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Rising to the Challenges of Human Resources for Health in Kenya: Developing Empirical Evidence for Policy Making

July 2006

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- *Availability and appropriate use of health commodities.*

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Abstract

This report presents a comprehensive analysis of the human resources for health (HRH) currently available and required to reach the targets set by the President's Emergency Plan for AIDS Relief and the Millennium Development Goals (MDGs) in both the public sector and the faith-based organizations (FBOs) in Kenya. A stratified convenience sample of health facilities at all levels of care (primary, secondary, tertiary) in each of the eight provinces was selected for the assessment. Detailed information on human resources and provision of services related to HIV/AIDS, tuberculosis (TB), malaria, maternal health, and child health was collected.

A sample of Ministry of Health and FBO health facilities at all levels of service in each of the eight provinces was selected for the assessment. As the purpose was to gather information on the provision of services related to the five focus areas of the assessment – HIV/AIDS, TB, malaria, maternal health, and child health – the selection of facilities was conducted using stratified convenience sampling that targeted facilities offering these services.

Several conclusions can be drawn from this report. First, data confirm the commonly held perception that HRH poses a major challenge to scale up HIV/AIDS and other basic health services. Second, the geographical distribution of skilled HRH in Kenya is heavily skewed towards urban areas. Third, report findings indicate that substantial annual growth rates (across all staff categories) are needed to meet the future requirements. For example, in order to achieve the MDGs, the number of doctors must increase about 3.4 percent between 2005 and 2010. The authors hope that this report provides policymakers and the donor community the information necessary to guide the mobilization of human resources to scale up HIV/AIDS, tuberculosis, and malaria in Kenya.

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Acronyms

AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal care
ARI	Acute Respiratory Infection
ART	Antiretroviral Therapy
CBS	Central Bureau of Statistics
CHAK	Christian Health Association of Kenya
DOTS	Directly Observed Therapy Short Course
FBO	Faith-based Organization
FP	Family Planning
FTE	Full-time Equivalent
GFATM	Global Fund for AIDS, TB & Malaria
GOK	Government of Kenya
HCD	Human Capacity Development
HIS	Health Information System
HIV	Human Immunodeficiency Virus
HNPStats	Health Nutrition and Population Statistics
HR	Human Resources
HRH	Human Resources for Health
IEC	Information, Education and Communication
IMCI	Integrated Management of Childhood Illnesses
IPT	Intermittent Presumptive Treatment
ITN	Insecticide-treated Nets
KCS	Kenya Catholic Secretariat
KDHS	Kenya Demographic and Health Survey
KNASP	Kenya National HIV/AIDS Strategic Plan
Ksh	Kenya Shillings
M&E	Monitoring and Evaluation
MCH	Maternal and Child Health

MDG	Millennium Development Goals
MOH	Ministry of Health
NACC	National AIDS Control Council
NACP	National HIV/AIDS Control Programme
NASCOP	National STI AIDS Control Program
NGO	Nongovernmental Organization
NHSSP	National Health Sector Strategic Plan
OHA	Office of HIV/AIDS
PEPFAR	President's Emergency Plan for AIDS Relief
PHR*plus*	Partners for Health Reform*plus* Project
PLWHA	People Living with HIV/AIDS
PMI	President's Malaria Initiative
PMTCT	Prevention of Mother-to-child Transmission
ROK	Republic of Kenya
SP	Sulfadoxine-Pyrimethamine
STI	Sexually Transmitted Infections
TB	Tuberculosis
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
US$	U.S. Dollar
USAID	United States Agency for International Development
VCT	Voluntary Counselling and Testing
WHO	World Health Organization

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Executive Summary

Kenya's health gains of the 1980s and '90s have begun to reverse. The country has recently witnessed a general deterioration in health indicators due to rapid population growth, child nutrition problems, poverty, HIV/AIDS, acute respiratory infections, malaria, diarrhea, and low quality of health facilities and services.

As a signatory to the United Nations (UN) Millennium Declaration, Kenya has committed to substantially improve maternal and child health, as well as to halt and begin to reverse the spread of HIV/AIDS, tuberculosis (TB), and malaria by 2015. Through the President's Emergency Plan for AIDS Relief (PEPFAR), the country plans to support 250,000 antiretroviral therapy (ART) patients, reach 3 million voluntary counseling and testing (VCT) clients, and provide prevention of mother-to-child transmission (PMTCT) to more than 520,000 pregnant women by 2008. One of the most important constraints to expanding the required health services in these areas, however, is the availability of human resources for health (HRH).

This report presents a comprehensive analysis of the HRH available and required to reach the targets set by PEPFAR and the health-related Millennium Development Goals (MDGs) in the public sector and the faith-based organizations (FBOs). The findings in this report are based on a health facility survey on HRH and service provision in 104 Ministry of Health (MOH) and FBO health facilities at all levels of care (primary, secondary, tertiary) across all of Kenya's eight provinces.

To meet the PEPFAR targets for VCT, ART, and PMTCT through 2008, the public sector needs to hire additional staff, including 55 doctors, 87 clinical officers, 137 nurses, and 158 VCT counselors over the next two years. The number of additional lab specialists needed (262) indicates a 15 percent increase in this category over the total number of lab specialists in 2005. The requirements for pharmacy specialists are even higher: 219 additional staff must be hired in the public sector over the next two years, which is equivalent to a 50 percent increase in the total number of pharmacy specialists from the number available in the public sector in 2005.

Similarly, in the FBO sector the additional staffing needs are highest among lab and pharmacy specialists, with 115 and 73 additional staff needed over the next two years in these categories, respectively. As in the public sector, this translates into a significant percent increase over the current number of staff available: 21 percent increase for lab specialists and 35 percent increase for pharmacy specialists.

Projections related to the health MDGs show that in the next five years, a substantial increase across all staff categories will be required in both the public and the FBO health sectors in order to place Kenya on the path to achieving the health-related MDGs. In the public sector, the required annual increase in the number of staff over the next five years is highest for VCT counselors (19 percent), followed by pharmacy specialists (10 percent), and lab specialists (7 percent). The number of doctors in public facilities should increase by 3 percent annually, whereas the number of clinical officers and nurses needs to increase by 4 percent annually between 2005 and 2010. Similar HRH growth rate requirements are observed in the FBO sector.

In both sectors, the HRH increase required in 2010-2015 is much lower than in the previous five years, because most of the increase from current to target patient coverage for MDG-related health services is envisioned for the following five years.

Several conclusions can be drawn from this report. First, data confirm the commonly held perception that HRH poses a major challenge to scale up HIV/AIDS and other basic health services. As PEPFAR and MDG initiatives rapidly scale up, significant HRH will be required to meet the demand.

Second, like many other sub-Saharan African countries, the geographical distribution of skilled HRH in Kenya is heavily skewed towards urban areas. It is not surprising to see that 42 percent of doctors and 30 percent of nurses of the total public sector staff are located in the Nairobi and the Rift Valley provinces. In rural areas, such as the Western province, there are only 7 percent of doctors and 11 percent of nurses out of the total public sector staff (ROK 2006).

Third, report findings indicate a human resource gap. Substantial annual growth rates (across all staff categories) are needed to meet the future requirements. It is not clear whether training institutions are currently producing enough new graduates (doctors, nurses, clinical officers, lab specialists, nutritionists, and counselors) to meet the growing demand for expanding basic health services in the public sector. There is a need to quantify the proportion of new medical graduates who enter the public sector. If new graduates are viewed as the major source for replacing HRH lost through attrition and filling the gap between available and required HRH (as quantified in this report), then scaling up the training of health workers would be required.

There are several interlinked policy options for ensuring availability of the required future number of HRH in the public health sector and the report proposed the following recommendations:

- The MOH should apply workload evidence to hire and deploy health workers for PEPFAR, MDG, and other new initiatives. Evidence from this report can provide guidance on what services need additional staff. Kenya has a large pool of unemployed health professionals. As with new graduates, there is a need to assess the extent to which the pool of unemployed health professionals can be used both for replacing HRH lost through attrition and for filling the gap between available and required HRH. If this option is considered as a viable alternative to scaling up training of new graduates, there may be a need for in-service training of health workers who have been unemployed for a long period, particularly in areas such as ART and PMTCT, where implementation of service provision guidelines is relatively recent.

- The Ministries of Health and Education in collaboration with development partners should conduct a comprehensive assessment of training institutions to ensure that production of new graduates meets the expected future HRH requirements.

- The donor community should assist the government of Kenya in developing a medium- to long-term human resources strategy that will address issues of hiring, deployment, retention, and incentives for health workers.

- The government and the donor community should explore the possibility of expanding some services in the private sector given the HRH constraints in the public sector. Kenya has a very robust private sector and efforts should be made to conduct a rapid assessment of the HRH situation in this sector.

1. Background

1.1 Challenges of Achieving the Millennium Development and PEPFAR Goals

Kenya's health gains of the 1980s and '90s have begun to reverse. The country has recently witnessed a general deterioration in health indicators due to rapid population growth, child nutrition problems, poverty, HIV/AIDS, acute respiratory infections, malaria, diarrhea, and low quality of health facilities and services (WHO 2003). For the last decade, infant mortality has increased from 62 deaths per 1,000 live births in 1993 to 77 deaths per 1,000 live births in 2003 (U.S. Census Bureau 2006). Meanwhile, the mortality rate for children under 5 was 115 per 1,000 live births. The country's population of 32.2 million people (as of 2003) (U.S. Census Bureau 2006) is characterized by a high maternal mortality rate, a low and declining life expectancy, and an increasing fertility rate (from 4.7 children per woman in 1995-1998 to 4.8 in 2000-2003). According to the Kenya Demographic and Health Survey (KDHS),[1] 40 percent of the total births were delivered in health facilities and only 4 percent of the pregnant women slept under insecticide-treated nets (ITN). The HIV/AIDS pandemic has made the health situation even worse. In 1990, the adult (15-49 years) HIV prevalence was estimated at 5.8 percent. This prevalence rate grew to 6.7 percent by the end of 2003 (KDHS 2004).

While the population has been growing at an average of 2 percent annually, the economy has remained stagnant in the last two decades. Between 1997 and 2002 the economy grew by an annual average rate of only 1.5 percent, below the population growth of 2.5 percent per annum. With a gross domestic product per capita of Ksh 38,393 in 2004, it is estimated that over half of the population (56 percent) is living below the poverty line (CBS 2000). The economic situation has also affected the provision of basic health services. In 2000, the government spent about US$6 on health care per capita, while this number was US$10 per capita 20 years ago. Despite the signs of economic recovery, the growth is far below the 7 percent growth rate needed to support implementation of the Millennium Development Goals (MDG)-related activities within the remaining decade to 2015 (ROK 2005).

Kenya is a signatory to the United Nations (UN) Millennium Declaration and has committed itself to this global partnership to reduce poverty, improve health, and promote peace, human rights, gender equality, and environmental sustainability. The country has established time-bound and quantifiable targets to address extreme poverty. It will be very difficult, however, for the country to achieve the MDGs by 2015 given the current health and economic situation.

The health-related MDGs focus on reducing the under-5 mortality rate by two-thirds, between 1990 and 2015; reducing the maternal mortality ratio by three-quarters between 1990 and 2015; and halting and beginning to reverse the spread of HIV/AIDS, malaria, and other diseases by 2015.

[1] Central Bureau of Statistics, Ministry of Health, ORC Macro. 2004. *Kenya Demographic and Health Survey 2003.* Calverton, Maryland. In later references, this document is referred to as "KDHS 2004".

Through the President's Emergency Plan for AIDS Relief (PEPFAR), the country plans to support 250,000 antiretroviral therapy (ART) patients, reach 3 million voluntary counseling and testing (VCT) clients, and avert 37,500 infections through prevention of mother-to-child transmission (PMTCT) for 529,286 clients by 2008 (PEPFAR FY06).

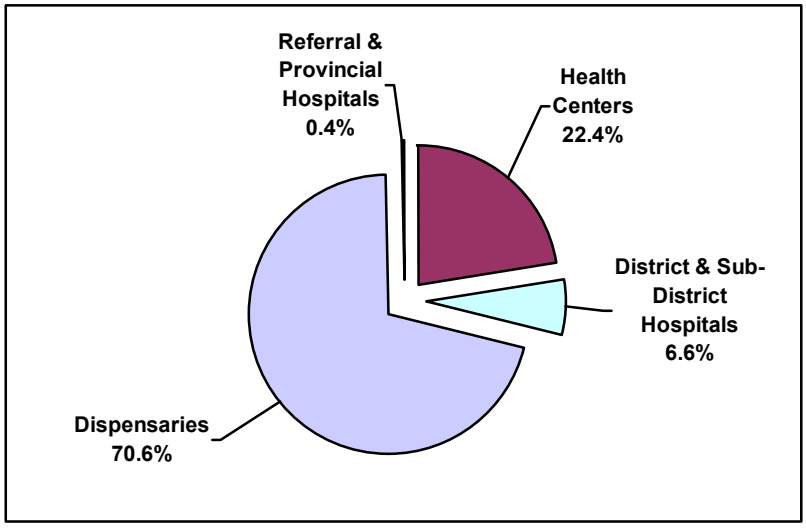
To reach these MDG and PEPFAR goals, the country needs to scale up basic health care services, which in turn means realigning and utilizing the current human resources for health (HRH) more efficiently and effectively.

As Kenya continues to scale up HIV/AIDS services, increased attention is being focused on identifying constraints to program expansion. One of the most important constraints is that of HRH, though this issue has received little attention nationally. As several studies on HRH in sub-Saharan Africa indicate, there are insufficient numbers of counselors, social workers, doctors, nurses, laboratory technicians, and pharmacists to serve the overwhelming and increasing population in need of ART, PMTCT, and VCT services, and it has become apparent that this chronic HRH shortage is extremely serious in Kenya. With nearly half of all hospital beds occupied by AIDS patients (ROK 2001), it is envisioned that significant numbers of health care personnel will be needed to provide AIDS-related medical services including ART and other basic health care services.

1.2 Brief Overview of the Health Care Delivery System

Before the 1970s, Kenya's health care system primarily consisted of public sector facilities. At that time, Kenya expanded its system to include private sector facilities and faith-based organizations (FBOs). Currently, the public sector owns 60 percent of all health care facilities in the country. The current public health care delivery system consists of three levels of care: primary, secondary, and tertiary. The tertiary level comprises national referral and teaching hospitals, of which there are two in the entire country. The secondary level consists of seven provincial general hospitals and 144 district hospitals. The primary level consists of 489 health centers and 1,540 dispensaries, which are crucial points of preventive and limited curative services. Staff types work across all services, but levels of staffing depend on staff role within the specific health service. Figure 1 shows the percentage distribution of public health facilities.

Figure 1. Percentage Distribution of Public Health Facilities in the Public Sector



In addition to the public sector, the private for-profit providers, FBOs, and nongovernmental organizations (NGOs) also play large roles in the Kenyan health sector. Of the total health facilities, FBOs account for 21 percent, NGOs operate about 5 percent, and private for-profit businesses manage approximately 14 percent (MEASURE DHS/ORC Macro, 2004).

1.3 Basic Health Services for Reaching the MDGs in Kenya

In order to reach these goals, Kenya must focus on scaling up the basic health care package, which consists of five main health care services: maternal, child, reproductive health services (including care for HIV/AIDS and other sexually transmitted infections (STIs)), tuberculosis (TB), and malaria. These services make up the basic health care package. The country has developed specific national indicators for the MDGs to be achieved by 2015, as shown in Table 1.

Table 1. National Indicators for the Millennium Development Goals

MDG Target	Indicator	Current Status in Kenya	Desired Status 2015
HIV/AIDS			
Halt and begin to reverse the spread of HIV/AIDS	HIV prevalence among 15- to 24-year-old pregnant women	12.2%	NA
	Contraceptive prevalence rate	39.0%	NA
	Number of children orphaned by HIV/AIDS	1.2 million	NA
Tuberculosis & Malaria			
Halt and begin to reverse the incidence of malaria and other major diseases	**Tuberculosis**		
	Expected new cases	300,000	200,000
	Number of notified cases	90,000	120,000
	Treatment success percentage	80%	85%
	Malaria		
	Fever cases accessing prompt treatment	60%	65%
	Coverage of ITN for children under 5 years	4.6%*	65%
	Coverage of ITN for pregnant women	4.4 %*	65%
	Pregnant women accessing prophylaxis	60%	65%
Maternal & Child Health			
Halving extreme poverty and hunger	Prevalence of underweight children under 5 years of age	22.10	11.05
	Prevalence of stunting in children under 5 years of age	6.60	3.09
	Prevalence of wasting in children under 5 years of age	22.10	11.05
Reduce under-5 mortality by two-thirds	Under-5 mortality rate	111.5	33.0
	Infant mortality rate	73.7	NA
	Proportion of 1-year-old children immunized against measles	76.1%	100%
Reduce maternal mortality by three-quarters	Maternal mortality ratio	590	147
	Delivery by skilled health personnel	41%*	100%

Source: All data are from WHO 2003 except the items marked with *, whose source is KDHS 2004.

The sections below provide detailed information on each of the five basic health services.

1.3.1 HIV/AIDS Services

According to UNAIDS, Kenya had an adult prevalence rate of 6.7 percent with an estimated 1.1 million people infected with HIV/AIDS at the end of 2003 (UNAIDS 2004). About 75 percent of all AIDS cases occur among society's most productive age group (20- to 45-year olds) (KDHS 2004), leading to a severe economic and social threat.

Recently, Kenya's historic gains in the fight against AIDS were touted among the few encouraging points in a bleak UN report on the global pandemic. The country's success in reducing its HIV infection rate from 10 percent to 7 percent of adults marks "only the second time in more than two decades that a sustained decline in national HIV infection levels has been seen in a sub-Saharan African country," as reported by UNAIDS in its 2005 update on the epidemic (UNAIDS/WHO 2005). The drop in HIV prevalence in Kenya has been most dramatic among pregnant women in urban areas. Gains have been particularly impressive in Busia, Meru, Nakuru, and Thika, where median HIV prevalence drastically improved from approximately 28 percent in 1999 to 9 percent in 2003. This is attributed to behavioral changes (UNAIDS/WHO 2005).

HIV/AIDS services are rapidly expanding to most facilities across the country. The three main services being provided are VCT, ART, and PMTCT. VCT — found in 35 percent of all facilities — is the most common HIV/AIDS service (Measure DHS/ORC Macro 2004). The majority of VCT is seen in stand-alone sites or hospitals as opposed to health centers, clinics, and other facilities. ART, which Kenya is just beginning to scale up, is only available at 7 percent of all health facilities, primarily at the secondary and tertiary levels (MEASURE DHS/ORC Macro 2004). PMTCT[2] is offered at approximately 74 percent of all public facilities. PMTCTplus, which includes the provision of ART for the mothers and their eligible family members, is offered at approximately 15 percent of all facilities, with the more likelihood of the service being available at a hospital (MEASURE DHS/ORC Macro 2004).

1.3.2 Tuberculosis Services

Kenya ranks 10th highest in estimated number of TB cases globally. The incidence rate is 610 per every 100,000 people (262 new cases per 100,000 people per year). The death rate for TB is 133 cases per 100,000 people. In 2002, the directly observed therapy short course (DOTS) treatment success rate was 79 percent, while the DOTS case detection rate remained at 46 percent in 2003. Also, TB has a high co-infection rate with HIV/AIDS; 29 percent of all TB-infected patients (ages 15-49) are also HIV-positive (WHO 2005).

The diagnosis and treatment of TB are integrated into the public health sector. In the early 1990s, the DOTS strategy was adopted by the National Leprosy and TB Program and achieved countrywide coverage by 1996. In the past 10 years, TB notification rates have increased by 500 percent (fivefold) (WHO 2005), mainly due to co-infection with HIV/ADS. For example, all public hospitals and health centers and some dispensaries include labs capable of sputum microscopy (WHO 2005). The

[2] The basic package for PMTCT in Kenya consists of VCT, antiretroviral prophylaxis, and counseling for family planning and infant feeding.

government of Kenya (GOK) is also committed to providing anti-TB drugs to all new patients and has initiated plans to scale up TB diagnostic and treatment services.

1.3.3 Malaria Services

Malaria is a significant contributor to both morbidity and mortality in Kenya. According to a 2004 report, 20 million people, or 70 percent of the population, are at constant risk of malaria (GFATM 2004). The country is divided into four main zones of malaria transmission: stable malaria (Coast, Western, and parts of Nyanza provinces); seasonal malaria (Eastern, Northeastern provinces, and parts of Central provinces); malaria epidemic prone (Rift Valley and parts of Nyanza provinces); and malaria free[3] (Nairobi and parts of Central provinces) (KDHS 2004). Malarial illness can result in frequent illness and a general loss of productivity. As much as 30 percent of new attendances at government health facilities are diagnosed and treated as malaria, making it the most frequently diagnosed condition among inpatients and outpatients, as well as the most common cause of death in most districts (ROK April 2001). In addition to the direct treatment costs incurred by malarial illness, 170 million working days are lost each year to the disease (KDHS 2004).

The GOK has recognized that most malarial complications occur in the home, and therefore realized the importance of educating the community on self- treatment. Most Kenyans self-medicate for malaria, buying antimalarials over the counter at pharmacies and/or using traditional medicine (ROK April 2001). To this end, the Division of Malaria Control has established program targets in four areas: vector control (larval reduction, personal protection, aerial spraying, environmental management); epidemic preparedness (early warning and detection systems, epidemic containment); information, education and communication (IEC) (key malaria messages to all households); and monitoring and evaluation (ROK April 2001).

1.3.4 Maternal and Child Health

Facilities at every level of the health system provide maternal health services. At the primary care level, dispensaries provide antenatal care (ANC) treatment for simple medical problems in pregnancy such as anemia, and occasionally conduct normal deliveries. Health centers provide a wider range of services and carry out deliveries more frequently. They are able to provide basic first aid for obstetric complications but are not equipped for surgery or for providing care for obstructed labor. At the secondary level of care, district hospitals are the lowest level of health facility equipped to carry out caesarean sections. The tertiary level facilities provide care for all cases.

According to the 1999 Kenya Services Provision Assessment Survey, almost all public facilities provided some child health services. The GOK uses two basic principles from the integrated management of childhood illnesses (IMCI) guidelines as the basis for assessing children's health. First, sick children must be routinely assessed for major symptoms,[4] which can be treated at all levels of care, although they are primarily treated at the primary level. Second, sick children must also be examined for "general danger signs," which, if present, lead to a referral or admission to a hospital at the secondary or tertiary level (MEASURE DHS/ORC Macro 2004). Well-child services, such as immunization and growth monitoring, are provided in many facilities.

[3] For the record, malaria is seasonally present in areas that research routinely cites as malaria free.
[4] Major symptoms include cough, breathing difficulty, diarrhea, fever, ear problems, nutritional and immunization status, feeding problems, and other issues.

1.4 Human Resources for Health Situation

Human resources have long been recognized as the cornerstone of any sector to produce, deliver, and manage services. In the health sector, the GOK views human resource development as an essential component of the health system especially in the provision of basic health services. There is growing recognition that HRH in the public sector are shrinking dramatically, thereby affecting the delivery of services. Several studies have shown that the emergence and re-emergence of infectious diseases, such as HIV/AIDS, tuberculosis, and malaria, have also increased the demand for health services, putting enormous stress on the existing human resources (ROK 2006).

As additional funds become available from the Global Fund to Fight AIDS, Tuberculosis, and Malaria and other international donors, Kenya's ability to absorb such funding will become constrained by the lack of adequate HRH. As shown in Table 2, there were 42,390 government health workers in the country in 2005. Nurses (registered and enrolled) were the largest group at 43 percent, followed by public health officers/technicians at 10 percent, while doctors and clinical officers constituted only approximately 10 percent of the total health workforce. Also interesting to note is that certain key staff types (e.g., doctors, nurses, midwives, pharmacists, and lab technicians) are found across the public, private, and FBO sectors.

Table 2. Number of Public Sector Health Personnel in 2005

Staff Type	Number in the Public Sector
Doctors	1,486
Clinical Officers	2,316
Registered Nurses	4,553
Enrolled Nurses	13,773
Pharmacists	225
Pharmacist Technologists	330
Lab Technologists	1,453
Lab Technicians	580
Radiographers	348
General Counselors	120
Health Administrative Officers	194
Public Health Officers / Public Health Technicians	4,283
Nutritionists	450
Social Workers	74
Others	12,205
TOTAL	**42,390**

Source: ROK 2006

In 2004, the GOK declared lack of HRH a major challenge to health development (ROK 2005). HRH remains a top priority in Kenya's health system. The Ministry of Health (MOH), whose core functions include policy formulation, regulation, and resource allocation, is committed to developing its human resource policy and making strategic choices in the areas of human resource management.

Currently, the country faces four main HRH challenges. First, Kenya is losing skilled health workers to both the private sector and other countries that offer better financial packages. Second, there is a shortage of skilled HRH workers across the country. For example, in 2004 the (public sector) doctor-to-population ratio was 3:100,000, while the nurse-to-population ratio was 49:100,000 (ROK 2006). The 2004-2005 Human Resource Mapping and Verification Exercise found that staffing levels do not meet the prevailing MOH staffing norms. Almost half of the dispensaries (47 percent) have only one community nurse plus one or two support staff, while 3 percent has only support staff, who are not qualified to administer drugs.

Third, the HRH shortage prevents the even distribution of skilled health workers across the country. More than half of all health personnel and four-fifths of doctors are urban based (ROK 2006). According to the Human Resource Mapping and Verification Exercise, the number of nurses working in district and provincial hospitals exceeded the need, while many health centers and dispensaries are acutely understaffed. Similarly, there is a great disparity in the staffing of doctors at district hospitals, with about half of the hospitals having fewer than six doctors (12 are required) and others having more than 20. For example, 42 percent of doctors and 30 percent of nurses of the total public sector staff are located in the Nairobi Rift Valley provinces. Percentages are much lower in rural areas, such as the Western province, where, of the total number of public sector staff available, only 7 percent of doctors and 11 percent of nurses are located (ROK 2006); see Annex A.

2. Purpose of the Study and Methodological Approach

This section describes the purpose of the study and assessment methodology, including sample selection, data collection instruments, and the HRH estimation model.

2.1 Purpose of the Report

The purpose of this report is to present a comprehensive analysis of the HRH available to reach the three health-related MDGs and PEPFAR targets. This report presents information on HRH required to achieve PEPFAR and the MDG targets. Estimates of HRH requirements are made at several data points. It is envisioned that findings from this report will provide the GOK and development partners with evidence on the availability of human resources required to use in the planning of human and financial resource mobilization to scale up HIV/AIDS, TB, malaria, and maternal and child health (MCH) services.

2.2 Sample Selection

A sample of MOH and FBO health facilities at all levels of service in each of the eight provinces was selected for the assessment. As the purpose was to gather information on the provision of services related to the five focus areas of the assessment — HIV/AIDS, TB, malaria, maternal health, and child health — the selection of facilities was conducted using stratified convenience sampling that targeted facilities offering these services.

At the highest facility level, one of the two national referral hospitals was selected (the Moi Referral and Teaching Hospital). Selection of health facilities at all other facility levels was stratified by province and type of facility. At the second highest level of facilities, the provincial general hospital in each of the eight provinces was included in the sample. A total of 23 districts were selected, representing all provinces. In each of the selected districts, the district hospital (if there was one) was included in the sample, and up to three health centers and one dispensary were also selected, based on their geographical proximity to the district hospital and on whether they provided the services of interest in the assessment.[5] Both public and FBO facilities were included in the sample of district hospitals, health centers, and dispensaries.

The resulting sample includes 104 health facilities, of which 88 are public and 16 are managed by FBOs. Table 3 shows the distribution of the sample by province and type of facility. (Annex B shows the overall distribution of public and FBO facilities in Kenya.)

[5] The Medical Officer of Health (who is in charge of district health services) was consulted for recommendation on health centers to visit, as he/she had knowledge of the services that these facilities provided.

Table 3. Distribution of Health Facilities in the Sample by Province and Type of Facility

Province	Provincial Hospitals	District Hospitals	Health Centers	Dispensaries	Total
Central	1	4	7	3	15
Coast	1	3	9	3	16
Eastern	1	2	6	2	11
Nairobi	1	1	6	1	9
North Eastern	1	0	2	1	4
Nyanza	1	2	8	3	14
Rift Valley	2*	2	11	5	20
Western	1	2	10	2	15
Total	**9**	**16**	**59**	**20**	**104**

* includes the Moi Referral and Teaching Hospital

Table 4 lists the set of services included in the assessment and the number of facilities included in the study that provided each service at the time of the survey. For example, findings related to VCT service provision are based on data from 76 facilities, while findings related to PMTCT and ART services are based on data collected in 86 and 49 facilities, respectively.

Table 4. Number of Facilities in the Sample Providing the PEPFAR and MDG-related Services Included in the Assessment

Type of Health Service	Number of Facilities Providing Each Service
Total number of facilities included in the sample	104
(1) HIV/AIDS	
VCT	76
PMTCT	86
ART	49
(2) TB	
TB DOTS	71
TB Inpatient	35
(3) Malaria	
Outpatient or Inpatient	98
(4) Maternal Health	
Prenatal Care (PNC)	
Routine PNC visits	101
IPT	85
ITN distribution	62
Delivery	
Normal	81
Complicated	52
Family Planning	92

(5) Child Health	
Child Health – preventive services	
Growth Monitoring	102
Immunization	101
ITN distribution	57
Child Health – curative services	
Outpatient	99
Inpatient	51

The data collection took place in October-November 2005. EpiInfo data screens were used for the data entry and all analysis was performed using Intercooled Stata v. 8.0. The Division of Planning at MOH provided overall coordination and supervision of the data collection process.

2.3 Data Collection Instruments

In each of the selected facilities, a comprehensive questionnaire was administered to selected respondents such as facility managers and health staff. These were staff in charge of the services included in the survey; for example, information regarding immunizations in a hospital was obtained from the nurse in charge at the hospital's child clinic. The questionnaire collected information on the following:

- Number of staff employed in 2004 and 2005. The enumerators collected this data directly from the facility registers.
- Number of incoming and outgoing staff by reason for leaving or starting work at the facility. These data were collected from the officer who was in charge of human resources (HR) management at each facility.
- Average time spent per patient visit for each of the services related to the five focus areas (listed in Table 4).[6]
- Number of days in a week when each of these services was provided at the facility.

When available, all staff-related data were collected for an extensive list of 15 professional health staff categories. Not all facilities, however, had staff from all 15 categories, and the survey showed that the services of interest in this analysis are primarily provided by doctors, clinical officers, nurses, pharmacy and lab specialists, radiographers, counselors, and nutritionists. Thus, the researchers confined the analysis to a list of the eight professional health staff categories previously listed.

[6] The staff members interviewed were asked to give an estimate of the time currently spent per patient visit on an average day, and the time that they would spend ideally.

2.4 Estimating HRH Requirements

2.4.1 Overview

Estimating health staff availability and requirements to reach a number of health-related targets is based on a model developed specifically for Kenya, using a combination of staffing models commonly used for HRH needs projections.[7]

HRH numbers are measured in full-time equivalent (FTE) staff units, as defined in Box 1. The purpose of the model was to estimate the following:

- FTE staff required for reaching the PEPFAR targets through 2008
- Number of FTE staff providing the MDG-related services included in the assessment, and FTE staff providing all other ("non-MDG") services in 2005, the baseline year
- Number of FTE staff required to service patient targets consistent with reaching the MDGs (for the same set of services), while maintaining the level of all other ("non-MDG") services at their 2005 level.

The FTE staff requirements are estimated for 2010 and 2015 to show the trend in projected HR needs.

Box 1. Definition of FTE Staff

An FTE staff member for a given service (e.g., ART) is a health professional who is spending all his/her working time allocated for patient visits to provide that service.

For example, a doctor has 220 working days per year and is assumed to spend 6.5 hours each working day attending to patients. If a doctor spends, on average, 24 minutes per ART patient visit and each ART patient sees a doctor four times a year, then an FTE doctor for ART can see 894 ART patients per year.

FTE staff requirements are calculated for the following staff categories:

- Doctors
- Clinical officers
- Nurses (including registered and enrolled nurses)
- Pharmacy specialists (pharmacists and pharmaceutical technologists)

[7] The variety of HR estimation models is described in Hirschhorn et. al 2006.

- Laboratory specialists (laboratory technicians and laboratory technologists)
- Radiographers
- Nutritionists
- Counselors

2.4.2 Estimating the Number of HRH Required to Meet PEPFAR and MDG-related Targets[8]

The FTE staff requirement calculation related to PEPFAR targets was done for 2008, whereas MDG-related calculations were done for 2010 and 2015. For each of the PEPFAR and MDG-related health services that are part of this assessment, the FTE calculation is as follows:

$$\text{Number of FTE staff} = \frac{\text{[Target number of patients to be covered in a year]}}{\text{[Number of patients that an FTE staff can see in a year]}}$$

The target number of patients projected for a given year (the numerator) is estimated based on information from MOH planning documents and health information system data, PEPFAR, the Demographic and Health Survey, and other sources. The estimation of the number of patients that an FTE staff member can see in a year (the denominator) follows the example presented in Box 1.

The estimation of the denominator is based on a set of key input parameters:

- Doctors have 220 working days a year, and all other staff categories have 229 working days a year. Each staff member spends on average 6.5 hours a day on patient visits.[9]
- The number of visits per year that a patient has with each staff type (or number of lab tests or prescriptions, in the case of laboratory and pharmacy staff) was determined for each of the services listed in Table 2, based on MOH clinical protocols and expert opinion.
- The average number of minutes spent by a staff member per patient visit was calculated from the data collected in the facility questionnaire.

Annexes C and D present details on the last two inputs. Assumptions specific to each of the services and related patient targets are described in greater detail in the respective section of the chapter presenting the assessment results.

[8] This part of the model draws on methodology presented in Huddart et al. 2004 and Kombe et al. 2005
[9] It is assumed that staff members spend 1.5 hours for lunch and tea breaks, and on administrative tasks and staff meetings.

2.4.3 Estimating the Number of FTE Staff Required to Maintain the Current Level of "Non-MDG" Health Services

The number of FTE staff devoted to each MDG-related service in 2005 (chosen as the base year) was calculated by using the estimated number of patients covered in 2005 as the numerator in Equation [1]. These FTE staff numbers were then added across all services to give the total MDG-related FTE staff "spent" in 2005.

As health staff spend time with patients on services other than the MDG-related services included in this assessment, it is necessary to isolate the FTE staff that was devoted to "other" services in 2005. This figure is obtained by subtracting the FTE staff devoted to MDG-related services in 2005 from the total number of staff employed in public and FBO health facilities (which is essentially the number of FTE staff devoted to all health services combined) in the same year. It is assumed that all staff are full-time employees.

If the level of services is to remain unchanged in the future, the health-staff-to-population ratio needs to stay constant. In other words, the ratio of the number of FTE staff for "other" services to total population needs to stay the same as in 2005. That ratio was calculated for 2005 and then multiplied by the projected total population in 2015 to obtain the FTE staff needed in 2015 to maintain the current level of "other" services. A similar calculation was done for 2010.

2.4.4 Estimating Total FTE Requirements

The MDG-related FTE staff requirements for 2015 were added to the FTE staff requirements for "other" services in the same year, to give the total staff requirements to reach the MDG-related targets, while maintaining all other services at their current level. The same calculations were done for 2010.

The resulting HRH requirements for 2010 and 2015 are then compared with baseline HRH data in the public sector and in the FBO sector to estimate the minimum annual growth rate needed for each staff category to reach the target number of staff in 2010 and 2015. The sequence of calculations is demonstrated in Table 5.

Table 5. Model Used for Calculating HR Requirements

Indicator	Formula	Source
Total staff in 2005	A	MOH HIS database for public sector; Kenya Catholic Secretariat (KCS) and Christian Health Association of Kenya (CHAK) for FBO sector
FTE staff for MDG services in 2005	B	Model estimate
FTE staff for non-MDG services in 2005	C=A-B	Calculation
Per capita	D= C/(Total Population in 2005)	Calculation
FTE staff required to maintain 2005 level of non-MDG services in 2015	E= D*(Total Population in 2015)	Calculation

FTE staff required for MDG services in 2015	F	Model estimate
Total FTE staff required in 2015	G=E + F	Calculation
Annual HR growth rate required 2005-2015	[(G/A)^(1/10)] – 1	Calculation

2.4.5 Limitations of the Model

The estimation model does not in any way attempt to model the interactions of the expected outcomes. For example, if the target number of children is reached with ITN distribution, growth monitoring, nutrition consultations, and immunizations, then fewer children will need curative services as a result of improvements in child health. Since it is difficult to model and predict such complex interaction effects, however, the analysis presented here takes the effects of all health services as independent of each other. Depending on the level of success in reaching the set targets over time, and on the magnitude of the associated improvement of the corresponding health indicators, the FTE staff requirements may vary from those presented here.

3. Key Findings and Discussions

The major findings from the report are presented below. The first section presents the HRH requirements to meet the PEPFAR targets; the second section discusses the HRH requirements to achieve the three health-related MDGs; and the third section examines the annual growth rates needed to meet future staff requirements.

HRH requirements for reaching the PEPFAR and MDGs are projected for the public and FBO health sectors. The target number of people to be covered in 2006-2008 by PEPFAR and the target numbers in 2010 and 2015 for the MDGs are explained in detail in each subsection. The distribution of each target among the public and FBO facilities uses the shares presented in Annex B (Table B3). Note that only the total number of patients is shown in the main report.

3.1 HRH Required to Meet PEPFAR Targets

The PEPFAR program in Kenya covers a broad range of HIV/AIDS-related services. This report focuses on quantifying the HRH requirements in the public and FBO health sectors for reaching three key PEPFAR targets: VCT, ART, and PMTCT. Table 6 shows the number of people that PEPFAR programs plan to cover through both direct (upstream) and indirect (downstream) PEPFAR support in the remaining three years of the program, 2006-2008.

Table 6. PEPFAR Targets for Kenya, 2006-2008*

	2006	2007	2008
VCT for pregnant women (in PMTCT setting)	181,000	362,200	529,286
VCT others	650,000	800,000	1,047,400
ART pregnant women identified in PMTCT setting	10,800	16,200	21,600
ART total target	69,500	112,000	250,000
PMTCT: ARV prophylaxis (nevirapine)	10,500	21,500	28,500

* All figures are for PEPFAR fiscal year, which ends in September.
Sources: PEPFAR 2006 & PEPFAR 2005.

Data on the overall distribution of HIV/AIDS-related service provision across the public, FBO, and private/NGO sectors were used to estimate the proportion of each PEPFAR target to be serviced by each of these three sectors. Then the researchers estimated the number of FTE staff required to reach the targets in the public sector and in the FBO sector, and the corresponding additional number of HRH needed to reach PEPFAR targets.

Table 7a shows the FTE staff numbers required to reach the PEPFAR VCT targets for the general population and for pregnant women (in PMTCT setting). The increase in the number of FTE

staff from one year to the next indicates the additional number of staff needed to scale up PEPFAR services. For example, in 2007 the public sector will need to have an additional 69 lab specialists, compared with 2006, to reach PEPFAR's VCT target, while in 2008 there is a need to further increase the total number of lab specialists by 85 for the VCT target alone.

Table 7a. Number of FTE Staff Required to Meet PEPFAR Targets for VCT in 2006-2008*

		Public sector	FBO sector	TOTAL
2006	Counselors**	176	90	266
	Lab Specialists	171	87	258
2007	Counselors**	246	125	371
	Lab Specialists	240	122	362
2008	Counselors**	334	170	504
	Lab Specialists	325	166	491

*Includes HIV counseling and testing for pregnant women.
**Counselors include clinical officers, nurses, general counselors, and nutritionists

Table 7b shows the number of FTE staff needed to provide ART and PMTCT prophylaxis services to the target number of patients given by PEPFAR. Again, the increase in FTE staff requirement from one year to the next indicates the additional number of staff that should be hired in the public and FBO sectors in order to cover the ART and PMTCT targets set by PEPFAR in each year. According to this study's estimates, over the next two years the public sector needs to increase the total number of pharmacy specialists by 219, while the number of lab specialists needs to increase by 108. The corresponding increase in the FBO sector is 73 pharmacy specialists and 36 lab specialists needed to accommodate the ART and PMTCT targets alone.

Table 7b. Number of FTE Staff Required to Meet PEPFAR Targets for ART and PMTCT in 2006-2008*

		Public sector	FBO sector	TOTAL
2006	Doctors	19	6	15
	Clinical Officers	30	10	40
	Nurses	47	16	63
	Pharmacy Specialists	84	28	112
	Lab Specialists	41	14	55
	Nutritionists	11	4	15
2007	Doctors	31	10	41
	Clinical Officers	49	16	65
	Nurses	77	26	103
	Pharmacy Specialists	136	45	181
	Lab Specialists	67	22	89
	Nutritionists	18	6	24

2008	Doctors	74	25	99
	Clinical Officers	117	39	156
	Nurses	184	61	245
	Pharmacy Specialists	303	101	404
	Lab Specialists	149	50	199
	Nutritionists	40	13	53

* PMTCT includes only ARV prophylaxis (nevirapine); HIV counseling and testing for pregnant women is included in the VCT target.

Totaling the FTE requirements for the three PEPFAR targets discussed above allows for estimating the number of additional HRH required in the public and FBO sectors (Table 7c).

Table 7c. Number of Additional Staff Required to Meet PEPFAR Targets

		Public sector	FBO sector	TOTAL
2006 - 2007	Doctors	12	4	16
	Clinical Officers	19	6	25
	Nurses	30	10	40
	Pharmacy Specialists	52	17	69
	Lab Specialists	95	43	138
	Nutritionists	7	2	9
2007 - 2008	Doctors	43	15	58
	Clinical Officers	68	23	91
	Nurses	107	35	142
	Pharmacy Specialists	167	56	223
	Lab Specialists	167	72	239
	Nutritionists	22	7	29

To meet PEPFAR targets, the public sector needs to hire an additional 55 doctors, 87 clinical officers, and 137 nurses over the next two years. The number of additional lab specialists (262) needed indicates a 15 percent increase in this category over the total number of lab specialists working in 2005. The requirements for pharmacy specialists are even higher: 219 additional staff need to be hired in the public sector over the next two years, which is equivalent to a 50 percent increase in the total number of pharmacy specialists from the number available in the public sector in 2005 (433 total).

Similarly, in the FBO sector the additional staffing needs are highest among lab and pharmacy specialists, with 115 and 73 additional staff needed over the next two years in these categories, respectively. As in the public sector, this translates into a significant percentage increase over the current number of staff available: 21 percent increase for lab specialists and 35 percent increase for pharmacy specialists.

One major conclusion can be drawn from these results: if the current freeze on appointments in the public health sector is in place through 2008 for the staff categories providing VCT, ART, and PMTCT services, there will be a significant shortage of HRH needed to cover PEPFAR targets. Two staff categories that would be in acute shortage are pharmacy and lab specialists.

3.2 HRH Required to Meet the MDG-related Targets

This section presents the current and required number of health staff in the public and FBO health sectors for the set of MDG-related services. The calculation of the estimated number of people covered in 2005 and the target number of people to be covered in 2010 and 2015 for each service is explained in detail in each subsection. The HRH requirements projected for the public and the FBO sectors take into account the share of the total target number of people that will seek health services in these two sectors (see Annex B, Table B3).

3.2.1 HRH Requirements for MDG-related Services in 2005, 2010, and 2015

The following subsections present the current and projected FTE staff requirements for each MDG-related health service. The FTE numbers for each service are totaled at the end to present the number of staff required to reach the MDGs, while maintaining all other ("non-MDG") health services at their current level. This allows for translating FTE numbers into actual staff numbers (see Box 2).

Box 2. Translating FTE Staff Numbers into Actual Staff Numbers

While HRH capacity available and required for each individual health service (and the corresponding patient target) is expressed in FTE units, when the FTE requirements for all health services are totaled at the end, the resulting HRH requirements translate into actual number of staff.

One way to interpret FTEs is as follows: a required increase in the number of FTE doctors for ART between 2005 and 2010 can be interpreted as a required increase in the total amount of doctors' time (or total doctor capacity) required for ART.

3.2.1.1 HRH Requirements for HIV/AIDS

This section presents the HRH requirements associated with three key HIV/AIDS-related services: VCT, ART (for both adults and children), and PMTCT.

VCT

According to the National STI AIDS Control Program (NASCOP), in 2005 there were 453,000 Kenyans who received VCT, including pregnant women in a PMTCT setting (NACC/NASCOP 2005). The Health Sector HIV/AIDS Strategic Plan 2005-2010 envisions that in 2010 there will be 500,000 Kenyans receiving VCT. It can be assumed that the demand for counseling and testing among the general population will decline by the estimated rate of decline of HIV prevalence in 2010-2015 (described in the following section).

In addition, if all women who receive the target ANC package in 2010 and 2015 (described later in the Maternal Health section)[10] also receive HIV testing and counseling, the total number of VCT clients is projected to be 1.4 million in 2010 and 1.5 million in 2015 (Table 8).

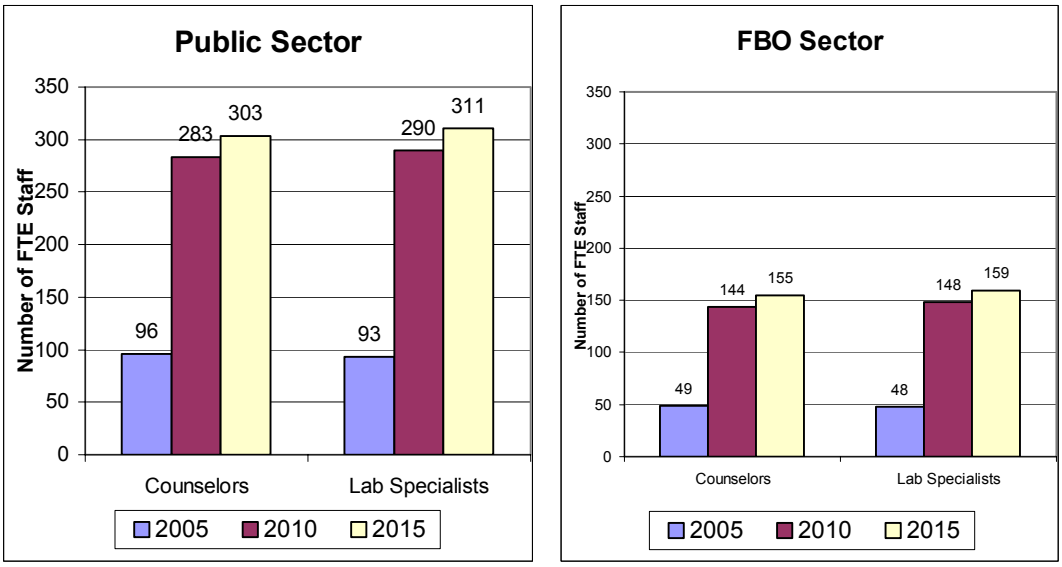
Table 8. Number of VCT Clients in 2005, 2010, and 2015

Year	General population VCT	HIV counseling and testing for pregnant women	Total
2005	188,000	265,000*	453,000
2010	500,000	870,285	1,370,285
2015	435,700	1,034,807	1,470,507

*Source: ROK 2005

Figure 2 shows the total number of FTE staff required to reach these targets. The scale-up of VCT services envisioned in the HIV/AIDS Strategic Plan 2005-2010 for the next five years would require 427 FTE counselors and 438 FTE lab specialists in 2010 — a threefold increase over the FTE number of counselors and lab specialists for VCT in 2005. The required increase in the following five years is substantially smaller, reflecting the much smaller increase in the number of VCT clients.

Figure 2. Number of FTE Staff Required for VCT Services in 2005, 2010, and 2015



Note: Counselors in 2005 include clinical officers, nurses, general counselors, and nutritionists.

[10] This target is to have 80 percent of pregnant women receive four ANC visits in 2010, and 100 percent to do so by 2015.

ART for adults (15-49 years)

The Kenya National HIV/AIDS Strategic Plan (KNASP) 2005/6 – 2009/10 estimates that adult HIV prevalence will drop to about 5.5 percent in 2010, from a current level of 6.7 percent. As no further projections on prevalence are available from national-level documents, the researchers assumed that between 2010 and 2015 adult prevalence will drop at the same rate as in the previous five years, reaching 4.5 percent by 2015. The resulting number of HIV-positive adults is shown in Table 9.

Table 9. Number of Adults (15-49 yrs) Receiving ART in 2005, 2010, and 2015

Year	HIV positive adults	Adults eligible for ART	Adults receiving ART
2005	1,100,000*	220,000*	60,392**
2010	998,855	248,085	186,063
2015	903,978	329,646	329,646

* WHO 2004
** NACC / NASCOP 2005

NASCOP reports that 60,392 adults were receiving ART in Kenya in 2005 (NACC/NASCOP 2005). Currently, about 20 percent of all HIV-positive adults (15-49 yrs) are eligible for ART (ROK March 2005). Assuming this proportion remains the same among those who are not already on ART, the estimated number of adults who would need ART in 2010 is 186,063, with the number increasing to 329,646 by 2015.

The Health Sector HIV/AIDS Strategic Plan 2005-2010 envisions that by 2010 at least 75 percent of those eligible for treatment would receive ART. This translates into 186,063 adults on ART by 2010. If five years later all adults estimated to need ART receive the regimen, the number increases to 329,646.

Since the number of annual visits differs for ART recipients who are just starting and for those who are continuing the therapy (i.e., have been on ART for at least a year), the researchers needed to estimate the proportion of ART target patients in each of these two groups. For 2010, it is assumed that ART initiations, as a percentage of total ART recipients, will equal the average projected increase in ART patients between 2005 and 2010, or 20 percent of all ART recipients in 2010. Similarly, it is assumed that in 2015, ART initiations will equal the average increase in ART patients between 2010 and 2015, or 11 percent of all ART recipients in 2015.

ART for children (0-15 years)

NASCOP reports that about 4,000 children under 15 years of age were receiving pediatric ART in 2005. Estimating future prevalence of HIV/AIDS among children, and projecting pediatric ART needs, is a complex exercise. It needs to consider changes in the rate of new infections (which are influenced by HIV prevalence among pregnant women and PMTCT use), as well as improvements in life expectancy for infected children resulting from wider implementation of pediatric ART programs. A commonly used rule-of-thumb is that the number of children 0-15 years eligible for ART is equal to 10 percent of the number of adults eligible for ART (UNAIDS, 2005). This means 24,808 children will be in need of ART in 2010 and 32,965 in 2015. It is assumed that pediatric ART target coverage is the same as adult ART coverage: 75 percent in 2010 and 100 percent in 2015.

PMTCT targets

The 2005 "AIDS in Kenya" report estimates that about half of HIV-positive pregnant women identified through VCT in a PMTCT setting received PMTCT antiretroviral prophylaxis, which translates into 10,600 women. The Health Sector HIV/AIDS Strategic Plan 2005-2010 envisions a 25 percent target reduction in HIV prevalence for pregnant women ages 15-24 by 2010, compared to a baseline given by KDHS. As no targets specific to all pregnant women of reproductive age are given, the researchers assumed a similar reduction for this group (15-49 years), which gives target HIV prevalence among pregnant women at 5.5 percent by 2010 and 4.3 percent by 2015 (from a baseline of 7.3 percent, given by KDHS 2003). By applying these HIV prevalence rates to all pregnant women who receive counseling and testing (as shown in Table 8), researchers projected that 47,648 women would have PMTCT needs in 2010 and 42,492 women in 2015 (Table 10). [11]

Table 10. Number of PMTCT Patients in 2005, 2010, and 2015

Year	Number of pregnant women*	Pregnant women receiving clinical HIV counseling and testing	Pregnant women receiving PMTCT **
2005	1,136,292	265,000	10,600
2010	1,087,856	870,285	47,648
2015	1,034,807	1,034,807	42,492

* Equal to number of births, as estimated from the HNPStats database of the World Bank (Annex E).
** In 2010 and 2015, equal to all pregnant women found HIV positive

As in the PEPFAR estimation, all women targeted to receive PMTCT are already included in the total VCT target (discussed above) for their counseling and testing services. In addition, it is assumed that those who are eligible to receive the standard ART regimen[12] are included in the ART target (also discussed above). This leaves only the need to estimate the number of FTE staff required to cover PMTCT prophylaxis (Nevirapine administration) for all HIV-positive pregnant women.

The estimated number of staff required for ART (adults and children) and for PMTCT prophylaxis is totaled in Table 11. The projected FTE staff requirements associated with national ART and PMTCT indicate that in 2010 the ART-specific number of FTE doctors, clinical officers, pharmacy and lab specialists, and nutritionists[13] is three times the FTE numbers dedicated to these services in 2005. The number of FTE nurses for ART needs to double over the same time period.

[11] KDHS 2004 notes that HIV prevalence was higher among pregnant women who seek ANC and VCT, compared with pregnant women who do not seek ANC or VCT. This implies that the projected number of HIV-positive pregnant women might be higher.
[12] It is assumed that the proportion of HIV-positive pregnant women eligible for ART is the same as in the general population of HIV-positive Kenyans, 20 percent (ROK March 2005)
[13] The Health Sector HIV/AIDS Strategic Plan envisions that 75 percent of people living with HIV/AIDS (PLWHA) will receive nutritional education and counseling at health facilities and at the community level by 2010. Since it is difficult to estimate how many PLWHA will receive such education each year, and it is not clear from the document whether nutrition education will be on a one-to-one basis or in-group sessions, the authors provided an estimate of the number of FTE nutritionists required if all those receiving ART have one personalized session per year with a nutritionist.

Table 11. Number of FTE Staff Required for ART Services (adults and children) and PMTCT Prophylaxis in 2005, 2010, and 2015

		Public sector facilities	FBO sector facilities	TOTAL
2005	Doctors	20	7	27
	Clinical Officers	35	12	47
	Nurses	75	21	96
	Pharmacy Specialists	80	27	107
	Lab Specialists	42	15	57
	Nutritionists	10	3	13
2010	Doctors	55	18	73
	Clinical Officers	89	30	119
	Nurses	146	50	196
	Pharmacy Specialists	250	84	334
	Lab Specialists	125	42	167
	Nutritionists	33	11	44
2015	Doctors	87	29	116
	Clinical Officers	146	50	196
	Nurses	234	79	313
	Pharmacy Specialists	442	148	590
	Lab Specialists	217	73	290
	Nutritionists	58	19	77

3.2.1.2 HRH Requirements for TB

With the onset of the HIV/AIDS epidemic, Kenya has witnessed a sharp increase in TB cases: it is estimated that over 60 percent of TB patients are co-infected (ROK 2005). The GOK has pledged treatment for all TB patients and MOH is implementing the internationally recommended DOTS strategy nationwide.

Table 14 shows data on the number of TB patients on DOTS in 2005, and the projected number for 2010 and 2015, as given by the National Leprosy and TB Program. Household survey data show that TB accounts for 3.3 percent of annual inpatient admissions and that there are 15 hospital admissions per 1,000 population per year in Kenya (ROK 2003). This translates into 50 TB-related hospital admissions per 100,000 population per year. If these rates remain the same in 2010 and 2015, the resulting number of hospitalized TB patients would increase from 17,577 to 18,658, as shown in Table 12.

Table 12. Number of TB Patients in 2005, 2010, and 2015

Year	Number of DOTS patients	Total inpatient admissions for TB*
2005	110,000	16,390
2010	193,800	17,577
2015	210,000	18,658

* The average length of stay for a TB-related hospital admission is 12 days (according to expert opinion by TB program officer at MOH)

As shown in Table 13, the number of FTE staff required to meet the expected patient load for inpatient services and DOTS in 2010 is 59 doctors, 90 clinical officers, 2,002 nurses, 245 lab specialists, and 50 radiographers in the public and FBO sectors, as shown in Table 13. Since most of the TB services are provided through the public sector, that sector will require a 50 percent increase in the number of doctors and clinical officers providing TB services between 2005 and 2010, with most of this increase attributed to the projected scale-up of DOTS. The required increase for FTE nurses and lab specialists providing TB treatment is estimated at 70 percent. It must be noted that the requirements in the FBO sector are minor, as this sector provides only a small share of inpatient TB services and no DOTS.

Table 13. Number of FTE Staff Required for TB Services in 2005, 2010, and 2015*

		Public sector facilities	FBO sector	TOTAL
2005	Doctors	36	1	37
	Clinical Officers	57	3	60
	Nurses	1,145	5	1,150
	Pharmacy Specialists	4	1	5
	Lab Specialists	139	1	140
	Radiographers	29	-	29
2010	Doctors	58	1	59
	Clinical Officers	87	3	90
	Nurses	1,997	5	2,002
	Pharmacy Specialists	8	1	9
	Lab Specialists	241	1	242
	Radiographers	49	1	50
2015	Doctors	63	1	64
	Clinical Officers	93	3	96
	Nurses	2,163	5	2,168
	Pharmacy Specialists	9	1	10
	Lab Specialists	261	1	262
	Radiographers	53	1	54

3.2.1.3 HRH Requirements for Malaria

About 70 percent of Kenya's population lives in malaria-prone areas (GOK 2005). The National Malaria Strategy 2001-2010 states that malaria "ranks as the most frequently diagnosed condition among out-patients and in-patients and deaths in most districts." Therefore, treatment of malaria places a major claim on health system resources.

Household survey data show that malaria accounts for up to 43 percent of outpatient visits (ROK 2003). According to expert opinion, about one-third of self-diagnosed malaria cases are clinically confirmed as such, therefore, the number used in this analysis is 14.4 percent of all outpatient visits (one-third of 43 percent).

The average number of outpatient visits per capita per year in Kenya is 1.9 (ROK 2003). About 23 percent of those who were sick, however, reported that they never sought medical care. If it is envisioned that care-seeking behavior will improve in the future (as a result of better availability of health personnel and drugs, IEC, and other services), and nearly all who are sick will seek modern care, then the number of malaria-related outpatient visits will be 340 per 1,000 population per year.[14] This translates into 10.4 million outpatient visits in 2010, and 11.2 million in 2015 (Table 16), excluding children under 5, as they are already included in the treatment target under the child health section (section 3.2.1.5).

Table 14 shows the estimated number of malaria-related hospital admissions, based on 15 hospital admissions per 1,000 population per year in Kenya, of which 40 percent are for malaria (ROK 2003).

Table 14. Outpatient and Inpatient Targets for Malaria in 2005, 2010, and 2015 (excluding children under 5)

Year	Total outpatient visits for malaria	Total inpatient admissions for malaria*
2005	7,853,720	171,306
2010	10,404,000	186,886
2015	11,242,440	201,947

The number of FTE staff required to treat the projected number of malaria patients in 2010 is 156 doctors, 350 clinical officers, 606 nurses, and 895 lab specialists, as shown in Table 15. The calculations for 2010 and 2015 assume no changes in malaria prevalence; therefore, the increase in HRH requirements is driven by population growth and the expected increase in people seeking care for malaria.

[14] Calculated as 0.144*1.9*(1+0.23)=0.34 malaria visits per capita.

Table 15. Number of FTE Staff Required for Malaria Services in 2005, 2010, and 2015

		Public sector facilities	FBO sector facilities	TOTAL
2005	Doctors	104	19	123
	Clinical Officers	232	43	275
	Nurses	402	75	477
	Pharmacy Specialists	111	21	132
	Lab Specialists	601	117	718
2010	Doctors	131	25	156
	Clinical Officers	295	55	350
	Nurses	510	96	606
	Pharmacy Specialists	146	28	174
	Lab Specialists	749	146	895
2015	Doctors	142	27	169
	Clinical Officers	318	60	378
	Nurses	552	103	655
	Pharmacy Specialists	158	31	189
	Lab Specialists	809	157	966

3.2.1.4 HRH Requirements for Maternal Health

This section presents the findings related to key maternal care services, including routine ANC, intermittent presumptive treatment (IPT), ITN distribution, and delivery with skilled birth attendants.

Antenatal Care

While nearly 90 percent of pregnant women in Kenya receive at least one ANC visit from a health professional, only 53 percent complete the four or more visits per pregnancy recommended by WHO (Annex C). Increasing access to and utilization of ANC is one of the main avenues to improve maternal health in Kenya. This section will address the HRH requirements associated with increasing the proportion of pregnant women who receive four routine ANC visits, specifically, an increase to 80 percent by 2010 and 100 percent in 2015.

According to the Kenya National Malaria Strategy 2001-2010, each year an estimated 6,000 women with a first-time pregnancy suffer from malaria-associated anemia, and nearly 4,000 infants have low birth weight as a result of maternal anemia. Only 4.7 percent of pregnant women sleep under impregnated bed nets and only 3.9 percent receive IPT for malaria during pregnancy (KDHS 2004). IPT is defined as receiving two doses of sulphadoxine and pyrimethanine (SP) during an ANC visit, and is one of the GOK policies listed in the National Malaria Strategy (under this definition).

While IPT and ITN utilization is very low, it should be noted that 16 percent of pregnant women reported sleeping under a net, and 21 percent reported taking *any* antimalarial drug for prevention, which indicates that with appropriate IEC interventions on IPT and ITNs supported by increased

ANC utilization, demand for these interventions can increase substantially.[15] A complementary goal to the scenario presented above in which 80 percent of pregnant women would receive four ANC visits by 2010 and 100 percent by 2015 would be to cover 80 percent of all pregnant women at risk for malaria for IPT therapy and ITN distribution in 2010. The proportion of women at risk for malaria is assumed to be the same as the proportion of the general population at risk, which is 70 percent. This translates into 761,600 pregnant women targeted to receive these two interventions in 2010. If this target increases to 100 percent of pregnant women at risk by 2015, the corresponding number of women would be 724,365.

Table 16 shows the FTE staff requirements in the public and FBO sectors associated with the ANC targets (including IPT and ITN distribution). Overall, the number of FTE nurses for ANC must increase by 35 percent from 2005 to 2015. A 23 percent increase is required for doctors and clinical officers providing ANC services, whereas the number of FTE lab specialists should increase by 72 percent (as the ANC target envisions that all pregnant women would receive one lab test per pregnancy in 2010 and 2015).

Table 16. Number of FTE Staff Required for ANC in 2005, 2010, and 2015

		Public sector facilities	FBO sector facilities	TOTAL
2005	Doctors	21	5	26
	Clinical Officers	49	10	59
	Nurses	395	83	478
	Pharmacy Specialists	3	1	4
	Lab Specialists	96	20	116
	PH Officers/Technicians	-	-	-
2010	Doctors	22	5	27
	Clinical Officers	161	34	195
	Nurses	456	86	542
	Pharmacy Specialists	45	9	54
	Lab Specialists	139	29	168
	PH Officers/Technicians	8	-	8
2015	Doctors	26	6	32
	Clinical Officers	191	40	231
	Nurses	541	103	644
	Pharmacy Specialists	53	11	64
	Lab Specialists	165	35	200
	PH Officers/Technicians	9	-	9

*Note that ITNs are only distributed by nurses and public health (PH) officers/technicians in the public health sector. As the percentage of pregnant women reporting use of ITNs in the baseline year is very small and no information is available on how many women received these bednets from health personnel in 2005, the researchers do not allocate any FTE staff numbers to ITN distribution in 2005.

[15] For example, the National Malaria Strategy envisioned that by 2006, 60 percent of pregnant women would receive two doses of SP for IPT in the second and third semester of pregnancy, and 60 percent of pregnant women would sleep under treated nets.

Although the required increase in the number of clinical officers and pharmaceutical specialists (the two staff categories involved in IPT) appears to be considerable, part of that increase might be due to the fact that the 2005 estimated baseline number of staff is lower than the number in actuality. In other words, while some clinical officers and pharmacy specialists might have spent time dispensing antimalarial prophylaxis to pregnant women, this time will not be reflected in the FTE estimates because of the strict definition of IPT. Nonetheless, the required number of FTE clinical officers (114) and pharmacy specialists (53) for IPT in the public sector in 2015 is substantial.

Delivery Care

The proportion of births attended by skilled health personnel is one of the two indicators measuring progress towards the MDG to reduce maternal mortality in Kenya. Only 42 percent of deliveries, however, occurred with a skilled attendant (KDHS 2004). If this proportion increases to 80 percent for normal deliveries and to 90 percent for deliveries with complications by 2010 and to 100 percent for all deliveries by 2015, the public sector would require the following FTE staff in 2010: 14 doctors, 75 clinical officers, and 200 nurses (Table 17).

Table 17. Number of FTE Staff Required for Delivery Care in 2005, 2010, and 2015

		Public sector facilities	FBO sector facilities	TOTAL
2005	Doctors	7	2	9
	Clinical Officers	39	11	50
	Nurses	104	29	133
2010	Doctors	14	4	18
	Clinical Officers	75	21	96
	Nurses	200	56	256
2015	Doctors	15	4	19
	Clinical Officers	84	23	107
	Nurses	228	63	291

The estimates assume that 15 percent of deliveries occur with complications (Safe Motherhood Policy Brief) and are attended by a doctor/clinical officer and a nurse, while normal deliveries are attended only by a nurse.[16] As Table 20 shows, meeting the set targets would require doubling the staff providing delivery services between 2005 and 2010.

It should be noted that these figures do not take into account the staff needed to provide care for post-abortion complications, as no reliable data are available on the number of post-abortion cases that obtained medical care in 2005. Various sources indicate that unsafe abortions account for 13 percent to 40 percent of maternal deaths in Kenya (KDHS 1999, GOK 2005). Since the number of future post-abortion cases reaching medical facilities is hard to estimate, it has not been included in the FTE staff estimates for emergency maternal care but note that this is an important factor that will increase substantially the number of doctors and nurses needed, particularly if no changes in abortion policy are envisioned.

[16] Note that 15 percent is an estimate for complications occurring among all deliveries. The percentage of complicated deliveries among those attended by skilled health personnel in 2005 is most likely higher (and thus more doctors were used), because women experiencing complications are more likely to seek care in a modern facility.

Family Planning

Kenya has one of the highest rates of contraceptive use for a sub-Saharan African country: 28.4 percent of women of reproductive age report using some method of contraception. At the same time, the unmet need for contraception among married women age 15-49 is reported to be 25 percent (KDHS 2004). The future demand for contraceptive methods is therefore a major claim on HR in the health system.

There are five major contraceptive methods that require a medical professional: female sterilization, birth control pill, IUD, injectable, and implant. Annex F shows the target demand figures (and associated number of visits in a health facility) for each method for 2010 and 2015 if the currently unmet demand for contraception is met.

The FTE staff requirements are shown in Table 18. The high demand for injectable and oral contraceptives (which require four appointments with a nurse per year) drive the high FTE staff requirements associated with family planning services. In 2005, an estimated 800 FTE nurses were devoted to family planning services in the public and the FBO sectors alone. To ensure that the estimated demand for contraceptives is fully met, the public and FBO sectors need to increase the FTE number of nurses providing the five FP services by 2.5 times over the next five years. Between 2010 and 2015, a further 30 percent increase would be required.

Table 18. Number of FTE Staff Required for Family Planning Services in 2005, 2010, and 2015

		Public sector facilities	FBO sector facilities	TOTAL
2005	Doctors	7	2	9
	Nurses	731	69	800
2010	Doctors	7	2	9
	Nurses	1,761	167	1,928
2015	Doctors	9	3	12
	Nurses	2,291	216	2,507

Since doctors are only involved in sterilizations, which is a less frequently used method of contraception, the number of FTE doctors required for direct provision of family planning services is minor.

3.2.1.5 HRH Requirements for Child Health

Infant and child mortality rates in Kenya have increased since 1990, with the majority of deaths resulting from five diseases: acute respiratory infections, diarrhea, measles, malaria, and malnutrition. While the majority of children are at risk of malaria infection, only 5 percent sleep under impregnated bed nets (KDHS 2004).

The 2005 MDG Status Report for Kenya acknowledges that, "Ensuring a critical mass of the human resources with skills needed to manage childhood illness remains a challenge to the government. The freeze on employment, worsened by high levels of attrition, has greatly reduced the skilled personnel that would provide the required services." (GOK 2005) The section below quantifies the HRH needed in the public and FBO health sectors to achieve a substantial scale-up of preventive and curative services for children by 2015.

Preventive Child Health Services

According to the National Health Sector Strategic Plan (NHSSP), 57 percent of children under 12 months were fully immunized in 2004/2005 (ROK 2005) (see Box 3 for definition). Scaling up immunizations and targeting younger children is a priority health policy for the health sector. Regular growth monitoring of children under 5 years is part of the IMCI policy, currently expanded in Kenya.

Box 3. Definition of Fully Immunized

The Kenya Expanded Programme on Immunizations (KEPI) has adopted WHO's goal to ensure completion of vaccinations by 12 months of age. The KEPI guidelines stipulate that a child is considered fully vaccinated if he/she receives the following: one dose of BCG, three doses of DPT/Hepatitis B/Influenza (a pentavalent vaccine) and polio vaccine, and one dose of measles vaccine. As the timing of the doses for DPT-HepB-Hib and polio vaccines is the same, it is assumed that a child needs a total of five immunization-related visits before reaching 12 months of age.

In addition to improving immunizations and growth monitoring of children, a substantial scale-up of ITN distribution is expected, as the Global Fund's fourth round of approved funds for Kenya distributes 3.4 million long-lasting ITNs as part of an integrated immunization campaign beginning in early 2006 (GOK 2005).

Table 19 presents the estimated FTE staff for preventive child care services in 2005, and the FTE staff requirements associated with the following:

- Fully immunizing 90 percent of children under 12 months in 2010 and 100 percent in 2015
- Performing regular growth monitoring for 90 percent of children under 5 in 2010 and 100 percent in 2015
- Distributing ITNs to 90 percent of children at risk of malaria by 2010 and 100 percent in 2015 [17]

[17] The NHSSP II gives a target of covering 60 percent of all children with ITNs by 2010 and 65 percent by 2015, which is consistent with covering 90 percent of all children at risk (given that the overall population at risk is 70 percent).

Table 19. Number of FTE Staff Required for Preventive Care for Children under 5 in 2005, 2010, and 2015

		Public sector facilities	FBO sector facilities	TOTAL
2005	Clinical Officers	63	26	89
	Nurses	787	254	1,041
	Nutritionists	223	93	316
	PH Officers/Technicians*	-	-	-
2010	Clinical Officers	60	25	85
	Nurses	840	243	1,083
	Nutritionists	160	67	227
	PH Officers/Technicians	43	11	54
2015	Clinical Officers	65	27	92
	Nurses	907	262	1,169
	Nutritionists	115	48	163
	PH Officers/Technicians	42	11	53

*Since no information was available from health personnel in 2005 on the number of children who sleep under ITNs, the researchers did not allocate any FTE staff numbers to child ITN distribution for that year.

The calculation assumes that all fully-immunized children receive a growth-monitoring visit at the time of each immunization, while all other children receive growth monitoring twice a year (either when taken to a provider because of illness, or as part of Vitamin A capsule administration). It also accounts for consultations with a nutritionist (in addition to the regular growth monitoring visits) for all underweight children. It is assumed that the proportion of underweight children will decrease from the current 20 percent (KDHS 2004) to 15 percent by 2010 and then to 10 percent by 2015.

Since nurses are the primary staff category providing immunizations and growth monitoring in both the public and FBO sectors, scaling up immunization rates from 57 percent to 100 percent of children under 12 months over the next 10 years would require increasing the number of FTE nurses from 1,041 in 2005 to 1,169 in 2015 (a 15 percent increase). The required number of nutritionists will decrease over time, due to a decrease in birth rates and malnutrition among children under 5 years.

Curative Child Health Services

Among children with symptoms of acute respiratory infection (ARI) and/or fever, only 46 percent were taken to a health facility or provider for treatment. Treatment of children for diarrhea is also inadequate: only 30 percent of children with diarrhea are taken to a professional health provider, and 32 percent receive no treatment at all (KDHS 2004). These findings indicate that with appropriate IEC interventions regarding treatment for children with ARI, fever, and diarrhea, utilization of health care for these conditions can be expected to increase in the future. If, for example, utilization of curative services for children requiring outpatient care increases 50 percent from current levels by 2010, then the average number of annual outpatient visits per child will increase from the current 3.5 visits to 5.2 visits annually (ROK 2003). The corresponding projections for the number of child outpatient visits are shown in Table 20, which also shows the number of expected inpatient cases if the rate for hospital admission among children under 5 stays at current levels: 19.5 admissions per 1,000 children (ROK 2003).

Table 20. Annual Number of Outpatient Visits and Hospital Admissions for Children under 5

Year	Number of children under 5*	Outpatient visits	Number of hospital admissions**
2005	4,887,000	16,909,020	97,740
2010	4,720,000	24,496,800	94,400
2015	4,544,000	23,583,360	90,880

* Source: HNPStats database of the World Bank (Annex E).
** Average length of stay is 6.4 days (ROK 2003)

In 2010, the FTE staff requirements in the public sector associated with servicing these patient targets would be 285 doctors, 584 clinical officers, 954 nurses, 202 pharmacy specialists, and 545 lab specialists, as shown in Table 21. By assuming that there would be no changes in disease prevalence among children over the next 10 years, the increase in the required number of staff across all categories between 2005 and 2010 would be driven by the assumption that the rate of seeking health care would improve. The birth rate decrease projected between 2010 and 2015 accounts for the decrease in the required FTE staff over that time period.

Table 21. Number of FTE Staff Required for Curative Care for Children under 5 in 2005, 2010, and 2015

		Public sector facilities	FBO sector facilities	TOTAL
2005	Doctors	208	42	250
	Clinical Officers	423	88	511
	Nurses	690	143	833
	Pharmacy Specialists	142	30	172
	Lab Specialists	381	81	462
	Radiographers	33	7	40
2010	Doctors	285	59	344
	Clinical Officers	584	123	707
	Nurses	954	200	1,154
	Pharmacy Specialists	202	43	245
	Lab Specialists	545	117	662
	Radiographers	47	10	57
2015	Doctors	274	57	331
	Clinical Officers	562	118	680
	Nurses	918	192	1,110
	Pharmacy Specialists	195	42	237
	Lab Specialists	525	112	637
	Radiographers	46	10	56

3.2.1.6 Summary: Total HRH for MDG-related Services in 2005, 2010, and 2015

The number of FTE staff needed for the MDG-related services, as presented in the preceding five subsections, totals the number of FTE staff shown in Table 22. All remaining FTE staff available in each year would be allocated to non-MDG services.

Table 22. Total FTE Public and FBO Sector Staff Required for MDG-related Health Targets in 2005, 2010, and 2015

	Public Sector			FBO Sector		
Staff Category	**2005**	**2010**	**2015**	**2005**	**2010**	**2015**
Doctors	403	572	617	78	114	127
Clinical Officers	897	1,348	1,459	193	290	321
Nurses	4,318	6,863	7,835	679	900	1,023
Pharmacy specialists	341	651	856	79	165	231
Lab specialists	1,353	2,082	2,282	281	479	533
Radiographers	62	97	99	7	10	10
Counselors[18]	96	290	311	49	148	159
PH officers/Technicians	N/A	51	52	N/A	11	11

Note: In 2005, counseling as part of VCT was provided by several categories of health workers, including nurses, clinical officers, general counselors, and nutritionists. The total time FTE staff spent for VCT in 2005 is grouped under counselors, as this is the category that is expected to provide the bulk of VCT in the future.

In the public sector, comparing the staff requirements for the MDG-related services provided in 2005 (Table 22) against the total available staff in 2005 (Table 23) shows that MDG services take up a major share of HRH across most staff categories. For example, 341 of the 433 total FTE pharmacy specialists and 1,353 of the 1,689 FTE lab specialists are currently dedicated to MDG-related services. In other words, the results show that, on average, pharmacy and lab specialists spend more than 60 percent of their time on patients for MDG-related services. The corresponding percentage of doctors and nurses is 27 and 24 percent, respectively.

In the FBO sector, nearly 90 percent (679 FTE) of nurses' time spent with patients was for MDG-related services, and 50 percent (281 FTE) of lab specialists' time was dedicated to such services in 2005 (Table 22).

The MDGs associated increase in HRH required through 2010 and 2015 is significant, particularly between 2005 and 2010. The overall required HRH increase is discussed in greater detail in the following section.

[18] In 2005, counseling as part of VCT was provided by several categories of health workers, including nurses, clinical officers, general counselors, and nutritionists. The total FTE time spent for VCT counseling in 2005 is grouped under counselors, as this is the category that is expected to provide the bulk of VCT counseling in the future.

3.2.2 Total HRH Required to Reach the MDGs and Maintain the Current Level of "Non-MDG" Health Services in 2010 and 2015

As health staff spend time with patients on services other than the MDG-related services included in this assessment, to obtain an accurate projection of the total HRH requirements in 2010 and 2015, it will be necessary to estimate the proportion of staff time (or number of FTE staff as proportion of total staff) devoted to these other services. The number of FTE staff for non-MDG services in 2005 was obtained by subtracting the FTE staff devoted to MDG-related services from the total number of staff for that year .The 2005 staff-to-population ratio for these non-MDG services is held constant through 2010 and 2015, providing an estimate for the FTE staff needed to maintain the 2005 level of these services in the future. Totaling the resulting FTE requirements for non-MDG services and the FTE requirements for the MDG-related services (from Table 22) will provide the total number of staff required in 2010 and 2015, as shown in Table 23.

Table 23. Number of Staff Available for All Services in 2005 and Number of Staff Required in the Public and FBO Sectors in 2010 and 2015

	Public Sector			FBO Sector		
Staff Category	**2005**	**2010**	**2015**	**2005**	**2010**	**2015**
Doctors	1,486	1,734	1,850	220	266	288
Clinical officers	2,316	2,870	3,075	219	318	350
Nurses	18,326	21,886	23,781	3,107	3,493	3,775
Pharmacy specialists	555	881	1,100	209	304	379
Lab specialists	2,033	2,811	3,055	544	767	839
Radiographers	348	403	425	-	10	10
Counselors	120	290	311	-	148	159

Source: Public sector 2005 data are from ROK 2005; FBO sector 2005 data are from the KCS and CHAK. It is assumed that all staff employed are full-time employees.

Note that the HRH numbers in Table 23 are in actual numbers of staff. In other words, this is the number of staff that should be employed in 2010 and 2015 in order to reach the MDG-related health targets while maintaining the current level of other health services. In the next five years, a substantial increase will be needed across all staff categories in the public sector: 59 percent for pharmacy specialists, 38 percent for lab specialists, 24 percent for clinical officers, 19 percent for nurses, and 17 percent for doctors.

The number of counselors must increase by 2.5 times over this time period. It is important to note that these future requirements assume that counselors are the only staff category providing VCT in 2010 and 2015. If training of other staff categories (such as nurses) for VCT is scaled up, then fewer counselors, but more nurses, will be required to reach the set VCT targets.

In the FBO sector, a similar increase in staff numbers will be required through 2010: 45 percent for pharmacy specialists, 41 percent for clinical officers and lab specialists, 21 percent for doctors, and 12 percent for nurses.

In both sectors, the HRH increase required in 2010-2015 is much lower than in the previous five years, with the exception of pharmacy specialists — their number needs to further increase by 25

percent in the public sector, and by 25 percent in the FBO sector, to 1,100 and 379 pharmacy specialists, respectively.

3.2.3 Annual HRH Growth Rate Projections to Achieve the MDG-related Health Targets

The HRH increase required over the next 10 years is translated in annual growth rates, as shown in Table 24. Between 2005 and 2010, the number of counselors in the public sector needs to increase by 19 percent annually, followed by pharmacy specialists (10 percent) and lab specialists (7 percent). The number of doctors in public facilities should increase by 3 percent, whereas the number of clinical officers and nurses needs to increase by 4 percent over the next five years. Similar HRH growth rate requirements are observed in the FBO sector.

If the required HRH numbers for 2010 are achieved, the required annual growth rates across all staff categories will decrease between 2010 and 2015 to less than 2 percent for all staff categories except for pharmacy specialists (4.5 percent)

Table 24. Annual HRH Growth Rate Projections to Achieve Staff Requirements

	Public Sector		FBO Sector	
	Annual growth rate 2005-2010	**Annual growth rate 2010-2015**	**Annual growth rate 2005-2010**	**Annual growth rate 2010-2015**
Doctors	3.1%	1.3%	3.9%	1.6%
Clinical Officers	4.4%	1.4%	7.8%	1.9%
Nurses	3.6%	1.7%	2.4%	1.6%
Pharmacy specialists	9.7%	4.5%	7.8%	4.5%
Lab specialists	6.7%	1.7%	7.1%	1.8%
Radiographers*	3.0%	1.0%	-	-
Counselors*	19.3%	1.4%	-	-

* No data were available for the number of radiographers and counselors in the FBO sector.

Scarce data exist on past trends in HRH growth in the public sector. The mapping exercise conducted by MOH in all public health facilities in 2004-2005 provides the most reliable estimate on actual HRH availability in the public sector. The discrepancies, however, between the number of health workers counted through the mapping and the number recorded in the registers indicate that HRH growth rates based on the latter source may not be indicative of the real picture of HRH change. Therefore, no reliable comparison can be made between past HRH growth rates and future HRH growth rates required in the public sector to reach the MDGs.

One major conclusion that is evident from the results presented in Table 24 is that if a freeze on the employment of these key health staff categories is in place for the public sector over the next 5 to 10 years, Kenya will not be able to reach the health-related MDGs. An acute shortage of health workers, particularly among pharmacy and lab specialists, counselors, and nutritionists, will preclude service provision to the target number of patients.

4. Conclusions and Recommendations

Several conclusions can be drawn from this report. First, data confirm the commonly held perception that HRH poses a major challenge to scale up HIV/AIDS and other basic health services. As PEPFAR and MDG initiatives rapidly scale up, significant HRH will be required to meet the demand.

Second, like many other sub-Saharan African countries, Kenya's geographical distribution of skilled HRH is heavily skewed towards urban areas. It is not surprising to see that 42 percent of doctors and 30 percent of nurses of the total public sector staff are located in the Nairobi Rift Valley provinces. Rural areas, such as the Western province, have only 7 percent of doctors and 11 percent of nurses out of the total public sector staff (ROK 2006).

Third, report findings indicate that substantial annual growth rates (across all staff categories) are needed to meet future requirements. Additional assessment is required to determine whether training institutions are currently producing enough new graduates (doctors, nurses, clinical officers, lab specialists, pharmacists, nutritionists, and counselors) to meet the growing demand for expanding basic health services in the public sector. There is a need to quantify the proportion of new medical graduates who enter the public sector. If new graduates are viewed as the major source for both replacing HRH lost through attrition and filling the gap between available and required HRH (as quantified in this report), then scaling up the training of health workers would be required.

Several interlinked policy options will ensure the future availability of the required number of HRH in the public health sector. This report provides a base of information on which the GOK can base analysis and planning for future HRH requirements. With this in mind, the report suggests the following recommendations:

- The MOH should convene a high-level stakeholder meeting to discuss innovative strategies to address attrition and maldistribution of health workers. Attrition rates among health workers in the public health sector must be quantified to establish how many health workers will need to be replaced each year. If attrition rates are very high, assessment of the major reasons contributing to HRH attrition will be needed. Such an assessment will inform and help prioritize policies aimed at retention of skilled health workers. Issues such as incentives for health workers deployed in rural areas should be included on the agenda.

- The MOH should apply workload evidence to hire and deploy health workers for PEPFAR, MDG, and other new initiatives. Evidence from this report can provide guidance on what services need additional staff. Kenya has a large pool of unemployed health professionals. As with new graduates, there is a need to assess the extent to which the pool of unemployed health professionals can be used for both replacing HRH lost through attrition and filling the gap between available and required HRH. If this option is considered as a viable alternative to scaling up training of new graduates, there may be a need for in-service training of health workers who have been unemployed for a long period, particularly in areas such as ART and PMTCT where implementation of service provision guidelines is relatively recent.

- The Ministries of Health and Education in collaboration with development partners should conduct a comprehensive assessment of training institutions to ensure that production of new graduates meets the expected future HRH requirements.
- The donor community should assist the GOK in developing a medium- to long-term HR strategy that will address issues of hiring, deployment, retention, and incentives for health workers.
- The government and the donor community should explore the possibility of expanding some services in the private sector given the HRH constraints in the public sector. Kenya has a robust private sector and efforts should be made to conduct a rapid assessment of the HRH situation in this sector.

Annex A: Distribution of Health Personnel by Province in 2004-2005

Table A1. Distribution of Health Personnel by Province in 2004-2005

Staff type	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western	Total
Doctors	546	156	115	178	20	104	286	81	**1,486**
Clinical officers	186	278	212	336	78	285	720	221	**2,316**
Registered nurses	1,116	561	343	487	87	341	981	257	**4,173**
Enrolled nurses	1,494	2,313	1,099	2,365	262	1,599	3,495	1,526	**14,153**
Pharmacists	114	25	12	21	1	12	31	9	**225**
Pharmaceutical technologists	76	22	26	47	18	25	95	21	**330**
Laboratory technologist	247	216	102	201	26	179	350	132	**1,453**
Laboratory technicians	99	37	93	69	19	40	178	45	**580**
Radiographers	53	49	27	50	9	41	97	22	**348**
Health administrative officers	46	24	13	26	1	14	54	16	**194**
Public health officers/public health technicians	248	652	340	664	118	505	1,380	376	**4,283**
Nutritionists	106	64	29	42	9	24	150	26	**450**
Social workers	38	1	0	2	0	2	27	4	**74**
General counselors under NASCOP	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	**120**
All others	3,797	1,421	765	1,517	158	1,306	2,728	716	**12,205**
TOTAL	**8,166**	**5,754**	**3,147**	**5,961**	**797**	**4,451**	**10,572**	**3,422**	**42,390**

Source: ROK, January 2006

Annex B: Distribution of Health Facilities and Patients in the Public and FBO Sectors

Table B1. Distribution of Health Facilities in the Public Health Sector by Province

Province	Provincial Hospitals	District Hospitals	Health Centers	Dispensaries	Total
Central	1	15	66	217	299
Coast	1	16	38	159	214
Eastern	1	28	70	279	378
Nairobi	1	4	10	17	32
North Eastern	1	4	13	43	61
Nyanza	1	26	94	191	312
Rift Valley	1	38	132	541	713
Western	1	13	66	92	172
Total	**8**	**144**	**489**	**1,539**	**2,181***

* In addition, there are two national referral hospitals: Moi Teaching and Referral Hospital (located in Rift Valley) and Kenyatta National Hospital (in Nairobi).

Table B2. Distribution of FBO-managed Health Facilities by Province

Province	Hospitals	Health Centers	Dispensaries	Total
CENTRAL	19	11	100	130
COAST	5	3	77	85
EASTERN	20	13	194	227
N. EASTERN	3	1	6	10
NAIROBI	3	1	41	45
NYANZA	14	42	77	133
RIFT VALLEY	15	51	240	306
WESTERN	10	19	79	108
Total	**89**	**141**	**814**	**1,044**

Table B3. Proportion of Patients Seeking Care in the Public and FBO Health Sectors in 2004

	Proportion of patients served by public sector facilities	Proportion of patients served by FBO sector facilities	Proportion of patients served by other providers (private, NGOs, etc)	Source
PMTCT	0.56	0.22	0.22	NASCOP, Kenya Service Provision Assessment Survey 2004 Report
ART	0.60	0.20	0.2	
VCT	0.49	0.25	0.26	
TB DOTS	1	0	0	MOH
TB Inpatient	0.72	0.11	0.17	Household Health Expenditure and Utilization Survey
Malaria				
Outpatient	0.51	0.10	0.39	Household Health Expenditure and Utilization Survey
Inpatient	0.72	0.11	0.17	
ANC				
Routine ANC visits	0.711	0.15	0.139	DHS 2003
IPT	0.711	0.15	0.139	Assume same as above
ITN distribution	1	0	0	MOH
Delivery				
Normal	0.65	0.18	0.17	DHS 2003
Complicated	0.65	0.18	0.17	DHS 2003
FP				
Sterilization	0.54	0.15	0.31	DHS 2003
Pill	0.49	0.04	0.47	DHS 2003
IUD	0.49	0.05	0.46	DHS 2003
Injectables	0.62	0.06	0.32	DHS 2003
Implant	0.61	0.05	0.34	DHS 2003
Child prevention				
Growth Monitoring	0.60	0.25	0.15	Kenya Service Provision Assessment Survey 2004 Preliminary Report
Immunization	0.60	0.25	1	Kenya Expanded Programme on Immunization
ITN distribution	1.00	0	0.15	MOH
Child curative			0	
Outpatient	0.51	0.10		Household Health Expenditure and Utilization Survey
Inpatient	0.72	0.11	0.39	

Annex C: Number of Patient Visits

Calculations of the total annual number of patient visits used in the estimation model are based on the service-provision requirements given in this annex. The tables provide the number of visits per patient per year or per episode of illness (depending on the condition). This information was obtained from official clinical guidelines of MOH, as well as from consultations with experts (in cases where common practices differed widely from the guidelines).

(1) HIV/AIDS

(1a) Voluntary Counseling and Testing

Each patient receives one counseling appointment and one lab test.

(1b) ART for Adults – visits per year

	Doctors	Clinical Officers	Nurses	Pharm. Specialists	Lab Specialists	Nutritionists
Initiation	6		6	12	6	1
Continuing	4		4	12	6	1

Note: Nurse visits are in addition to doctor/clinical officer visits.

The target patient load that requires a doctor or a clinical officer is distributed among doctors and clinical officers according to the 2004 ratio of this staff at the hospital level: 65.7 percent of such patient visits go to clinical officers and the rest go to doctors.

(1c) ART for Children – visits per year

Doctors	Clinical Officers	Nurses	Pharm. Specialists	Lab Specialists	Nutritionists
4		4	12	5	1

Note: Nurse visits are *in addition* to doctor/clinical officer visits.

The target patient load that requires a doctor or a clinical officer is distributed among doctors and clinical officers according to the 2004 ratio of this staff at the hospital level: 65.7 percent of such patient visits go to clinical officers and the rest go to doctors.

(1d) PMTCT – visits per pregnancy

Number of Visits*	Doctors	Clinical Officers	Nurses	Pharm. Specialists	Lab Specialists
if on ART	0	0	1	0	
if **not** on ART	2	2	2	1	1

* Visits are for the mother and the baby

Assume the following:

- VCT target already includes all pregnant women, so those who are on PMTCT have already had VCT. Testing and counseling is not part of PMTCT as defined here; this FTE covers only the nevirapine administration part of PMTCT.
- ART target already includes all pregnant women who need ART (20 percent of the HIV+ women), so they only need one visit with a nurse for nevirapine for the baby. The pre-delivery dose is given to these women at their regular ART visits

The target patient load that requires a doctor or a clinical officer is distributed among doctors and clinical officers according to the 2004 ratio of this staff at the hospital level: 65.7 percent of such patient visits go to clinical officers and the rest go to doctors.

(2) Tuberculosis

(2a) TB – Directly Observed Short-course Treatment (visits per treatment episode)

	Doctors	Clinical Officers	Nurses	Pharm. Specialists	Lab Specialists	Radiographers
TB DOTS	3		60	1	6	2

Note: Nurse visits are *in addition* to doctor/clinical officer visits

The target patient load is distributed among doctors and clinical officers according to the 2004 ratio of this staff at the hospital level: 65.7 percent of such patient visits go to clinical officers and the rest go to doctors.

(2b) TB Inpatient Care (visits per treatment episode)

	Doctors	Clinical Officers	Nurses	Pharm. Specialists	Lab Specialists
TB Inpatient	1 a day		1 a day	2 per admission	1 per admission

Note: Nurse visits are *in addition* to doctor/clinical officer visits

The inpatient (IP) target patient load is distributed among doctors and clinical officers according to the 2004 ratio of this staff at the hospital level: 65.7 percent of such patient visits go to clinical officers and the rest go to doctors.

(3) Malaria Treatment (visits per treatment episode)

	Doctors	Clinical Officers	Nurses	Pharm. Specialists	Lab Specialists
Outpatient	1*		1	1*	1**
Inpatient	1 a day		1 a day	1 per admission	1 per admission

* Only for those in hospitals
** Only for those in hospitals and health centers
Note: Nurse visits are *in addition* to doctor/clinical officer visits

The Kenya Household Health Expenditure and Utilization Survey Report 2003 found that among those who sought care in public and FBO facilities the distribution of outpatient visits is as follows:

Type of facility	Percentage of all outpatient visits
Hospitals	46
Health Centers	23
Dispensaries	31
Total	100

The total number of outpatient visits is distributed according to this breakdown. In addition, the following is assumed:

- Patients who sought care in hospitals were seen by a doctor or a clinical officer (these visits are distributed among doctors and clinical officers according to the 2004 ratio of this staff at the hospital level: 65.7 percent of such patient visits go to clinical officers and the rest go to doctors).
- Patients who sought care in health centers were seen by a clinical officer or a nurse (these visits are distributed among clinical officers and nurses according to the 2004 ratio of this staff at the health center level: 12 percent of such patient visits go to clinical officers and the rest go to nurses).
- All patients who sought care in dispensaries were seen by a nurse.

The IP target patient load is distributed among doctors and clinical officers according to the 2004 ratio of this staff at the hospital level: 65.7 percent of such patient visits go to clinical officers and the rest go to doctors.

(4) Antenatal Care (ANC) - Visits per Pregnancy

Antenatal Care Visits, 2005

Number of ANC visits	Percentage of pregnant women*	Total number of ANC visits
4+ visits	53.2	2,418,029**
-3 visits	31.3	889,148
1 visit	4.2	47,724
Did not receive ANC from a medical provider	11.3	-
Total	**100**	-

* Source: KDHS 2003

**There is no information on the average number of ANC visits in this group; therefore, the researchers used four visits, recognizing that this underestimates the total number of visits.

(4a) Routine ANC Visits

- Only women with complications during pregnancy get ANC visits with a doctor or clinical officer (the researchers assumed 15 percent of pregnancies, as this is the proportion of complicated deliveries); the rest only see a nurse

- All who had four or more ANC visits during pregnancy are assumed to have had one lab test per pregnancy in 2005. In 2010 and 2015, however, the target is that all women receiving the ANC package of four visits also receive one lab test per pregnancy.

The visits for doctors/clinical officers (15 percent of total) are distributed among doctors and clinical officers according to the 2004 ratio of this staff: 64.3 percent of such patient visits go to clinical officers and the rest go to doctors.

(4b) Intermittent Presumptive Treatment for Malaria

Every woman receiving IPT had two visits with a clinical officer (for the prescription) and two visits with a pharmacy staff. These visits are in addition to the four routine ANC visits.

(4c) ITN Distribution

Every pregnant woman had a visit with either a nurse or a public health staff member for the ITN, in addition to her ANC and IPT visits.

(5) Delivery Care

Targets for delivery care are as follows:

- In 2010, 80 percent of all normal deliveries will be with a clinical officer or a nurse, and in 2015, it will be 100 percent.
- In 2010, 90 percent of all deliveries with complications (emergency and post-abortion care cases) will be with a doctor/clinical officer and a nurse, and in 2015, it will be 100 percent.
- It is assumed that 15 percent of deliveries will be complicated (Safe Motherhood Policy Brief).

Normal deliveries are distributed among clinical officers and nurses according to the ratio of deliveries supervised by a doctor and a nurse, as reported in DHS 2003; therefore, 23 percent of normal deliveries are with a clinical officers and the rest are with a nurse.

Complicated deliveries are distributed among doctors and clinical officers according to the 2004 ratio of this staff at the hospital level; therefore, 65.7 percent go to clinical officers and the rest go to doctors.

(6) Family Planning (visits per year)

FP Method	Doctors	Nurses	Notes
Sterilization	2	2	
Pill	0	4	Initiation visit is followed by appointments every three months
IUD	0	2	After the procedure, a patient comes for a check-up after three months, and then for annual check-up. IUDs last about 10 years
Injectable	0	4	Patients seen every three months
Implant	0	1	No annual check-up required. Lasts for four to five years

Note: Nurse visits are in addition to doctor visits.

(7) Child Health – Preventive Services (visits per year)

Service	Age	Clinical Officers	Nurses	Nutritionists*	PH Staff
Growth Monitoring	0-12 months	5 (same as immunization)		5	-
	12-59 months	2 (same as vitamin A capsule)		2	-
Immunizations	0-12 months	-	5	-	-
ITN distribution	0-12 months	-	-	-	1

* Nutritionists only see underweight children *in addition* to the CO/nurse visits for these children.

(8) Child Health – Curative Services (visits per treatment episode)

All assumptions related to service provision for children under 5 are the same as those given in the section for malaria, with the exception of visits that used services of a pharmacy staff, lab specialists, and radiographers (these are as described in the table below).

	Doctors	Clinical Officers	Nurses	Pharm. Specialists	Lab Specialists	Radiographers
Outpatient	1*		1	1 for half of visits*	1 for a third of all visits**	1* for a third of respiratory OPs[19]
Inpatient	1 a day		1 a day	1 per admission	1 per admission	1* per admission for all respiratory IPs[20]

* Only for those in hospitals
** Only for those in hospitals and health centers
Note: Nurse visits are *in addition* to doctor/clinical officer visits

[19] MOH 2003 reports that 19 percent of all child outpatient visits are for respiratory conditions
[20] MOH 2003 reports that 17 percent of child inpatient admissions are due to respiratory or TB illness.

Annex D: Average Time per Patient Visit

Table D1. Average Time per Patient Visit Reported in Facility Questionnaire (minutes)

Type of service:	Doctors	Clinical Officers	Nurses	Pharm. Staff*	Lab specialists**	Radiographers	Counselors***	Nutritionists	Public Health Officers/ Technicians
VCT					38		39		
ART	24	21	21	15	15			24	
PMTC	16	23	31	9	20				
DOTS	21	15	15	3	18	11			
Non-DOTS									
TB IP care	15	19	19	4	19	14			
Malaria treatment	11	12	13	5	18				
ANC routine visit	14	16	17	9	20				
ANC – IPT	10	12	12	5	20				
ANC – ITN distribution			8						6
Normal Delivery	36	35	40						
Emergency delivery/post-abortion care	37	31	35						
Family Planning	27	20	22	25	15				
Growth Monitoring			9					14	
Immunization			9						
ITN distribution - children									6
Outpatient children	11	12	12	6	17	12			
Inpatient children	20	17	19	10	18	10			

* Includes pharmacists and pharmaceutical technologists
** Includes laboratory technicians and laboratory technologists
*** Counselors include clinical officers, nurses, general counselors, nutritionists, and public health officers/technicians

The researchers' review of MOH data on Workload Indicator Staffing Norms confirmed that the average times from the survey are close to those given by these documents (wherever data from both sources were available).

Annex E: Population Statistics

All population projections used in this analysis are based on data from the HNPStats database of the World Bank. The database is developed to serve as a health, nutrition, and population data hub from a variety of sources. The primary sources are WHO, United Nations Children's Fund (UNICEF), Food and Agricultural Organization of United Nations, United Nations Statistics Division, the Organization for Economic Co-operation and Development, United Nations Population Fund, and the World Bank Group and its client countries. The data for Kenya are shown in Table E1.

Some of the population data used may be different from projections given by the Kenya census. However, since more detailed breakdown of population projections by age and sex (required for the analysis) were found in the World Bank database but were not available from the census, the researchers decided to use the HNPStats data.

Table E1. Population Statistics and Projections

AGE GROUP	2000	2005	2010	2015
TOTAL M+F	30,092	32,936	35,320	37,493
MALES				
0-4	2,372	2,478	2,393	2,302
5-9	2,095	2,295	2,393	2,317
10-14	2,137	2,076	2,275	2,372
15-19	1,834	2,107	2,051	2,247
20-24	1,553	1,777	2,045	1,994
25-29	1,200	1,452	1,658	1,922
30-34	946	1,072	1,296	1,500
35-39	759	821	925	1,139
40-44	595	657	703	808
45-49	462	516	564	614
50-54	333	405	448	496
55-59	226	296	357	399
60-64	192	198	259	315
65-69	159	160	165	217
70-74	109	120	121	126
75+	108	116	127	133
TOTAL	15,080	16,545	17,779	18,901
FEMALES				
0-4	2,338	2,409	2,327	2,241
5-9	2,053	2,265	2,331	2,258
10-14	2,091	2,045	2,256	2,321
15-19	1,796	2,050	2,009	2,219
20-24	1,538	1,702	1,946	1,917

25-29	1,191	1,397	1,543	1,785
30-34	937	1,038	1,215	1,366
35-39	752	813	895	1,067
40-44	596	667	714	798
45-49	474	539	597	646
50-54	351	436	492	548
55-59	247	325	402	454
60-64	215	225	296	367
65-69	178	188	197	260
70-74	122	144	152	159
75+	135	148	169	185
TOTAL	15,012	16,391	17,541	18,592
Dependency ratio (%)	85.8	78.1	73.0	65.9
		2000-05	2005-10	2010-15
Birth rate (per 1,000 people)		34.5	30.8	27.6
Death rate (per 1,000 people)		16.4	16.9	15.6
Rate of natural increase (per 100 people)		1.8	1.4	1.2
Net migration rate (per 1,000 people)		0.0	0.0	0.0
Population growth rate (average annual %)		1.8	1.4	1.2
Total fertility rate (births per woman)		4.2	3.7	3.2
Net reproduction rate (female births per woman)		1.5	1.3	1.1
Life expectancy at birth (years)		45.6	44.9	47.0
Life expectancy at age 15 (years)		37.5	37.0	38.8
Infant mortality rate (per 1,000 live births)		80.2	82.1	75.9
Under-5 mortality rate (per 1,000)		125.5	129.9	119.5

Source: HNPStats database of the World Bank (http://devdata.worldbank.org/hnpstats/dp1.asp)

Breakdown of the population projections for children under 5 was obtained from http://devdata.worldbank.org/hnpstats/dp2.asp

The number of births for the years of interest was calculated using the population and birth rate applicable to each year. The number of pregnancies in the ANC analysis was approximated by the number of births.

Annex F: Demand for Contraceptive Methods, 2005, 2010, and 2015

Table F1 shows the estimated demand for contraceptives in 2010 and 2015 and the associated patient visits. Unmet demand for contraceptives (25 percent of women of reproductive age, according to KDHS 2004) is distributed across the different methods proportionately to the distribution of currently used methods (shown in the second column), with the exception of sterilization.[21]

Table F1. Demand for Family Planning (FP) Methods in 2005, 2010, and 2015 – Women of Reproductive Age (15-49 yrs)[22]

FP Method	Percentage of women currently using each FP method*	Percentage of women using each FP method if unmet demand is added	Total number of patient visits		
			2005	2010	2015
Sterilization	2.9	2.9	19,092	21,076	24,056
Pill	4.9	10.9	402,094	975,084	1,071,182
IUD	1.6	3.6	131,296	318,395	349,774
Injectable	10.5	23.4	861,630	2,089,466	2,295,391
Implant	1.2	2.7	21,883	53,066	58,296

* Source: KDHS 2004

Annual demand estimates shown in Table F1 take into account the specifics of each method: for example, the implant only requires a follow-up visit every 4 to 5 years, so the total number of women estimated to seek this FP method is divided by 4.5 to give the number of women who will get an implant in any one year. The estimation of the annual demand for sterilization is more complex and is shown in Table F2.

[21] Comparison of data from KDHS 1998 and KDHS 2003 shows that preference for sterilization among younger women has shifted towards temporary methods. Therefore, it is assumed that the overall demand for sterilization will stay at the level given by KDHS 2003 and any unmet demand for contraception is distributed across the other FP categories.

[22] Annual demand estimates take into account the specifics of each method: for example, the implant only requires a follow-up visit every four to five years, so the total number of women estimated to seek this FP method is divided by 4.5 to determine the number of women who will get an implant in any one year. The estimation of the annual demand for sterilization is more complex and is shown in Annex E.

Table F2. Sterilization Demand Estimation

Age group	Percentage currently sterilized*	Percentage of this cohort getting sterilization in next 5 years	Annual demand for sterilization over 5 yrs of cohort transition	Percentage of women in age group getting sterilization each year	Number of ster. 2010	Number of ster. 2015
15-19	0	0.1	0.02			
20-24	0.1	0.3	0.06	0.0002	389	383
25-29	0.4	1.9	0.38	0.0006	926	1,071
30-34	2.3	3.7	0.74	0.0038	4,617	5,191
35-39	6	5.8	1.16	0.0074	6,623	7,896
40-44	11.8	0.2	0.04	0.0116	8,282	9,257
45-49	12	0	0	0.0004	239	258

* Source: KDHS 2004

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