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A Situation Assessment of Human Resources in the Public Health Sector in Nigeria

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Mission

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▲ *Delivery of quality services by health workers.*

▲ *Availability and appropriate use of health commodities.*

September 2006

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Abstract

Nigeria has one of the largest stocks of human resources for health (HRH) in Africa. However, great disparities in health status and access to health care exist among the six geo-political zones, and between rural and urban areas. This assessment measures the size, skills mix, distribution, and growth rate of HRH in the public health sector in Nigeria. The assessment also quantifies the increase in HRH requirements in the public health sector necessary for reaching key PEPFAR targets and the health Millennium Development Goals. The findings are based on a survey conducted in April-May 2006 in 290 public health facilities representing all levels of care (primary, secondary, and tertiary). The study data enabled us to estimate the total number of doctors, nurses, midwives, lab and pharmacy staff, and community health workers currently employed in the public sector. The distribution of health workers by level of care, and HRH availability in rural and urban areas was also quantified. Staff attrition rates, measuring the number of those leaving the public sector as percent of total staff, were determined among all staff categories. The annual growth in HRH in the public sector from new graduates was also measured.

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Acronyms

AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
ARI	Acute Respiratory Infection
ART	Antiretroviral Therapy
ARV	Antiretroviral drugs
CHEWs	Community Health Extension Workers
CHOs	Community Health Officers
CI	Confidence Interval
DOTS	Directly Observed Treatment Short-course
FBO	Faith Based Organization
FCT	Federal Capital Territory
FMC	Federal Medical Center
FMOH	Federal Ministry of Health
FTE	Full-time Equivalent
GAVI	Global Alliance for Vaccines and Immunization
GFATM	Global Fund to Fight AIDS, TB, and Malaria
FGN	Federal Government of Nigeria
HIV	Human Immunodeficiency Virus
HRH	Human Resources for Health
IEC	Information, Education, and Communication
IPT	Intermittent Presumptive Treatment
IUD	Intrauterine Device
LACA	Local Action Committee on HIV/AIDS
LGA	Local Government Areas
MDGs	Millennium Development Goals
NACA	National Action Committee on HIV/AIDS
NASCP	National AIDS/STD Control Program
NDHS	Nigeria Demographic and Health Survey
NGO	Non Governmental Organization

PEPFAR	President's Emergency Plan for AIDS Relief
PHR*plus*	Partners for Health Reform*plus* Project
PMTCT	Prevention of Mother-to-Child Transmission
RBM	Roll Back Malaria
SACA	State Action Committee on HIV/AIDS
TB	Tuberculosis
UN	United Nations
UNAIDS	United Nations Programme on HIV/AIDS
UNFPA	United Nations Population Fund
UNICEF	United Nations Children Fund
USAID	United States Agency for International Development
VCT	Voluntary Counseling and Testing
WHO	World Health Organization

Foreword

I note with great concern that the situation of human resource for health is dramatically deteriorating in many African countries. The Federal Republic of Nigeria however, has one of the largest stocks of human resources for health (HRH) in Africa, comparable only with Egypt and South Africa. Our government recognizes that human resources are essential to efficient health sector functioning. The National Health Policy stipulates that human resources for health planning should include providing appropriate and adequate human resources to deliver care at all levels, as well as ensuring their equitable distribution between urban and rural areas.

In recent years, the HIV/AIDS epidemic has exacerbated human resource needs and availability. The priority of governments in providing quality treatment, care and support services for people living with HIV/AIDS has put further pressures on already overburdened health care systems. Furthermore, the distribution of limited human resources between rural and urban areas is posing a major challenge to state and federal health planners. Rural areas are particularly vulnerable to shortages of skilled medical personnel.

This report builds upon previous studies that have attempted to quantify available human resource needs to achieve the national and international targets including the Millennium Development Goals and the United States President's Emergency Plan. The report provides useful data and information on the distribution of doctors, nurses, laboratory, pharmacy and community health workers across the country. An understanding of the current manpower available within the health sector will allow the government to implement measures to better allocate existing human resources for health and encourage human resource development in areas that are lacking.

I commend everyone who has contributed in putting this document together and recommend the document to federal and state policy makers, administrators, development partners, non-governmental organizations and other partner agencies for use as guidance in their specific responses. The conclusions and recommendations highlighted in this report can only be realized with commitment and cooperation among all stakeholders.

It is our hope that through cooperative efforts among our international and local partnerships, we can accomplish the goal of a vibrant health care system; and, that our success in human resources for health will become a template for other African nations to follow as we prepare to meet the demands for health services in the era of HIV/AIDS and other emerging diseases.

Professor Babatunde Osotimehin
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National Action Committee on AIDS
September, 2006.

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Executive Summary

Nigeria has one of the largest stocks of human resources for health (HRH) in Africa comparable only to Egypt and South Africa. There are about 35,000 doctors and 210,000 nurses registered in the country, which translates into 28 doctors and 170 nurses per 100,000 population. This compares to a Sub-Saharan average of 15 doctors and 72 nurses per 100,000 population.

Despite the large stock of human resources for health, there are great disparities in health status and access to health care among different population groups in Nigeria. For example, the under-five mortality rate in rural areas is estimated at 243 per 1,000 live births, compared to 153 per 1,000 in urban areas. While 59 percent of women in urban areas deliver with a doctor, nurse, or midwife, only 26 percent of women in rural areas do so. Unlike most of Sub-Saharan Africa, rural areas in Nigeria have a higher HIV/AIDS prevalence than urban areas. Furthermore, there are wide variations in health status and access to care among the six geo-political zones of the country, with indicators generally worse in the North than in the South.

Purpose and Methodology of the Assessment

The purpose of this assessment is to determine the size, skills mix, distribution, and rates of change of HRH in the public sector in Nigeria. Specifically, the assessment estimates:

- ▲ Availability and distribution of HRH for key health staff categories.

- ▲ Attrition rates in the HRH stock.

- ▲ Increase in the HRH stock from new graduates.

- ▲ HRH requirements for reaching a set of targets under PEPFAR and the health-related Millennium Development Goals (MDGs), and the gap between the projected and required HRH stock in 2010 and 2015.

The assessment is based on (1) comprehensive research of documents and data on HRH in the public sector, and on malaria, TB, HIV/AIDS, family planning, and maternal and child health in Nigeria; (2) a nationally-representative survey conducted in public sector health facilities at all levels of care; and (3) a model for estimating staff requirements for reaching the health-related MDGs and PEPFAR targets.

The survey was conducted in April-May 2006 in 290 public health facilities representing all levels of care (primary, secondary, and tertiary). The facilities were selected using two-stage stratified sampling. From each of the six geo-political zones in Nigeria, two states were selected based on population size; in addition, the Federal Capital Territory of Abuja was included. A sample of facilities at the three levels of care (primary, secondary, and tertiary) was then selected in each state, using systematic random sampling.

Size, Skills Mix, and Distribution of HRH in the Public Sector

Based on the staffing situation of surveyed facilities, it is estimated that in 2005 the public sector in Nigeria had about 17,800 doctors, 122,000 nurses and midwives, and 86,600 community-level health staff (CHOs/CHEWs). This translates to 13 doctors, 92 nurses and midwives, 10 pharmacists, and 64 CHOs/CHEWs in the public sector per 100,000 population. The health workforce per population indicators in 2004 and 2006 are similar to those in 2005.

There are large differences between rural and urban areas in the health workers per population ratios in the public sector. On average, an urban resident has access to nearly 3 times more doctors and 2 times more nurses/midwives, compared to a rural resident. A similar disparity is seen for pharmacy and lab staff. One exception are community health workers who are more numerous in rural areas.

The distribution of health workers by level of care shows that the primary care level has 19 percent of doctors, 31 percent of nurses and midwives, 42 percent of lab and 38 percent of pharmaceutical staff working in the public sector. CHOs/CHEWs are present predominantly at primary level facilities, while the secondary and tertiary levels of care have the majority of all other staff categories, which can be explained in part by the higher complexity of services provided at these levels.

Changes in the HRH Stock of the Public Sector

Staff attrition rates, measuring the number of those leaving the public sector as percent of total staff, range between 1.3 and 2.3 percent for the different staff categories, and are highest for doctors and pharmaceutical staff. HRH attrition rates in rural areas are generally higher than in urban areas. While attrition rates measure the outflow of HRH from the public health sector, overall changes in staff numbers are also dependant on new incoming staff. The major source of incoming staff in the public health sector are new graduates (83 percent of total new incoming staff in 2005). They represent an increase of about 3 percent of manpower in the public sector.

The contribution of new graduates to existing staff numbers varies among staff categories, from 7.7 percent for doctors to only one percent for nurses/midwives. It is estimated that about 1,200 new medical graduates (who have finished their youth service assignment) entered the public sector in 2005, which means that about 60 percent of newly graduated doctors start their career in the public sector.

HRH Requirements for Reaching the PEPFAR Targets in the Public Sector

The PEPFAR program in Nigeria covers a broad range of HIV/AIDS-related services. This assessment focuses on quantifying the HRH requirements in the public health sector for reaching three key PEPFAR targets: VCT, ART, and PMTCT. Through PEPFAR support, the target for Nigeria is to have, by 2008:

- 3.5 million receive voluntary counseling and testing (VCT), including 500,000 pregnant women in PMTCT setting;

- 350,000 patients on anti-retroviral therapy (ART), and

▲   40,000 pregnant women receive prevention of mother-to-child transmission (PMTCT) drug prophylaxis.

Findings from the assessment indicate that between 2005 and 2008, the public sector will need to add about 792 lab specialists, 707 pharmacy specialists, 317 nurses/midwives, and 384 doctors, to cover the PEPFAR targets alone. These figures represent 5 percent of the total number of lab specialists, 6 percent of pharmacy specialists, and 2.2 percent of doctors available in the public sector in 2005.

HRH Requirements for Reaching the Health MDGs in the Public Sector

In order to reach the health MDGs in 2015, the public sector will require a steady increase in the number of HRH. The number of doctors in the public sector needs to increase from about 17,800 in 2005 to 22,000 in 2010, while the number of nurses needs to increase from about 122,800 to more than 140,000 in the same time period. Substantial further increases are required across all staff categories in 2010-2015 as well.

We project HRH numbers in the public sector in 2010 and 2015 under the following assumptions:

▲   overall number of new graduates stays about constant at the level given by the Health Manpower Situation Analysis of the Federal Ministry of Health (2003)

▲   proportion of new graduates entering the public sector stays about constant (at the level estimated for 2004/05 from the survey data)

▲   there are no changes in the HRH attrition rate (from the level estimated for 2004/05 using the survey data)

The gap between the projected HRH availability and HRH requirements for the MDGs for 2010 and 2015 is striking: in 2010, the public sector in Nigeria will have a projected shortage of about 21,000 nurses/midwives, 3,800 pharmacy specialists, and 4,480 lab specialists, from the numbers required for reaching the MDG targets. The projected shortage in these categories in 2015 is of similar magnitude, but even larger for nurses (about 39,880). It appears that Nigeria will have a sufficient number of doctors in the public sector, as required by the MDG-related targets. In 2015, our estimates even show a slight surplus (of about 5 percent) in the number of doctors required.

Finally, it should be noted again that what is presented here is only the public sector side of the health system. Little is known about what is happening in the private sector, yet this information is very important because it will allow FMOH to incorporate all sectors in the planning of human resources for health in Nigeria.

Recommendations

The authors of this report make the following recommendations:

▲   Conduct a rapid appraisal of the human resources in the private sector, including private for-profit providers and Faith Based Organizations, to get a comprehensive picture of HRH in the country.

- Based on the evidence from this report, staff attrition rates appear to be high in rural facilities. The reasons for these attrition rates need to be explored in order to better address the problem.

- FMOH in collaboration with state and local health authorities should explore strategies to keep health professionals in rural areas. For example, infrastructure in rural areas needs to be improved to attract younger and newly graduating HRH to rural areas.

- Consider introducing/expanding incentive packages to keep health professionals from leaving the public sector (for example, compensation packages, issues relating to brain drain).

- Address issues related to number of new graduates turned out each year- improve and increase the capacity of institutions of higher learning to stay open and turn out required graduates at the right time.

- Improve routine data collection in all health facilities and the human resource information system to produce quality and up-to-date data.

1. Background

1.1   Introduction

With a population of more than 132 million, Nigeria is the most populous country in Africa. Life expectancy is 44 years and 45 percent of the population is under 15 years of age (UN 2004). Improvements in key health indicators have been slow and today Nigeria ranks among the countries with the highest child and maternal mortality: the under-five mortality rate is 201 per 1,000 live births (NDHS 2003) and the maternal mortality ratio is estimated at 800 per 100,000 live births (WHO/UNICEF 2004). Among the major contributors to the disease burden of the country are malaria, tuberculosis (TB), and HIV/AIDS.

Malaria is a major health and developmental problem in Nigeria, with a prevalence of 919 per 100,000 population (WHO 2002). It is by far the most important cause of morbidity and mortality in infants and young children: about 75 percent of malaria deaths occur in children under five. One in ten maternal deaths is due to malaria (FGN 2002).

The HIV/AIDS epidemic has unfolded on a large scale in Nigeria: adult prevalence is 4 percent and nearly 2.9 million people are living with the virus (UNAIDS 2006). In 2005 alone, there were about 220,000 HIV/AIDS related deaths in Nigeria (UNAIDS 2006). Tuberculosis cases have increased dramatically with the onset of HIV/AIDS in the country, with an estimated prevalence of 546 cases per 100,000 population in 2004. About 27 percent of adults with TB are also HIV co-infected (WHO 2006).

There are great disparities in health status and access to health care among different population groups in Nigeria. For example, the under-five mortality rate in rural areas is estimated at 243 per 1,000 live births, compared to 153 per 1,000 in urban areas (NDHS 2003). While 59 percent of women in urban areas deliver with a doctor, nurse, or midwife, only 26 percent of women in rural areas do so (NDHS 2003). Unlike most of Sub-Saharan Africa, rural areas in Nigeria have a higher HIV/AIDS prevalence than urban areas (UNAIDS 2004). Furthermore, there are wide variations in health status and access to care among the six geo-political zones of the country, with indicators generally worse in the North than in the South (MDG Report 2004).

1.2   Health Policy

National policies, strategies, and guidelines to address health problems related to malaria, TB, HIV/AIDS, and maternal and child health have been developed by Nigeria's Federal Ministry of Health (FMOH), many of them recently with donor assistance. The first national malaria control plan of action (1996-2001) was developed in 1996. Following the launch of Roll Back Malaria (RBM) in 1998, a five-year strategic plan for RBM was developed (2001-2005) with main objectives to reduce morbidity and mortality by malaria by 25 percent by the end of 2005, particularly among pregnant women; and to reduce malaria case fatality by 10 percent in pregnant women and children by the end

of 2005 (FMOH 2001c). The Federal Government has adopted intermittent presumptive treatment (IPT) as a strategy to prevent malaria in pregnancy.

There is high political commitment to fight HIV/AIDS, as evidenced by the initiation of the Presidential Council on AIDS, the National AIDS/STD Control Programme (NASCP), and the National Action Committee on AIDS (NACA) which is a multi-sectoral agency including members from many government ministries and civil society. At the state level, State Action Committees on AIDS (SACA) have been established, while at the local level there are Local Action Committees on AIDS (LACA). A national Strategic Framework and a National Health Sector Strategic Plan for HIV/AIDS 2005-2009 was recently published, as well as a Scale Up Plan on PMTCT of HIV. In addition, FMOH, with assistance from a number of international and donor organizations, has published national guidelines on VCT and use of ARV drugs.

Recognizing TB as a major public health problem in Nigeria, the government launched the National TB and Leprosy Control Programme in 1991. The federal government maintains a policy of free TB treatment (FGN 2002) but the Directly Observed Treatment Short-course (DOTS) for TB was available to only 65 percent of the Nigerian population at the end of 2004 (WHO 2006).

Nigeria is a participant in and receives technical and financial assistance from many global health initiatives, such as Roll Back Malaria (RBM), the WHO Stop TB initiative, and the Global Fund to Fight AIDS, TB, and Malaria (GFATM). Two of the most-important international initiatives affecting health policies and outcomes in Nigeria are the Millennium Development Goals (MDGs) and US President's Emergency Plan for AIDS Relief (PEPFAR). The MDGs represent the world's collective goals to improve outcomes in education, health, and environment by 2015. PEPFAR targets are short-term country-specific goals of the US government in HIV/AIDS prevention, care and mitigation.

Nigeria has committed to the following health-specific goals, as part of the MDGs (to be achieved between 1990 and 2015):

- Improve child health: reduce under-five mortality by two-thirds, to 49 or less per 1,000 live births;

- Improve maternal health: reduce the maternal mortality ratio by three-quarters, to less than 400 per 100,000 births;

- Halt and reverse the spread of HIV/AIDS and the incidence of malaria and other major diseases.

Progress towards reaching the MDGs in Nigeria has been very slow and the 2004 MDG Status Report for Nigeria claims that the country is "unlikely " to reach any of the three health related MDGs (FGN, 2004a). One of the challenges to improving maternal and child health, identified in the report, is lack of health personnel and other infrastructure, particularly in rural areas. Among the priorities for development assistance towards achieving the MDGs, the report lists "increased accessibility and provision of qualified health personnel" (FGN, 2004a).

Through PEPFAR support, the target for Nigeria is to have, by 2008:

- 3.5 million receive voluntary counseling and testing (VCT), including 500,000 pregnant women in PMTCT setting;

- ▲ 350,000 on anti-retroviral therapy (ART), and

- ▲ 40,000 pregnant women receive prevention of mother-to-child transmission (PMTCT) drug prophylaxis. (PEPFAR 2006)

1.3   Organization of the Health System

Health service provision in Nigeria includes a wide range of providers in both the public and private sectors, such as public facilities managed by federal, state, and local governments, private for-profit providers, NGOs, community-based and faith-based organizations, religious and traditional care givers (WHO 2002).

Nigeria is a federation with three tiers of government - federal, state, and local – and responsibility for health service provision in the public sector is based on these three tiers. The levels of care in the public sector are:

- ▲ Primary: Facilities at this level form the entry point of the community into the health care system. They include health centers and clinics, dispensaries, and health posts, providing general preventive, curative, promotive, and pre-referral care. Primary facilities are typically staffed by nurses, community health officers (CHOs), community health extension workers (CHEWs), junior CHEWs, and environmental health officers. Local Government Areas (LGAs) are mandated by the constitution to finance and manage primary health care.

- ▲ Secondary: Secondary care facilities include general hospitals, providing general medical and laboratory services, as well as specialized health services, such as surgery, pediatrics, obstetrics and gynecology. General hospitals are typically staffed by medical officers (who are physicians), nurses, midwives, laboratory and pharmacy specialists, and community health officers.   Secondary level facilities serve as referral points for primary health care facilities. Each district, LGA, or zone is expected to have at least one secondary level health facility.

- ▲ Tertiary: Tertiary level facilities form the highest level of health care in the country and include specialist and teaching hospitals and federal medical centers (FMCs). They treat patients referred from the primary and secondary level and have special expertise and full-fledged technological capacity that enable them to serve as referral centers and resource centers for knowledge generation and diffusion. Each state has at least one tertiary facility.

Primary and secondary level of care is also provided by the largely unregulated private health sector, which includes a wide range of providers such as physician practices, clinics, and hospitals. Faith-based organizations (FBOs) also support health clinics and hospitals. Outside of the modern health care system, traditional herbalists are another frequently used source of care.

1.4   Current Situation of Human Resources in Health

Nigeria has one of the largest stocks of human resources for health (HRH) in Africa comparable only to Egypt and South Africa. There are about 35,000 doctors and 210,000 nurses registered in the country, which translates into 28 doctors and 170 nurses per 100,000 population (Table 1.1). This compares to a Sub-Saharan average of 15 doctors and 72 nurses per 100,000 population (WHO 2006).

Table 1.1. Number of Health Workers in Nigeria 2003/2004

Staff Type	Number of Staff*	Number of Staff per 100,000 population
Doctors	35,000	28
Nurses	210,000	170
Dentists	2,500	2
Pharmacists	6,350	5
Community Health Workers	115,800	91

* rounded figures
SOURCE: WHO 2006

The figures presented in Table 1.1 are for health professionals registered by Nigeria's professional medical associations and include health workers in both the private and public health sectors, and, very likely, health professionals who are not practicing in the country or may not be practicing at all. The administrative decentralization that separates authority for different levels of health care between the LGA, state, and federal level, and deficiencies in existing national health information systems make it difficult for FMOH to monitor HRH development at the local level. As a result, it is difficult to obtain aggregated data on the total number of health workers employed by the public health sector at all levels of care. Generally, it is estimated that about 75% of health professionals practicing in Nigeria are employed by the public sector.

The section on health manpower development in the latest National Health Policy stipulates that HRH planning should include providing appropriate human resources for health care delivery at all levels, as well as ensuring their equitable distribution between rural and urban areas (FGN, 2004b). However, there is anecdotal evidence of rural/urban disparities in the distribution of the public health workforce.

The report of the Nigeria Roll Back Malaria Consultative Mission notes that, based on a recent review of human resources, "generally health staff numbers are adequate, but their allocation to the different States may not be fully equitable. The priority identified for human resources is improved capacity of existing staff through training, provision of guidelines, etc." (Nigeria RBM Consultative Mission, 2004).

Nigeria has 18 fully and 5 partially accredited medical schools, that produced about 2,000 doctors, 5,500 nurses, and 800 pharmacists per year in 2002/2003 (FMOH, 2003).

2. Purpose of Assessment

This assessment focuses on determining the size, skills mix, distribution, and rates of change of HRH in the public sector in Nigeria. The findings from the assessment serve as a base for a set of recommendations on Nigeria's HRH capacity in the public sector to meet the health-related MDGs and PEPFAR targets.

The specific objectives of this assessment are to estimate:

- Availability and distribution of HRH for key health staff categories (by geo-political zone, level of health care, and rural/urban area);

- Attrition rates in the HRH stock

- Increase in the HRH stock from new graduates;

- HRH requirements for reaching a set of targets under PEPFAR and the health-related Millennium Development Goals (MDGs).

The rest of the report is organized as follows: Section 3 describes the methodology of the assessment; Section 4 presents the findings on the size, skills mix, distribution, and rates of change of HRH in the public sector; Section 5 presents an estimation of the HRH required for reaching the PEPFAR and health-related MDGs in the public health sector; and Section 6 present conclusions and policy recommendations, based on the findings of the assessment.

The main report presents all findings at the national level only. Annex F provides a summary of key data on HRH and services provided in public health facilities for each of the 13 states included in the survey.

3. Methodology

This assessment is based on (1) comprehensive research of documents and data on HRH in the public sector, and on malaria, TB, HIV/AIDS, family planning, and maternal and child health in Nigeria; (2) a nationally-representative survey conducted in public sector health facilities at all levels of care; and (3) a model for estimating total staff requirements for reaching the health-related MDGs and PEPFAR targets. This section describes the survey and analysis methodology.

3.1   Sample Selection

A survey was conducted in 290 public health facilities representing all levels of care (primary, secondary, and tertiary).[1] The facilities were selected using two-stage stratified sampling. First, two states were selected from each of the six geo-political zones in Nigeria, with probability of selection of each state proportional to its population size.[2] In addition, the Federal Capital Territory of Abuja (FCT) was added to the two states selected in the North Central zone. The selected states in each zone cover between 32 and 50 percent of the zone's population and in total, the 13 states included in the sample account for 40 percent of Nigeria's population (Table 3.1).

Table 3.1. States Included in the Sample and Population Covered

Zone	Selected States	Population size of selected states (as percent of total population of zone)
North West	Kano, Sokoto	35%
North East	Adamawa, Borno	39%
North Central	Kogi, Niger, FCT	40%
South West	Lagos, Ondo	46%
South South	Akwa Ibom, Cross River	32%
South East	Anambra, Imo	50%
Total for Nigeria		40%

In the second stage of sampling, a sample of facilities at each level of care was chosen in each selected state. All Federal Medical Centers and teaching hospitals in the sampled states were selected with certainty. All other facilities were selected using systematic random sampling. A higher proportion of hospitals, compared to smaller facilities, were included in the sample in order to

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[1] In addition, 24 FBO facilities in the sampled states were surveyed, but due to the scarcity of data available on the total number of FBO health facilities in the country and their share of patients (from the overall private share), the analysis presented in this report for the public sector could not be extended to the FBO sector.
[2] Certain states were excluded from the sampling framework due to the prevailing security situation in those states at the time of the study. The states excluded were Rivers, Bayelsa and Delta.

increase the number of facilities that have most of the data being collected. Table 3.2 shows the distribution of the sample across types of health facility. Primary care facilities include health centers, health clinics, maternities, and dispensaries. There was non-response from two facilities selected with certainty.

Table 3.2. Distribution of Health Facilities Surveyed

Level of care	Sample	Estimated total in the country*
Primary	188	12,756
Secondary	88	1,546
Tertiary	14	91

* Source: FMOH database of health facilities in Nigeria

3.2 Data collection instrument

In each of the selected facilities, a questionnaire was administered to eligible 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 health clinic. The questionnaire collected information on:

1. Number of staff employed in 2004, 2005, and at the time of survey (April 2006);

2. Number of incoming and outgoing staff in 2005 by reason for leaving or starting work at the facility;

3. Types of services provided at the facility for HIV/AIDS, TB, malaria, maternal and child health, and family planning;

4. Number of patients seen at the facility in the three months preceding the survey for each of these services;

5. Which types of health staff provide each service;

6. Average time spent per patient-visit for each of the services related to the five focus areas.[3]

3.3 Analysis

The survey was conducted in April-May 2006. Data from the survey questionnaires was entered electronically using an EpiInfo database, and all data analysis was performed using Stata v.8 software. Sampling weights were constructed for all facilities included in the analysis. The weights were based on the probability of selection of each state, and the probability of selection of individual facilities within each state. All estimates of HRH availability, skills mix, and distribution are based on the data collected from the health facility survey, and are computed using the sampling weights. It

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[3] 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.

should be stressed that these are statistical estimates based on our sample, and are subject to a certain margin of error (see Annex A).

The analysis related to estimating the HRH requirements for reaching the PEPFAR and MDG targets is based on a model derived from a combination of staffing models commonly used for HRH needs projections (the model is described in detail in Annex B).

4. Findings on the Size, Skills Mix, and Distribution of HRH in the Public Health Sector

This section provides an overall picture of HRH availability and skill mix in the public sector in Nigeria. Where possible, detailed analysis broken down by level of care (primary, secondary, and tertiary), by geo-political zone, and for the urban and rural areas is performed.

Many of the findings are presented for the following combined categories of health personnel:

- ▲ *Nurses/midwives*: includes nurses, public health registered nurses, midwives, and nurse-midwives;

- ▲ *Pharmaceutical staff*: includes pharmacist and pharmacy technicians and assistants;

- ▲ *Lab staff*: includes laboratory scientists and laboratory technicians/technologists;

- ▲ *Community health officers/community health extension workers* (CHOs/CHEWs): includes public health nursing officers, environmental health officers, community health officers, community health extension workers, and junior community health workers.

4.1   Availability and skill mix of health manpower in the public sector

The number of health workers reported in the health facility survey was used to extrapolate this information to the entire public health sector in Nigeria. Based on the staffing situation of surveyed facilities, it is estimated that in 2005 the public sector in Nigeria had about 17,800 doctors, 122,000 nurses and midwives, and 86,600 community-level health staff (Table 4.1).

Table 4.1. Estimated total number of health workers in the public sector, 2005

Category	Number
Doctors	17,815
Medical interns (house officers)	2,357
Nurse/Public Health RNs	37,602
Midwives	6,786
Nurse midwives	77,464
Laboratory scientists	5,522
Laboratory technicians/technologists	10,108
Radiographers	2,786

Category	Number
Pharmacists	3,749
Pharmacy technicians and assistants	8,940
Administrators	6,678
Medical record officer (Data managers)	12,828
Public health (nursing) officers	7,202
Environmental health officers	8,006
Community health officers	11,515
Community health extension workers (J-CHEW)	59,853

Figure 4.1 shows the average number of key categories of health personnel serving 100,000 population in 2005 for the country as a whole and for urban and rural areas. In 2005, Nigeria had about 13 doctors, 92 nurses and midwives, 10 pharmacists, and 64 CHOs/CHEWs in the public sector per 100,000 population. The health workforce per population indicators in 2004 and 2006 are similar to those in 2005 (not shown).

There are large differences between rural and urban areas in the health workers per population ratios. On average, an urban resident has access to nearly 3 times more doctors and 2 times more nurses/midwives, compared to a rural resident. The only exception is the combined category of CHOs/CHEWs, who are more numerous in rural areas.

Figure 4.1. Number of public sector health workers per 100,000 population, 2005
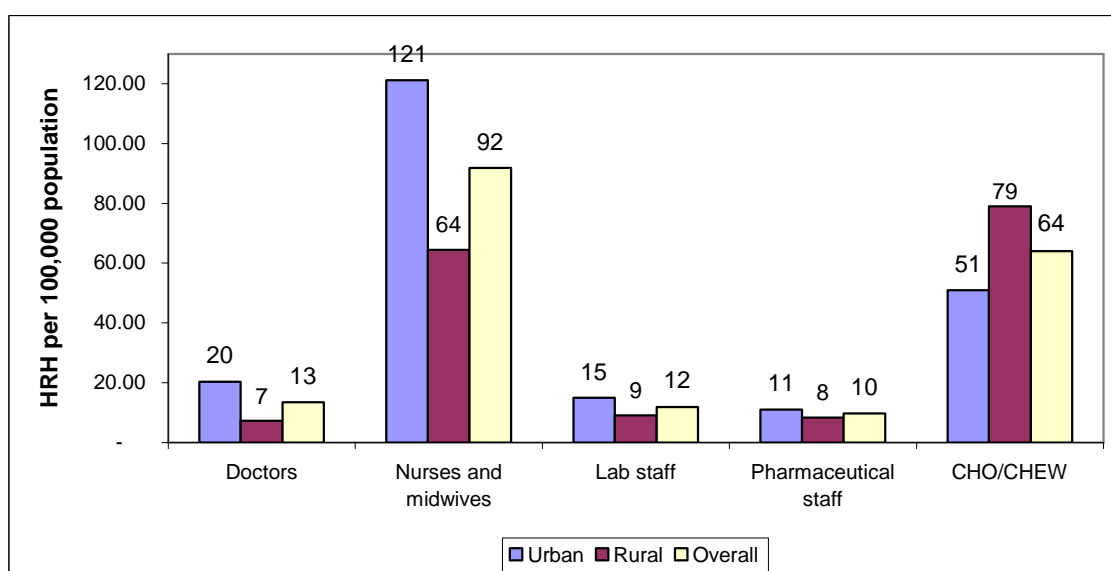
Table 4.2 presents the number of health workers per 100,000 population in each of the six geopolitical zones of Nigeria. It reveals that zones have very different staffing patterns. The one zone that appears to have the lowest availability of public sector health workers is the South East.

Table 4.2. Number of public sector health workers per 100,000 population by zone, 2005

Zone	Doctors	Nurses and midwives	Lab staff	Pharma staff	CHOs/CHEWs
North West	15	68	10	9	60
North East	7	90	7	3	76
North Central	14	155	21	11	101
South West	21	89	17	21	65
South South	10	125	10	8	69
South East	10	30	4	2	18

The distribution of health workers by level of care shows that the primary care level has 19 percent of doctors, 31 percent of nurses and midwives, 42 percent of lab and 38 percent of pharmaceutical staff working in the public sector (Figure 4.2). CHOs/CHEWs are present predominantly at primary level facilities, while the secondary and tertiary levels of care have the majority of all other staff categories, which can be explained in part by the higher complexity of services provided at these levels.

Figure 4.2. Distribution of public sector health workers by level of care, 2005
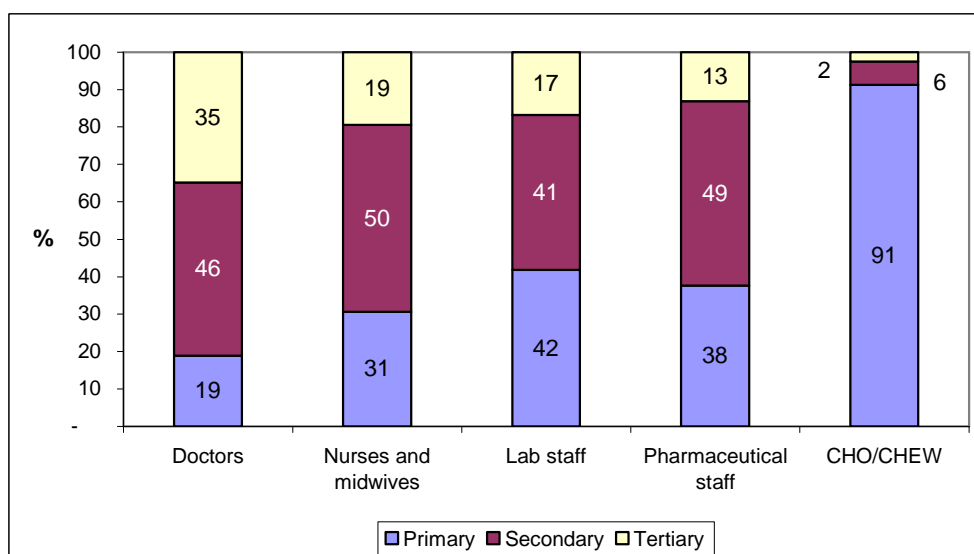
Table 4.3 presents the average number of key staff per facility by level of care. Each primary facility has on average 0.23 medical doctors (or there is, on average, one doctor for every four primary facilities). The average secondary level facility (general hospital) in Nigeria has about 5 doctors, while a tertiary hospital has an average of 62 doctors. While there are, on average, about 3 nurses/midwives per primary facility, a lab worker can only be found in half of primary facilities, and there is one pharmacy staff worker for each three such facilities. The vast disparity in staff number among levels of care is not surprising given the very different tasks they assume. CHOs/CHEWs are most frequently found in primary facilities - there are about 6 per facility.

Table 4.3. Average number of public sector health workers per facility by level of health care facility

HRH Category:	Number per facility		
	Primary	Secondary	Tertiary
Doctors	0.2	5.0	62
Nurses and midwives	2.6	41.0	284
Lab staff	0.5	4.3	28
Pharmaceutical staff	0.3	4.2	18
CHOs/CHEWs	6.1	3.4	18

4.2   Changes in the HRH stock of the public sector

In 2005, it is estimated that the public sector lost at least 7,400 staff in the categories included in this assessment.[4] The main reason for staff attrition is resignation (accounting for nearly half of total staff attrition), followed by contract termination (23 percent). Staff who retired or died in 2005 accounts for a third of total attrition (Figure 4.3).

Figure 4.3 Distribution of reasons for leaving the public health sector, 2005
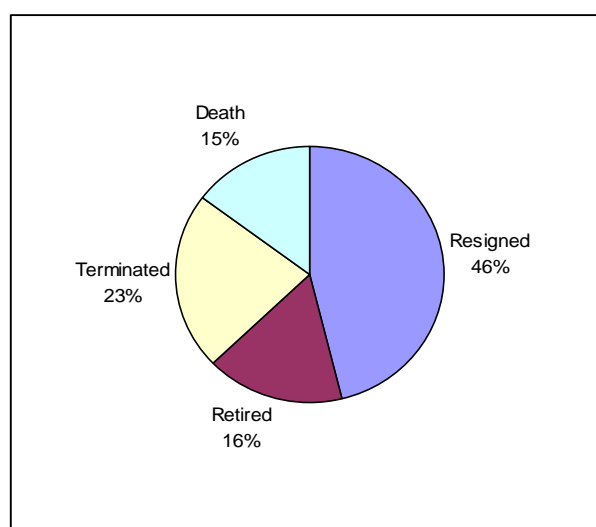
Staff attrition rates, measuring the number of those leaving the public sector as percent of total staff, are presented in Figure 4.4. Overall attrition rates range between 1.3 and 2.3 percent for the different staff categories, and are highest for doctors and pharmaceutical staff. However, in some cases there are large differences between rural and urban areas. For example, attrition rates for doctors in rural areas are three times higher than in urban areas, whereas for nurses and midwives

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4 These categories are listed in Table 1 of this section.

attrition rates are twice as high in rural areas. There is virtually no attrition among lab staff in urban areas, but more than 3 percent in rural areas.

Figure 4.4. Attrition rates of HRH in the public sector by location, 2005
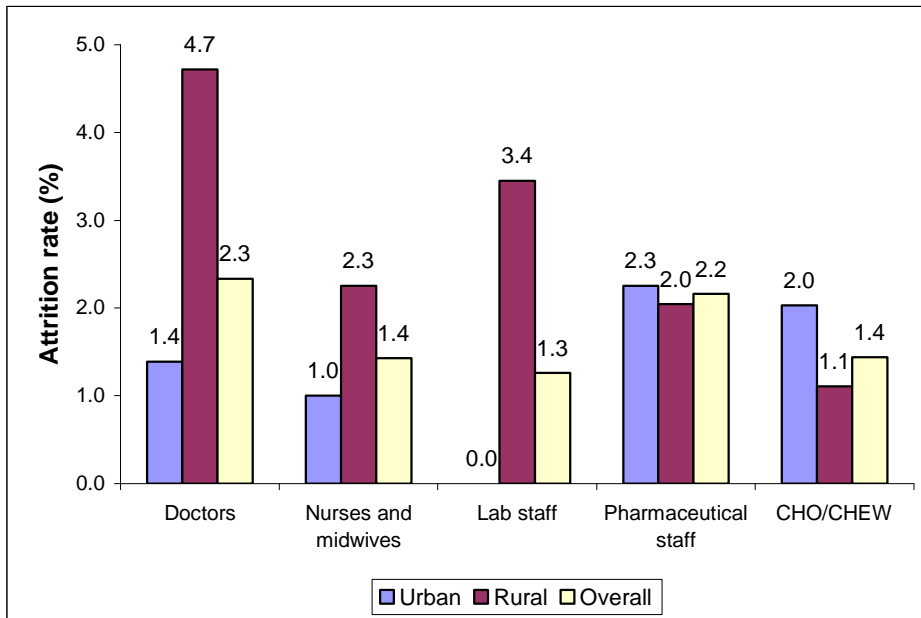
Review of attrition rates by level of care shows that the rates for doctors and nurses/midwives working at the primary care level are much higher than at secondary and tertiary levels (Figure 4.5). For lab staff, attrition rates are higher at the secondary level than at the primary level, while for pharmaceutical staff and CHOs/CHEWs, there appears to be no difference in attrition rates between primary and secondary level, but rates are much higher at the tertiary level (by a factor of 8 for pharmacy staff).

Figure 4.5. Attrition rates of HRH in the public sector by level of care, 2005
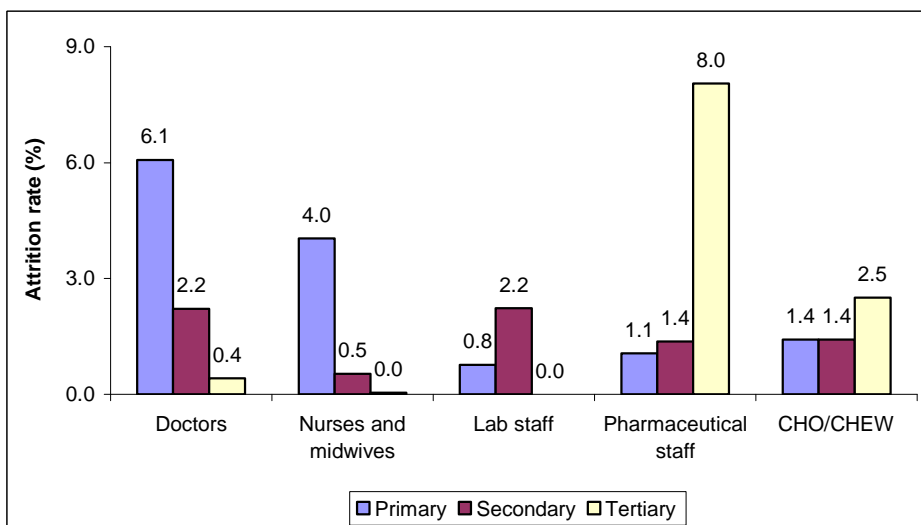
While attrition rates measure the outflow of HRH from the public health sector, overall changes in staff numbers are also dependant on new incoming staff. The major source of incoming staff in the public health sector is new graduates – they comprised 83 percent of the total new incoming staff for public health facilities in 2005.

Table 4.4 presents the estimated total number of new graduates entering the public sector in 2005. The estimate for doctors was 1,214. The Health Manpower Situation Analysis of the Federal Ministry of Health (FMOH 2003) reported an average annual turnout of about 2,000 doctors from medical training institutions. This means that about 60 percent of new medical graduates start their career in the public health sector.

Table 4.4. Estimated total number of new graduates entering public sector in 2005

Category	Number of new graduates entering public sector	Annual turn-out of new graduates from training institutions**
Doctors	1,214*	2,000
Nurses and midwives	1,331	5,500
Lab staff	501	n/a
Pharmaceutical staff	423	800 pharmacists; number not available for pharm. technicians
CHO/CHEW	2,742	n/a

* The new graduate doctors in this table are the estimated number who join the public sector after finishing their youth service assignment.
** Source: Health Manpower Situation Analysis of the Federal Ministry of Health (2003)

The situation for nurses and midwives is different. As shown in Table 4.5, about 1,330 nurses and midwives started work at public facilities after graduation, which represents about 25 percent of total number of graduates in this category. Among the estimated 423 newly graduated pharmaceutical staff joining the public sector, about half are pharmacists who represents nearly a quarter of the annual turn-out of pharmacists from training institutions. It is possible that some of the new graduate pharmacists joining public health facilities (who were counted in the survey) are doing housemanship/internship and are not permanent staff. This in turn may be reflected in an overestimation of the number of new graduate pharmacists who start their career in the public sector.

The number of new graduates entering the public health sector represents an increase of about 3 percent of manpower in the public sector in 2005 (total for all staff categories covered in the survey). The contribution of new graduates to existing staff numbers varies among categories. Newly graduated doctors who joined the public health sector represented 7.7 percent of the total number of doctors already in the public sector. The contribution from new nurses and midwives is only 1 percent, and that among lab, pharmaceutical staff, and CHOs/CHEWs is 3 to 4 percent.

While increase in HRH numbers may come from sources other than new graduates (such as health workers from the private sector or from other countries), new graduates are the most sustainable source of additional health workforce in the long term. Therefore, it is important to know to what extent do new graduates cover the posts of health workers who leave the public health sector. Table 4.5 compares the increase in 2004 staff that resulted from new graduates entering the sector in 2005, and attrition rate in the same time period. For all staff categories, except for nurses/midwives, the number of new graduates substantially exceeds the number of health workers who have left. The

small number of newly graduated nurses/midwives who join the public sector (compared to the overall number of nurses/midwives) fails to cover the gap left in this staff category by staff attrition.

Table 4.5. Comparison of HRH stock increase from new graduates and attrition rates in the public sector in 2004/2005

Category	Increase from new graduates (%)	Attrition rate (%)
Doctors*	7.70	2.34
Nurses and midwives	1.14	1.43
Lab staff	3.42	1.26
Pharmaceutical staff	3.56	2.16
CHO/CHEW	3.25	1.44

* The new graduate doctors in this table are the estimated number who joined the public sector after finishing their youth service assignment.

It should be noted that these are estimates for only one year and it could be the case that long term trends in staff attrition and rate of new graduates entry into the public health sector may be very different from the results shown in Table 4.5.[5]

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[5] There was discrepancy between the percentage change in overall staff numbers that were reported in 2004 and 2005, and the change in staff numbers derived from the number of incoming and outgoing staff in the same time period. This could be due to problems with reporting/records at the facility level.

5. HRH Required for Reaching the PEPFAR and Health-related MDGs- in the Public Health Sector

This section presents the estimated HRH requirements for reaching the PEPFAR and MDG targets in Nigeria's public health sector.

5.1 PEPFAR

The PEPFAR program in Nigeria covers a broad range of HIV/AIDS-related services. This assessment focuses on quantifying the HRH requirements in the public health sector for reaching three key PEPFAR targets: VCT, ART, and PMTCT. Table 5.1 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 5.1. PEPFAR Targets for Nigeria, 2006-2008

	2006	**2007**	**2008**
VCT general (non PMTCT)	881,220	1,014,916	1,148,612
VCT for pregnant women (in PMTCT setting)	127,075	175,746	224,217*
PMTCT: ARV prophylaxis	8,130	12,972	17,914
Total number on ART (including women in PMTCT-Plus)**	76,990	120,000	350,000

*Assuming same rate of increase as in previous two years.

** Cumulative target (including patients that have started ART in previous years).

Source: PEPFAR Country Operational Plan for Nigeria, Fiscal Year 2006, and information provided by USAID Nigeria. All figures are for PEPFAR fiscal year, which ends in September.

About 70 percent of those receiving VCT and PMTCT services under PEPFAR, and nearly all ART and PMTCT-Plus patients under PEPFAR are seen in the public sector. We use these shares of the overall PEPFAR targets shown in Table 5.1 to estimate the corresponding HRH requirements in the public sector in the next three years. The HRH requirements were computed using the concept of full-time equivalent (FTE) health worker (described in Box 1).

The left-side panel of Table 5.2 shows the FTE staff numbers required to reach the PEPFAR targets in the public sector. The number of FTE specialists that are needed for each service is shown in Annex C.

The increase in the number of FTE staff from one year to the next indicates the additional number of staff that the public sector needs to scale up PEPFAR services (right-side panel of Table 5.2). For example, in 2005 there were 86 FTE lab specialists covering the PEPFAR targets achieved in that year in the public sector. In 2006, 305 FTE lab specialists are needed to cover the 2006 PEPFAR target. Therefore, the public sector will need to have 219 additional lab specialists, compared with 2005, specifically to service the combined PEPFAR targets. Similarly, in 2007 and 2008 there is a need to further increase the total number of lab specialists by 108 and 465, respectively. In other words, about 790 additional lab specialists will be needed in the public sector in 2008, compared with 2005, to cover the PEPFAR targets alone, which represents 5 percent of the total number of lab specialists available in 2005.

As shown in the right-side panel of Table 5.2, the number of HRH in the public sector needs to increase by about 384 doctors, 317 nurses/midwives, and 707 pharmacy specialists between 2005 and 2008, in order to accommodate the PEPFAR targets. This means that a 6 percent increase in the number of pharmacists working in the public sector is required between 2005 and 2008 to service PEPFAR targets alone, while the additional doctors and nurses needed are a relatively small number, compared to those available in 2005.

Counseling as part of VCT (including in PMTCT setting) is a service that can be distributed across several categories of staff, such as doctors, nurses, midwives, and lab specialists. It is difficult to estimate the proportion of VCT clients who receive counseling from each of these staff categories. The health facility survey showed that in the same facility, VCT is often provided by more than one staff category.

If the vast majority of VCT clients receive counseling from nurses/midwives, then PEPFAR's VCT targets are not likely to pose a burden on the overall stock of this staff category, because the 527 counselors needed in 2008 are equal to less than one percent of the 2005 number of nurses and midwives in the public sector. However, if a considerable number of VCT clients currently receive

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Box 1: Computing HRH requirements

A full-time equivalent (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 in the public sector in Nigeria has 221 working days per year and spends about 6.5 hours each working day attending to patients.[1] If a doctor spends, on average, 24 minutes per ART patient-visit and each ART patient sees a doctor 4 times a year, then a FTE doctor for ART can see 898 ART patients per year, since:

898 = (221 days*6.5 hours*60 minutes) / (24 minutes per visit * 4 visits per patient).

If the target is to have ART provided to 120,000 patients, and one FTE doctor can see 898 ART patients per year, then the FTE number of doctors required to reach the target is 134 (since 120,000 / 898 = 134).

For each of the HIV/AIDS services included in the assessment, the HRH calculations use the average time for one patient visit reported by each staff type providing the service (in the facility survey). The number of visits per patient per year required for each service is based on official FMOH clinical protocols and expert opinion.

[1] Public health sector employees in Nigeria have 221 working days per year (net of holidays, vacation days, etc.). Each staff member works for 8 hours a day and it is assumed that he/she spends 1.5 hours for lunch and tea breaks, and on administrative tasks and staff meetings.

counseling from lab specialists, then a policy that shifts counseling services mostly towards nurses/midwives should be considered (e.g. training more nurses/midwives in VCT counseling).

Table 5.2. Staff Required for Reaching PEPFAR Targets in the Public Sector

| Staff Category | FTE Staff Requirements for PEPFAR | | | | Additional HRH needed in the public sector | | | | |
	2005 (a)	2006 (b)	2007 (c)	2008 (d)	2006 (b) – (a)	2007 (c) – (b)	2008 (d) – (c)	Total 2006-2008	Increase in total 2005 staff required by 2008*
Doctors	31	94	117	414	63	24	297	384	2.2%
Nurses/midwives	27	82	114	344	55	32	230	317	0.3%
Pharmacy specialists	63	171	182	770	108	11	588	707	5.6%
Lab specialists	86	305	413	878	219	108	465	792	5.1%
*Counselors***	*64*	*394*	*461*	*527*	*330*	*67*	*67*	*464*	-

* Increase in staff required between 2005 and 2008 as percent of total staff available in the public sector in 2005 (see Table 1).

* *These could be doctors, nurses/midwives, or any other staff category that provides VCT counseling.

5.2 HRH Requirements in the Public Sector to Reach the Health-related Millennium Development Goals

The three health-related MDGs focus on maternal and child health, and on HIV/AIDS, malaria and other major diseases. Each of these goals has a set of indicators to monitor progress, many of them directly associated with provision of a particular health service. For example, one of the maternal health indicators is the proportion of births attended by a skilled health professional; and one of the child health indicators is the proportion of children under one year immunized against measles. In Nigeria, the status of health services associated with the MDGs is still very far from the 2015 targets (FGN 2004a). Only about a third of all births are attended by a doctor, nurse, or midwife, while two-thirds of women give birth at home, often without any assistance. A little more than one in ten children has been fully-immunized before reaching one year (NDHS 2003).

An extensive review of official government policies and strategic planning documents related to the health MDGs provided a baseline status (for 2005) and desired targets (in 2010 and 2015) for a number of MDG-related health services. Annex C contains a summary of all targets, and the source for each. We estimate the public sector HRH requirements associated with each target, and compute the corresponding annual growth rate of each health staff category through 2015. The estimates are obtained from a model that is based on a combination of staffing models commonly used for HRH needs projections (the model is described in detail in Annex B). The basic framework of the model and the underlying assumptions and inputs are similar to those used for estimating the HRH requirements for PEPFAR (see Box 1).

Table 5.3 presents the full-time equivalent staff available at baseline (year 2005) and required in 2010 and 2015 for the five areas included in the assessment: HIV/AIDS, TB, malaria, maternal and child health. There are substantial increases in the number of staff required in all five areas:

(1) HIV/AIDS: while the patients receiving ART and PMTCT in the public sector in 2005 used the FTE of 31 doctors and 31 nurses, five years later there is a need for 12 times more FTE doctors and 15 times more FTE nurses to meet the ambitious targets set by the National Health Sector Strategic Plan for HIV & AIDS (2005-2009). An increase of similar magnitude is required in the number of FTE pharmacy and lab specialists (the latter category also includes the increase in lab services required under VCT).

(2) Tuberculosis: similarly to ART, the very low starting point of DOTS detection and treatment of TB cases, and the high targets set in the 2002 GFATM Proposal, translate in substantial increase in the number of FTE staff seeing TB patients (2010 requirements are 2 to 4 times the FTE staff in 2005 for each staff category).

(3) Malaria: this section includes outpatient treatment for malaria[6] with no assumptions of changes in care-seeking or prevalence from current levels. The FTE requirements are driven mostly by population growth.

(4) Maternal health: The targets associated with maternal health include increase in the number of women who make four ANC visits, the number who deliver with a skilled health professional (doctor or nurse/midwife), and receive postnatal care. In addition, the FTE requirements account for a set of family planning targets in line with goals set by the National Reproductive Health Policy & Strategy (2001). As nurses/midwives and CHOs/CHEWs are the staff categories that primarily provide basic maternal care and family planning services (particularly at the primary level), the largest required increase for FTE staff is among them (3 to 5 time increase in FTE staff by 2010).

(5) Child health: The targets associated with child health include immunizations, growth monitoring, nutrition (as part of IEC provided to caregivers), and outpatient care. Again, a low starting point, particularly for immunizations, drives the substantial increase in the number of FTE nurses/midwives and CHOs/CHEWs required. For example, the FTE number of nurses providing child health care services needs to increase nearly 3 times by 2010.

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[6] Limited to population over five years of age (all children under five are included in the child health section). Reliable national-level data on inpatient malaria cases was difficult to obtain and inpatient treatment was included as part of "all other services."

Table 5.3 FTE Staff Requirements for Reaching the Health-related MDGs in the Public Sector

	2005	2010	2015
HIV/AIDS			
Doctors	31	310	365
Nurses/midwives	31	319	426
Pharmacy specialists	62	736	1,170
Lab specialists	214	1,343	1,678
*Counselors**	*184*	*884*	*856*
Tuberculosis			
Doctors	27	70	77
Nurses/midwives	42	94	103
Pharmacy specialists	158	417	460
Lab specialists	113	269	296
CHOs/CHEWs	27	96	106
Malaria			
Doctors	1,274	1,813	2,021
Nurses/midwives	1,695	2,177	2,427
Pharmacy specialists	1,621	2,188	2,439
Lab specialists	817	1,102	1,229
CHOs/CHEWs	2,045	2,482	2,766
Maternal Health			
Doctors	596	789	1,049
Nurses/midwives	1,723	4,486	7,145
Lab specialists	542	810	1,185
CHOs/CHEWs	281	1,328	1,954
Child Health			
Doctors	1,645	3,170	3,200
Nurses/midwives	2,103	5,475	6,259
Pharmacy specialists	2,678	4,887	4,933
Lab specialists	1,284	4,034	4,072
CHOs/CHEWs	7,052	11,135	11,961

* These could be doctors, nurses/midwives, or any other staff category that provides VCT counseling

Table 5.4 shows HRH available in the public sector in 2005 (as estimated from the health facility survey conducted to support this assessment), and the projected HRH number in 2010 and 2015 required for reaching the health-related MDGs in Nigeria's public health sector, while maintaining all other health service at their 2005 level.[7] The number of doctors in the public sector needs to increase

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[7] Maintaining 'all other' services at their current level is equivalent to keeping the staff-to-population ratio for all other ('non-MDG') services constant through 2015 (at the 2005 level).

from about 17,800 in 2005 to 22,000 in 2010, while the number of nurses needs to increase from about 120,800 to more than 140,000 in the same time period.

The projected increases in HRH numbers are translated into annual growth rates, also shown in Table 5.4 Between 2005 and 2010, the number of doctors needs to increase by 4 percent per year, while the number of nurses needs to increase by about 3 percent per year. The increases are much higher for lab specialists (7 percent) and pharmacy specialists (6 percent).

If the required HRH numbers for 2010 are achieved, the required annual growth rates across all staff categories will decrease substantially between 2010 and 2015, to about 2 percent for each staff category.

Table 5.4 HRH requirements for reaching the MDG targets and corresponding required growth rates in the public sector

Staff Category	2005*	2010**	2015**	Annual required growth rate 2005-2010	Annual required growth rate 2010-2015
Doctors	17,815	21,968	24,147	4.3%	1.9%
Nurses/midwives	120,790	140,420	157,315	3.1%	2.3%
Pharmacy specialists	12,689	17,317	19,021	6.4%	1.9%
Lab specialists	15,630	21,658	24,003	6.7%	2.1%
CHOs/CHEWs	84,444	98,330	108,600	3.1%	2.0%
Counselors	*N/a*	*884*	*856*	-	-

* Total staff available   ** Total staff required

The previous section showed that attrition rates are higher than the addition to the existing workforce from new graduates for the HRH categories included in this assessment (except for nurses). However, the net growth in HRH for most cadres (as estimated from the one year of data available) is not sufficient to reach the growth rate required for expanding health services to reach the MDGs. The following section describes this finding in greater detail.

5.2.1   Projected Gap in HRH for 2010 and 2015

Scarce data exist on past trends in HRH growth in the public sector and it is difficult to attempt a reliable comparison between past HRH growth rates and future HRH growth rates required in the public sector to reach the MDGs. However, we provide projections of HRH that would be available in the public sector in 2010 and 2015 using the one-year data that is available, and assuming that:

1. overall number of new graduates stays about constant at the level given by the Health Manpower Situation Analysis of the Federal Ministry of Health (2003);

2. proportion of new graduates entering the public sector stays about constant (at the level estimated for 2004/05 from the survey data, as given in Table 4.5); and

3. there are no changes in the HRH attrition rate (from the level estimated for 2004/05 using the survey data, as given in Table 4.6)

The HRH projections and the corresponding gap from requirements for the MDGs (either surplus or shortage) for 2010 and 2015 are shown in Tables 5.5a-b. The findings are striking: in 2010, the public sector in Nigeria will have a projected shortage of about 21,000 nurses/midwives, 3,800 pharmacy specialists, and 4,480 lab specialists, from the numbers required for reaching the MDG targets. The projected shortage in these categories in 2015 is of similar magnitude, but even larger for nurses (about 39,880).

It should be noted that nursing is an area where the effects of brain may be most significant. There is an overall shortage of nursing staff worldwide and nurses are continually flowing to greener pastures. The reason this is very critical for Nigeria is that some of the MDG related goals and PEPFAR targets are areas that almost entirely can be performed by nurses.

It appears that Nigeria will have a sufficient number of doctors in the public sector, as required by the MDG-related targets. In 2015, our estimates even show a slight surplus (of about 5 percent) in the number of doctors required.

Table 5.5a HRH requirements for reaching the MDG targets and projected surplus/shortage

(public sector), 2010

Staff Category	Projected 2010 (a)	Required 2010 (b)	HRH Shortage (-) or Surplus (+) in 2010 (a) – (b)	Gap as % of total projected (b)/(a) -1
Doctors	21,896	21,968	6,738	0.3%
Nurses/midwives	119,052	140,420	-21,368	-18%
Pharmacy specialists	13,492	17,317	-3,825	-28%
Lab specialists	17,175	21,658	-4,483	-26%
CHOs/CHEWs	92,247	98,330	-6,083	-7%

Table 5.5b HRH requirements for reaching the MDG targets and projected surplus/shortage

(public sector), 2015

Staff Category	Projected 2015 (a)	Required 2015 (b)	HRH Shortage (-) or Surplus (+) in 2015 (a) – (b)	Gap as % of total projected (b)/(a) -1
Doctors	25,521	24,147	14,234	5.4%
Nurses/midwives	117,435	157,315	-39,880	-34%
Pharmacy specialists	14,211	19,021	-4,810	-34%
Lab specialists	18,625	24,003	-5,378	-29%
CHOs/CHEWs	99,503	108,600	-9,097	-9%

While human resources is a vital component of the health system, in order to reach the health targets set by the MDGs in the public sector in Nigeria, it is important to ensure that not only the

required number of the appropriate cadres are in place, but that they are supported by other inputs such as well-equipped facilities, medicines and supplies, transportation, etc.

6. Conclusions and Policy Recommendations

In 2005, Nigeria had about 13 doctors, 92 nurses and midwives, 10 pharmacists, and 64 CHOs/CHEWs in the public sector per 100,000 population. The staffing pattern of public facilities varies widely by level of care, by geo-political zone, and between urban and rural areas. Rural areas in particular appear much more disadvantaged compared to the urban areas in terms of availability of health personnel: on average, an urban resident has access to nearly 3 times more doctors and 2 times more nurses/midwives, compared to a rural resident.

Attrition rates for doctors, nurses/midwives, and lab staff in rural areas appear to be higher than in urban areas. Doctors and nurses/midwives working at the primary level have higher attrition rates than those working at the secondary or tertiary level. It appears that most newly graduated doctors start their career in the public sector, whereas only one in four nurses/midwives and pharmacists do so. For the newly graduated doctors, tertiary hospitals are the most frequent destination.

The number of new graduates who join the public health sector substantially exceeds the number of health workers who have left the public sector, for all staff categories included in the assessment, except for nurses/midwives. The small number of newly graduated nurses/midwives who join the public sector (compared to the overall number of nurses/midwives) fails to cover the gap left in this staff category by staff attrition. However, this overall growth in HRH does not appear to be sufficient to cover the requirements for reaching the MDGs in the public health sector (as discussed below).

The PEPFAR program in Nigeria covers a broad range of HIV/AIDS-related services. This assessment focused on quantifying the HRH requirements in the public health sector for reaching three key PEPFAR targets: VCT, ART, and PMTCT. Findings from the assessment indicate that between 2005 and 2008, the public sector will need to add about 792 lab specialists, 707 pharmacy specialists, 317 nurse/midwives, and 384 doctors, to cover the PEPFAR targets alone. These figures represent 5 percent of the total number of lab specialists, 6 percent of pharmacy specialists, and 2.2 percent of doctors available in the public sector in 2005.

In order to reach the health MDGs in 2015, the public sector will require a steady increase in the number of HRH. The number of doctors in the public sector needs to increase from about 17,800 in 2005 to 22,000 in 2010, while the number of nurses needs to increase from about 122,800 to more than 140,000 in the same time period. Substantial further increases are required across all staff categories in 2010-2015 as well.

The gap between the projected HRH availability (at current: attrition rates, number of new graduates, and rate of new graduates entering the public sector) and HRH requirements for the MDGs for 2010 and 2015 is striking. In 2010, the public sector in Nigeria will have a projected shortage of about 21,000 nurses/midwives, 3,800 pharmacy specialists, and 4,480 lab specialists, from the numbers required for reaching the MDG targets. The projected shortage in these categories in 2015 is of similar magnitude, but even larger for nurses (about 39,880). It appears that Nigeria will have a

sufficient number of doctors in the public sector, as required by the MDG-related targets. In 2015, our estimates even show a slight surplus (of about 5 percent) in the number of doctors required.

Finally, it should be noted again that what is presented here is only the public sector side of the health system. Little is known about what is happening in the private sector, yet this information is very important because it will allow FMOH to incorporate all sectors in the planning of human resources for health in Nigeria.

The authors of this report make the following recommendations:

▲ Conduct a rapid appraisal of the human resources in the private sector, including private for-profit providers and Faith Based Organizations, to get a comprehensive picture of HRH in the country.

▲ Based on the evidence from this report, staff attrition rates appear to be high in rural facilities. The reasons for these attrition rates need to be explored in order to better address the problem.

▲ FMOH in collaboration with state and local health authorities should explore strategies to keep health professionals in rural areas. For example, infrastructure in rural areas needs to be improved to attract younger and newly graduating HRH to rural areas.

▲ Consider introducing/expanding incentive packages to keep health professionals from leaving the public sector (for example, compensation packages, issues relating to brain drain).

▲ Address issues related to number of new graduates turned out each year- improve and increase the capacity of institutions of higher learning to stay open and turn out required graduates at the right time.

▲ Improve routine data collection in all health facilities and the human resource information system to produce quality and up-to-date data.

Annex A: Detailed Tables of HRH Estimates

The tables in this annex extend the analysis presented in the main report. The tables also report the 95 percent confidence interval for each indicator estimate that is shown in the main report. We are 95 percent confident that the true value of the indicator is contained in this interval and each reported estimate should be interpreted in conjunction with its confidence interval.[8]

Table A1. Estimated total number of health personnel working in the public sector, 2004			
Category	**Estimate**	**95% CI**	
Doctors	15,615	13,089	18,141
Medical interns (house officers)	2,193	1,071	3,314
Nurse/Public Health RNs	35,054	16,117	53,991
Midwives	6,346	1,009	11,683
Nurse midwives	76,309	52,184	100,435
Laboratory scientists	5,063	3,795	6,331
Laboratory technicians/technologists	9,573	5,025	14,121
Radiographers	2,797	1,610	3,985
Pharmacists	3,663	2,863	4,462
Pharmacy technicians and assistants	8,238	5,013	11,463
Administrators	6,468	3,910	9,026
Medical record officer (Data managers)	12,647	5,780	19,514
Public health (nursing) officers	6,876	4,089	9,663
Environmental health officers	6,469	875	12,062
Community health officers	12,232	7,371	17,093
Community health extension workers (J-CHEW)	59,057	39,714	78,400

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[8] By definition, a 95% confidence interval which is constructed for an unknown population value (or indicator) means that if we construct 100 such intervals based on repeated 100 samples from the same population, we expect 95% of the intervals to contain the unknown value, while 5% of the intervals will not contain the true value.

Table A2. Estimated total number of health personnel working in the public sector, 2005			
Category	Estimate	95% confidence interval	
Doctors	17,815	14,920	20,710
Medical interns (house officers)	2,357	1,384	3,330
Nurse/Public Health RNs	37,602	18,781	56,423
Midwives	6,786	457	13,114
Nurse midwives	77,464	53,398	101,529
Laboratory scientists	5,522	4,047	6,996
Laboratory technicians/technologists	10,108	5,137	15,080
Radiographers	2,786	1,632	3,940
Pharmacists	3,749	2,986	4,513
Pharmacy technicians and assistants	8,940	5,579	12,300
Administrators	6,678	3,937	9,419
Medical record officer (Data managers)	12,828	5,575	20,080
Public health (nursing) officers	7,202	3,976	10,427
Environmental health officers	8,006	243	15,769
Community health officers	11,515	6,611	16,419
Community health extension workers (J-CHEW)	59,853	35,502	84,205

Table A3. Estimated total number of health personnel working in the public sector, 2006*			
Category	Estimate	95% CI	
Doctors	18,277	15,893	20,660
Medical interns (house officers)	2,991	1,398	4,583
Nurse/Public Health RNs	38,625	19,986	57,265
Midwives	7,850	253	15,448
Nurse midwives	75,597	55,676	95,517
Laboratory scientists	5,620	4,019	7,222
Laboratory technicians/technologists	10,330	5,356	15,304
Radiographers	2,883	1,745	4,021
Pharmacists	3,929	2,861	4,996
Pharmacy technicians and assistants	8,757	4,730	12,783
Administrators	6,932	4,019	9,846
Medical record officer (Data managers)	12,682	5,180	20,185
Public health (nursing) officers	6,994	3,989	9,998
Environmental health officers	7,768	(29)	15,566
Community health officers	12,169	5,821	18,518
Community health extension workers (J-CHEW)	60,957	35,223	86,691

*As of April 2006

Table A4. Distribution of health personnel by level, 2004-2006 (%)

Category	2004			2005			2006		
	L1	**L2**	**L3**	**L1**	**L2**	**L3**	**L1**	**L2**	**L3**
Doctors	20	45	35	19	46	35	18	46	36
Medical interns (house officers)	19	21	59	15	25	60	12	20	68
Nurse/Public Health RNs	24	52	24	29	49	22	26	48	26
Midwives	28	40	32	37	40	24	35	45	20
Nurse midwives	30	52	18	31	52	18	27	53	20
Laboratory scientists	17	59	24	20	57	23	23	53	24
Laboratory technicians/technologists	52	34	14	54	33	13	53	33	14
Radiographers	7	75	18	7	76	18	6	75	18
Pharmacists	9	72	19	10	72	18	6	76	18
Pharmacy technicians and assistants	47	42	11	49	40	11	48	41	12
Health social workers/welfare workers	15	80	5	15	81	4	15	81	4
Nutritionists	64	27	9	71	22	7	73	21	7
Administrators	27	53	20	26	52	22	25	53	22
Medical record officer (Data managers)	30	38	32	33	36	31	32	38	30
Public health (nursing) officers	81	15	4	82	15	3	81	16	3
Environmental health officers	98	2	0	97	3	0	99	1	0
CHO	95	4	1	95	4	2	95	4	2
J-CHEW	93	6	2	91	6	3	91	6	3

L1: primary level; L2: secondary level; L3: Tertiary level

Table A5. Number of public sector health workers per 100,000 population, 2005*

Category	Urban	Rural	Total
Doctors	20 (16 – 25)	7 (5 – 9)	13 (11 – 16)
Nurses and midwives	121 (75 – 168)	64 (49 – 80)	92 (71 – 113)
Lab staff	15 (9 – 21)	9 (5 – 13)	12 (8 – 16)
Pharmaceutical staff	11 (8 – 14)	8 (3 – 14)	10 (7 – 13)
CHOs/CHEWs	51 (20 – 83)	79 (55 – 103)	64 (43 – 88)

* 95% confidence interval shown in parentheses.

Table A6. Number of public sector health workers per 100,000 population by zone, 2005

Zone	Doctors	Nurses and midwives	Lab staff	Pharma staff	CHOs/CHEWs
North West					
Point estimate	15	68	10	9	60
95% CI	(10 – 20)	(42 – 96)	(10 – 11)	(2 – 16)	(0 – 120)
North East					
Point estimate	7	90	7	3	76
95% CI	(5 – 9)	(72 – 108)	(2 – 12)	(0 – 6)	(47 – 103)
North Central					
Point estimate	14	155	21	11	101
95% CI	(8 – 20)	(37 – 273)	(5 – 37)	(5 – 17)	(28 – 171)
South West					
Point estimate	21	89	17	21	65
95% CI	(17 – 24)	(44 – 133)	(0 – 34)	(10 – 31)	(16 – 112)
South South					
Point estimate	10	125	10	8	69
95% CI	(3 – 17)	(113 – 136)	(1 – 19)	(5 – 12)	(27 – 109)
South East					
Point estimate	10	30	4	2	18
95% CI	(3 – 17)	(13 – 47)	(3 – 4)	(1 – 3)	(4 – 32)

Table A7. Average number of key staff per facility by level *

Category	Primary	Secondary	Tertiary
Doctors	0.2 (0.1 – 0.4)	5.0 (2.8 – 7.2)	61.8 (37.8 – 85.8)
Nurses and midwives	2.6 (1.1 – 4.1)	41.0 (26.2 – 55.8)	284 (230 – 338)
Lab staff	0.5 (0.2 – 0.7)	4.3 (2.8 – 5.8)	28.4 (15.5 – 41.3)
Pharmaceutical staff	0.3 (0.2 – 0.5)	4.2 (2.3 – 6.1)	17.9 (10.3 – 25.5)
CHOs/CHEWs	6.1 (4.9 – 7.0)	3.4 (0.6 – 6.7)	17.6 (0 – 68.6)

Annex B. Model for Estimating HRH Requirements for Reaching the MDG Targets

1. Overview

Estimating health staff availability and requirements to reach a number of health-related targets is based on a model based on a combination of staffing models commonly used for HRH needs projections.[9] HRH numbers are measured in full-time equivalent (FTE) staff units, as defined in Box 1 in the main report. The purpose of the model was to estimate:

1. 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;

2. 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, in order to show the trend in projected HR needs.

2. Estimating the number of HRH required to meet the MDG-related targets[10]

For each of the MDG-related health services that are part of this assessment, the FTE calculation is as follows:

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

The target number of patients projected for a given year (the numerator) is estimated based on information from FMOH and other national agencies' planning documents, DHS, and other sources (Annex C). The estimation of the number of patients that a 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:

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[9] The variety of HR estimation models is described in Hirschhorn et. al (2006)
[10] This part of the model draws on methodology presented in Huddart et al. (2004) and Kombe et al. (2005)

All public health sector employees have 221 working days per year and each staff member spends on average 6.5 hours a day on patient visits.[11] 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 included in the assessment, based on FMOH 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.

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 those '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.

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 to 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 B1.

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[11] It is assumed that staff spend 1.5 hours for lunch and tea breaks, and on administrative tasks and staff meetings.

Table B1. Model used for calculating HR requirements

Indicator	Formula	Source
Total Staff in 2005	A	mid-point estimate, based on HRH numbers from the facility survey (see Table 1)
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	$[(G/A)^{\wedge}(1/10)] - 1$	Calculation

5. Limitations of the model

It should be noted that this model does not take into account:

- ▲ technological change and skill improvements for health staff that may increase staff productivity over time and thus reduce the number of staff required to treat a given number of patients;

- ▲ potential changes in the disease burden of some of the conditions included in the assessment, which may increase or decrease the number of patients that need to be treated (for example, increased utilization of ITNs would decrease the incidence of malaria).

Another important limitation is that the expected outcomes from scaling up some of the MDG-related services are interlinked: for example, if the target number of children are reached with growth monitoring, nutrition consultations, and immunizations, then less children will need curative services as a result of improvements in child health. 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 for future years may vary from the estimated figures.

Annex C. HRH Requirements in the Public Sector for Specific PEPFAR Targets

This Annex presents the FTE staff requirements and the additional HRH needs in the public sector for reaching the PEPFAR patient treatment targets in ART, PMTCT, and VCT.

Table C.1. Staff Required for Reaching PEPFAR's ART Targets (including PMTCT-Plus) in the Public Sector

	FTE Staff Requirements				Additional HRH needed in the public sector			
Staff Category	**2005** **(a)**	**2006** **(b)**	**2007** **(c)**	**2008** **(d)**	**2006** **(b) – (a)**	**2007** **(c) – (b)**	**2008** **(d) – (c)**	**Total to be added** **2006-2008**
Doctors	31	89	112	414	58	22	303	383
Nurses/midwives	27	75	104	344	48	29	239	317
Pharmacy specialists	63	169	179	770	106	10	591	707
Lab specialists	53	145	221	660	92	76	439	607

Table C.2. Staff Required for Reaching PEPFAR's general VCT Targets* in the Public Sector

	FTE Staff Requirements				Additional HRH needed in the public sector			
Staff Category	**2005** **(a)**	**2006** **(b)**	**2007** **(c)**	**2008** **(d)**	**2006** **(b) – (a)**	**2007** **(c) – (b)**	**2008** **(d) – (c)**	**Total to be added** **2006-2008**
Counselors**	45	363	418	473	318	55	55	428
Lab specialists	16	128	148	167	112	19	19	151

* Excluding VCT provided in PMTCT setting.

* *These could be doctors, nurses/midwives, or any other staff category that provides VCT counseling.

Table C.3. Staff Required for Reaching PEPFAR's PMTCT Targets* in the Public Sector

	FTE Staff Requirements			
Staff Category	**2005 (a)**	**2006 (b)**	**2007 (c)**	**2008 (d)**
Doctors	-	3	4	6
Nurses/midwives	-	4	7	10
Pharmacy specialists	-	1	2	2
Lab specialists	18	33	47	58
Counselors**	*17*	*29*	*40*	*51*

* Including VCT provided in PMTCT setting and PMTCT prophylaxis. Excluding PMTCT-Plus as those patients are already counted under the total ART target.

Annex D. HRH Requirements for PEPFAR Targets, All Sectors

This Annex presents the overall number of HRH required for reaching the PEPFAR targets in Nigeria (all sectors), assuming the same clinical protocols as in the public sector.

Table D.1: Staff Required for Reaching PEPFAR's Targets in VCT, PMTCT, and ART (all sectors)

Staff Category	FTE Staff Requirements for PEPFAR				Additional HRH needed in Nigeria			
	2005 (a)	2006 (b)	2007 (c)	2008 (d)	2006 (b) – (a)	2007 (c) – (b)	2008 (d) – (c)	Total to be added 2006-2008
Doctors	31	93	117	423	63	24	305	392
Nurses/midwives	27	81	114	358	55	33	243	331
Pharmacy specialists	63	171	182	773	108	11	592	711
Lab specialists	100	372	493	977	271	121	484	877
*Counselors**	*91*	*562*	*658*	*753*	*472*	*96*	*95*	*663*

* These could be doctors, nurses/midwives, or any other staff category that provides VCT counseling.

Annex E. Target Number of Patients for MDG-related Health Services in the Public Sector: 2010 and 2015

This section describes the methodology used to compute the estimated number of patients that sought care in the public sector in 2005, and are expected to seek care in the public sector in 2010 and 2015, for each of the MDG-related health services included in the assessment. The target number of patients is estimated based on information from national strategic and planning documents, FMOH health information system data, the Nigeria Demographic and Health Survey 2004, and other sources, all summarized in Table C1. The population projections used in the estimation are from the UN Population Division Database (UN 2004). For each target, the share to be covered by the public sector has been estimated, based on available published information.[12]

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[12] For example, the proportion of deliveries and contraceptive users who received services in the public sector is from NDHS 2003; the public sector share in ANC provision is assumed to be the same as for deliveries because no information was available.

Table E.1: Baseline and Targets for MDG-related Health Services

Health Services[13]	2005*	2010 target	2015 target
HIV/AIDS:			
VCT	943,600 estimated demand for VCT [1]	808,000 general population VCT demand [1], and 2 m pregnant women through PMTCT [2]	89,000 general population VCT demand [1], and 2 m pregnant women through PMTCT [2]
PMTCT prophylaxis	1% of HIV+ pregnant women reached [4]	50% reduction in transmission by MTCT by 2009 [5]	50% reduction in transmission by MTCT every five years [6]
ART	37,200 received ART [7]	430,000 total eligible for ART [8]	688,000 total eligible for ART [9]
TB DOTS	150,800 [10]	318,800 [11]	351,500 [12]
Malaria (outpatient)	50% of the population has at least one episode of malaria per year [13]	50% of the population has at least one episode of malaria per year [14]	50% of the population has at least one episode of malaria per year [15]
Maternal Health:			
Antenatal care	62% receive at least one ANC visit; 65% of those who had ANC received at least 2 lab tests [16]	70% receive 4 ANC visits; 80% of them also receive 3 lab tests [17]	90% receive 4 ANC visits 90% of them also receive 3 lab tests [18]
IPT[14]	1% receive IPT; but 20% took any antimalarial prevention drug [19]	All women at risk who receive ANC [20]	All women at risk who receive ANC [21]
Delivery	36% [22]	70% [23]	90% [24]
Postnatal care	29% receive at least one postnatal care visit [25]	70% receive 2 postnatal care visits [26]	90% receive 2 postnatal care visits [27]
Family Planning:	Overall target: Increase in modern contraceptive prevalence by at least 2 percentage points per year by 2015 [28]		
Oral contraceptive	2.0% of women 15-49 yrs [29]	7.4% of women 15-49 yrs [30]	
Hormonal injection contraceptive	1.6% of women 15-49 yrs [31]	8.2% of women 15-49 yrs [32]	
IUD	0.6% of women 15-49 yrs [33]	1.2% of women 15-49 yrs [34]	
Implant	-	0.3% of women 15-49 yrs	

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[13] All health services to be provided by trained health professionals.
[14] IPT is defined as sulfadoxine-pyrimethamine received during an ANC visit.

		[35]	
Tubal ligation	0.2% of women 15-49 yrs [36]	0.5% of women 15-49 yrs [37]	
Child Health:			
Immunization[15]	25% of children immunized with DPT3 by age 12 months [38]	70% of children fully-immunized by age 12 months [39]	90% of children fully-immunized by age 12 months [39]
Growth monitoring	All fully-immunized infants at 5 visits per year; all other children under 5 who received vit. A supplements.[40]	All fully-immunized infants at 5 visits per year; and 70% of all other children under five at 2 visits per year [41]	All fully-immunized infants at 5 visits per year; and 90% of all other children under five at 2 visits per year [42]
Outpatient curative care[16]	4.1 visits per child per year [43]	5.8 visits per child per year [44]	5.6 visits per child per year [45]
IEC for maternal and child health	All public facilities providing maternal and child health services (weekly "health talks" in group setting, at average group size of 30 women) [46]		

* In cases where 2005 data was not available, most recent year available was used as proxy for 2005.

Notes and Sources:

[1]	Estimated by a VCT demand estimation model used by WHO: annual demand for VCT is equal to twice current prevalence divided over five years (WHO 2002a). National Policy on HIV/AIDS, 2003 target is for 50% of Nigerians to have access to quality VCT by 2009.
[2] – [3]	Same as above calculated at prevalence 2.9% in 2010 and 2.2% in 2015 (the National Health Sector Strategic Plan for HIV & AIDS (2005-2009) target is 25% decline in adult prevalence every 5 years (p.46), and baseline prevalence is 3.9% in 2005 according to UNAIDS 2006). PMTCT target is from the *Scale Up Plan on PMTCT of HIV in Nigeria* (FMOH 2005).
[4]	Scale Up Plan on PMTCT of HIV in Nigeria (FMOH 2005)
[5]	National Policy on HIV/AIDS, 2003; National Health Sector Strategic Plan for HIV & AIDS (2005-2009)
[6]	Assume same target reduction in transmission as in previous five years.
[7]	UNAIDS 2006 reports that 7% of those with advanced HIV received ART in 2005 which gives about 37,200 on ART (assuming that 20% of those infected are eligible for ART). Estimates vary by source: for example, a report by the Network of PLWA in Nigeria estimates about 57,000 on ART as of December 2005.[17]
[8]	Calculated at prevalence 2.9% in 2010 and 2.2% in 2015 (the National Health Sector Strategic Plan for HIV & AIDS (2005-2009) target is 25% decline in adult prevalence every 5 years (p.46), and baseline prevalence is 3.9% in 2005 according to UNAIDS 2006). For comparison, the National Policy on HIV/AIDS, 2003 envisions that 1 m have access to ART by 2009.
[9]	Same as above
[10]	Estimated based on prevalence of 546 cases per 100,000 population and DOTS case detection rate of 21% (WHO 2006).
[11]-[12]	Same as above but target DOTS case detection rate of 40% is used (given by GFTAM 2002 proposal)

[15] See Box C1 for definition of fully-immunized.
[16] Care sought for children with symptoms of ARI, fever, and diarrhea.
[17] Report available at:
http://www.icaso.org/ungass/country%20reports/Nigeria%20UNGASS%20report%20ENGLISH%20FINAL.pdf

[13] – [15]	FMOH National Antimalarial Treatment Policy (p.5) reports that about 50% of the population have at least one malaria attack per year; estimated that 38% of malaria cases are seen in public sector facilities (median for several African countries studied by Mendis et.al 2003)
[16]	NDHS 2003
[17]– [18]	Assumptions based on MDG indicators and the minimum number of ANC visits recommended by WHO.[18] Number of routine lab tests based on information from interviews with health providers
[19]	NDHS 2003
[20]- [21]	Based on national target for earlier years for "at least 60% of pregnant women using correct regimen of IPT" (FMOH 2001a)
[22]	NDHS 2003
[23]- [24]	Assumptions based on MDG indicators and clinical guidelines published for Nigeria (FMOH/UNFPA 2002).
[25]	NDHS 2003
[26]- [27]	Assumptions based on MDG indicators and clinical guidelines published for Nigeria (FMOH/UNFPA 2002).
[28]	Federal Ministry of Health (2001) National Reproductive Health Policy & Strategy
[29]- [37]	NDHS 2003 data used for 2005. Estimated future demand in 2010 and 2015 was calculated by adding the unmet demand for contraceptives (among non-users), given by NDHS 2003 for each method.
[38]	Use as proxy for fully-immunized. Source: UNICEF data for 2004 (http://www.unicef.org/infobycountry/nigeria_statistics.html#13)
[39]	Assumptions based on MDG indicators and targets for earlier years given in the 2004 GAVI Progress Report for Nigeria (FMOH, 2004c)
[40]	Visits for fully-immunized children same as immunization visits; Vit. A supplements were received by 27% of children under 5 (UNICEF)
[41]– [42]	Visits for fully-immunized children same as immunization visits; for all other children, visits are same as Vit. A supplementation visits recommended by FMOH (FMOH Nutrition Division 2005). The National Health Policy envisions "institutionalization of nutrition information and surveillance system including growth monitoring and promotion in all health facilities" (GON 2004).
[43]	Calculated based on NDHS 2003 data on the number of children taken to a health provider for ARI, fever, and diarrhea
[44]	Calculated based on 2005 data [43] and a 50% increase in formal care seeking for ARI, fever, and diarrhea
[45]	Calculated based on 2005 data [43] and a 50% decrease in 2005 prevalence combined with 50% increase in care-seeking from 2010 for ARI, fever, and diarrhea
[46]	Average group size estimate based on field interviews and observations. Facility survey showed that IEC was provided in 82% of primary and 77%of secondary public health facilities. Assume that 95% of facilities provide IEC in 2010 and 2015.

[18] Clinical guidelines published for Nigeria recommend 9 to 10 ANC visits (FMOH/UNFPA 2002).

Box E.1 : Definition of Fully Immunized

Nigeria's National Programme on Immunization has adopted WHO's goal to ensure completion of vaccinations by 12 months of age. The National Immunization Policy stipulates that a child is considered fully vaccinated if he/she receives the following vaccines:

At birth – BCG (tuberculosis), OPV0 (polio), HBV1 (Hepatitis B)

6 weeks – DPT1 (diphtheria, pertussis, tetanus), OPV1, HBV2

10 weeks – DPT2, OPV2

14 weeks – DPT3, OPV3, HBV3

9-11 months – Measles, Yellow Fever

This schedule translates into five immunization visits per child 0-11 months of age. In addition, vaccination against meningitis is considered to contain outbreaks in high-risk populations.

Source: National Programme on Immunization, "National Immunization Policy" - December 2003 revision.

Annex F: State-Level Findings from Health Facility Survey in the Public Sector

This annex presents summary of key findings based on data collected in the health facility survey, for each of the 12 states and the FCT of Abuja. The summary of findings is followed by a detailed discussion and tables/figures presenting the results for each state.

Note: Data was not collected from the following three tertiary facilities: Federal Medical Center – Akwa Ibom, Federal Medical Center-Imo, and teaching Hospital-Borno. The number of staff and services provided in these facilities are therefore not reflected in the analysis described below.

1. Summary of Findings

HRH availability and distribution in public health facilities varies widely among the 13 states where the survey was conducted. Availability of HRH appears to be poorest in the states surveyed in the North West, North East, and South East zones, while the North Central zone appears to have better than average HRH availability.

Overall, the states of Cross River, Niger, Kogi, and the FCT have more health workers per population than the national average in each of the categories included in the study (doctors, nurses/midwives, lab specialists, pharmacy specialists, and CHO/CHEW).[19] The states that have considerably less health workers to population in all or most staff categories are Adamawa, Anambra, Borno, Imo, Kano, and Sokoto.

The doctor/nurse ratio also varies considerably, from about 3 to 4 nurses/midwives per doctor (in Anambra, FCT, Imo, Kano, Ondo, and Sokoto) to about 16 to 19 nurses/midwives per doctor (in Adamawa, Akwa Ibom and Kogi).

In most states, the majority of doctors, nurses/midwives, and pharmacy specialists are in secondary and tertiary facilities, whereas concentration of lab specialists at these higher levels of care is only seen in about half of the states where the survey was conducted. In all states, CHO/CHEW are predominantly found at the primary level.

2. Discussion of Findings

2.1. Availability, skills mix and distribution of HRH

The doctor/population ratio is substantially lower than the national average of 14 doctors per 100,000 population in the states of Adamawa, Akwa Ibom, Borno, Imo, Kano, Kogi, and Sokoto. On

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[19] One exception in Kogi is the doctors/population ratio, which is slightly lower than the national average.

the other hand, Cross River state and the FCT have considerably more doctors per 100,000 population than the average for the country.

The picture for nurses and midwives is a little different: Anambra, Borno, Imo, Kano, Lagos, Ondo, and Sokoto have a very low nurse/midwive to population ratio than the average for Nigeria (92 nurses/midwives per 100,000 population), while in the states of Akwa Ibom, Cross River, Kogi, Niger, and the FCT have substantially more nurses/midwives per 100,000 population than the national average.

Availability of lab specialists, compared to population, is higher than the national average (which is 12 per 100,000 population) in the states of Cross River, Kogi, Ondo and the FCT. The picture is the same for pharmacy specialists. In the rest of the states surveyed, the lab specialists to population ratio and the pharmacy specialists to population ratio is lower than the national average.

The doctor/nurse ratio varies considerably across the 13 states, from as few as 3 to 4 nurses/midwives per doctor in Anambra, FCT, Imo, Kano, Ondo, and Sokoto, to about as many as 16 to 19 nurses/midwives per doctor in Adamawa, Akwa Ibom and Kogi.

The distribution of health workers across levels of care shows several patterns. In most states, the majority of doctors and nurses/midwives are in secondary and tertiary facilities. Exceptions are Adamawa, Cross River, and Imo, where more than half of doctors are found at primary facilities; and Akwa Ibom, Cross River and Ondo, where the majority of nurses/midwives are at primary facilities. In all states, CHO/CHEW are predominantly found at the primary level. Pharmacy specialists are concentrated at secondary and tertiary facilities, except in Akwa Ibom, Cross River, Lagos and Ondo where more than half of pharmacy specialists are found at primary level facilities. In about half of the states where the survey was conducted, lab specialists were concentrated at secondary and tertiary facilities (Anambra, Borno, Cross River, FCT, Imo, Kano, Lagos, Niger, and Sokoto); in the remaining states most lab specialists are in primary facilities.

2.2. Availability of Key Health Services

The facility survey collected information on which of the key health services in the areas of HIV/AIDS, TB, malaria, maternal and child health were provided,[20] and the number of patients treated in the three months preceding the survey (January, February, and March 2006).

Maternal and Child Health Services

In most states, nearly all primary facilities reported providing immunization services.[21] Exceptions are the states of Anambra, Cross River, Niger, and Sokoto where less than 80 percent of primary facilities provide immunization services.

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[20] It should be noted that the facility staff interviewed in the survey was only asked whether the facility provided the service or not.

[21] Note that the survey did not collect specific information on which immunizations were provided. Therefore, if a facility reported that immunizations were provided, it may mean that only some and not all required immunizations are provided at that facility.

Between 60 and 80 percent of primary facilities provide normal delivery services in most of the surveyed states. Notable exceptions are Kano, where only a third of primary facilities provide normal delivery assistance; and Sokoto, where less than 20 percent of primary facilities do so.

Family planning services (most often in the form of providing or prescribing oral or injectable contraceptives) are available in more than half of primary facilities in the states of Adamawa, Akwa Ibom, Borno, Cross River, FCT, Kogi, Lagos, and Ondo. By contrast, in Kano and Imo only about a third of primary facilities provided some form of family planning services.

HIV/AIDS Services

Provision of VCT services varies widely by state. Of the secondary and tertiary facilities surveyed, VCT was provided by:

- ▲ nearly all in Adamawa, FCT, Lagos, and Ondo;

- ▲ about two-thirds of such facilities in Cross River, Imo, Kano, Kogi, and Sokoto;

- ▲ less than half in Akwa Ibom, Anambra, Borno, and Niger.

VCT is less common at the primary level. In Cross River, Ondo and FCT, about 30 to 40 percent of surveyed primary facilities reported providing VCT, while about 20 percent or less of primary facilities in Adamawa, Akwa Ibom, Anambra, Imo, Kano, Kogi, and Lagos provide VCT. None of the primary facilities surveyed in Borno, Niger, and Sokoto provided VCT services.

PMTCT service provision is less common: in only 6 states (Adamawa, Cross River, FCT, Kogi, Lagos, and Sokoto) 20 percent or more of secondary/tertiary facilities provided PMTCT services, and none of the facilities surveyed in Imo reported provision of PMTCT. Lagos is the one state that stands out, with half of secondary/tertiary facilities providing PMTCT.

While ART is provided in 30 to 40 percent of secondary/tertiary facilities in FCT, Kogi, and Lagos, none of the facilities at this level in Borno and Imo do so. In all other states included in the survey, less than 20 percent of secondary/tertiary facilities reported providing ART.

TB Services

TB-DOTS/outpatient treatment is most commonly provided in Adamawa, Lagos and Sokoto where more than 80 percent of secondary/tertiary facilities report providing such services. TB-DOTS/outpatient treatment is provided in about 60 percent of secondary/tertiary facilities in Akwa Ibom, FCT, Imo, Niger, Ondo, while less than half of such facilities in the remaining states provide this service.

In each state, the share of primary level facilities providing TB-DOTS/outpatient services is less than the share for secondary/tertiary facilities. Primary facilities in Adamawa, FCT, and Ondo provide TB-DOTS most often (40 to 60 percent of facilities), while in the remaining states provision is by about a third of primary facilities or less.

In most of the states, inpatient TB care is usually provided by about 20 percent or less of secondary/tertiary facilities. Inpatient TB care is provided in more than 20 percent of secondary/tertiary facilities only in the states of Adamawa, Borno, Imo, Kogi, Lagos, and Sokoto.
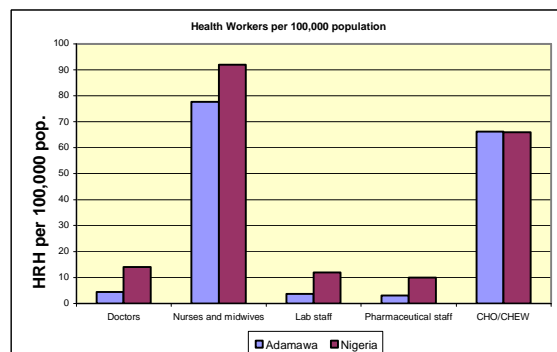
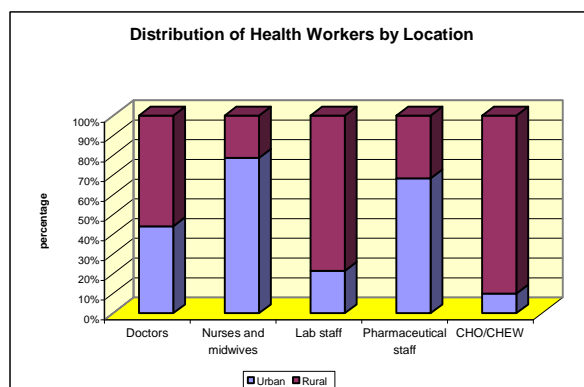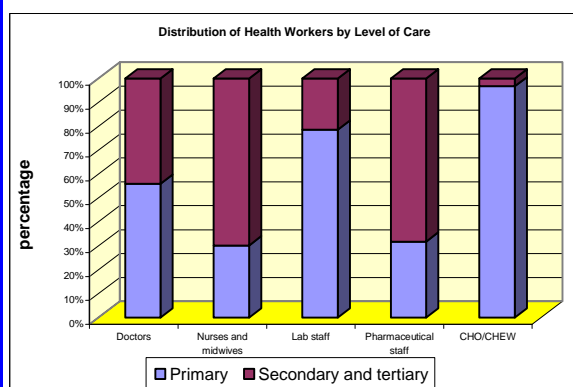# ADAMAWA

Number of Public Health Facilities

Level of care	Total	Sample
Primary	208	15
Secondary and tertiary	21	2

Total number of Health Workers

Staff Category	2004	2005	2006
Doctors	121	133	143
Nurses and midwives	2,398	2,360	2,026
Lab staff	83	113	142
Pharmaceutical staff	116	93	93
CHO/CHEW	1,906	2,010	1,921
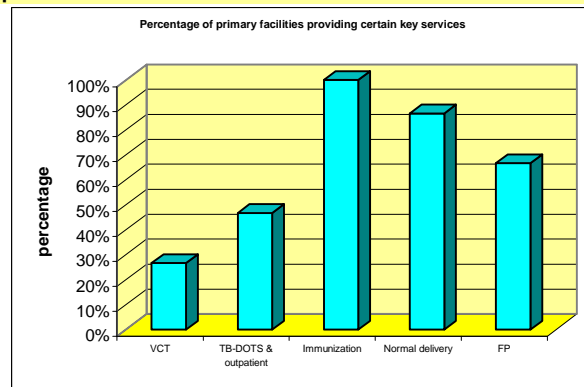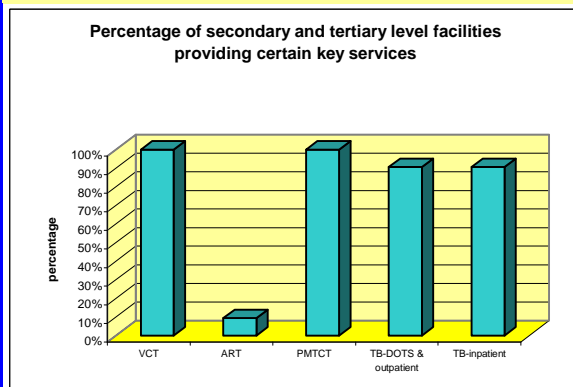
Health Workers per 100,000 population

Distribution of Health Workers

Distribution of Health Workers by Level of Care

Distribution of Health Workers by Location

Service provision

Percentage of secondary and tertiary level facilities providing certain key services

Percentage of primary facilities providing certain key services

Estimated Monthly Volume of Services

Service	Number of Patients	Service	Number of Patients
VCT	1,375	Antenatal care	15,141
ART	468	Normal delivery	2,700
PMTCT	n/a	Complicated delivery	n/a
TB: DOTS and non-DOTS outpatient	n/a	Oral contraceptives	1,735
Malaria outpatient	18,901	Injectable contraceptives	1,799
Malaria inpatient	5,512	IUD	164

AKWA IBOM

Number of Public Health Facilities

Level of care	Total	Sample
Primary	230	17
Secondary and tertiary	26	5

Total number of Health Workers

Staff Category	2004	2005	2006
Doctors	257	237	264
Nurses and midwives	3,540	3,849	3,510
Lab staff	97	157	158
Pharmaceutical staff	114	183	221
CHO/CHEW	2,842	2,771	2,598
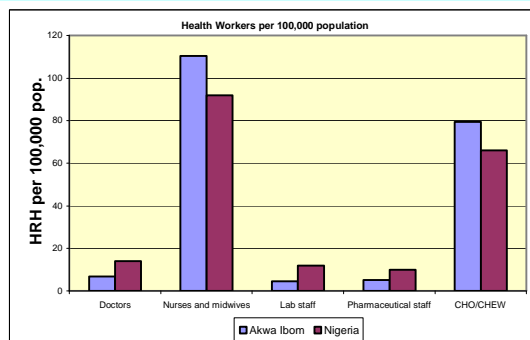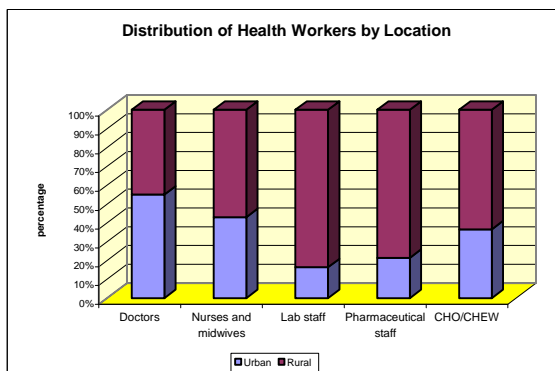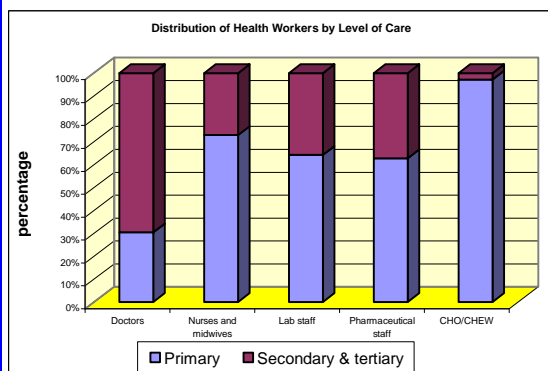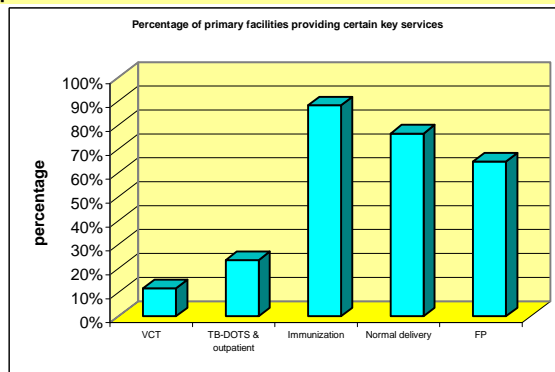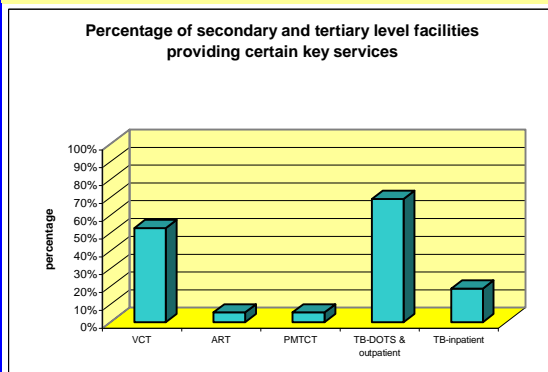
Health Workers per 100,000 population

Distribution of Health Workers

Distribution of Health Workers by Level of Care

Distribution of Health Workers by Location

Service provision

Percentage of secondary and tertiary level facilities providing certain key services

Percentage of primary facilities providing certain key services

Estimated Monthly Volume of Services

Service	Number of Patients	Service	Number of Patients
VCT	532	Antenatal care	5,546
ART	n/a	Normal delivery	602
PMTCT	182	Complicated delivery	n/a
TB: DOTS and non-DOTS outpatient	n/a	Oral contraceptives	763
Malaria outpatient	4,060	Injectable contraceptives	2,239
Malaria inpatient	369	IUD	756

ANAMBRA

Number of Public Health Facilities

Level of care	Total	Sample
Primary	148	14
Secondary and tertiary	42	16

Total number of Health Workers

Staff Category	2004	2005	2006
Doctors	410	509	493
Nurses and midwives	1,281	1,418	1,386
Lab staff	139	152	160
Pharmaceutical staff	55	58	61
CHO/CHEW	365	413	413
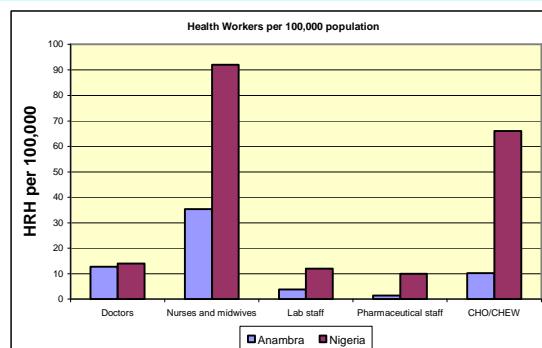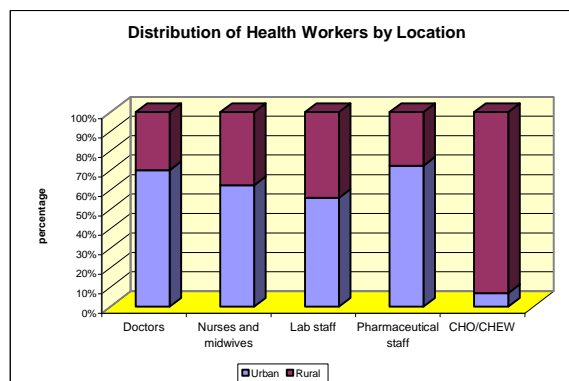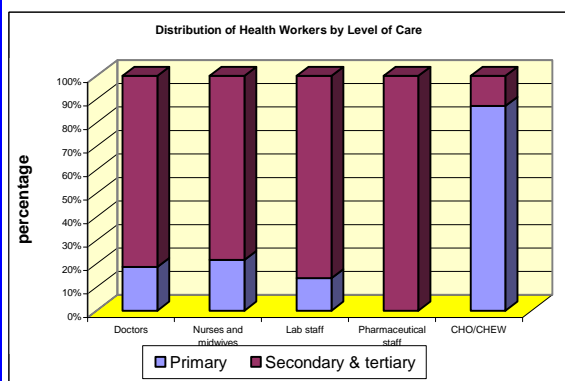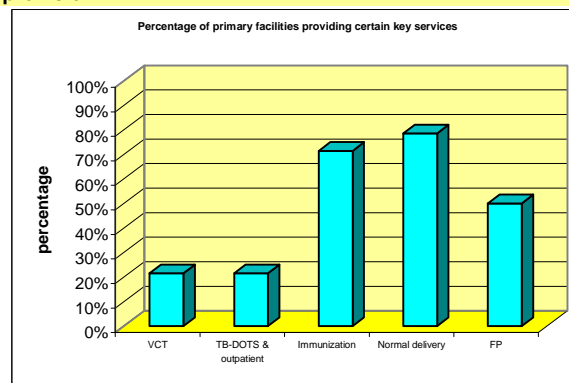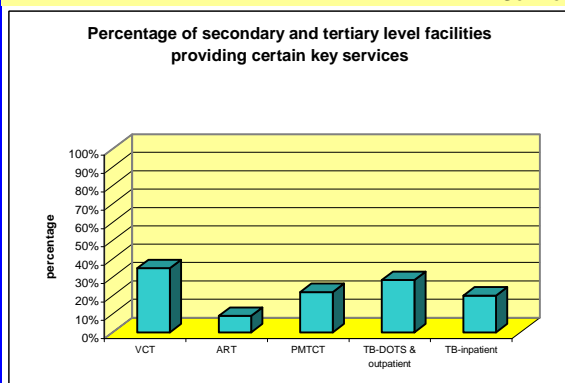
Health Workers per 100,000 population

Distribution of Health Workers

Distribution of Health Workers by Level of Care

Distribution of Health Workers by Location

Service provision

Percentage of secondary and tertiary level facilities providing certain key services

Percentage of primary facilities providing certain key services

Estimated Monthly Volume of Services

Service	Number of Patients	Service	Number of Patients
VCT	3,985	Antenatal care	5,078
ART	158	Normal delivery	937
PMTCT	640	Complicated delivery	n/a
TB: DOTS and non-DOTS outpatient	n/a	Oral contraceptives	192
Malaria outpatient	4,562	Injectable contraceptives	257
Malaria inpatient	285	IUD	166

BORNO

Number of Public Health Facilities

Level of care	Total	Sample
Primary	288	20
Secondary and tertiary	45	13

Total number of Health Workers

Staff Category	2004	2005	2006
Doctors	n/a	194	136
Nurses and midwives	1,777	1,940	1,978
Lab staff	192	221	221
Pharmaceutical staff	37	37	33
CHO/CHEW	2,127	1,383	1,429
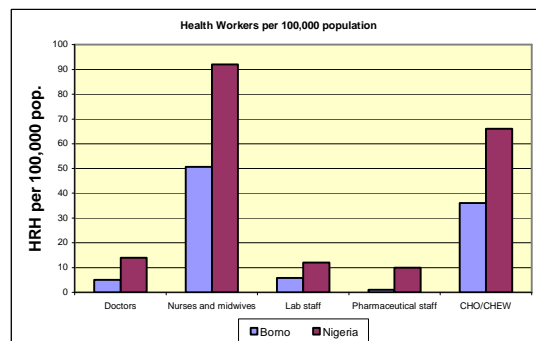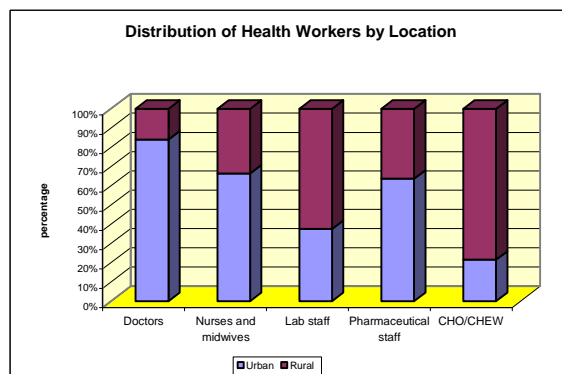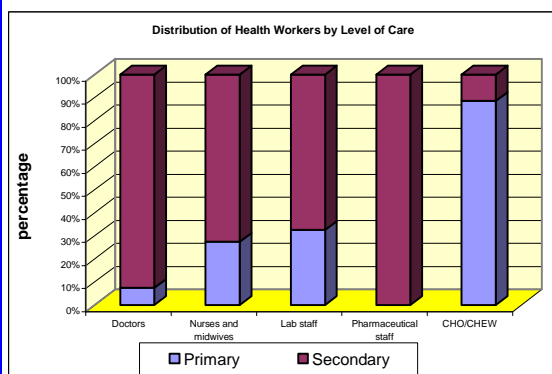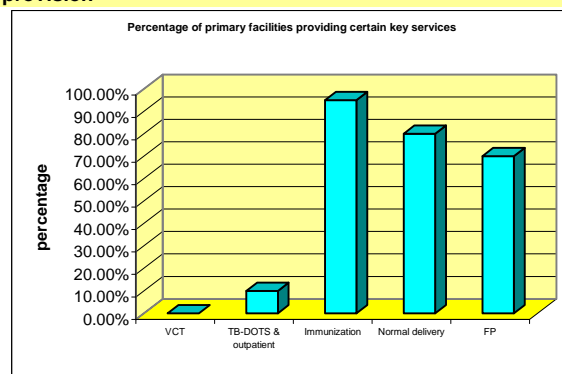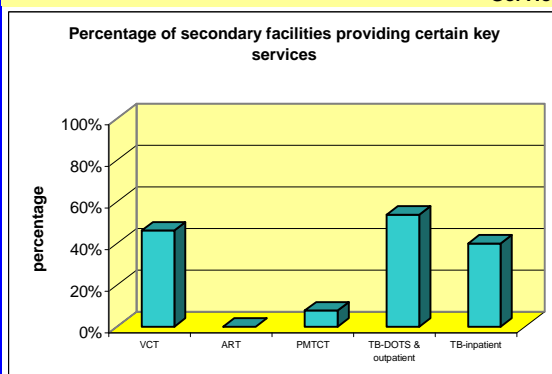
Health Workers per 100,000 population

Distribution of Health Workers

Distribution of Health Workers by Level of Care

Distribution of Health Workers by Location

Service provision

Percentage of secondary facilities providing certain key services

Percentage of primary facilities providing certain key services

Estimated Monthly Volume of Services

Service	Number of Patients	Service	Number of Patients
VCT	2,886	Antenatal care	51,316
ART	n/a	Normal delivery	7,783
PMTCT	2,718	Complicated delivery	n/a
TB: DOTS and non-DOTS outpatient	n/a	Oral contraceptives	12,242
Malaria outpatient	11,186	Injectable contraceptives	5,580
Malaria inpatient	3,719	IUD	608

CROSS RIVER

Number of Public Health Facilities

Level of care	Total	Sample
Primary	357	9
Secondary and tertiary	30	7

Total number of Health Workers

Staff Category	2004	2005	2006
Doctors	472	564	497
Nurses and midwives	3,049	4,203	4,632
Lab staff	457	516	530
Pharmaceutical staff	396	402	403
CHO/CHEW	2,392	2,311	2,128
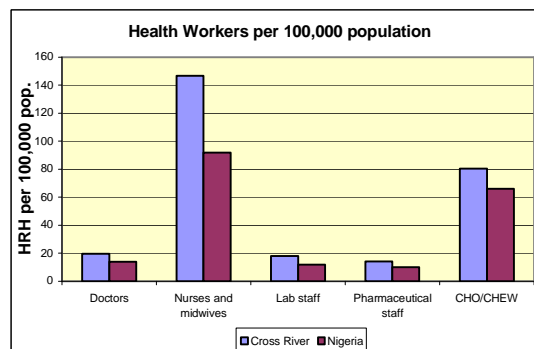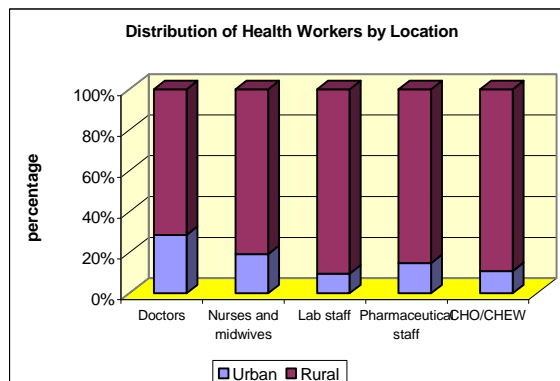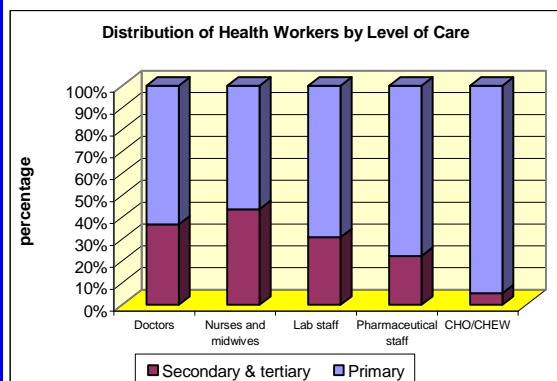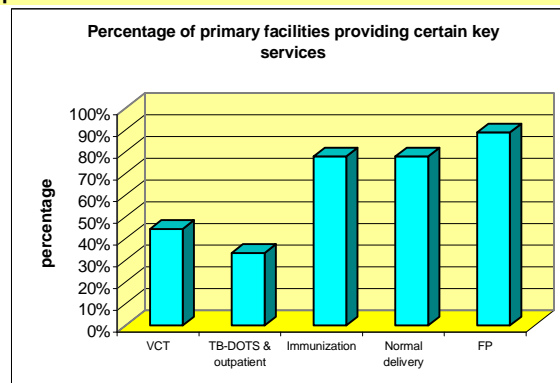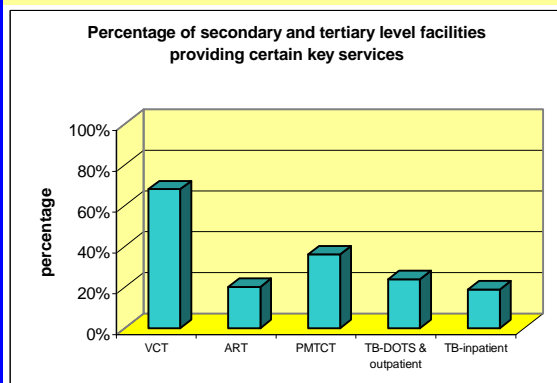
Health Workers per 100,000 population

Distribution of Health Workers

Distribution of Health Workers by Level of Care

Distribution of Health Workers by Location

Service provision

Percentage of secondary and tertiary level facilities providing certain key services

Percentage of primary facilities providing certain key services

Estimated Monthly Volume of Services

Service	Number of Patients	Service	Number of Patients
VCT	5,662	Antenatal care	10,356
ART	463	Normal delivery	2,698
PMTCT	403	Complicated delivery	n/a
TB: DOTS and non-DOTS outpatient	n/a	Oral contraceptives	3,723
Malaria outpatient	12,892	Injectable contraceptives	1,899
Malaria inpatient	3,526	IUD	252

FCT

Number of Public Health Facilities

Level of care	Total	Sample
Primary	25	3
Secondary and tertiary	9	5

Total number of Health Workers

Staff Category	2004	2005	2006
Doctors	248	235	222
Nurses and midwives	951	968	944
Lab staff	144	142	146
Pharmaceutical staff	97	94	104
CHO/CHEW	550	557	555
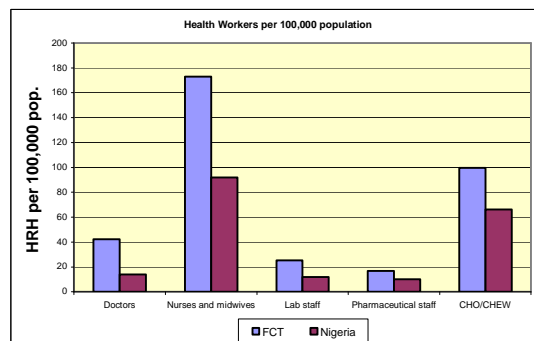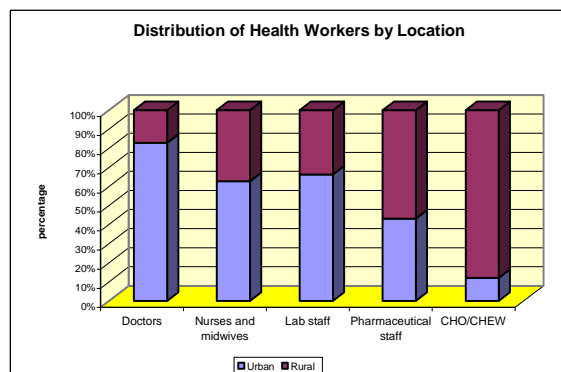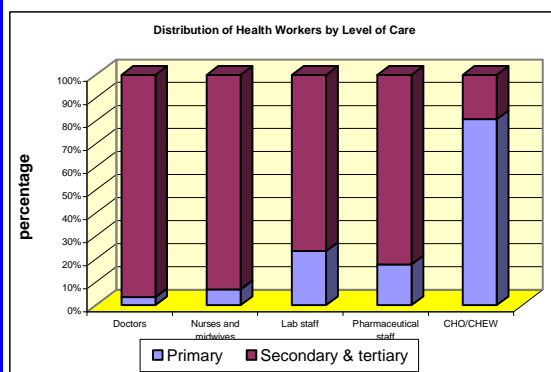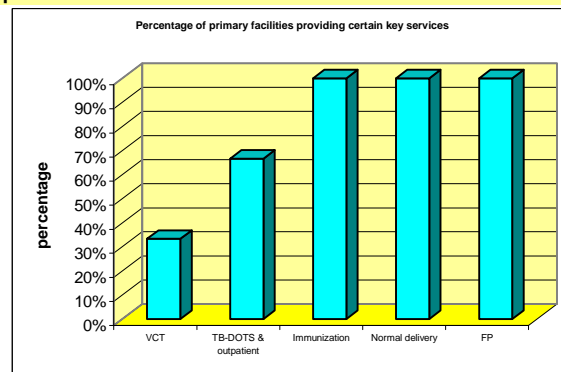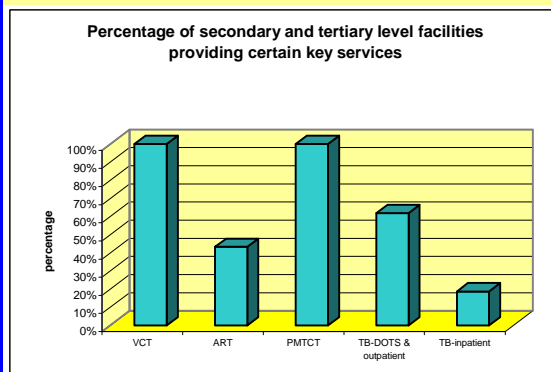
Health Workers per 100,000 population

Distribution of Health Workers

Distribution of Health Workers by Level of Care

Distribution of Health Workers by Location

Service provision

Percentage of secondary and tertiary level facilities providing certain key services

Percentage of primary facilities providing certain key services

Estimated Monthly Volume of Services

Service	Number of Patients	Service	Number of Patients
VCT	848	Antenatal care	5,657
ART	354	Normal delivery	500
PMTCT	168	Complicated delivery	n/a
TB: DOTS and non-DOTS outpatient	n/a	Oral contraceptives	352
Malaria outpatient	4,141	Injectable contraceptives	519
Malaria inpatient	269	IUD	n/a

IMO

Number of Public Health Facilities

Level of care	Total	Sample
Primary	201	21
Secondary and tertiary	17	6

Total number of Health Workers

Staff Category	2004	2005	2006
Doctors	231	204	249
Nurses and midwives	573	652	655
Lab staff	62	90	83
Pharmaceutical staff	57	66	53
CHO/CHEW	527	642	671
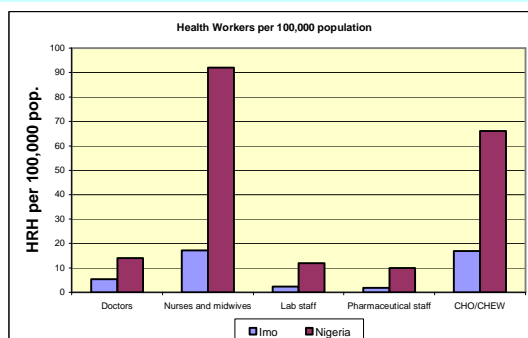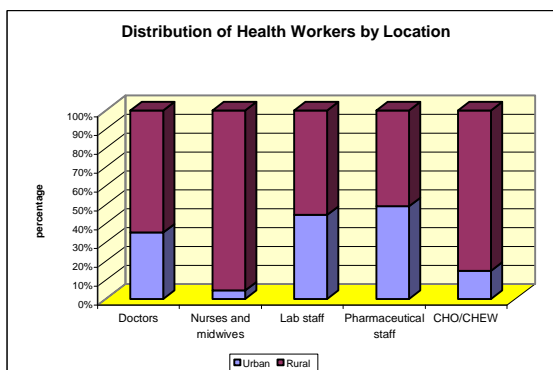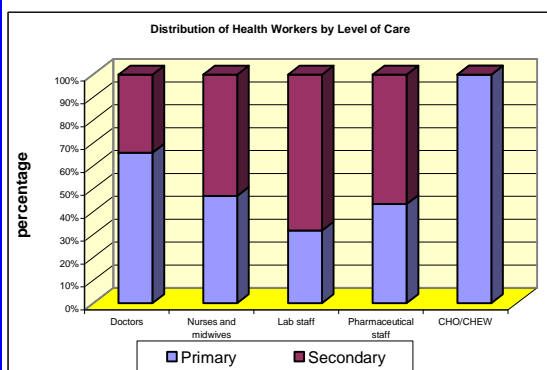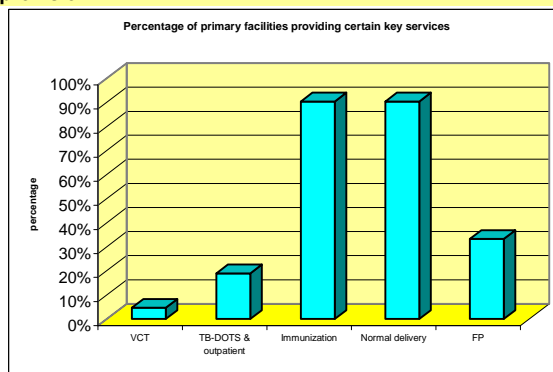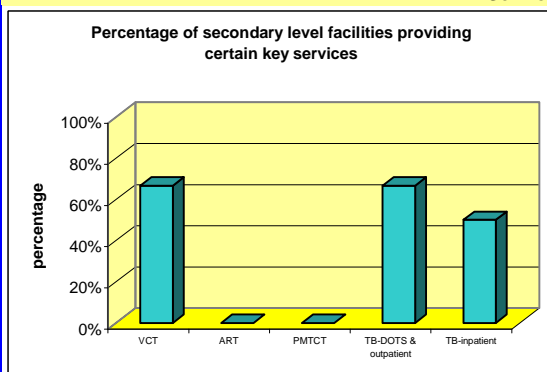
Health Workers per 100,000 population

Distribution of Health Workers

Distribution of Health Workers by Level of Care

Distribution of Health Workers by Location

Service provision

Percentage of secondary level facilities providing certain key services

Percentage of primary facilities providing certain key services

Estimated Monthly Volume of Services

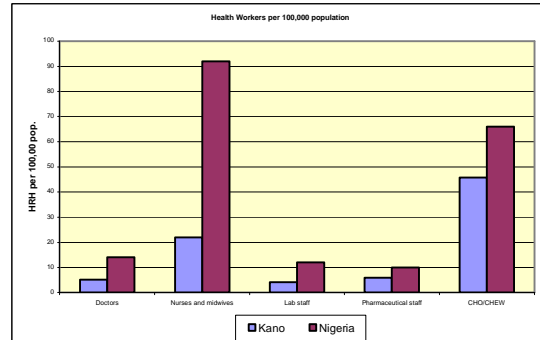| Service	Number of Patients	Service	Number of Patients
VCT	212	Antenatal care	3,551
ART	0	Normal delivery	805
PMTCT	0	Complicated delivery	n/a
TB: DOTS and non-DOTS outpatient	n/a	Oral contraceptives	120
Malaria outpatient	5,982	Injectable contraceptives	109
Malaria inpatient	437	IUD	n/a

KANO

Number of Public Health Facilities

Level of care	Total	Sample
Primary	605	29
Secondary and tertiary	42	12

Total number of Health Workers

Staff Category	2004	2005	2006
Doctors	358	430	438
Nurses and midwives	1,821	1,832	2,074
Lab staff	269	339	383
Pharmaceutical staff	398	491	554
CHO/CHEW	2,734	3,813	4,012
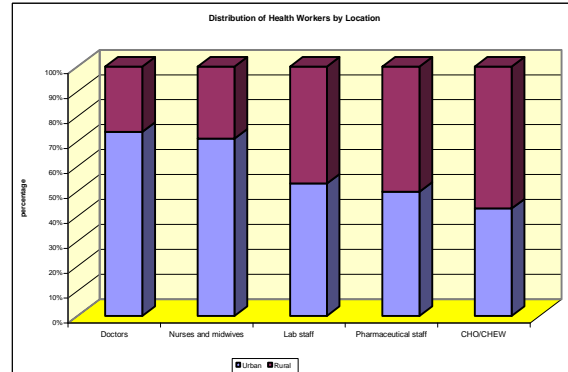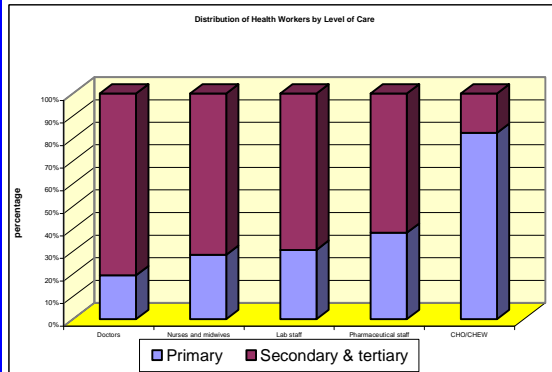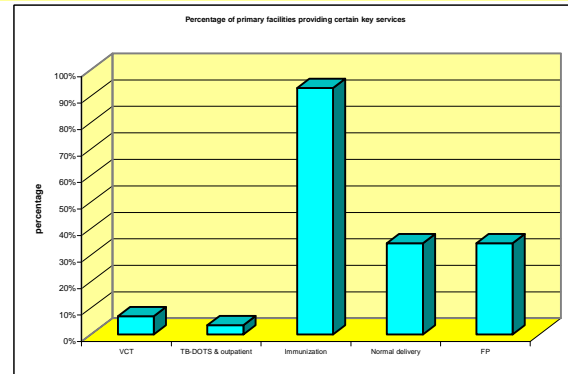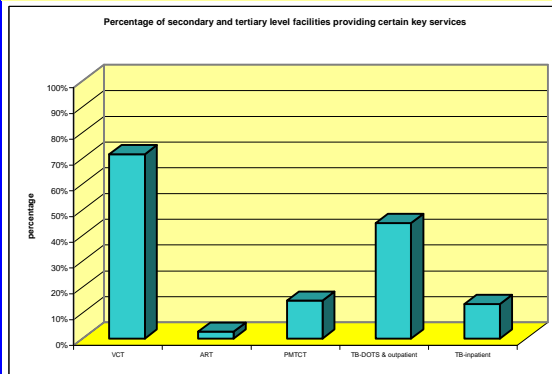
Health Workers per 100,000 population

Distribution of Health Workers

Distribution of Health Workers by Level of Care

Distribution of Health Workers by Location

Service provision

Percentage of secondary and tertiary level facilities providing certain key services

Percentage of primary facilities providing certain key services

Estimated Monthly Volume of Services

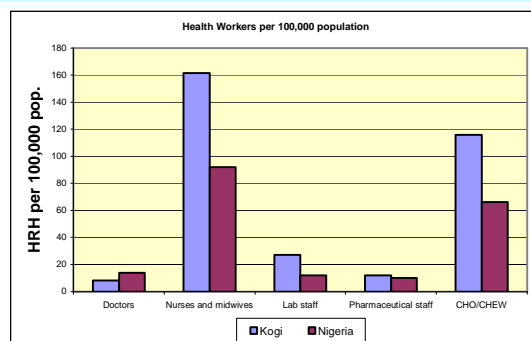| Service	Number of Patients	Service	Number of Patients
VCT	2,904	Antenatal care	222,835
ART	1,441	Normal delivery	16,747
PMTCT	3,326	Complicated delivery	671
TB: DOTS and non-DOTS outpatient	615	Oral contraceptives	3,740
Malaria outpatient	66,662	Injectable contraceptives	3,438
Malaria inpatient	8,479	IUD	n/a

KOGI

Number of Public Health Facilities

Level of care	Total	Sample
Primary	645	14
Secondary and tertiary	28	13

Total number of Health Workers

Staff Category	2004	2005	2006
Doctors	296	289	262
Nurses and midwives	5,646	5,612	5,502
Lab staff	932	941	941
Pharmaceutical staff	425	418	409
CHO/CHEW	3,880	4,027	4,284
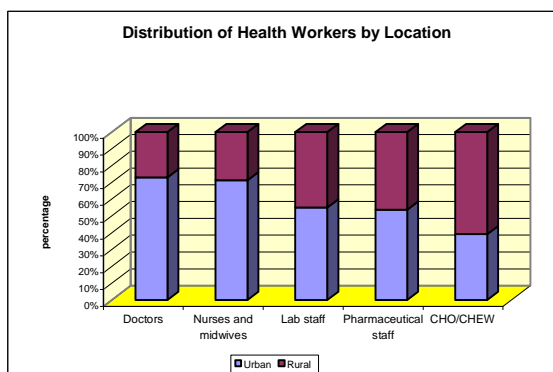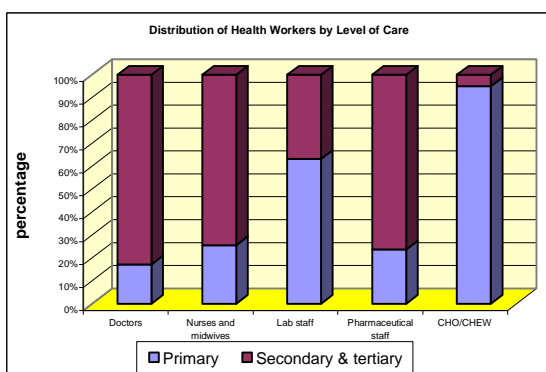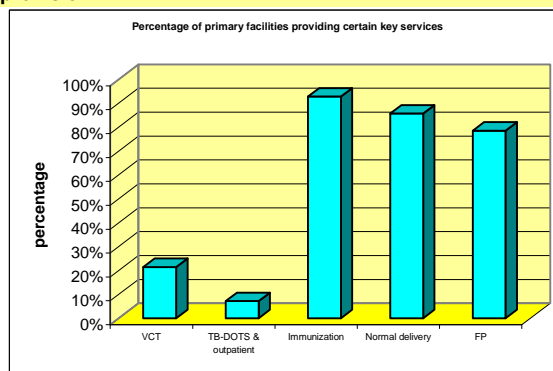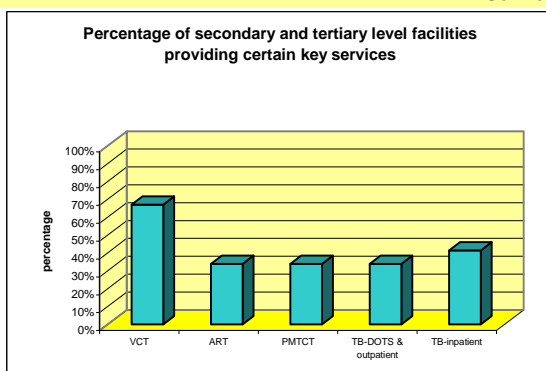
Health Workers per 100,000 population

Distribution of Health Workers

Distribution of Health Workers by Level of Care

Distribution of Health Workers by Location

Service provision

Percentage of secondary and tertiary level facilities providing certain key services

Percentage of primary facilities providing certain key services

Estimated Monthly Volume of Services

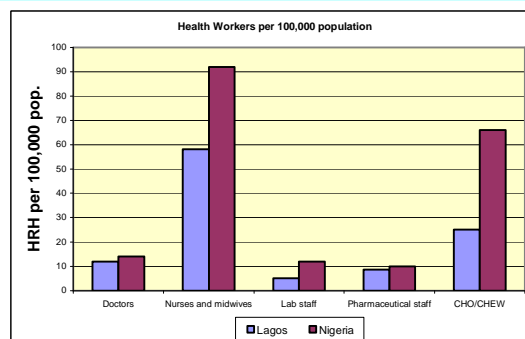| Service	Number of Patients	Service	Number of Patients
VCT	7,896	Antenatal care	18,920
ART	284	Normal delivery	3,227
PMTCT	1,388	Complicated delivery	282
TB: DOTS and non-DOTS outpatient	297	Oral contraceptives	6,160
Malaria outpatient	17,102	Injectable contraceptives	4,511
Malaria inpatient	2,695	IUD	953

LAGOS

Number of Public Health Facilities

Level of care	Total	Sample
Primary	245	10
Secondary and tertiary	35	16

Total number of Health Workers

Staff Category	2004	2005	2006
Doctors	939	1,000	1,179
Nurses and midwives	4,833	4,839	4,658
Lab staff	488	416	452
Pharmaceutical staff	674	715	598
CHO/CHEW	2,105	2,081	1,851
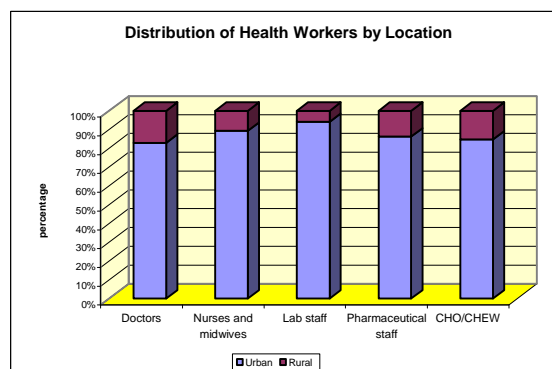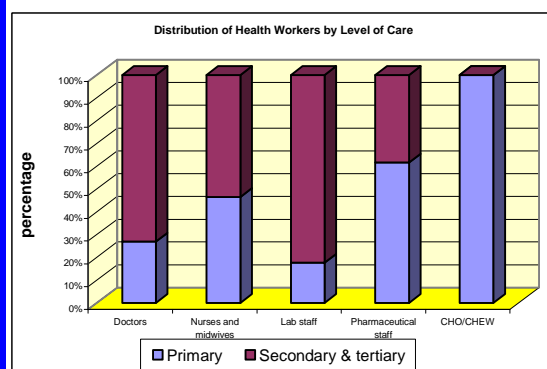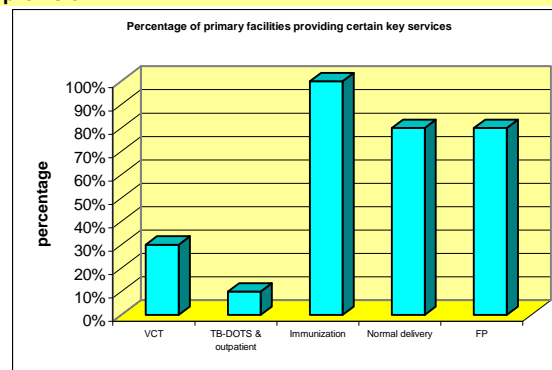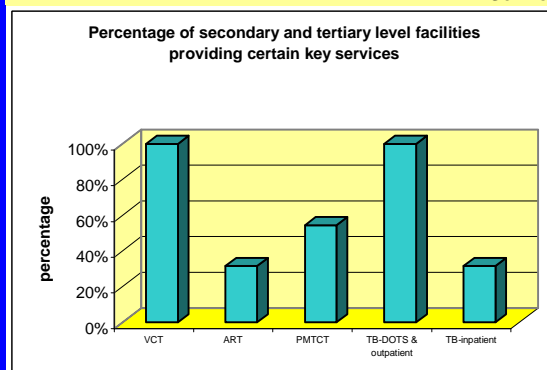
Health Workers per 100,000 population

Distribution of Health Workers

Distribution of Health Workers by Level of Care

Distribution of Health Workers by Location

Service provision

Percentage of secondary and tertiary level facilities providing certain key services

Percentage of primary facilities providing certain key services

Estimated Monthly Volume of Services

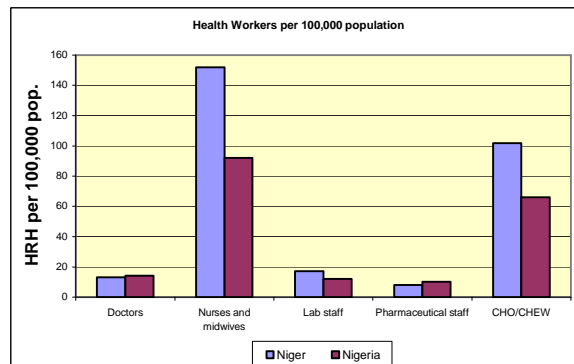| Service	Number of Patients	Service	Number of Patients
VCT	11,099	Antenatal care	16,660
ART	3,479	Normal delivery	2,903
PMTCT	474	Complicated delivery	274
TB: DOTS and non-DOTS outpatient	n/a	Oral contraceptives	956
Malaria outpatient	41,056	Injectable contraceptives	2,925
Malaria inpatient	n/a	IUD	1,968

NIGER

Number of Public Health Facilities

Level of care	Total	Sample
Primary	570	16
Secondary and tertiary	79	6

Total number of Health Workers

Staff Category	2004	2005	2006
Doctors	321	482	478
Nurses and midwives	5,548	5,619	5,583
Lab staff	611	626	627
Pharmaceutical staff	260	295	295
CHO/CHEW	3,730	3,766	3,837
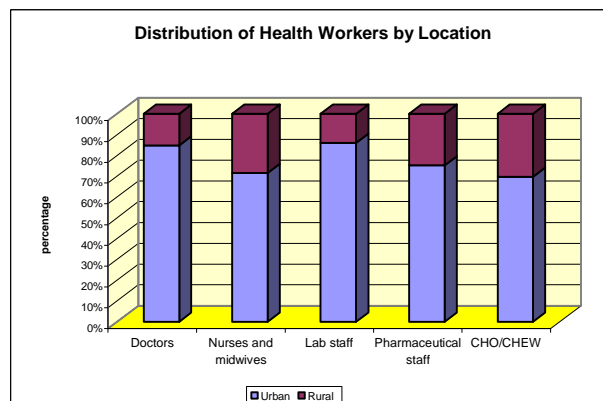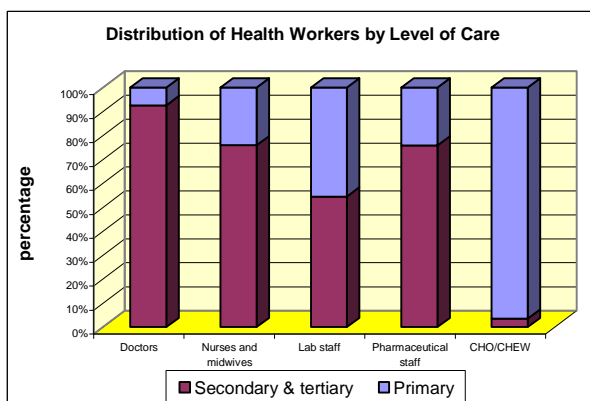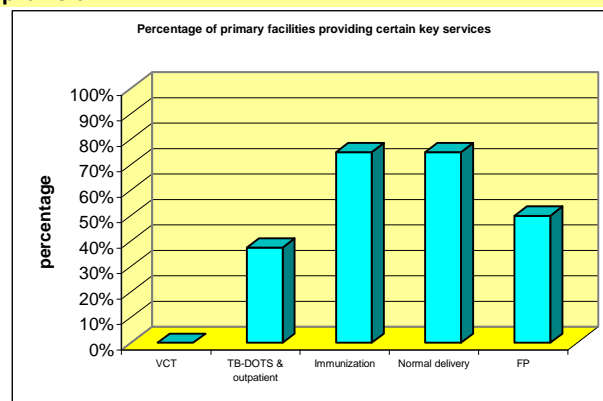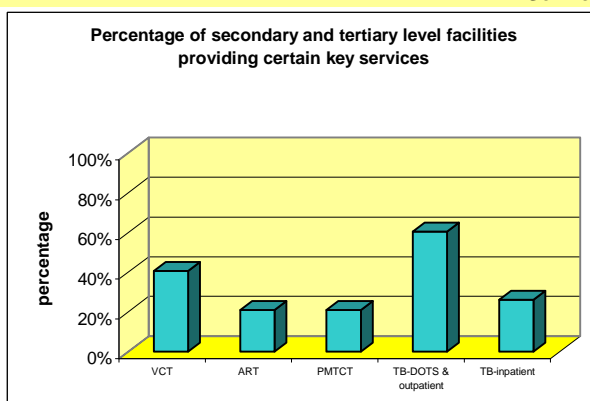
Health Workers per 100,000 population

Distribution of Health Workers

Distribution of Health Workers by Level of Care

Distribution of Health Workers by Location

Service provision

Percentage of secondary and tertiary level facilities providing certain key services

Percentage of primary facilities providing certain key services

Estimated Monthly Volume of Services

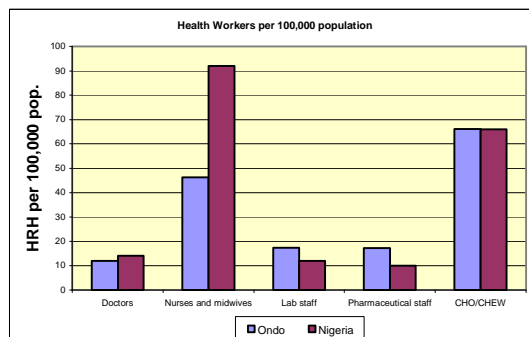| Service	Number of Patients	Service	Number of Patients
VCT	288	Antenatal care	29,678
ART	133	Normal delivery	5,124
PMTCT	n/a	Complicated delivery	486
TB: DOTS and non-DOTS outpatient	n/a	Oral contraceptives	564
Malaria outpatient	9,445	Injectable contraceptives	2,558
Malaria inpatient	1,774	IUD	122

ONDO

Number of Public Health Facilities

Level of care	Total	Sample
Primary	295	9
Secondary and tertiary	35	6

Total number of Health Workers

Staff Category	2004	2005	2006
Doctors	374	407	483
Nurses and midwives	1,615	1,559	1,477
Lab staff	549	585	587
Pharmaceutical staff	554	580	561
CHO/CHEW	2,203	2,230	2,526
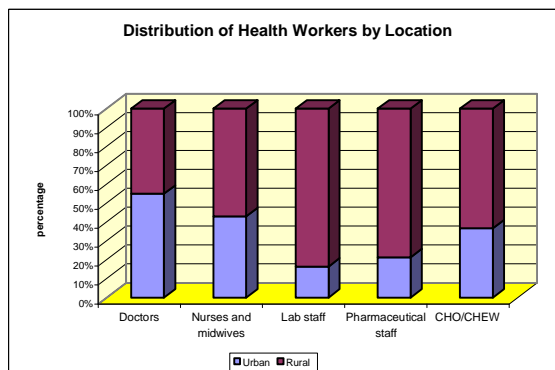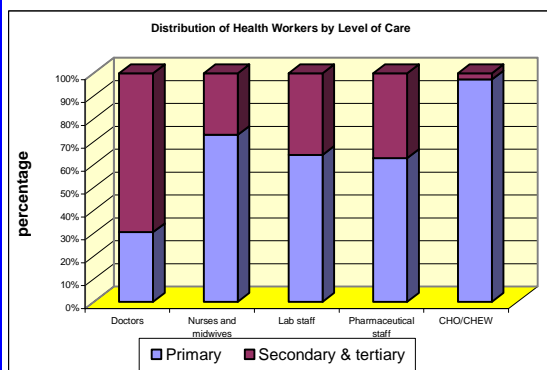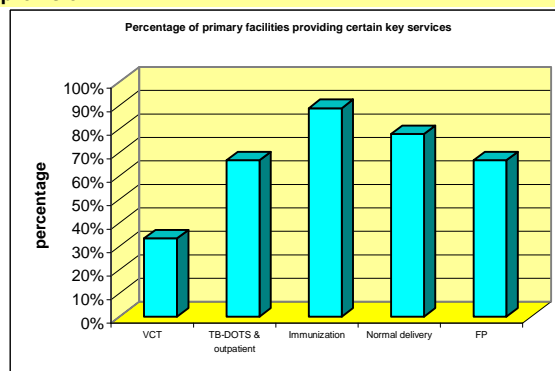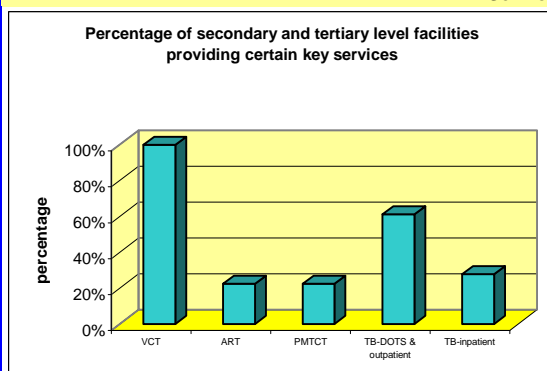
Health Workers per 100,000 population

Distribution of Health Workers

Distribution of Health Workers by Level of Care

Distribution of Health Workers by Location

Service provision

Percentage of secondary and tertiary level facilities providing certain key services

Percentage of primary facilities providing certain key services

Estimated Monthly Volume of Services

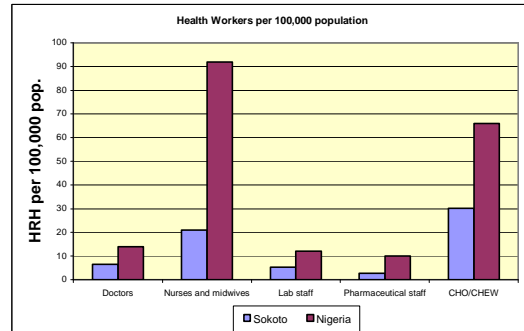| Service	Number of Patients	Service	Number of Patients
VCT	1,945	Antenatal care	24,564
ART	n/a	Normal delivery	5,017
PMTCT	n/a	Complicated delivery	184
TB: DOTS and non-DOTS outpatient	n/a	Oral contraceptives	2,228
Malaria outpatient	9,191	Injectable contraceptives	2,808
Malaria inpatient	211	IUD	1,617

SOKOTO

Number of Public Health Facilities

Level of care	Total	Sample
Primary	317	11
Secondary and tertiary	36	5

Total number of Health Workers

Staff Category	2004	2005	2006
Doctors	222	222	217
Nurses and midwives	742	713	759
Lab staff	159	179	170
Pharmaceutical staff	99	94	97
CHO/CHEW	1,023	1,023	1,023
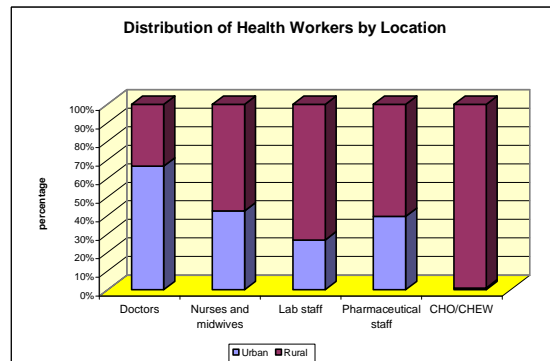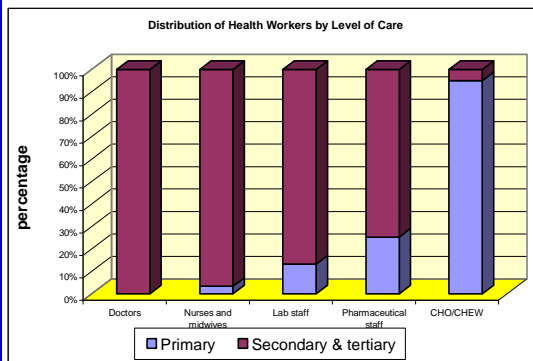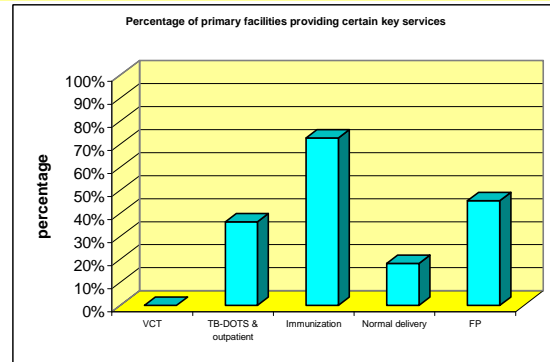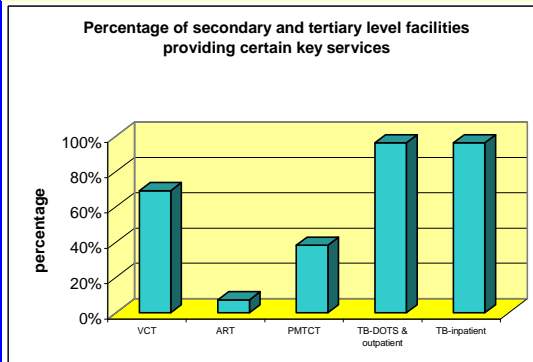
Health Workers per 100,000 population

Distribution of Health Workers

Distribution of Health Workers by Level of Care

Distribution of Health Workers by Location

Service provision

Percentage of secondary and tertiary level facilities providing certain key services

Percentage of primary facilities providing certain key services

Estimated Monthly Volume of Services

Service	Number of Patients	Service	Number of Patients
VCT	327	Antenatal care	9,401
ART	255	Normal delivery	1,052
PMTCT	110	Complicated delivery	155
TB: DOTS and non-DOTS outpatient	n/a	Oral contraceptives	545
Malaria outpatient	15,099	Injectable contraceptives	709
Malaria inpatient	1,947	IUD	n/a

Annex G: Stakeholders's Validation Meeting for Draft Report on Human Resources for Health Assessment in Nigeria. Attendance List

Name	State	Organization/Designation
Mr Awopeju O.F	Abuja	NASCP/FMOH
Haruna Y. Dabo	Borno	MOH
Egba Jibrin	Niger	MOH (PRS)
Atim Enoh	Akwa Ibom	SACA
Shaibu W.D.	Kogi	SACA
Kwatri T. Futules	Adamawa	MOH Yola
Dr Nwammadu B.C.	Imo	SACA
Dr Mann Alli	Ondo	MOH
Dr Uche Onyebuchi	Anambra	MOH/SACA M&E
Y.S. Madaki	Abuja	ABU Zaria
Akinbiyi O.A.	Abuja	NASCP/FMOH
Dr Ali Onoja	Abuja	PHRplus
F Adeosun	Abuja	AHP/MOH
Ukpoji James A.	Abuja	AHP/MOH
Dr. Greg Ashefor	Abuja	NACA
Charity Ibeawuchi	Abuja	ENHANSE
Alh. Haliru Yusuf	Sokoto	MOH
Folake Oluokun	Abuja	UNAIDS
Dr. P.N. Momah	Abuja	FMOH
M.M. Enumah	Abuja	FMOH/HP
Godwin Asuquo	Abuja	ENHANSE
Louis Edema	Abuja	NACA
Dr. Asadu Emeka	Abuja	NASCP/ FMOH
Yinka Akibu	Abuja	FACA
Tessy Ochu	Abuja	ENHANSE
Dr Sofola	Abuja	FMOH/Malaria
Dr K. Ogungbemi	Abuja	NACA

Annex H: References

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