TRAC curricula and TRAC-trained trainers to conduct training. Pre-service training programs are not using the TRAC curricula, or very limited components of them; few pre-service training institutions even have copies of the TRAC guidelines and curricula on site.

Table 19: Trainee Selection Criteria by Institution

Training Program	Minimum Qualifications for Participation in In-service Training	
	Minimum Educational/ Professional Level	Other Considerations
TRAC – VCT	No minimum for VCT/PMTCT A2 nurses for TOT	
TRAC – OI/STI	A2 nurses	
TRAC – ART	A2 nurses	
National Reference Laboratory	A2 nurses*	Currently working as a laboratory technician
NUR School of Public Health	Bachelors degree	2 years' work experience minimum
FHI IMPACT – VCT/PMTCT	No minimum	Must work at FHI-sponsored site
IntraHealth –VCT/PMTCT	No minimum	Must work at IntraHealth-sponsored site
EGPAF** – VCT/PMTCT	No minimum	Must work at EGPAF-sponsored site
KHI evening course for nurses	A2 nurses	Currently employed as a nurse
Center for Continuing Medical Education, KHI (CEFOCK)	For students = in secondary school For nurses = A2	

* National Reference Laboratory (NRL) registers suggest that while many A2 nurses are being trained, some A3 nurses and some auxiliary staff and aides are also included in training programs.

** Elizabeth Glaser Pediatric AIDS Foundation.

Trainees trained per year: Tables 20 and 21 present information on the number of staff trained in HIV/AIDS areas (VCT, PMTCT, ART) per year. Pre-service training numbers represent the total number of students graduating from schools each year, but may not represent the number of students with HIV/AIDS knowledge or skills graduating per year. Table 21 thus represents the potential number of trainees that could be trained in HIV/AIDS knowledge and skills through pre-service training institutions in the future, rather than the number currently exiting these programs with HIV/AIDS training.

Training costs: Costs for VCT, PMTCT, ART, and laboratory training varied by training type and funding institution. Factors that contributed to differences in cost included: (1) number of individuals trained and associated per diem paid, (2) number of trainers participating in the training, (3) number of trainers or participants needing accommodation, (4) training location fees (e.g., hotel used for training), (5) transportation, (6) international trainers/participants (higher overall costs), and (7) miscellaneous costs, including snacks and telephone cards.

Per participant care and treatment (ART/IO) and TOT training costs tended to be higher than those for VCT/PMTCT. This is attributed mainly to the cost of the venue selected for the training and the higher per diem offered to trainees. For the ART/IO training, per diem represented the second highest cost, at FR95,229 per trainee for the entire 10 days, or about US\$167 per trainee.

Costs associated with pre-service HIV training are difficult to analyze for two primary reasons: (1) HIV topics are generally incorporated into existing courses, and (2) there are few supplies or materials used with HIV pre-service training, other than components associated with laboratory work. Most students attending the School of Medicine receive a scholarship of approximately FR25,000 per month (US\$43), and most of those funds costs are allocated to room and board, supplies, and various incidental expenses. Students attending Rwamagana School of Nursing pay approximately FR18,000 (US\$31) per trimester, but this includes all costs, including tuition, room, and board; the Ministry of Education is considering raising this cost to FR25,000 (US\$44) per trimester.

Table 20: Capacity for In-service Training in HIV/AIDS

Training/Support Organization	Number of Trainers with HIV Expertise	Average Number of Trainees per Session	Number of Students Trained Per Year
TRAC VCT/PMTCT	8 ¹	30	150 ²
TRAC District Level VCT/PMTCT	4/district	25	451
TRAC OI/STI	7	49	146 ³
TRAC ART	11	100	400
NUR-School of P Health	12	19 ⁴	30 ⁵
NRL	3	9	147 ⁶
KHI Evening Program for Nurses	10 in VCT/PMTCT; None in ART	130	New program; none to date
CEFOCK	0 ⁷	13	ND
FHI IMPACT	0 ⁸	10 – 30	116 ⁹
IntraHealth	5 ¹⁰	11	55
EGPAF	1 ¹¹	38	111 ¹²

¹ TRAC has 8 trainers on staff and a number of others, who work mainly at major referral hospitals, who are called as trainers from time-to-time.

² This number was estimated based on the maximum number of trainees/session (30) and the number of sessions conducted in 2003 (5).

³ This training began in March 2004. The data represented are for 2004 only.

⁴ The school of public health has progressively increased its intake rates. Ten students were accepted in year one, 18 in year 2, and 30 in year 3 (2004).

⁵ Represents 2004.

⁶ Represents 2004.

⁷ Trainers hired from outside the institution.

⁸ Trainers hired for each training session.

⁹ Based on 2004 only.

¹⁰ IntraHealth has five trainers on staff and hires others when needed.

¹¹ EGPAF has one trained trainer on staff and hires others as needed.

¹² Based on 2004 only.

Table 21: Capacity for Pre-service Training

Training/Support Organization	Number Trained Per Year		
	Number of Trainers with HIV Expertise	Number of Students	Number of Students Graduating Per Year
NUR-School of Medicine*	10	500-600	70
Kigali Health Institute	10 in VCT/PMTCT; none in ART	973 (incl. 200 nurses)	245 total (includes 65 nurses and 80 laboratory technicians)
Gitwe Institute of Higher Education	None as part of regular staff; relies on visiting professors	144 (incl. 105 nurses)	33 nurses
Rwamagana School of Nursing	None as part of regular staff; relies on visiting professors or clinicians at the local hospital	110	40

*Data are approximations.

Table 22: Training Costs for In-service Training

Training Institution	Training Content	Number of Trainees	Average cost per participant for entire training
VCT/PMTCT Training			
TRAC (Kigali) – 10 days	VCT/PMTCT	58	\$208
EGPAF (onsite) – 10 days	VCT/PMTCT	20	\$125
FHI IMPACT (onsite) – 5 days	VCT/PMTCT	30	\$180
IntraHealth (onsite) – 10 days	VCT/PMTCT	10	\$305
ART/OI Training			
TRAC (Kigali) – 10 days	ART/OI	130	\$545
Laboratory Training			
National Reference Laboratory* – 5 days	Laboratory	10	\$291
Training of Trainers - VCT/PMTCT			
TRAC (Kigali) – 30 days (6 weeks)	VCT/PMTCT TOT	53	\$786

* For one week dedicated to HIV; entire training is for two weeks.

IV. MODELING OF HIV SERVICE PROVIDER NEEDS AND SOLUTIONS

A. Underlying Assumptions

The number of clients that will require counseling annually for the government to reach its ART target of 100,000 will depend on HIV prevalence and the percentage of HIV-positive clients requiring ART. At present, national plans are based on a prevalence of 8.9%, although this may be revised. According to TRAC, health centers currently offering VCT see an average of 250 clients per month or 3,000 clients per year (data from TRAC). With an average population served by health centers in Rwanda of roughly 25,000, an annual client load of 3,000 is equivalent to 12% of the population. The government is in a phase of rapid scale-up, and it is likely that this rather high uptake will decline over time as the number of sites increases. Perhaps more importantly, this high uptake rate assumption may not be necessary.

Taking a target of 100,000 ART clients (TRAC 2004), one can work back to roughly 8% or 4% uptake rates depending on the assumed percentage of HIV-positive clients requiring ART and the number of years (three or five) the government sets to reach this target. The National Reference Laboratory (NRL) in Kigali estimates that roughly 33% of clients who receive CD4 tests require ART (personal communication with the director of the NRL). This would suggest that should the government want 100,000 HIV-positive clients on treatment, then at least 300,000 HIV-positive clients would have to be identified through VCT or PMTCT programs. In fact, the number will likely have to be higher, since those currently seeking testing include many who are already sick. Over time, the percentage of HIV-positive patients who require ART will probably decline, and a larger pool of HIV-positive patients will have to be identified to reach national targets for ART treatment and care. For this reason, the Government of Rwanda's HIV/AIDS plan estimates that 17% of HIV-positive clients will require ART, necessitating that nearly 600,000 HIV-positive clients be identified to reach 100,000 with ART (MINISANTE & Foundation, 2003).

Box 1 shows the number of clients that will be identified in three or five years given 4%, 8%, and 12% uptake rates, accounting for PMTCT clients and assuming 17% and 33% of HIV-positive clients require ART.

These calculations are crude but provide a reasonable means for approximating the VCT uptake rates needed to achieve a target of 100,000 patients on ART in different scenarios. The bulk of the analysis in this report uses an uptake rate of 8% to provide a reasonable basis for estimating the human resources implications of HIV/AIDS scale-up.

In addition to VCT, universal HIV testing of pregnant women in antenatal care (ANC) is the second key strategy for identifying HIV-positive individuals. Currently, an estimated 92% of pregnant women have at least one ANC consultation. In 2005, this represented 343,392 women. Assuming an HIV prevalence of 8.9%, 30,562 HIV-positive pregnant women will be identified per year.

The ART, VCT, and PMTCT targets the government chooses will depend on how rapidly it wants to identify HIV-positive patients requiring treatment and how many staff can be allocated to provide services. While targets for ART will likely remain fixed, targets for VCT uptake rates and PMTCT coverage of ANC clients may vary over time depending on the revision or maintenance of prevalence estimates, the percentage of HIV-positive clients requiring ART, and staff capacity. VCT uptake targets may also start off larger and then wane in later years as the government approaches its ART target.

B. VCT/PMTCT Staffing Scenarios/Options

Estimates of staffing requirements presented in this section assume that a FTE service provider works 216 days per year unless otherwise noted (see Box 2).

VCT: At the time of the study, the Government of Rwanda had no established target for VCT uptake. The analysis in this section uses 4%, 8%, and 12% uptake rates of VCT to show a range of possibilities and their effects on staffing requirements. Table 23 shows how changes in the assumed VCT uptake rate affect staffing requirements over time.

PMTCT: The Rwandan Government's target for PMTCT is to provide services to all (100%) women who seek ANC services. An estimated 92% of pregnant women receive ANC. Based on this target, 169 FTE PMTCT counselors and 13 FTE HIV testers would be required by 2009. Table 24 projects staffing needs for counseling and testing 100% of ANC clients over the next five years.

Box 1: Reaching Targets under Different Uptake and Treatment Assumptions

Total population: 8,483,000
Assumes HIV prevalence of 8.9%

	VCT Uptake	VCT and ART Clients Identified	PMTCT and ART Clients Identified	Total Identified for ART
If 33% of HIV-positive persons require ART:				
Target reached in three years	4%	29,897	30,256	60,154
	8%	59,795	30,256	90,051
	12%	89,692	30,256	119,949
Target reached in five years	4%	49,829	50,427	100,256
	8%	99,658	50,427	150,085
	12%	149,487	50,427	199,915
If 17% of HIV-positive persons require ART:				
Target reached in three years	4%	15,402	15,587	25,670
	8%	30,803	15,587	51,339
	12%	46,205	15,587	77,009
Target reached in five years	4%	25,670	25,978	51,647
	8%	51,339	25,978	77,317
	12%	77,009	25,978	102,986

Box 2: Full-time Equivalent (FTE) Calculations

In accordance with the national personnel standards, public sector health workers in Rwanda are granted the following days of training and leave each year:

- 104 weekend days
- 10 public holidays
- 22 days of vacation
- 6 days of sick leave
- 7 days for training

149 total days training and leave

FTE = 365 - 149 = 216 Days (8 hours/day) per year

Table 23: VCT FTE Requirements over the Next Five Years for Different Uptake Rates

Year*	Total VCT Staffing	VCT Annual Uptake Rate					
		4%		8%		12%	
		Counselors	Lab Staff	Counselors	Lab Staff	Counselors	Lab Staff
2005	Total VCT clients	339,320		678,640		1,017,960	
	Total FTE required	152	12	305	24	456	37
2006	Total VCT clients	346,785		693,570		1,040,355	
	Total FTE required	156	12	311	25	467	37
2007	Total VCT clients	354,414		708,829		1,063,243	
	Total FTE required	159	13	318	26	477	38
2008	Total VCT clients	362,211		724,423		1,086,634	
	Total FTE required	163	13	325	26	488	39
2009	Total VCT clients	370,180		740,360		1,110,540	
	Total FTE required	166	13	332	27	498	40

* Based on a 2005 population of 8,483,000; assumes a 2.2% increase in the total population per year over the five years represented.

Table 24: PMTCT FTE Requirements over the Next Five Years

PMTCT	2005	2006	2007	2008	2009
ANC Clients	343,392	350,946	358,667	366,558	374,622
Counselors	154	158	161	165	169
Laboratory Staff	12	13	13	13	13

VCT/PMTCT staffing scenarios: The calculations above assume that health workers work 216 days per year as stipulated in the national personnel standards. It is estimated, however, that as much as 20% of worker-days are spent off site at trainings, workshops, or other events. While these activities may be important in improving health worker skills, they also detract from service delivery time. Table 25 shows differences in FTE requirements given three scenarios of actual service delivery days. All figures are based on an 8% VCT uptake rate, which may be required to identify enough HIV-positive patients to reach the target set for ART in a three-year period.

Table 25: Effect of Actual Service Provision Days on FTE Staff Required for VCT and PMTCT

VCT/PMTCT Counseling Staffing Scenarios	Target	Year				
		2005	2006	2007	2008	2009
FTE = 216 days per year: Providers offer services on all of those days	VCT uptake of 8%	305	311	318	325	332
	PMTCT 100% of ANC clients	154	158	161	165	169
	Total FTE Counselors	459	469	479	490	501
	Total FTE Lab Staff	36	37	39	39	40
FTE = 206 full-time service days (216 days per year less 10 days allocated for training)	VCT uptake of 8%	319	326	333	340	348
	PMTCT 100% of ANC clients	162	265	169	173	176
	Total FTE Counselors	481	591	502	513	524
	Total FTE Lab Staff	39	39	40	41	42
FTE = 173 full-time service days (216 days per year less 20% [43 days] spent on non-service related tasks, such as off-site training, meetings, and workshops, or on additional days of sick* leave)	VCT uptake of 8%	380	389	397	406	415
	PMTCT 100% of ANC clients	192	197	201	205	210
	Total FTE Counselors	572	586	598	611	625
	Total FTE Lab Staff	46	47	48	49	50

* Sick leave here includes maternity leave, leave for caring for a relative, or leave for an extended illness, all beyond the six days allotted.

C. VCT/PMTCT Cost Scenarios/Options

1. Cost Scenarios of VCT and PMTCT Counseling and Testing

Salaries: The total health human resources budget of the civil service in 2004 was approximately US\$5.4 million. This budget accounts for roughly 45% of the health workforce; other staff are paid through contracts and health facility funds. The FTE costs represented in Table 26 are the worker salary costs of providing VCT and PMTCT services given 4% uptake, 8% uptake, and 12% uptake of VCT services for 2005. Depending on the staff member's employment arrangement, these worker salaries may be paid by the civil service, through contracts, or through health facility user fees. Total costs of salaries for VCT/PMTCT counselors and testers will vary considerably depending upon the VCT uptake the government aims for and the types of staff involved in VCT/PMTCT service provision.

Table 26: Salary Costs for VCT and PMTCT, 2005

VCT/PMTCT Staffing Scenarios		VCT 4% Annual Uptake PMTCT 100% of ANC Clients		VCT 8% Annual Uptake PMTCT 100% of ANC Clients		VCT 12% Annual Uptake PMTCT 100% of ANC Clients	
		FTE	Annual Salary Cost	FTE	Annual Salary Cost	FTE	Annual Salary Cost
Based on 2005 staffing requirements	VCT counselors	152	\$152,246	305	\$304,491	456	\$456,738
	PMTCT counselors	154	\$154,109	154	\$154,109	154	\$154,109
All HIV testers are A2 lab technicians or nurses	Lab staff	24	\$24,313	36	\$36,535	49	\$48,753
Scenario 1 Total		330	\$330,668	495	\$495,135	659	\$659,600
Counselors are 50% A2 nurses and social workers and 50% auxiliary staff or lay counselors*	VCT counselors	152	\$112,983	305	225,965	456	\$338,948
	PMTCT counselors	154	\$114,365	154	114,365	154	\$114,365
HIV testers are 50% A2 lab technicians or nurses and 50% auxiliary staff	Lab staff	24	\$18,045	36	27,112	49	\$36,180
Scenario 2 Total		330	\$245,393	495	\$367,442	659	\$489,493
Counselors are 33.3% A2 nurses and social workers and 66.7% auxiliary staff or lay counselors	VCT counselors	152	\$99,869	305	\$199,737	456	\$299,606
	PMTCT counselors	154	\$101,091	154	\$101,091	154	\$101,091
HIV testers are 50% A2 lab technicians or nurses and 50% auxiliary staff	Lab staff	24	\$18,045	36	\$27,112	49	\$36,180
Scenario 3 Total		330	\$219,005	495	\$327,940	659	\$436,877

Costs are in U.S. dollars.

* Assumes lay counselors would receive the same salary as auxiliary staff. This salary is quite low (US\$40.35 per month) and may not be sufficient to attract people to counseling. Other possibilities could include paying trained lay counselors 75% of an A2-level salary, which would come to about US\$62.50 per month, or simply pay them an A3-level salary (US\$65.79 per month).

Training costs: The Government of Rwanda seeks to create integrated HIV/AIDS services. To do so, it plans to train all nurses and social workers in VCT and PMTCT. In the early stages of PMTCT and VCT training, TRAC provided training to counselors at the central level. In 2004 the process of decentralizing training began. To support training at the district level, 78 trainers were trained. These trainers are responsible for conducting trainings at the district level, but the number of trainings per year and number of trainees per training are not specified. Table 27 calculates the total cost for training all nurses, social workers, lab technicians, and auxiliary staff who have not yet been trained in VCT/PMTCT. Training costs are based on costs for centralized training, since costs of training in districts were unavailable. It should be kept in mind, however, that training costs for decentralized, district-level training will be less than what is represented here.

Table 27: In-service Training Costs for Integrated VCT and PMTCT Services

	Training Costs/ Participant*	Total Staff Trained As of December 31, 2004	Total Remaining Nurses, Social Workers, Lab Technicians, and Auxiliary Staff	Total Cost for Training Remaining Staff
Counselors	\$208	595	3825**	\$795,600
Laboratory technicians	\$291	200	166***	\$48,306
Total Cost				\$843,906

* Per capita training costs are based on average cost of in-service training in Kigali reported by TRAC and the NRL; see Table 52 in Furth et al. (2006).

** Assumes 3014 A1, A2, and A3 nurses (2314 current + an additional 700 A1 and A2 nurses, which the government planned to hire as of March 2005); 258 social workers; and 1148 auxiliary staff. Although the government has set a minimum requirement of A2 nurse or A2 social worker status for counseling, auxiliary staff is being trained both at the central level and, more commonly, in district trainings. Therefore, the cost of training these staff has been included in this table.

*** Assumes one laboratory technician will be trained for each of the 366 health centers.

D. ART Services Scenarios/Options

1. HIV Care and Treatment Services

Several different national targets for ART have been listed in existing documents. The *Government of Rwanda HIV/AIDS Treatment and Care Plan 2003-2007* lists a target of 58,000 adult and pediatric patients, while the TRAC document, *Scaling up Antiretroviral Therapy (ART): Experience in Rwanda*, lists a target of 100,000 by 2007. Rather than select one of these targets over another for the staffing analysis, three possible targets—50,000, 75,000, and 100,000—are analyzed. In addition, two different time scenarios are represented. In the first, targets are reached in five years (end 2009), and in the second, targets are reached in three years (end 2007). The speed with which ART clients are identified and put on treatment will affect how rapidly staff will need to be trained, deployed, and possibly recruited.

Tables A1-A8 in Appendix 1 detail HIV care and treatment staffing FTE requirements and costs for five-year targets and three-year targets for both initiating and monitoring ART clients (see Box 3). Tables A1 and A2 are based on reaching targets in five years. Table A1 details the task time and FTE requirements for monitoring CD4 counts for HIV-positive clients not requiring ART, initiating clients on ART, monitoring ART clients, and dispensing ARV medications to clients. Table A2 details the task time and FTE requirements for performing CD4, viral load, and other blood tests required for ART monitoring. Tables A5 and A6 provide the same information but are based on the assumption of reaching targets in three years. These tables assume that health providers are offering services 216 days per year and that they are working at 75% efficiency (six hours a day) with the remaining 25% (two hours per day) spent on organizing materials, waiting for clients, completing routine administrative tasks, and staff meetings. The analysis represented in these tables also assumes that no clients will stop CD4 monitoring or ART services due to death or other reasons. While it is clear that some HIV care and treatment patients will

drop out or die, the potential treatment discontinuation rate estimated in the “Treatment and Care Plan,” 1.5%, is so small that it would not have a measurable impact on staffing requirements. Lastly, these tables begin with 8,000 ART monitoring clients. For the purposes of this study, the total number of ART clients recorded in Rwanda as of September 30, 2004 (6,230) was used to estimate the number of clients at the end of 2004. In the interest of simplicity, the tables are based on the assumption that all clients on ART in one year will be monitoring clients in the following year.

Box 3: Classification of ART Clients

Initiating clients are defined as clients who receive one initiation visit and three standard follow-up visits. According to the national guidelines, these follow-up visits are to take place two weeks after initiation, three months after initiation, and six months after initiation. Thereafter the client is considered a *monitoring client* and is scheduled for routine monitoring visits every six months.

Tables A3 and A4 project yearly staffing salary costs for ART care providers and lab staff, respectively, for reaching ART client targets in five years, under three different staffing mix scenarios: 1) using only doctors for CD4 monitoring, ART initiation, and ART monitoring and A1 nurses for all ARV dispensing; 2) having doctors perform 63% of CD4 monitoring and ART initiation and 33% of ART monitoring tasks and having A1 nurses perform 37% of CD4 monitoring and ART initiation tasks, 67% of ART monitoring, and 100% of ART dispensing; and 3) having doctors perform 63% of CD4 monitoring and ART initiation and 33% of ART monitoring tasks, having A1 nurses perform 37% of CD4 monitoring and ART initiation tasks, and 67% of ART monitoring, and having A2 nurses do all ARV dispensing.

The scenarios highlight for policy makers the cost savings that may be obtained by delegating certain tasks to lower-level healthcare providers. Tables A7 and A8 project salary costs for ART care providers and lab staff under these same staffing mix scenarios but reaching ART client targets in just three years.

2. HIV Care and ARV Dispensing

Tables A3, A4, A7, and A8 in Appendix 1 show that many different combinations of staff could perform CD4 count monitoring for clients not yet requiring ART, ART initiation, ART monitoring, and ARV dispensing tasks and that different combinations of staff have very different cost implications. The largest input for HIV care and treatment, in terms of staff time, is the continual monitoring of HIV-positive clients not yet requiring ART, but needing biannual CD4 counts. A large number of staff is required for this activity because the number of clients will be much greater than the number of HIV-positive clients on ART. The monthly dispensing of ARVs to ART clients will require the second largest number of FTE staff. If this task can be handled by A2 nurses, auxiliary staff, or even community members, then the burden of ART care will be greatly reduced for doctors, A1 nurses, and social workers. As for care for initiating and monitoring of ART clients, there are too few doctors (204⁷ active) to handle 100% of the initiation and monitoring care for all ART clients, which will require at least 48⁸ FTE personnel when a target of 100,000 clients is reached. Having nurses take responsibility for selected tasks related to initiation and monitoring may be one way to reduce the need for doctors and reduce cost as well.

Tables A5 and A6 show that the shorter the time to reach targets (i.e., three years rather than five), the greater the number of care providers and laboratory technicians required. Although the target for these two scenarios (100,000) is the same, more FTE staff is required to care for clients initiating ART, who are scheduled for four routine visits with a care provider as opposed to ART monitoring clients, who receive two routine visits with a provider per year. The faster ART services are scaled up, the greater the number of clients initiating ART per year.

⁷ Active refers to medical personnel engaged in service provision, as opposed to administration. The numbers here reflect only personnel in the public health system.

⁸ Based on a five-year target; see Table A1, last column, for 100,000 target in 2006. If a three-year target is to be achieved, then 58 FTE staff will be required (see Table A5).

3. Opportunistic Infection Care

Estimating staff required for providing care for opportunistic infections is difficult because various infections require different types of care and investments of provider time and because it is difficult to estimate the number of clients who will require services for specific OI. It is estimated, however, that a significant number of in-patients in hospitals require treatment for OI. The National Care and Treatment Plan 2003-2007 notes that 60% of all hospital beds are occupied by AIDS patients (MINISANTE & The Clinton Foundation, 2003). Adequate staff will be required to address these patients' needs as well. Calculations of FTE staff requirements presented in Tables A1-A8 do not include staff needed for OI care.

4. Laboratory Testing

Table A6 shows that a large number (254) of FTE laboratory personnel would be required to carry out routine testing for initiating and monitoring 100,000 ART clients. Currently, there are only 16 A1 and 162 A2 laboratory technicians active in Rwanda. The number of required laboratory technicians may change if equipment that can process tests more quickly and in larger batches is made available. Consideration will have to be given as to how the laboratory gap can be filled. Kigali Health Institute is graduating approximately 80 trained laboratory technicians per year, which will help. Assuming that laboratory technicians working on routine testing are posted at the three referral hospitals and 33 district hospitals, a minimum of six FTE laboratory technicians would be required per site in order to fulfill the routine testing requirements of 100,000 ART clients.

E. ART Services Cost Scenarios/Options

1. ART Care and Treatment Staffing Costs

Which types of staff are allocated to carry out CD4 count monitoring, ART initiation, ART monitoring, and ARV dispensing tasks will influence the cost of supporting ART services. Tables A3, A4, A7, and A8 provide costs for staff salaries in three different staffing mix scenarios and according to different ART client targets. Scenario 1 costs out the use of only doctors for all CD4 count monitoring, ART initiation and ART monitoring activities and A1 nurses for ARV dispensing. Scenario 2 imagines that doctors and A1 nurses split CD4 count monitoring, ART initiation and ART monitoring tasks, with doctors doing 63% of initiation tasks and 33% of monitoring tasks and nurses filling in the rest of the initiation and monitoring tasks and doing all dispensing. For example, this division of tasks might include doctors doing physical examinations of patients, ordering lab tests, and reviewing test results and nurses interviewing clients for medical history and symptoms, weighing, taking blood pressure and dispensing ARVs to clients. Or, it may be some other division of tasks. The last scenario, scenario 3, considers the same division of CD4 count monitoring, ART initiation and ART monitoring among doctors and A1 nurses but includes A2 nurses doing all dispensing. Since dispensing requires the greatest number of FTE of all ART services, using lesser paid staff for dispensing activities greatly reduces cost. It will also ensure that there is an adequate number of staff to actually provide the service, since doctors and A1 nurses are in short supply.

It should be noted that the costs included in these tables and in Table 26 for VCT and PMTCT are based on current civil service salaries. The Government of Rwanda is in the process of developing a plan to increase these salaries, which are generally considered low; thus, real costs in the future may be greater than those represented here.

2. HIV/AIDS Care and Treatment In-service Training Costs

Assuming that both doctors and nurses (A1 and A2) will be providing ART services, the cost of in-service training of existing staff will reach US\$184,004. This would cover the cost of training 202 FTE staff for care and treatment and 254 laboratory staff. As noted above, very few trained laboratory technicians are currently employed in Rwanda. This study identified only 16 A1 laboratory technicians and 162 A2 laboratory technicians active in the Rwandan public health system.

F. Health Facility Staffing and Service Organization Options

1. Health Center Example

The FTE calculations in the previous sections address FTE needs for the total population of Rwanda and do not address needs for particular health facilities. HIV/AIDS service provider requirements for individual health facilities will vary depending on the size of the population served by the facility. The following section offers an illustrative example of VCT and PMTCT staffing requirements at a health facility with a population of 25,000, which is a roughly the average population for the 366 health centers in Rwanda.

According to TRAC, in 2004 health centers offering VCT and PMTCT averaged 250 clients per month per service or 3000 clients/year for each service.⁹ Table 28 below shows how many staff would need to be allocated to VCT and PMTCT, full time (216 days per year), if the targeted number of clients were to be served. The table assumes 12% coverage rate for VCT (since 3000 clients equal 12% of 25,000) and 100% coverage of all ANC clients (92% of all pregnant women).¹⁰

Table 28: FTE Counselors Needed per Health Center

Staff Type	Target	Year				
		2005	2006	2007	2008	2009
Counselors	VCT coverage of 12%	1.22	1.38	1.41	1.44	1.47
	PMTCT 100% of ANC clients	0.44	0.45	0.46	0.47	0.48
	Total FTE Counselors	1.66	1.83	1.87	1.91	1.95
Testers	VCT coverage of 12%	0.11	0.11	0.11	0.12	0.12
	PMTCT 100% of ANC clients	0.04	0.04	0.04	0.04	0.04
	Total FTE Lab Staff*	0.14	0.15	0.15	0.15	0.16

*The time required by laboratory staff includes only the time for conducting rapid tests and completing client records and/or register books. It does not include any additional time the laboratory technician might spend preparing samples to be sent to the national laboratory for quality control.

2. Daily VCT and PMTCT Staffing at Service Sites

How services are organized will affect the number of counselors required per service day. Tables 29 and 30 offer two different scenarios of service organization and shows the related counselor and laboratory staffing requirements. While the total FTE required throughout the year would be the same (assuming 216 days of service provision), the number of staff available to fulfill client demand on any particular day would vary depending on whether the services were offered continually (251 days per year)¹¹ or as concentrated service (in the example below, 104 days per year, two days per week).

Continual service – daily staffing: For a site with *continual service* – service offered every day the facility operates – the number of providers counseling clients for six hours per day, with two hours allotted for waiting for clients, organizing materials and compiling records or reports, would be 1.43 FTE counselors in 2005 (see Table 29).

⁹ The study sample of 20 sites showed an average quite close to this – 233 clients/month – for the 12 months of service delivery (November 2003-October 2004).

¹⁰ Pregnant women are calculated here based on a crude birthrate of 4.4%

¹¹ Service site days of operation are calculated as 365 days per year minus 104 weekend days and 10 public holidays = 251.

Table 29: Continual Service Delivery Staffing (Five Days per Week)

Provider Type	Target	2005	2006	2007	2008	2009
Counselors	VCT coverage of 12%	1.05	1.18	1.21	1.24	1.26
	PMTCT 100% of ANC clients	0.38	0.39	0.40	0.41	0.42
	Total counselors/service day VCT and PMTCT	1.43	1.57	1.61	1.65	1.68
Testers	VCT coverage of 12%	0.09	0.10	0.10	0.10	0.10
	PMTCT 100% of ANC clients	0.03	0.03	0.03	0.03	0.03
	Total testers/service day VCT and PMTCT	0.12	0.13	0.13	0.13	0.13

Concentrated service – daily staffing: For sites with *concentrated services* – service only offered on particular days of the week – the number of service providers available on service days would be greater because client loads would be concentrated on specific days of the week, rather than spread out over the week.

Most facilities the study team visited offered VCT two days a week and PMTCT two days a week. For example, VCT was offered Wednesdays and Fridays and PMTCT on Tuesdays and Thursdays. Offering services only a few days of the week can be very convenient for service providers and for clients, but it also means that client loads will increase for those specified days. Table 30 illustrates how many staff would have to be dedicated to VCT and PMTCT per service day, if each service were only offered two days a week. The total number of counselors per day listed in Table 30 is not aggregated since the services are offered on separate days.

Table 30: Concentrated Service Delivery Staffing (Two Days per Week per Service)

Provider Type	Target	2005	2006	2007	2008	2009
Counselors	VCT coverage of 12%	2.53	2.86	2.92	2.98	3.05
	PMTCT 100% of ANC clients	0.92	0.94	0.96	0.98	1.01
Testers	VCT coverage of 12%	0.22	0.23	0.23	0.24	0.25
	PMTCT 100% of ANC clients	0.07	0.08	0.08	0.08	0.08

On VCT service days, 2.53 counselors would be required in 2005 and 2.86 counselors in 2006, as opposed to 1.05 and 1.18 counselors, respectively, for these years for sites with continual service delivery. For a site with six full-time qualified staff members (not including laboratory technicians), this would mean that 42% of staff would have to be dedicated to VCT two days a week, a potential burden on other services provided at the health facility. In addition, three counseling rooms would need to be available so that these staff could counsel the clients within a six-hour period. While VCTI and other donors are in the process of constructing counseling facilities, few health centers currently have an adequate number of counseling rooms to provide services to clients.

In either scenario, little time is required of laboratory technicians to complete the required tests. In the continual service delivery model, a laboratory technician would spend less than 45 minutes per day in 2005 and just under 50 minutes per day in 2009 processing VCT tests. For VCT service delivery days in the concentrated model, about one hour and 45 minutes of laboratory staff time would be required per service day in 2005, and this would increase to only two hours by 2009.

G. Summary of FTE Requirements and Annual Staff Salary Costs All HIV/AIDS Services

Table 31 aggregates the total annual salary costs for all HIV/AIDS services, based on assumptions of an ART target of 100,000 clients in three years, an 8% uptake of VCT, and 100% of ANC clients provided with PMTCT. The table illustrates the substantial human and financial cost of HIV/AIDS service scale-up. The 74 FTE doctors it will require to provide care and treatment for initiating and monitoring ART clients by 2007 represent 36% of the 204 doctors providing health services nationwide. This estimate relies on the assumption that doctors would provide 63% of initiation care and only 33% of monitoring care. If doctors were to provide 100% of those services, at least 126 FTE doctors would be required, which would be equivalent to roughly 62% of active doctors nationwide. As the government scales up and decentralizes ART services, staff distribution will also have to be carefully considered. Differences in prevalence in rural and urban areas should be taken into consideration when staff deployment is planned.

In addition to physician requirements, 607 nurses and social workers would be required for VCT, PMTCT, and HIV/AIDS care and treatment services by 2007, a number representing 22% of those cadres currently active in the Rwandan health system (2812). Laboratory technicians are the most under-represented category of staff required for HIV/AIDS services. Nationwide there are currently only 235 laboratory technicians. Table 31 suggests that 304 FTE laboratory staff will be required by 2007 to fulfill HIV/AIDS testing requirements.

It should be kept in mind that this analysis covers provision of standard ART initiation and monitoring care and does not include care for opportunistic infections.

Table 31: Staff Salary Costs, All HIV/AIDS Services

Service	Cadre	FTE	2005	FTE	2006	FTE	2007
VCT 8%	A2 Nurse/Social Worker	305	\$304,492	311	\$320,527	318	\$337,405
	A2 Lab Tech/Nurse	24	\$24,437	31	\$32,154	37	\$36,655
	Subtotal	329	\$328,929	342	\$352,681	355	\$374,060
PMTCT 100% ANC	A2 Nurse/Social Worker	154	\$154,109	158	\$162,225	161	\$170,768
	A2 Lab Tech/Nurse	12	\$12,098	13	\$13,016	13	\$14,423
	Subtotal	166	\$166,207	171	\$175,241	174	\$185,191
HIV/AIDS Care and Treatment 100,000 by 2007	Doctors	26	\$76,349	49	\$142,918	74	\$226,648
	A1 Nurses/Social Workers	17	\$26,153	33	\$51,796	52	\$85,359
	A2 Nurses/Social Workers*	19	\$19,290	37	\$39,738	76	\$81,860
	A1 Lab Tech	23	\$36,449	43	\$70,858	85	\$140,283
	A2 Lab Tech	47	\$46,652	89	\$90,694	169	\$179,554
Subtotal	132	\$204,893	251	\$396,004	456	\$713,704	
Total		627	\$700,029	764	\$923,926	985	\$1,272,955

Costs are in U.S. dollars.

* In this case, these nurses or social workers would dispense ARVs and provide counseling on taking medications.

The US\$1,272,955 required to support the salaries of these FTE staff that would be needed to provide HIV/AIDS services represents 24% of the 2004 MOH health human resources budget for Rwanda (US\$5,400,000). Salaries are currently considered quite low, despite recent pay increases through primes, and the government is working on plans to further increase the salaries of civil service employees as part

of its health reforms (GOR-MIFOTRA, 2004). Thus it is possible that the total costs of health personnel salaries could increase substantially in the upcoming years.¹²

Growth of the health workforce: In recent years several training institutions have been created or strengthened, allowing for a rapid growth in the number of trained healthcare workers. The School of Medicine graduates approximately 70 new physicians every year. If this trend continues, over 200 new physicians could be available to work in hospitals and health centers in the next three years.

Nursing schools, training on average 20 to 40 students per institution per year, are also responsible for growth in the health workforce. The Ministry of Health is in the process of reorganizing nursing education and has plans to reduce nursing schools from 21 to five and to upgrade required qualifications for A1 and A2 nurses. Without a clear sense of how many nursing schools will be operational in the next few years, and how many students they will be able to accommodate, it is difficult to determine how many more nurses will enter the health workforce in the next few years.

Kigali Health Institute is graduating laboratory technicians at the rate of about 80 per year. This could result in approximately 250 new lab technicians being added to the workforce in the next three years.

Future staffing needs: While the human resource and financial requirements for the rapid scale-up of HIV/AIDS services are substantial, staffing requirements may level off or even decline over time. The faster the government seeks to reach a target of 100,000 clients on ARVs, the higher the VCT uptake required and the greater the percentage of ANC clients that will need to be tested. Greater numbers of clients provided with PMTCT and VCT, in turn, lead to higher numbers of identified HIV-positive clients who will require CD4-count monitoring. Over time, after initial targets have been met, the government may be able to reduce VCT uptake, thereby decreasing the need for VCT counselors and lab staff. The pace of increasing the number of staff serving ART clients may also slow if VCT uptake rates are reduced, although the total number of FTE staff needed to provide HIV/AIDS treatment and care will continue to increase.

V. RECOMMENDATIONS

Recommendation 1: Strengthen and promote coordination and synergy between CNLS, TRAC, and other MOH departments and ministries.

HIV/AIDS service statistics and data should be integrated into the national health management information system so that TRAC, the Department of Planning, and the Department of Health Care (DSS) can use the data to monitor, evaluate, and manage their respective health service coordination activities. DSS and TRAC should also work together to develop training and supervision strategies and to clearly define and integrate the roles and responsibilities of district supervisors for HIV/AIDS service monitoring and supportive supervision. In addition, the Department of Planning, the Department of Human Resources and Support Services, and the Ministry of Public Service, Skills Development and Labor (MIFOTRA) should communicate regarding staffing plans for HIV/AIDS service delivery to ensure that any increases or reallocation of staff are feasible and correspond to human resource budgets.

Recommendation 2: Consideration should be given to if and how staff supported through contractual arrangements funded by donors and support agencies will be sustained when HIV/AIDS funding subsides.

If donor agencies step in to provide financial support for hiring staff at health facilities then the job security of these staff would be subject to continued donor funding. The Rwanda Ministry of Health should continue collecting staffing data from annual health facility reports but should also invest in entering these data into a database and monitoring staffing and staff employment so that the potential effects of reductions in financial support on staffing can be anticipated and mitigated.

¹² Plans for salary changes have not yet been implemented and are not expected in the next year (personal communication with the national coordinator for the Rwandan health reform project).

Recommendation 3: Involve A2 nurses, auxiliary staff, or community members in ARV dispensing to decrease the workload of A1 nurses and social workers.

The involvement of lower-level cadres or non-health professionals in ARV dispensing should be investigated, keeping in mind that clear role/responsibility definition, appropriate training, and effective referral systems would be required to ensure service quality. Involvement of lower-level cadres, and perhaps even community members, in the distribution of drugs and counseling about adherence will enable A1 nurses and social workers to dedicate more time to clinical care. It will also reduce the cost of ARV service provision.

Recommendation 4: The Ministry of Health should consider whether the scale-up of VCT and PMTCT services should be achieved, in part, through the use of appropriately trained lay counselors, such as auxiliary staff.

The inclusion of auxiliary staff or other lay counselors in VCT and PMTCT counseling and testing could provide a viable and cost-effective means for the rapid scale-up of VCT and PMTCT services, reduce the work burden on nurses, and increase the quality of counseling.

Recommendation 5: Expand the training of laboratory staff and invest in more efficient testing technologies.

With automated equipment, laboratory staff will be able to “multi-task” and process multiple samples simultaneously, thereby greatly reducing the time required for any one test or sample and reducing FTE staffing requirements. Even if more efficient technologies are made available, however, laboratory technicians are among the categories of staff in shortest supply in Rwanda, and efforts will need to be made to either expand pre-service training programs, attract more candidates into training programs, or both.

Recommendation 6: Training in service and personnel management /organization should be provided to site managers.

To ensure that staff time is used as effectively and efficiently as possible and that staff and service allocation correspond to service demand and infrastructural capacity, site managers should receive training in service and personnel management and organization.

Recommendation 7: Service delivery facilities with few staff or with a limited number of counseling rooms should be encouraged to offer services on a continual basis (five days per week).

Spreading services throughout the week will reduce demand for counseling space and FTE providers required per service delivery day.

Recommendation 8: Efforts should be made to link staffing at sites to service delivery demand and targets.

Analysis of staffing compared to service usage suggests that staff allocation and/or hiring does not correspond to service provision demands and/or targets. Current surveillance data may provide a reasonable basis on which to estimate staffing requirements of different regions and sub-regions within the country to ensure adequate allocation of HIV/AIDS service provision staff. It should be kept in mind that some facilities may already have a surplus of staff and may not need additional HIV/AIDS service providers.

Recommendation 9: As scale-up of VCT and PMTCT rolls out, the need is urgent to establish procedures for regular monitoring of service quality.

Quality assurance systems – such as supervision, data management, performance measurement and reviews, action planning, and training – should be developed and expanded, and the national VCT and PMTCT guidelines should be widely disseminated to provinces, district health offices, and health facilities.

Recommendation 10: Supervision of HIV/AIDS service provision should be strengthened.

To ensure effective supervision, the roles of district supervisors with regard to the supervision of HIV/AIDS services as well as other health services need to be clearly defined and integrated into supervisor job descriptions. Supervisory tools including guidance for data collection, data analysis, data-driven planning, decision-making, and report writing should also be created. Consideration also needs to be given as to how counselor performance can be monitored during training and active service to ensure that counseling and clinical care standards are maintained at an acceptable level. Greater emphasis should be placed on supervisor observation of provider counseling and care and on providing constructive feedback to service providers.

Recommendation 11: Consideration should be given to integrating reviews of record-keeping quality and support to health facility staff for record keeping, into routine supervisory visits.

TRAC has created standards for register book design and record keeping. However, inadequate attention has been paid to training staff to keep accurate records and to use data in the records for facility-based decision-making. Facility and district staff should be assisted to improve record-keeping skills and trained to use data for facility-based and district-wide quality assurance, decision-making, and planning.

Recommendation 12: Consideration should be given to appointing selected staff at facilities as HIV/AIDS focal persons or mentors/preceptors.

Appointing one or more staff members at each site as an HIV/AIDS focal person or preceptor could provide a cost-effective mechanism for on-the-job refresher training and quality assurance. An HIV/AIDS focal person or preceptor would spend a greater percentage of his or her time providing HIV/AIDS services, perhaps even 100% of his or her time, and would serve as a resource person for other staff. He/she might also be responsible for supervising other staff members, providing on-the-job training, and identifying staff requiring more formal refresher training.

Recommendation 13: Expand development and dissemination of job aids and decision-making algorithms, which can be utilized by counselors and clinicians providing HIV clinical care.

Provision of high quality care can be furthered through the use of job aids including decision-making algorithms, checklists, and bulleted recommendations. Efforts should be made to further the development and dissemination of these tools, through the Rwanda Health Communication Center or similar bodies.

Recommendation 14: Integrate training in HIV clinical care into existing nursing curricula in pre-service training institutions.

The health workforce trained to provide HIV clinical management can be more rapidly developed and upgraded through the training of nurses. To endow nurses with the necessary skills, however, the following will need to be addressed:

- Provision of training in HIV clinical management to nurse educators.
- Development of HIV-specific curricula and training materials that can be utilized at all nursing schools. These should address provision of VCT and PMTCT, assessment of treatment adherence and treatment-associated side effects, and provision of routine clinical care, including management of opportunistic infections.
- Formalization of the practicum component, which includes regular supervision of students' activities.

Recommendation 15: Identify mechanisms for credentialing or certifying clinicians and laboratory technicians to provide HIV services in pre-service training programs.

Pre-service training should be upgraded and assessment procedures expanded to allow graduates to immediately begin providing HIV clinical care or laboratory services following graduation, without participating in an additional training program.

Recommendation 16: Develop better mechanisms for tracking and monitoring staff training at the health facility, district, and central levels.

Without a clear sense of the numbers of staff being trained, or who is being trained, TRAC and the rest of MOH cannot adequately analyze and monitor training costs, cadres being trained, or staff in need of refresher training. A simple database will help the government identify those in need of refresher training, reduce the occurrence of duplicate training, and enable the government to monitor training inputs and outcomes. Where possible, efforts should be made to link or integrate systems for tracking HIV/AIDS-related training with other training records/systems.

Recommendation 17: Develop mechanisms for keeping clinicians up to date with the latest information regarding HIV clinical management.

In addition to attendance at trainings, efforts should be made to provide clinicians with greater and more regular access to existing clinical materials, curricula, and guidelines developed by both Rwandan and international agencies. An institution or organization to provide routine and sustainable in-service training to health care professionals under the auspices of TRAC should also be identified. In addition, guidance should be developed regarding the frequency and criteria for refresher training, and the periodicity of this training should be linked to changes in curriculum and guidelines.

Recommendation 18: Streamline in-service training programs to as few days as possible.

The Government of Rwanda may wish to consider limiting the length of in-service training. Longer training sessions result in providers being away from their health facilities for longer periods of time, reducing access to them by patients and increasing the work burden on other health care providers.

Recommendation 19: Continue to build capacity and capability of the School of Public Health to address public health and organizational aspects associated with the HIV epidemic.

The School of Public Health provides important training in various areas including: (1) epidemiology and biostatistics, (2) quality improvement, (3) behavior change communication, and (4) health management. Mastery of these skills by senior and mid-level health care managers allows for greater use and efficiency of scarce resources and the design of more effective interventions to reduce disease transmission.

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APPENDIX 1: HIV/AIDS CARE AND TREATMENT STAFFING AND COST TABLES FOR REACHING TARGETS IN FIVE YEARS AND THREE YEARS

The data in Tables A1-A8 are based on the following:

FTE days per year	216
One day of HIV/AIDS service	Six hours of client contact and two hours of administration, preparation, waiting, and staff meetings
Population in 2005	8,483,000
Populations growth	2.2% per year
Crude birth rate	4.4%
ANC first attendance	92%
HIV prevalence	8.9%

Definition: ART *initiating clients* are those clients who start ARVs for the first time. Clients are considered initiating clients for the first 6 months of treatment after which they become ART *monitoring clients*. ART *monitoring clients* are those clients who have had their initial visit, two-week follow-up visit, three-month follow-up visit, and six-month follow-up visit and who have reached the point of routine biannual visits.

For illustrative purposes, the number of clients on ART per year was derived by reducing from the target number by 27% per year for the five-year target or 50% per year for the three-year target.

To calculate the number of HIV-positive patients that will be identified per year, a VCT uptake rate of 4% and 100% ANC clients receive PMTCT was applied for a target of 50,000 ART clients and a VCT uptake rate of 8% and 100% ANC clients receive PMTCT was applied for the targets of 75,000 and 100,000 ART clients.

Assumptions

1. HIV-positive clients identified through VCT and PMTCT receive CD4 counts every six months
2. All ART *initiating clients* complete the full course of initiating services in one calendar year
3. All clients who started ARVs or were already on ARVs in 2004 become *monitoring clients* in 2005; all clients initiating or monitoring in 2005 become monitoring clients in 2006, and so on, until the target is reached.
4. At the end of 2004, 8000 clients were on ARVs. These clients are counted as monitoring clients in 2005, while all other ART clients will be considered initiating clients.
5. No clients on ARVs will die or permanently stop taking ARVs over the next 5 years. While “exits” from the ART program due to death or other reason will likely occur—the Clinton Foundation estimates a 1.5% death rate/year of ARV patients—the number is not substantial enough to have an impact on the number of FTE required.
6. All staff is paid according to the government salary scale, and salaries increase at a steady rate of 3% per year.

Table A1: Task Time and FTE Care Providers Required for Different HIV/AIDS Care and Treatment Services, Assuming Five-year Targets

HIV/AIDS Care and Treatment	2005			2006			2007			2008			2009		
Five-year Target	50,000	75,000	100,000	50,000	75,000	100,000	50,000	75,000	100,000	50,000	75,000	100,000	50,000	75,000	100,000
Total ART Clients	14,199	21,299	28,398	19,451	29,176	38,902	26,645	39,968	53,290	36,500	54,750	73,000	50,000	75,000	100,000
CD4 Count Monitoring Clients Not on ART	54,562	77,662	70,563	111,409	162,747	153,021	167,679	246,962	233,640	222,684	329,277	311,027	275,472	408,261	383,261
Time per visit – minutes	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Visits/year	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total counseling minutes/year	1,527,743	2,174,540	1,975,753	3,119,441	4,556,903	4,284,591	4,695,004	6,914,948	6,541,918	6,235,157	9,219,763	8,708,763	7,713,205	11,431,299	10,731,299
Total FTE: CD4 Monitoring	20	28	25	40	59	55	60	89	84	80	119	112	99	147	138
ART Initiating Clients	6,199	13,299	20,398	5,252	7,878	10,503	7,194	10,791	14,388	9,855	14,783	19,710	13,500	20,250	27,000
Time per visit – minutes	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Visits/year	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Total counseling minutes/client/year	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
Total counseling minutes	384,345	824,518	1,264,691	325,607	488,411	651,214	446,037	669,056	892,075	611,010	916,515	1,222,020	837,000	1,255,500	1,674,000
Total FTE: ART Initiation	5	11	16	4	6	8	6	9	11	8	12	16	11	16	22
ART Monitoring Clients	8,000	8,000	8,000	14,199	21,299	28,398	19,451	29,176	38,902	26,645	39,968	53,290	36,500	54,750	73,000
Time per visit – minutes	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Visits/year	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total time/client/year	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
Total counseling minutes	224,000	224,000	224,000	397,575	596,363	795,151	544,624	816,936	1,089,248	746,060	1,119,090	1,492,120	1,022,000	1,533,000	2,044,000
Total FTE: ART Monitoring	3	3	3	5	8	10	7	11	14	10	14	19	13	20	26
ARV Dispensing	14,199	21,299	28,398	19,451	29,176	38,902	26,645	39,968	53,290	36,500	54,750	73,000	50,000	75,000	100,000
Times ART dispensed/year	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Visits/client/year	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Total time/client/year	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Total counseling minutes	851,947	1,277,921	1,703,894	1,167,051	1,750,577	2,334,102	1,598,700	2,398,050	3,197,400	2,190,000	3,285,000	4,380,000	3,000,000	4,500,000	6,000,000
Total FTE: Dispensing	11	16	22	15	23	30	21	31	41	28	42	56	39	58	77
ART total care hours	49,801	75,016	86,139	83,495	123,204	134,418	121,406	179,983	195,344	163,037	242,339	263,382	209,537	311,997	340,822
ART total care days	8,300	12,503	14,356	13,916	20,534	22,403	20,234	29,997	32,557	27,173	40,390	43,897	34,923	51,999	56,804
Total FTE: All Care and Treatment Tasks	38	58	66	64	95	104	94	139	151	126	187	203	162	241	263

Table A2: Task Time and FTE Laboratory Staff Required for Different ART Testing Services, Assuming Five-year Targets

	2005			2006			2007			2008			2009		
Five-year Target	50,000	75,000	100,000												
Test: CD4															
Test time minutes	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Tests/year	137,523	197,922	197,922	261,719	383,846	383,846	388,647	573,860	573,860	518,368	768,054	768,054	650,943	966,521	966,521
Total minutes/year	825,136	1,187,530	1,187,530	1,570,313	2,303,074	2,303,074	2,331,885	3,443,159	3,443,159	3,110,210	4,608,327	4,608,327	3,905,659	5,799,128	5,799,128
Test: Viral Load*															
Test time minutes	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Tests/year	14,199	21,299	28,398	19,451	29,176	38,902	26,645	39,968	53,290	36,500	54,750	73,000	50,000	75,000	100,000
Total minutes/year	354,978	532,467	709,956	486,271	729,407	972,543	666,125	999,188	1,332,250	912,500	1,368,750	1,825,000	1,250,000	1,875,000	2,500,000
Test: Liver Function															
Test time minutes	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Tests/year	59,394	109,091	158,788	65,160	97,741	130,321	89,261	133,891	178,522	122,275	183,413	244,550	167,500	251,250	335,000
Total minutes/year	1,158,180	2,127,270	3,096,360	1,270,627	1,905,940	2,541,254	1,740,585	2,610,877	3,481,169	2,384,363	3,576,544	4,768,725	3,266,250	4,899,375	6,532,500
Test: Full Blood Count															
Test time minutes	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Tests/year	46,996	82,493	117,991	54,657	81,985	109,314	74,872	112,309	149,745	102,565	153,848	205,130	140,500	210,750	281,000
Total minutes/year	343,068	602,202	861,336	398,995	598,493	797,991	546,569	819,853	1,093,138	748,725	1,123,087	1,497,449	1,025,650	1,538,475	2,051,300
Test: Kidney Function															
Tests/year	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Test time minutes	22,199	29,299	36,398	33,650	50,475	67,300	46,096	69,144	92,192	63,145	94,718	126,290	86,500	129,750	173,000
Test minutes/year	421,783	556,675	691,567	639,349	959,024	1,278,699	875,821	1,313,732	1,751,642	1,199,755	1,799,633	2,399,510	1,643,500	2,465,250	3,287,000
Total minutes/year	3,103,145	5,006,144	6,546,748	4,365,556	6,495,938	7,893,559	6,160,984	9,186,809	11,101,359	8,355,552	12,476,340	15,099,011	11,091,059	16,577,228	20,169,928
Total testing hours	51,719	83,436	109,112	72,759	108,266	131,559	102,683	153,113	185,023	139,259	207,939	251,650	184,851	276,287	336,165
Total FTE days	8,620	13,906	18,185	12,127	18,044	21,927	17,114	25,519	30,837	23,210	34,656	41,942	30,808	46,048	56,028
Total FTE: All ART Lab Tasks	40	64	84	56	84	102	79	118	143	107	160	194	143	213	259

* Viral load tests were not being conducted in Rwanda at the time study observations were made. The time noted in this table is the time estimated for viral load tests conducted in Zambia (see Huddart et al. 2003).

Table A3: Cost Scenarios for ART Care Providers (Five-year Analysis)

	2005			2006			2007			2008			2009		
	50,000	75,000	100,000	50,000	75,000	100,000	50,000	75,000	100,000	50,000	75,000	100,000	50,000	75,000	100,000
FTE Care and Treatment Providers	38	47	56	64	73	82	94	106	117	126	142	158	162	184	206
Scenario 1: CD4 monitoring, ART initiation, and ART monitoring are done by doctors, while A1 nurses do ARV dispensing															
Total Cost/Year*	\$96,877	\$146,022	\$163,575	\$171,958	\$253,232	\$268,709	\$259,344	\$383,960	\$405,798	\$357,908	\$531,432	\$562,245	\$470,170	\$699,431	\$742,905
Scenario 2: Doctors do 63% of CD4 monitoring and ART initiation tasks and 33% of monitoring tasks. ** Nurses do 37% of CD4 monitoring and ART initiation tasks, 67% of ART monitoring tasks, and all ARV dispensing															
Total Cost/Year	\$82,033	\$181,718	\$192,466	\$229,454	\$336,953	\$343,373	\$349,434	\$516,384	\$525,442	\$480,722	\$712,743	\$725,524	\$624,783	\$928,226	\$946,260
Scenario 3: Doctors do 63% of CD4 monitoring and ART initiation tasks and 33% of ART monitoring tasks. A1 Nurses do 37% of CD4 monitoring and ART initiation tasks and 67% of ART monitoring tasks. A2 nurses or social workers do all dispensing															
Total Cost/Year	\$106,057	\$161,307	\$177,839	\$191,736	\$281,837	\$291,300	\$291,021	\$430,336	\$443,687	\$400,795	\$594,538	\$613,376	\$522,826	\$777,101	\$803,681

* Costs are in U.S. dollars and are based on an average salary for these categories of worker according to current (November 2004) salaries paid by the civil service: Doctors at FR138,000 (US\$2,905/year), A1 nurses at FR74,000 (US\$1558/year), and A2 nurses at FR47,500 (US\$1000/year).

** The percentages represented here imagine a scenario in which doctors do some tasks—such as patient examinations, ordering of tests, and prescribing ARVs—while nurses take care of other tasks, such as interviewing the client regarding medical conditions, weighing the client, taking blood pressure, and counseling the client on taking his/her medication, etc.

Table A4: Annual Staffing and Salary Cost Scenarios for ART Laboratory Staff (Five-year Analysis)

	2005			2006			2007			2008			2009		
	50,000	75,000	100,000	50,000	75,000	100,000	50,000	75,000	100,000	50,000	75,000	100,000	50,000	75,000	100,000
FTE Laboratory Staff	40	64	84	56	84	102	79	118	143	107	160	194	143	213	259
Laboratory staff costs	50,000	75,000	100,000	50,000	75,000	100,000	50,000	75,000	100,000	50,000	75,000	100,000	50,000	75,000	100,000
Scenario 1: A1 laboratory technicians do all lab testing for HIV-positive clients															
Total Cost/Year*	\$62,170	\$100,296	\$131,162	\$90,086	\$134,048	\$162,889	\$130,950	\$195,263	\$235,957	\$182,923	\$273,137	\$330,554	\$250,094	\$373,803	\$454,815
Scenario 2: A1 laboratory technicians do 50% of testing, and A2 laboratory technicians do 50% of testing															
Total Cost/Year	\$77,606	\$114,528	\$149,773	\$112,452	\$167,329	\$203,330	\$163,462	\$243,742	\$294,539	\$228,338	\$340,950	\$412,622	\$312,186	\$466,609	\$567,735
Scenario 3: A1 laboratory technicians do 33% of laboratory testing and A2 laboratory technicians do 67% of testing															
Total Cost/Year	\$47,343	\$76,376	\$99,880	\$68,601	\$102,078	\$124,040	\$99,719	\$148,693	\$179,681	\$139,296	\$207,994	\$251,717	\$190,447	\$284,651	\$346,342

* Costs are in U.S. dollars and are based on an average salary for laboratory technicians according to current (November 2004) salaries paid by the civil service: A1 laboratory technician at FR74,000 (US\$1558/year) and A2 laboratory technician at FR47,500 (US\$1000/year).

Table A5: Task Time and FTE Care Providers Required for Different HIV/AIDS Care and Treatment Services, Assuming Three-year Targets

HIV/AIDS Care and Treatment	2005			2006			2007		
Three-year Target	50,000	75,000	100,000	50,000	75,000	100,000	50,000	75,000	100,000
Total ART Clients	12,500	18,750	25,000	25,000	37,500	50,000	50,000	75,000	100,000
HIV-positive: CD4 Monitoring but not ART	56,261	80,211	73,961	105,859	154,423	141,923	144,324	211,930	186,930
Time per visit in minutes	14	14	14	14	14	14	14	14	14
Visits/year	2	2	2	2	2	2	2	2	2
Total counseling minutes/client/year	28	28	28	28	28	28	28	28	28
Total counseling minutes/year	1,575,318	2,245,903	2,070,903	2,964,065	4,323,839	3,973,839	4,041,064	5,934,038	5,234,038
Total FTE: CD4-Count Monitoring	20	29	27	38	56	51	52	76	67
ART Initiating Clients	4,500	10,750	17,000	12,500	18,750	25,000	25,000	37,500	50,000
Time per visit	20	20	20	20	20	20	20	20	20
Visits/year	4	4	4	4	4	4	4	4	4
Total counseling minutes/client/year	62	62	62	62	62	62	62	62	62
Total counseling minutes	279,000	666,500	1,054,000	775,000	1,162,500	1,550,000	1,550,000	2,325,000	3,100,000
Total FTE: ART Initiation	4	9	14	10	15	20	20	30	40
ART Monitoring Clients	8,000	8,000	8,000	12,500	18,750	25,000	25,000	37,500	50,000
Time per visit	14	14	14	14	14	14	14	14	14
Visits/year	2	2	2	2	2	2	2	2	2
Total time/client/year	28	28	28	28	28	28	28	28	28
Total counseling minutes	224,000	224,000	224,000	350,000	525,000	700,000	700,000	1,050,000	1,400,000
Total FTE: ART Monitoring	3	3	3	5	7	9	9	14	18
ARV Dispensing	12,500	18,750	25,000	25,000	37,500	50,000	50,000	75,000	100,000
Times ART dispensed/year	5	5	5	5	5	5	5	5	5
Visits/client/year	12	12	12	12	12	12	12	12	12
Total time/client/year	60	60	60	60	60	60	60	60	60
Total counseling minutes	750,000	1,125,000	1,500,000	1,500,000	2,250,000	3,000,000	3,000,000	4,500,000	6,000,000
Total FTE: ART Dispensing	10	14	19	19	29	39	39	58	77
Care and treatment total care hours	47,139	71,023	80,815	93,151	137,689	153,731	154,851	230,151	262,234
Care and treatment total care days	7,856	11,837	13,469	15,525	22,948	25,622	25,809	38,358	43,706
Total FTE: All Care and Treatment Tasks	36	55	62	72	106	119	119	178	202

Table A6: Task Time and FTE Laboratory Staff Required for Different ART Testing Services, Assuming Three-year Targets

HIV Care and Treatment	2005			2006			2007		
Three-year Target*	50,000	75,000	100,000	50,000	75,000	100,000	50,000	75,000	100,000
Test CD4									
Test time in minutes	6	6	6	6	6	6	6	6	6
Tests/year	137,523	197,922	137,523	261,719	383,846	323,447	388,647	573,860	513,461
Total minutes/year	825,136	1,187,530	825,136	1,570,313	2,303,074	1,940,680	2,331,885	3,443,159	3,080,766
Test Viral Load									
Test time in minutes	25	25	25	25	25	25	25	25	25
Tests/year	12,500	18,750	25,000	25,000	37,500	50,000	50,000	75,000	100,000
Total minutes/year	312,500	468,750	625,000	625,000	937,500	1,250,000	1,250,000	1,875,000	2,500,000
Test Liver Function									
Test time in minutes	20	20	20	20	20	20	20	20	20
Tests/year	47,500	91,250	135,000	112,500	168,750	225,000	225,000	337,500	450,000
Total minutes/year	926,250	1,779,375	2,632,500	2,193,750	3,290,625	4,387,500	4,387,500	6,581,250	8,775,000
Test Full Blood Count									
Test time in minutes	7	7	7	7	7	7	7	7	7
Tests/year	38,500	69,750	101,000	87,500	131,250	175,000	175,000	262,500	350,000
Total minutes/year	281,050	509,175	737,300	638,750	958,125	1,277,500	1,277,500	1,916,250	2,555,000
Test Kidney Function									
Tests/year	19	19	19	19	19	19	19	19	19
Test time in minutes	20,500	26,750	33,000	37,500	56,250	75,000	75,000	112,500	150,000
Test minutes/year	389,500	508,250	627,000	712,500	1,068,750	1,425,000	1,425,000	2,137,500	2,850,000
Total minutes/year	2,734,436	4,453,080	5,446,936	5,740,313	8,558,074	10,280,680	10,671,885	15,953,159	19,760,766
Total FTE: All ART Lab Tasks**	35	57	70	74	110	132	137	205	254

* For the 50,000 target, the model assumes a 4% VCT uptake rate per year and 100% of ANC clients receiving PMTCT services. For the targets of 75,000 and 100,000 the model assumes a VCT uptake rate of 8% per year and 100% of ANC clients receiving PMTCT services. The number of people being tested in VCT and PMTCT will enable the achievement of ART targets but will also influence the number of HIV-positive clients whose CD4 counts are being monitored on a biannual basis.

** This calculation of FTE lab staff is based on the time it takes laboratory technicians to carry out the specified lab tests given current technology and laboratory practices. Technology that allows for quicker processing or testing in batches will reduce FTE laboratory staff requirements.

Table A7: Annual Salary Cost Scenarios for HIV Care and Treatment Providers (Three-year Analysis)

Staffing Scenarios Care and Treatment	2005			2006			2007		
	50,000	75,000	100,000	50,000	75,000	100,000	50,000	75,000	100,000
FTE	36	55	54	72	106	119	119	178	202
Scenario 1: CD4 monitoring, ART initiation, and ART monitoring done by doctors; ARV dispensing done by A1 nurses.									
Total Cost/Year*	\$92,676	\$139,721	\$155,173	\$188,312	\$277,763	\$301,418	\$313,125	\$464,631	\$513,359
Scenario 2: Doctors do 63% of CD4 monitoring and ART initiation tasks and 33% of monitoring tasks. A1 nurses do 37% of CD4 monitoring and ART initiation tasks, 67% of ART monitoring tasks, and all ARV dispensing.									
Total Cost/Year	\$88,084	\$118,464	\$132,554	\$179,706	\$265,031	\$287,029	\$298,205	\$442,441	\$487,758
Scenario 3: Doctors do 63% of CD4 monitoring and ART initiation tasks and 33% of ART monitoring tasks. A1 nurses do 37% of CD4 monitoring and ART initiation tasks and 67% of ART monitoring tasks. A2 nurses or social workers do all ARV dispensing.									
Total Cost/Year	\$72,822	\$110,393	\$121,793	\$148,377	\$218,667	\$234,452	\$243,693	\$361,351	\$393,866

* Costs are in U.S. dollars and are based on average annual net pay (salary plus primes and standard benefits) provided to health workers; assumes average salary increases of .3% per year.

Table A8: Annual Staffing and Salary Cost Scenarios for HIV Care and Treatment Laboratory Staff (Three-year Analysis)

Staffing Scenarios Care and Treatment Laboratory Testing	2005			2006			2007		
	50,000	75,000	100,000	50,000	75,000	100,000	50,000	75,000	100,000
FTE Laboratory Staff	35	57	70	74	110	132	137	205	254
Scenario 1: All lab testing for ART clients done by A1 laboratory technicians									
Total Cost/Year*	\$54,783	\$89,216	\$109,127	\$118,455	\$176,602	\$212,149	\$226,828	\$339,081	\$420,010
Scenario 2: A1 laboratory technicians do 50% of testing, and A2 laboratory technicians do 50% of testing									
Total Cost/Year	\$50,802	\$73,241	\$89,588	\$109,847	\$163,768	\$196,732	\$210,345	\$314,439	\$389,488
Scenario 3: A1 laboratory technicians do 33% of laboratory testing, and A2 laboratory technicians do 67% of testing									
Total Cost/Year	\$41,718	\$67,938	\$83,101	\$90,204	\$134,482	\$161,551	\$172,730	\$258,210	\$319,838

* Costs are in U.S. dollars and are based on average annual net pay (salary plus primes and standard benefits) provided to health workers; assumes average salary increases of 3% per year.

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