

# Impact Evaluation Study

## Health Impact of the Scale-up to Fight AIDS, TB and Malaria with special reference to the Global Fund

### Country report Malawi

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## List of Acronyms

ACT	Artemisinin-based Combination Therapy
ANC	Antenatal Clinic
ARI	Acute Respiratory Infection
ART	Antiretroviral Therapy
BSS	Behavioural Surveillance Survey
CHAM	Christian Health Association of Malawi
DHS	Demographic and Health Survey
DSS	Demographic Surveillance System
DOTS	Directly Observed Short Course Therapy
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
ITN	Insecticide Treated Nets
IPTp	Intermittent Presumptive Treatment for pregnant women
PMTCT	Prevention of Mother to Child Transmission of HIV
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
MICS	Multiple Indicator Cluster Survey
NAC	National AIDS Commission
NHA	National Health Account
NMCP	National Malaria Control Programme
NTP	National Tuberculosis Programme
SS+	Sputum smear positive
SP	Sulphadoxine-Pyrimethamine
WHO	World Health Organization
MSF	Médecins Sans Frontières

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## Executive Summary

In the past five years, the Global Fund to Fight HIV/AIDS, Tuberculosis, and Malaria and other donors have increased the amount of global resources directed at reducing the burden of these three diseases. This study addresses the question of whether the increased funding for the three diseases has increased the quantity and quality of services for the three diseases. The study takes a broader approach in which health impact is defined as the measurement or estimation of overall programme effect on disease morbidity and/or mortality, brought about by all control initiatives and programmes combined irrespective of their financing sources, in a country or in a region.

The study uses both secondary and primary data. Secondary data was collected through a national record review of the three diseases. All the key institutions working on the three diseases were visited and secondary data was abstracted. Secondary data was also abstracted through hospital record review. Data was also collected from existing disease programme reports and published literature. Published studies were identified through electronic search of several databases (Pubmed and Medline), local library files and reference lists of published articles, as well as books. Primary data was collected through district comprehensive household survey, health facility survey, ART and TB follow-up surveys, and a National Health Account Survey. All the surveys employed structured questionnaires to collect the data in the nine sampled districts.

### **HIV/AIDS**

#### *Trends in the Prevalence of HIV/ AIDS*

The first case of HIV/AIDS in Malawi was reported in 1985. The prevalence of HIV/AIDS grew by 69.5% between 1988 and 1994. The growth rate slowed down between 1994 and 1998. It remained constant between 1998 and 2000. Since 2000, negative growth rates have been registered. The results from modeling exercise attribute the change in the prevalence rate of HIV/AIDS largely to widespread prevention and information campaigns that have precipitated a change in sexual behavior of sexually active individuals.

Despite the encouraging downward trend in the prevalence of HIV/AIDS, there still exist spatial, gender and regional disparities that were noted in the early years of the epidemic. In particular, the prevalence rate of HIV/AIDS is higher in urban than in rural areas; it is also higher in females aged 15-49 years than males, it is also higher among girls aged 15-24 years than boys in the same age bracket. The consolation, however, is that in recent years there has been a substantial reduction in these disparities.

#### *Trends in Funding*

HIV/AIDS resources have increased dramatically since 2002/2003. As a percentage of Total Health Expenditure (THE), HIV/AIDS resources increased from 16% in 2002/2003 to 23.7% in 2005/2006. The share of the government in total HIV/AIDS resources declined between 2002/2003 and 2005/2006. The government share staggered at 44% in 2002/2003 and fell to 18.4% in 2005/2006. The fall in the government funding might be a direct consequence of resources from the Global Fund. In 2005/06, resources from the Global Fund made up 30% of THE. The declining trend in government resources violates the additionality principle. The additionality principle says that an increase in funding from one source should not lead to a decline in resources from other existing sources. Out-of-pocket expenditure as a percentage of private health expenditure increased between 2002/03 and 2005/06. It increased from 28% in

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2002/03 to 33% in 2005/06. The increase in out-of-pocket expenditure may be due to medical expenditures incurred by patients to treat opportunistic infections.

A similar downward trend can be observed for the share of donors in the HIV/AIDS resource envelope between 2002/03 and 2005/06. It decreased from 42% in 2002/03 to 30.7% in 2005/06. The results also show that HIV/AIDS resources have been decentralized in recent years in line with the three 'one' principle. The proportion of HIV/AIDS resources controlled by the Ministry of Health declined from 43% in 2002/03 to 9% in 2005/06. On the other hand, the amount of resources managed by the rest of the world increased from 19% in 2002/03 to 40% in 2005/06. The National AIDS Commission registered a similar upward trend in the management of HIV/AIDS resources. It managed 11% and 19% in 2002/03 and 2005/06, respectively.

Notwithstanding the fact that resources from the Global Fund has increased the quality and coverage of health care services in general and HIV/AIDS, malaria and tuberculosis services in particular bottlenecks exist. Funding from the Global Fund mainly focuses on short-term health investment such as purchase of equipment and supplies. To a large extent it does not invest in long term investment such as health care infrastructure. In light of this, the Global Fund needs to shift its funding paradigm from short-term investment to long-term investment. The other major challenge reported by for civil society and CBOs concerning Global Fund resources, is that the application procedures are bureaucratic, complicated, cumbersome and time-consuming. The Global Fund needs therefore to revisit its funding procedures and requirements.

#### *Coverage and Quality of ART Services*

The decade-long and emotional debate about unavailability of life-prolonging antiretroviral treatment (ART) and care in Malawi, as in other resource-poor countries, is no longer fashionable in HIV/AIDS policy discourse. It is no longer fashionable because resources from the Global Fund to fight HIV/AIDS, Tuberculosis and Malaria and international donors have enabled Malawi to roll out large-scale ART treatment effort in the last five years. The number of sites increased from one site in 2001 to one hundred and sixty three sites in 2007. The increase in the number of sites has resulted in exponential increase in the number of patients accessing treatment. The proportion of persons newly enrolled on first line treatment of those who were medically eligible rose from 6% in 2003 to 139% in 2007. Similarly, the proportion of persons receiving first line ART of those who were medically eligible rose from 2% in 2003 to 36% in 2007. The bulk of patients started treatment though WHO clinical staging. The challenge is that CD4 cell count machines are mainly available in higher level facilities such as tertiary and district hospitals. The annual number of health workers who were trained in ART increased from 617 in 2004 to 710 in 2006 and it decreased to 520 in 2007. The challenge however is that health providers in the higher level facilities are more likely to receive ART training than health workers in lower-level facilities.

The health outcome for patients on treatment is encouraging. Of 146,856 patients who ever started on free ART by end of December 2007, 69% were alive and on ART at the site of registration, 11% had died, 10% were lost to follow-up, 10% had transferred to another facility (and were presumably alive) and less than one percent had stopped treatment.

There is gender, spatial and regional disparity in distribution of ART sites and in accessing ART services. More women than men are on ART. The majority of ART sites are concentrated in urban areas presumably because urban areas have a higher prevalence rate of HIV/AIDS rural areas. The greatest disparity is observed in the central region where up to 82% of sites are urban. The urban-rural bias implies that the majority of patients who are based in rural areas have to travel long distances to access ART services. This results in high transport costs. High transport

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cost is a recipe for late initiation of ART and default and nonadherence to treatment. The other disparity is that the Southern Region has more facilities than the Central and Northern Regions. A candidate explanation of this disparity is that the Southern Region has a highest prevalence of HIV/AIDS compared to the Central and Northern Regions.

Since the roll out of ART treatment, the number of HIV/AIDS-related deaths have declined. The number of HIV/AIDS decreased from 70,121 deaths in 2003 to 60,932 in 2007. Also, the number of orphans averted due to scale up of ART has increased over the years. It was 59,146 in 2003 and it increased to 112,707 in 2007.

#### *Quality and Availability of Services in Health Facilities*

The results from the facility survey showed that the majority of sites providing ART have trained staff and guidelines but do not have the basic infrastructure and supplies to provide ART services. This result is supported by the result from the ART follow-up study which showed that most patients are recruited into ART treatment through WHO clinical staging. The widespread use WHO is due to lack of CD4 cell count machines in the bulk of rural-based health facilities. Further result from ART follow up study showed that no regular follow-up on patients is made in the most facilities providing ART services. That is, there is no regular monitoring of CD4 cells after the initiation of treatment. This makes it difficult for health care providers to monitor clinical, pharmacological and immunological progress of patients. The results from the health facility survey should however be interpreted with caution since they may not be representative of the entire population of facilities since out of 375 facilities in the nine districts only 113 were surveyed.

#### *Quality and Coverage of HIV Testing and Counseling Services*

The number of static sites providing HTC services increased in Malawi between 2002 and 2006. They increased from 14 sites in 2001 to 351 sites in 2006.. Of the 351 sites 61, 112 and 178 were allocated in the Northern, Central and Southern Region, respectively. Caution should be exercised here in interpreting these statistics because they might show that there exist regional disparities because they are not weighted by population of each region. Specifically, the Southern Region of Malawi may boast a higher number of HTC sites because it is the region that has been hardest hit by HIV/AIDS..

The increase in the number HTC sites has resulted in an increase in the uptake of HTC services.. The number of HTC clients rose from 40,805 in 2001 to 661,400 in 2006. The main explanation for the astronomical increase in the number of people accessing HTC services is the introduction of HTC Testing Week in 2006. The Government through the Ministry of Health stages a nation-wide and week-long HIV testing campaign every year. The overwhelming response from the HIV testing week by the general population has led to surpassing of universal access targets of 900,000 and 1,000,000 by 2008 and 2009 respectively.. Despite the impressive HTC performance, the results from the facility survey showed that the majority of rural-based health facilities in the nine sampled districts do not have the infrastructure and supplies to conduct HTC testing. Furthermore, results from household survey show that there are income and education disparities in accessing HIV testing. Women who are more educated and those in the richest income quintile are more likely to access HIV testing services than those who are less educated and those in the poorest income quintile.

#### *Coverage and Quality of Prevention of mother-to-child transmission (PMTCT) Services*

The number of clinics providing PMTCT services has increased in recent years. When the PMTCT program started in 2003, there were only 7 facilities in Malawi. The number rose to 17

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facilities in 2003, 31 in 2004, 40 in 2005 and 60 in 2006. The Ministry of Health has put in place measures to accelerate the provision of PMTCT services which include increasing the number of sites and instituting an opt-out policy for testing pregnant women.

The results from the health facility survey showed that most of the sampled facilities in the nine districts have the guidelines and trained staff. They do not however have the basic infrastructure, equipment and supplies to provide high-quality PMTCT services. Furthermore, the results from the household survey showed that income disparities exist in accessing PMTCT services in Malawi. Women in the richest income quintile were more likely to access PMTCT services than women in the poorest quintile. Education is not a source of disparity in access to PMTCT services.

#### *Other HIV/AIDS Services*

Over the years there has been an increase in use of condoms and recognition of condoms as preventive method for HIV infection. Condom use among women at last high risk sex increased from 19.6% in 1996 to 28.7% in 2000 and 30.1% in 2004. The results for males show that some significant increases in condom use were reported for the age groups 15-19, 20-24 and 25-29 in the same period with overall figures at 37.5% for 1996, 38.9% for 2000 and 47.1% for 2004. These results reveal the existence of disparity in condom use between men and women. In particular, a higher proportion of men used condoms at their last high-risk sexual encounter than women.

There are also income and education inequalities in accessing condom amongst women. More educated and wealthier women are more likely to know the source of condom than less educated and poorer households. On the other hand, the household survey results shows that a higher proportion of wealthier and more educated women had higher risk sex in the past twelve months than less educated and poorer women. The consolation is that these inequities have taken a downward trend in recent years.

### **Tuberculosis**

#### ***Trends in Prevalence of Tuberculosis***

Tuberculosis is one of public health problems in Malawi. In the last 12 years, TB case numbers have increased by between 300% and 400% mainly because of HIV that increases the risk of disease reactivation in people with latent TB infection. In 2006, 27, 011 cases were reported countrywide while in 2005, 27,610 cases were reported. Despite the slight decline in the number of cases, the Malawian caseload remains one of the highest in sub-Saharan Africa.

DOTS coverage remains at 100% in all districts. Both TB case detection and cure rates targets set at 70% and 85% are yet to be achieved. WHO maintains that case detection in Malawi stands at 50%. The low case detection is due the use of passive case detection method. However, Malawi is moving towards active case detection. It is currently implementing a nation-wide tuberculosis prevalence study.

Malawi seems to be making a steady upward improvement towards the 85% cure and treatment success target set by WHO. Treatment success rate stands at 78% for new smear positive cases and 77% for re-treatment cases. Treatment completion rate among new smear negative cases is 75% and 73% for extra pulmonary cases.

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### *Trends in Funding*

Financial resources for tuberculosis, as a percentage of THE, declined between 2002/03 and 2005/06. It declined from 2.3% in 2002/03 to 1.2% in 2005/06. External expenditure on TB as a percentage of THE, dropped significantly from 2.08% to only 0.50 % between 2002/03 and 2005/06). As of 2007, the National Tuberculosis Programme (NTP) did not receive funding from the Global Fund. In addition donor funding has stagnated in recent years. However, the National Tuberculosis Control Programme has applied for funding from the Global Fund in the next round of funding.

### *TB Services*

The quantity and quality of tuberculosis services have increased in Malawi the past five years. All the facilities offering TB services have adopted DOTS.. The number of health workers who were trained in TB diagnosis and treatment by district increased from 61 in 1998 to 108 in 2007. The number of diagnostic centres increased from 83 in 1998 to 140 in 2007.

The increase in quantity and quality of services has resulted in high treatment and cure rate and low default rates. Treatment success rate stands at 75% (10% below the WHO target of 85%) for new smear positive cases. For relapse cases, 77% of patients are cured. Treatment completion rate among new smear negative cases is 75% and 73% for extra pulmonary cases.

The major challenge of TB services is low detection and high death rates. The World Health Organization estimates that Malawi only detects 49% of all TB cases. The low case detection is largely explained by passive case detection method.. Death rate among TB patients declined from 22% in 1998 to 13% in 2006. The major culprit for this outcome is HIV/AIDS. Most TB patients are co-infected with HIV/AIDS.

The results from health facility survey showed that the majority of the sampled facilities in the nine districts do not offer smear-microscopy services. The other result was that a disproportionate number of sampled facilities could not perform sputum tests. It is however a encouraging that most facilities are stocked with first-line TB drugs.

## **Malaria**

### *Trends in Prevalence and Incidence of Malaria*

Malaria is a major public health problem in Malawi. It is the leading cause of morbidity and mortality in children under five years of age and pregnant women. The 2004-2005 Health Management and Information System (HMIS) Bulletin indicate that 200, 000 malaria outpatients were being reported monthly throughout health facilities in Malawi. This translates into 3.5 million episode of malaria reported in the outpatient departments between 2004 and 2005. However, according to a recent report of the community survey, more than 50% of malaria cases are not treated at the health facilities. Therefore, it can be estimated that Malawi experiences 6 million episodes of Malaria annually.

### *Trends in Funding*

Total expenditure on malaria as a percentage of THE rose from 19.9% in 2002/03 to 22% in 2005/06. Despite the general increase in malaria resources, contributions from major financing sources declined between 2002/03 and 2005/06. Donors accounted for 51.7% of total malaria resources in 2002/03. It declined to 45.9% in 2005/06. Public funds also declined from 35.1% in 2002/03 to 27% in 2005/06. The decline in funding from the major financing sources, that in

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turn violates additionality principle, may be explained by the contribution from the Global Fund that made up 9.3% of the total malaria resources in 2005/06.

#### *Coverage of Prompt and Effective Treatment within 24 hours*

The percentage of children receiving prompt and effective treatment within 24 hours of the onset of fever has increased substantially since 2000. Despite the increase, the Roll Back Malaria target of treating 60% of children under five within twenty four hours of onset of fever has not been met. A major culprit for this situation is that there is widespread self-treatment of malaria. In particular, about 50% of malaria cases are treated at home. There are also disparities in accessing treatment between urban and rural children, and the poorest and richest households. Urban children are more likely to access treatment within 24 hours of onset of fever than rural children. Children in the richest quintile are more likely to access prompt treatment than their counterparts in the poorest quintile. Over the years, these disparities have taken a downward trend.

#### *Coverage and Use of Insecticide Treated Nets (ITNs)*

Ownerships and use of ITN has increased over the years in Malawi. More households own at least one ITN and a larger proportion of children and pregnant and pregnant women are sleep under ITNs. Notwithstanding the impressive increase in the coverage and use of ITNs, Malawi failed to achieve the Roll Back Malaria of having 60% of underfive children and pregnant women sleeping under a mosquito net by 2005. There are also spatial, income and education-based disparities in ITN ownership and use. Urban households are more likely to own and use ITNs. Households in the richest quintile are more likely to own and use ITN than their counterparts in the poorest income quintile. The urban-rural disparities and income-based inequalities have however decreased over time. In particular, net ownership in urban areas was almost six times higher than in rural households in 2000 while in 2006, urban household net ownership was two times higher than rural households. This represents a decrease of two-thirds in ITN ownership inequality between 2000 and 2006.

#### *Coverage of Intermittent Preventive Therapy (IPT) in pregnant women*

The proportion of pregnant women accessing IPT<sub>p</sub> has substantially increased over the years. This is not surprising given the fact that the success of IPT<sub>p</sub> depends on the attendance rate of pregnant women at antenatal clinics. In Malawi about 97.8% of pregnant women attend antenatal care clinics in Malawi. Disparities however exist in access to IPT whereby a higher proportion of urban women access IPT<sub>p</sub> than rural women. This disparity may be explained by the health care delivery system that is skewed towards urban areas. Pregnant women who are more educated have a better access to IPT than women who are less educated. These disparities have however declined over the years.

#### *Non-HIV/AIDS, Tuberculosis and Malaria Services*

The Global Fund resources have strengthened the health care system. It has resulted in high retention of staff in the public sector due to the financial incentives that are provided to professional health staff. It has also strengthened the capacity of health care delivery system by recruitment of more than 5000 health surveillance assistants. Resources from the Global Fund have also been used for purchasing and procurement of equipment and supplies.

The resources from the Global Fund and other donors have also strengthened the community-based health system by providing financial and technical support. Resources have also been used to establish a bursary for payment of school fees of orphans and other vulnerable children.

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However, the Global Fund has also skewed the health system towards HIV/AIDS, Tuberculosis and malaria. In particular, more attention is paid to the three diseases than other equally important health problems such as primary health care.

# 1 Evaluation Introduction

## 1.1 Evaluation Background

### 1.1.1 Evaluation Framework and Study Questions

In the past five years, the Global Fund to Fight HIV/AIDS, Tuberculosis, and Malaria and other donors have increased the amount of global resources directed at reducing the burden of these three diseases. This large increase in resources is expected to have had a significant impact on the availability and quality of services for the three diseases as well as on intervention coverage and outcomes and, consequently, on disease burdens. The Five-Year Evaluation of the Global Fund: Study Area 3 – Health Impact is expected to shed light on whether the expectations for the increased funding are being realized. Recognizing that it is not possible to separate the effects of different donors and funding streams, the evaluation will not attempt to attribute noted effects to the Global Fund, although it can speculate about the overall contribution of the Global Fund to the achievements so far.

The Health Impact Evaluation has been designed to determine the impact of available financial resources on the delivery of services, on the coverage of those services, and, to the extent possible, on the burden of the three diseases. The evaluation framework is detailed in Figure 1.

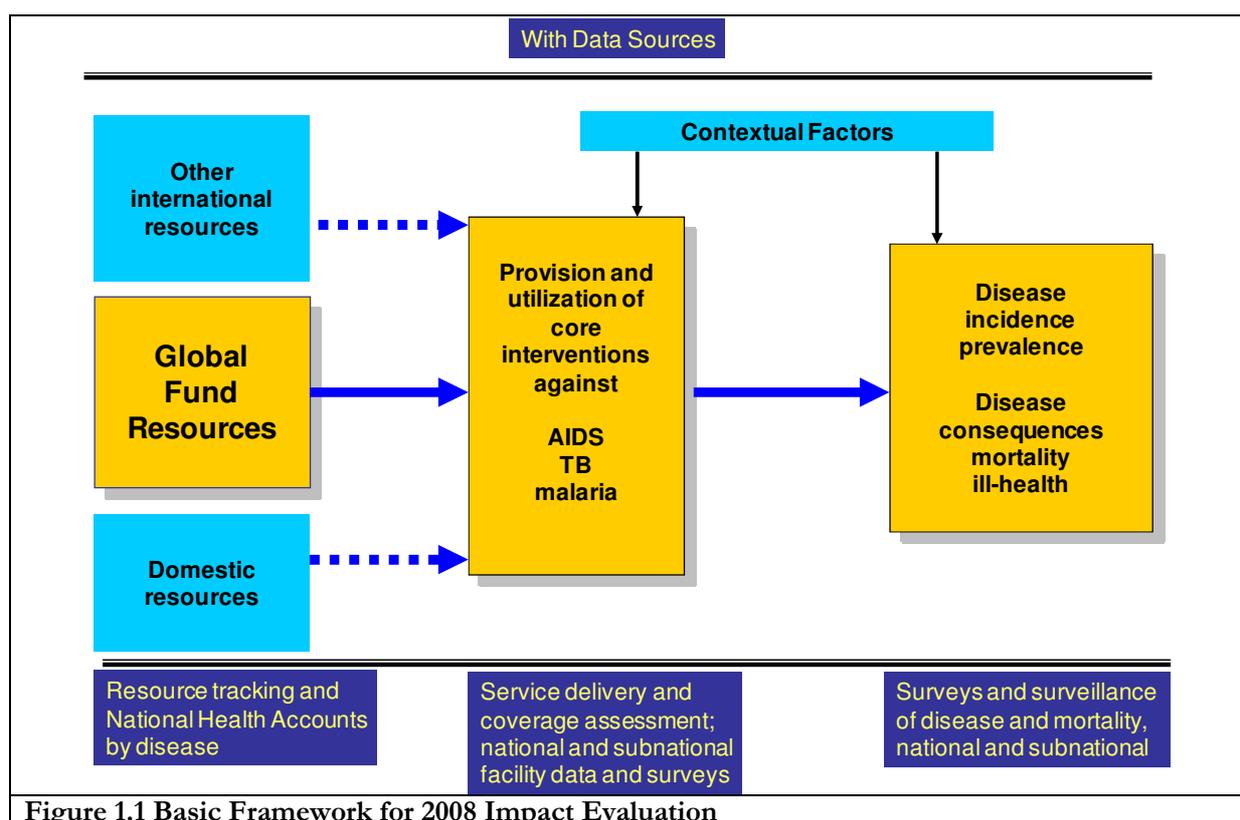


Figure 1.1 Basic Framework for 2008 Impact Evaluation

Based on this framework, the main hypothesis for the proposed analysis can be phrased as follows:

**Increases in financial resources have led to → improved services (quality, quantity, coverage) which in turn have led to → Reductions in the burden of disease (incidence, prevalence and mortality)**

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This hypothesis can be divided into three main study questions with additional sub-questions:

1. Has funding/spending increased for the three disease programmes?
2. Has the availability of services (both treatment and preventative) increased?
  - Has the quantity of services increased?
  - Are services more equitably (geographic, gender, age) distributed?
  - Has the quality of services improved?
  - Has the coverage of services improved?
  - Is coverage more equitable?
  - Have knowledge and risk behaviours changed?
3. Have the incidence, prevalence and mortality related to the three diseases changed?

In addition to these basic questions related to the three diseases, there is also the question whether the scale-up in the fight against the three diseases has had any system-wide effects that go beyond the three diseases. Therefore, an additional question related to the hypothesis will also be studied:
4. Have there been any effects on health services other than those for HIV/AIDS, tuberculosis, and malaria; particularly maternal and child health related services?

Detailed descriptions of these questions are found in Appendix A. In order to answer these questions, information from existing sources in 18 countries will be examined. In eight of these countries (the Primary Data Analysis Countries), new sub-national data will also be collected. The evaluation framework applies both to the national and the sub-national level.

### 1.1.2 Evaluation Components

Abstracting and collecting data for the Evaluation was divided into five components which are described below.

#### **Component 1: National Record Review**

Routine information about HIV (counselling and testing, prevention of mother to child transmission, and antiretroviral therapy) services, tuberculosis services, and ANC surveillance was abstracted from the national health information system. A standard set of information was requested but countries were requested to adapt to what was available.

#### **Component 2: Review of Secondary Data (National Survey Review)**

A standard set of pertinent information from population surveys, health facility surveys and other sources of information were abstracted.

#### **Component 3: District Comprehensive Assessment**

In the Primary Data Analysis Countries, nine districts were selected for inclusion in the District Comprehensive Assessment (DCA). These districts were selected to reflect different intensities of disease intervention scale-up. Within each district the following studies were completed:

- District financial study – information from which to complement that work of the National Health Accounts in Component 4.
- District health facility census – patterned after the Service Provision Assessment, information about HIV, tuberculosis, and malaria service readiness was obtained from all health facilities providing those services within the district.
- District health facility record review – Patient registers from the health facilities involved in the census were reviewed for two purposes: One, to validate the routine information for the district that is available at the national level (as found in Component 1) health facility records and, two, to obtain a more detailed picture of the provision of services in the district.
- District hospital record review – District hospital record reviews were only conducted in hospitals with exemplary information. From these reviews, inpatient diagnoses, hospital-cause of death, and birth weights were abstracted.

- ART outcomes study – A review of the records of a sample of patients on antiretroviral therapy was conducted in order to determine effectiveness of therapy.
- TB follow-up study – former TB patients (or their families if deceased) were contacted and their sputum examined to determine if treatment had been successful.
- Household survey – A household survey was conducted and women were interviewed to obtain household health expenditure information (to complement the NHA of Component 4), risk behaviour intervention, and coverage of services.

**Component 4: NHA and other financial information**

A formal National Health Accounts Exercise was conducted in order to get information about the trend in resources applied to these diseases. Additionally, information about major funding sources was obtained.

**1.1.3 General and Country-Specific Evaluation Information**

**1.1.3.1 Framework of the Evaluation**

There are four general principles underpinning the country evaluation studies. These principles are described further in the document, *Multi-country Evaluation Study: Data collection design and methods*, March 2007. They include:

- Utilizing information from a wide variety of data sources and filling data gaps where possible;
- Using common methods and instruments across countries;
- Building upon existing data collection and analysis efforts;
- Strengthening country capacity and improve foundation for long term monitoring and evaluation.

There are four phases in the country evaluation of health impact: Planning, data collection, data analysis, and dissemination. The time frame is such that the final product, the country evaluation report, should be ready by May-June 2008.

Month	Main activities & products	Project tools
0-4	Task force operational* Data gaps review* Work plan for evaluation Subcontracts plan developed	Task Force responsibilities description  Template for work plan
3-12	Data collection – record reviews; comprehensive district assessment; surveys; NHA; special studies	Standard data requirements  Protocols for data collection
5-15	Data analysis – draft report	Analytical tools and methods
13-15	Final report and dissemination	Template final report

Figure 1.2 Phases in the evaluation study

**1.1.3.2 Components of the Evaluation**

Malawi is one of the countries chosen to undertake both secondary and primary assessment. The secondary assessment includes review of the national records and survey on HIV/AIDS,

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tuberculosis and malaria. Malawi has undertaken an extensive data gap analysis exercises whose details are contained in three separate reports<sup>1,2,3</sup> that can be summarised as follows:

- **National record reviews data gaps:**
  - Availability of aggregated data is a problem with some data from HMIS, private sector data, hospital records etc.
  - Missing records is a problem that affects completeness of data and has been faced during data abstraction from health facilities as well as private and public sector organizations.
  - Limitation of data due to either data having been collected once or data collected through sampling frames that are not representative of the population or sub-populations
  - Questionable quality of data due to non-existence of any form of data quality control mechanism or supervision
  - Non-existence of essential data due to absence of records e.g. village and other registries.
- **Household surveys:**
  - Either use of outdated modules or non-inclusion of disease specific modules in some major household surveys
  - Outdated legal framework for the conduct of national surveys resulting in implementation of national surveys by various organizations depending on availability of donor funding resulting in loss of data bases for some surveys
  - Non-conduct of some surveys as per expected schedules mainly due to lack of funding or proper planning
  - Extremely limited sample frame used in some of the household surveys making it difficult to generalize data
- **National Health Accounts:**
  - Absence of disease specific sub-accounts except for AIDS (malaria and TB do not have sub-accounts)
  - Lack of up-to-date National Health Accounts and lack of a well-defined system for tracking resources under each of the three diseases.
- **District specific data:**
  - The Malawi DHS, sentinel surveillance, and various other national surveys are not district-based creating a gap in district-specific data
  - Although HMIS collects district specific data, in some cases data is not disaggregated putting major limitations on its utility
  - The quantity and quality of district-specific programmatic data is affected by lack of M&E capacity and lack of functional and co-ordinated district-level M&E systems
  - There are two districts that produce District Demographic Health survey – Karonga and Mangochi.
- **Research studies:**
  - Some key research studies have only been done once and need to be repeated in order to establish national or regional trends
  - Samples of other key research studies have been too small and may need to be repeated covering a larger sample.

For the secondary data review in this evaluation study, a research protocol was developed which comprised a literature search, data abstraction and data synthesis methods. The search for literature was restricted to peer-reviewed publications (journal articles and working papers) and published and grey literature on HIV/AIDS, tuberculosis and malaria. Published studies were identified through electronic search of several databases (Pubmed and Medline), local disease-

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<sup>1</sup> Report of the Malawi Triangulation Project (2007), National AIDS Commission,

<sup>2</sup> Salima impact assessment workshop report (February 2007), National AIDS Commission, Lilongwe

<sup>3</sup> Malawi HIV impact triangulation workshop report (June 2007) National AIDS Commission, Lilongwe

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programme library files and reference lists of published articles, as well as books. The literature was identified through contacts with disease programme staff. Informal discussions were also held with programme staff about the availability of literature. The disease control programme officials provided strategic and policy documents on the three diseases.

The primary assessment (district comprehensive assessment) includes the health facility and household surveys at district level. For the comprehensive assessment plan, six types of data or evidence are envisioned:

- Data that already exist (but remain to be compiled, assessed for quality, and presented within the framework)
- Data that can be abstracted from existing records or other sources (e.g., age- and cause-specific mortality among patients at district hospitals)
- Data that can be collected by the insertion of indicator measures into on-going research, surveillance, or programme activities or by strengthening those programmes (e.g., the insertion of mortality measures into the DHS planned for 2009 or selective support to fully implement the village registry of vital statistics in a few sentinel districts)
- Data that can be obtained by repeating past studies (e.g., repeating the 1991-2000 study of mortality among employees in public sectors)
- Entirely new studies needed to fill key gaps in the assessment of impact (e.g., the REACH Study to assess barriers to ART access and use)
- Mathematical modelling (e.g., modelling the changes in the trajectories of new infections and burden of disease attributable to the national response)

The approach undertaken in conducting the activities was to support institutional capacity building for both government and academic/research institutions. Different research institutions were commissioned to undertake the activities. The participating institutions in the evaluation include:

- The National Statistics Office, responsible for district household survey
- Research for Equity And Community Health Trust
- College of Medicine
- Epidemiology Unit
- National Malaria Control Programme
- National Tuberculosis Control Programme

This plan envisages the use of various types of data for assessing impact of the response. The type of data is defined according to its availability.

### **1.1.3.3 Impact Evaluation Task Force and related country mechanism**

The impact evaluation is co-ordinated by a national Task Force comprising of stakeholders from both government and non-governmental institutions. The National Task Force was formed to make sure that stakeholders for the three diseases are represented and development partners are included. The proposed list was submitted to the CCM which approved it. The Task Force is broad with multi-disciplinary membership to guide all evaluation activities. Specifically the responsibilities of the national Task Force responsibilities are:

- Development of the Impact Evaluation work plan in collaboration with the Evaluation Study Consortium;
- Advise on the delegation of impact evaluation activities as defined in the Impact Evaluation Work Plan, including technical work, administration and oversight of activities, supervision and quality assurance, etc.;
- Mobilize in-country institutions, resources and partners for data collection and analysis work;
- Provide regular debriefings on the progress of the impact evaluation to the CCM;

- Assist in the preparation of deliverables to be provided to the Consortium;
- Reviewing the preliminary and final reports.

The country Task Force in close collaboration with the Evaluation Study Consortium partner developed the Malawi evaluation work plan and budget. In addition, the Task Force reviewed and approved work plans and proposals by the sub-contractors. The Malawi Country Task Force is chaired by the Ministry of Health. It ensures co-ordination and strong linkages with the Malawi Country Co-ordination Committee. The national Task Force is supported by the National Co-ordinator based within the Research for Equity and Community Health Trust. Since its inception the Task Force has met more than four times. Among the major milestones achieved include, selection of the nine districts for the district assessment, review of all proposals and tracking of progress of the activities. In addition, the Task Force has actively reviewed and commented on project documents and secondary data analysis through the Task Force meetings. The members of the Task Force are as follows:

<b>Institution</b>	<b>Name of Member</b>
Director, TB Programme	Felix Salaniponi (Director)
Director, HMIU	Chris Moyo
UCC – UNAIDS	David Chitate
Director, Light House	Sam Phiri
Director, Malaria Programme	Doreen Ali
Director, HIV UNIT	Eric Schouten
WHO	Richard Nkhoma
National Aids Commission	Blackson Matatiyo
College of Medicine	Mfutso Bengo

#### **1.1.3.4 Financing of the Evaluation Activities**

The Global Fund approved a budget of US\$548,114 which was far much less than the budget which was submitted by the National Task Force. The National Task Force also mobilised resources at national level to complement the finances approved by the Global Fund. The stakeholders that contributed to the national budget are the National AIDS Commission and UNAIDS (US\$20,000). The National AIDS Commission pledged to fund the non-biomedical component of the study, HIV/AIDS mainstreaming and national health accounts (NHA). The National AIDS Commission also pledged to fund the health facility survey.

### **1.2 Secondary data abstraction**

Several adaptations were made to the data collection instruments during the data abstraction process. This was done so that the adaptations were relevant to the Malawian context. Several changes were made to the ART, HTC, and PMTCT tools which are mentioned below:

#### **1.2.1 ART**

The ART record review data collection tool was used for data abstraction without any abstractions to the template. However the recommended age groups of children under 5 years old or under 15 years old, men and women 15-59 years old, persons aged 60 years old and over were adapted to the Malawian hospital records as follows: children under 18 months, children under 15 years old, and 15 years old and above. The section on clinical staging for HIV positive clients was removed because it is not collected in a systematic manner.

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## **1.2.2 HIV Testing and Counselling**

The standard data collection tool for HTC was used for data abstraction. However, data on indeterminate or unknown HIV results, residence and educational status of the HTC clients was not captured because it is not normally captured in the health facilities.

## **1.2.3 PMTCT**

The standard data collection tool for PMTCT was used for data abstraction. However, age disaggregated data was not collected. For the data processing, data from the record review component was entered into standardised MS Excel tables at the health facilities by the field supervisors. The datasets were merged by the study co-ordinator, cleaned and analysed in SPSS.

## **1.3 District comprehensive assessments**

### **1.3.1 District Categorization**

Based on the Task Force recommendations, quintile analysis of coverage of intervention using malaria, TB and HIV/AIDS indicators was done to assess districts with low, medium and high coverage. The following indicators were used for calculating and categorising districts into four quintiles:

- HIV/AIDS burden
- Number of patients receiving ART
- Coverage of ITNs
- Coverage of VCT
- Coverage of PMTCT
- TB case notification

The districts in quintile 1 and 2 were regarded as low, 3 medium and 4 high in terms of intervention coverage. The Task Force endorsed the selection and made alterations based on accessibility of the districts and socio-cultural factors. Four districts were selected in Southern Region due to high population density, three in Central Region and two in the Northern Region. A combination of districts with low, medium and high coverage was selected for the study.

The following districts were selected:

- Mzimba/Mzuzu
- Karonga
- Nkhatakota
- Ntchisi
- Lilongwe
- Zomba
- Mwanza
- Machinga
- Chiradzulu

### **1.3.2 District selection criteria**

The nine districts were purposefully selected for the DCA to reflect geographical representation of each region or province, and an urban/rural selection of districts to reflect the national situation. Although the sample of districts is not statistically representative at the national level, the results in each district are representative of the district and were used to determine health service coverage, availability and quality.

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### **1.3.3 Methodology**

The DCA was undertaken as a validation exercise that involved primary data collection for HIV, TB and Malaria. This exercise focused on assessing the data quality at the district level, health expenditure by disease, the coverage of services and the utilization of health services. The assessment comprised a review of data gaps in the hospital records, implementation of a household survey, and an assessment of resources allocated to the three diseases using the National Health Accounts (NHA). Additionally, follow-up studies of patients on ART and TB treatment were included to evaluate the outcomes of treatment for HIV and TB as well as defaulters.

#### **1.3.3.1 Health Facility Survey**

This was a rapid assessment of all public and private facilities which focused on the provision of services: The presence of human resources, training intensity, basic infrastructure, basic equipment, drugs and commodity, guidelines, diagnostic support and M&E systems such as record keeping, processing, analysis and storage. The district facility census captured relative contribution of Christian Health Association of Malawi (CHAM) and government supported facilities. In order to ensure quality of data collected, researchers were trained for three days. The researchers used were medical students from the College of Medicine. A database for the major public and private health facilities within the nine districts was obtained from the Ministry of Health.

A questionnaire was administered to all major CHAM and public health facilities in the nine districts minus pharmacies. Due to limited funding coverage was not 100 percent in two districts, Lilongwe and Mzimba.

#### **1.3.3.2 Hospital record review**

For the hospital record review component of the DCA, all private and public hospitals in the nine districts were selected for inclusion in the survey. To ensure that quality data was collected one-day training for enumerators was conducted where they reviewed standardised data collection instruments for the evaluation. The field staff comprised three teams involved in the data abstraction. Each team had a supervisor to monitor the progress of the work and assess the quality of data being collected.

#### **1.3.3.3 Household and Women's Survey**

National Statistical Office (NSO) produced a new scannable version of the questionnaire so that it could be scanned during data entry. To do this the standard questionnaires sent to NSO were adapted to Eye and Hands software before the data collection training. Further, some questions on toilet facility and roofing material were removed because they were not applicable to the Malawian context:

- Toilet facility (composting toilet, bucket toilet, hanging toilet/latrine)
- Main material of the roof (roofing shingles, sod)

Additionally, two questions on monetary health insurance premiums and prepaid health plans were removed from the expenditure module since this is almost non-existent in the country.

#### **Sampling-**

Households in each district were selected using a two-stage multi-stage design. To reduce standard error, enumeration areas (EAs) which were the primary sampling units were taken as strata. In each district, 30 EAs were randomly selected with probability proportional sampling [PPS]. Twenty-five households were selected in each EA using systematic sampling after a complete listing of households in the EA was done by the enumerator. The number of

households from the 1998 Census was taken as a size measure for each EA; with the exception of EAs in the 900-series, namely national parks.

In Lilongwe the district was subdivided into two strata, one urban and one rural. The urban strata had 25 EA selected. In the rural strata, 30 EAs were selected in order to reduce variation in this district. The number of households sampled was 7,375.

The sample for the household survey was drawn from each district separately, and as it was a two-stage sample design; the weights were calculated as follows:

Let  $h$  = district number  
 $N_h$  = number of EAs to be sampled from district  $h$   
 $M_h$  = Total number of households in district  $h$ , according to population projections from 1998 Census  
 $M_{hi}$  = Measure of size of  $EA_{hi}$  from projected figures from census.  
 $M'_{hi}$  = Number of eligible households listed from  $EA_{hi}$

The probability of selection of a household in  $EA_{hi}$  was

$$P(EA) * P(HH/EA) = \frac{n_h M_{hi}}{M_h} * \frac{M_{hi}}{M'_{hi}}$$

$$\text{And the weight } w_{hi} = \frac{M_h}{n_h M_{hi}} * \frac{M'_{hi}}{25}$$

### Data quality assurance measures

To ensure that quality data was collected, one-week training for enumerators and data entry personnel was conducted where they reviewed standardised data collection instruments for the evaluation. To control the quality of household data collected, the district and senior supervisors visited each of the enumerators regularly and reviewed work for consistency. This included completeness and accuracy in filling out questionnaires. Random spot checks were done by the senior supervisors on five randomly selected households per EA. The senior supervisors signed all the activities that were done with each enumerator in the supervisors control booklet to record the supervision visit.

Quality control was achieved by having a team of highly trained data processors under the supervision by a data entry supervisor. The scanning software also has features for controlling quality. During supervision, samples of questionnaires were reviewed from each enumeration. Problems identified were cross-checked with the questionnaires.

### Data processing

Following the one-week training with the enumerators, the data entry clerks had a one-week training on data processing. The training covered how to review a questionnaire, how to scan it, and how to handle questionnaires that were not scannable due to missing data or incorrectly filled forms.

To prepare the questionnaires for data processing, the enumerators were instructed how to write digits and make marks on the questionnaire. A registry was used to verify the received questionnaires and the number of eligible study participants to ensure there was no loss of questionnaires. All questionnaires were verified using consistency checks to ensure that correct codes for the household, cluster number and gender were used.

Data processing was done parallel to data collection with a lag time of one week. The questionnaires were first checked manually and ordered to fit the scanning process, scanned

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using Readsoft scanning software, verified and finally compiled into analysis files. The data processing was supervised by a team of supervisors. In the event the scanner could not detect the questionnaire, a new questionnaire was filled out. When there was missing data, the supervisor was consulted to verify with the enumerator who would have had to go back to the field to collect any missing data. Once the data from all the questionnaires was entered, the data processing manager merged the files in SPSS. A final check to verify the data management process was verified by the study coordinator.

### **Calculation of wealth quintiles**

The calculation of wealth quintiles was based on the Principal Components method using household asset variables that correlate with expenditure. The variables were generated from questions about ownership of electronic items such as TV or radio, housing materials such as flooring, sources of drinking water and toilet facilities. Each asset was assigned a weight (factor score) where the score differs depending on whether the household owned that asset and the resulting asset scores were standardized in relation to a standard normal distribution with a mean of zero and standard deviation of one. The total population in the households included in the sample was then divided into quintiles from one (lowest) to five (highest). The distribution of heads of households by quintiles indicates the degree to which wealth was evenly (or unevenly) distributed by district.

#### **1.3.3.4 ART Treatment Outcome and Follow-up Study**

The study comprised a sample of patients from a retrospective cohort of adults enrolled in ART programmes in the selected districts for the DCA. The source of data was pre-existing patient-level data from facility registers, patient records, and lab records. Information on key patient-level demographic and clinical characteristics was abstracted and associated with patient outcomes, however no personal identifiers were collected. A Unique Abstraction Code was assigned to each subject and was used to cross-reference patients between different types of records.

Data collection of retrospective patient information from ART sites involved transcribing data from facility registers and patient records directly into a laptop computer. Data collection was planned for a total sample of 1,800 ARV patients in all ART facilities in the nine districts selected for the DCA. However, despite the ethical clearance obtained from the Ministry of Health, the providers in Karonga and Mwanza were reluctant to release information from the Master Cards for patients. This led to extraction of data for 1,138 patients from 8 districts excluding Mwanza. In Chiradzulu data collection was delayed since permission from the authorities was required for ART sites operated by MSF.

### **Quality assurance**

To ensure accuracy in data collection, a back-up of the original data, without personal identifiers to ensure confidentiality, was obtained by photographing pertinent information with digital cameras. Transcribed data will subsequently be checked for completion and a sample of individual values verified. Where electronic data existed, a copy of the anonymized dataset of eligible patients was obtained.

The data collection for the ART follow-up study component was undertaken in collaboration with the District TB Officers and ART clerks. Both REACH Trust researchers and the district members involved were trained for three days to achieve the following:

- Understanding of the key concepts and nature of data to be retrieved
- Issues of confidentiality
- Interviewing skills

Supervision of the field work was undertaken by the lead REACH Trust researcher.

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### 1.3.3.5 TB Treatment outcome and defaulter follow-up study

The scope of the tuberculosis follow-up study was reviewed by REACH Trust and NTP officers. It was agreed that the study should focus on tracing defaulter and patients who did not return to submit sputum for verification of treatment outcome. The purpose of focusing on these two elements was to generate information that can improve quality of services and identify factors leading to defaulting and lack of compliance to submitting specimen. The evaluation of outcomes following tuberculosis treatment and defaulter study involved patients 18 years and older diagnosed within the NTP with new smear-positive pulmonary tuberculosis, who began and completed treatment under DOTS and were declared to be cured. Review of patients' outcomes was undertaken on patients who had been registered on TB treatment within three quarters (October 2006 to June 2007).

Initially the study was designed for a sample size of 138 patients however data was collected for 111 patients who were lost to follow-up and did not return for final sputum collection. The data on patient characteristics and treatment outcomes mainly on death, cured, treatment completed and lost to follow-up was collected from the district tuberculosis register using standardized forms. All patients who were identified as defaulters and treatment completed without follow-up laboratory test were followed and interviewed using a structured questionnaire. Where consent was granted patients who had completed treatment were requested to submit specimen for verification of their TB outcome status. As part of quality assurance, ethical clearance was obtained from the Ministry of Health to follow-up patients, interview and collect sputum. The researchers were trained for three days on the following:

- Data abstraction from the TB and patients' registers
- Community and patient approach
- Interviewing skills and quality control
- Data entry.

Field work was undertaken for a period of three weeks. This was longer than expected because tracing of houses of patients in some cases was very challenging because of wrong information provided or relocation. Supervision was undertaken by REACH Trust senior researcher. Data management was done using Epi-Info. The REACH Trust Data entry clerk conducted the data entry and was checked and cleaned by the Senior Researcher.

### 1.4 District individual characteristics

Table 1.2 shows a description of the basic characteristics of the women interviewed in the DCA Household Survey. It provides the background for interpreting findings presented later in the report. The table shows how women classified by age, education and wealth quintiles are distributed according to District.

In addition to standard background characteristics, most of the results for the DCA Household Survey are shown by wealth quintiles, an indicator of the economic status of households. Although the surveys do not collect data on consumption or income, they do collect detailed information on dwelling and household characteristics; access to a variety of consumer goods and services; and assets which are used as a measure of socio-economic status. The resulting wealth index is an indicator of the level of wealth that is consistent with expenditure and income measures. The wealth index is constructed using household asset data and principal components analysis. Each asset is assigned a weight (factor score) where the score differs depending on whether the household owned that asset (or, in the case of sleeping arrangements, the number of people per room), and the resulting asset scores are standardized in relation to a standard normal

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distribution with a mean of zero and standard deviation of one. Each household is then assigned a score for each asset, and the scores are summed for each household; individuals are ranked according to the total score of the household in which they reside. The total population in the households included in the sample is then divided into quintiles from one (lowest) to five (highest). The distribution of women by quintiles indicates the degree to which wealth is evenly (or unevenly) distributed by district.

The results indicate that of the women in the interviewed districts, 35 percent, 49 percent and 16 percent were of age group 15-24 years, 25-39 years and 40 years plus respectively. About 19 percent of the women on average had no formal education while 67 percent had attended primary school level. Only less than 14 percent had done secondary school or higher education. In Lilongwe city, almost half of the women had attended higher education. The distribution of women within the quintile groups is on average the same across the quintiles except in Ntchisi, Mzimba and Lilongwe.

Table 1.2 Age, education, and wealth quintile of women by district															
Percent distribution of women age 15-49, by age, education, and wealth quintile, according to district, [Malawi, 2007]															
	Age group of woman			The highest level of school attended					Wealth Quintile				Total Women	Missing	
	15-24	25-39	40+	None	Nursery	Primary	Secondary	Higher	Lowest	2	3	4			5
<b>Total</b>	1,716	2,436	773	936	3	3,314	671	39	794	887	908	947	950	4,925	459
<b>Karonga</b>	12	10	9	6	0	9	9	5	8	8	7	9	9		
<b>Mzimba</b>	8	10	14	5	0	10	14	10	7	9	14	8	10		
<b>Nkhotakota</b>	8	9	9	12	0	9	7	3	9	10	9	11	8		
<b>Ntchisi</b>	10	12	9	9	0	13	10	8	17	9	10	10	7		
<b>Lilongwe Rural</b>	12	12	11	16	0	13	6	3	19	14	14	13	6		
<b>Lilongwe City</b>	10	9	5	5	33	7	24	46	7	5	7	9	20		
<b>Machinga</b>	10	9	11	16	0	9	5	8	7	9	6	7	6		
<b>Zomba</b>	9	9	11	8	33	11	8	8	8	12	11	12	11		
<b>Chiradzulu</b>	11	11	13	12	33	12	11	10	8	12	13	12	14		
<b>Mwanza</b>	10	8	8	10	0	9	6	0	11	11	8	8	7		

<b>Table 1.3 Frequencies of women and children in households</b>		
	<b>Household survey</b>	<b>Women's survey</b>
Children under 18 years	16,086	-
Children under 5 years	5185	-
Women aged 15-49 years	1,346	5,384
<b>Total population sampled</b>	<b>17,634</b>	<b>5,384</b>
Mean number of people per household	3	-
Mean number of children aged under 5 years per household	1	1
Mean number of children aged under 18 years per household	3	-
Total children listed in birthhistory*	-	4,724
*Children aged under 5 years were reported by women interviewed		

A breakdown of the women and children sampled in the household and women's surveys are shown in Table 1.3. On average, the number of children per household aged under 5 and 18 years were 1 and 3 respectively. The total population sampled in the household survey were 17,634. More than 5,000 women were sampled in the women's survey.

Tables 1.4 and 1.5 report the total number of facilities sampled for the health facility survey from the nine districts. Out of the total of 375 facilities in the nine districts, 113 facilities were selected for the study (Table 1.4). This represents 30% of all the facilities in the nine districts. We did not conduct a facility census because of a small survey budget. In particular, budget and time constraints necessitated sampling of facilities from the nine study districts. The decision to sample the facilities was reached after consultations with the Technical Working Group (Task Force) of the Impact Evaluation Study.

The survey findings of 113 out of 375 health facilities do not have high validity or reliability. The study may not be representative of the entire population of health facilities even though the sample was derived from a probability distribution. In particular, the sampled facilities may not adequately represent other facilities because the information that was collected from the facilities is dynamic in nature. That is, health facilities may not have the same information at particular point in time. For example, it might be case that all the sampled facilities had electricity at the time of the survey while the bulk of the facilities that were not sampled did have electricity at the time of the survey. It would therefore be difficult to generalise the result of the survey that all the facilities had electricity at the time of the survey. This interpretation could be correct if all the facilities were included in the survey. In light of this, handicap, the result of the survey may therefore not be representative of the entire population of facilities.

The bias arising from sampling of facilities may further be exacerbated by strategic bias. Respondents may have falsified information with the expectation that the Global Fund or the government would provide more resources to their facilities. This bias may have been attenuated by the fact that interviewers were given strict instructions that they would have to physically inspect health infrastructure that health providers claimed that were available or not available at the health facility. Moreover, all interviewers were medical doctors who have a good knowledge of health facilities in Malawi.

Caution also needs to exercise when interpreting the results of the facility survey , It is important to note that most facilities in the sample are in rural areas and a disproportionate number of them are public facilities. Rural facilities, more often than not, are not the mirror image of the urban facilities in terms of their capacity to provide health care services. The quality of services of urban facilities measured in terms of availability of basic infrastructure, supplies and trained staff may be better than the facilities domiciled in rural areas. The problem of urban rural-bias is further exacerbated by the fact that there are no standardised indicators of health facility survey against which the results of the survey may compare with.

The other problem related to the urban-bias in the distribution of facilities is that the bulk of rural facilities are served by not-for-profit mission hospitals. Not-for-profit health facilities have generally better health infrastructure than public health facilities since they are largely funded by donors. This state of affairs makes it difficult to generalise the results of the facility survey to entire population of facilities, both those that participated in the survey and those that did not participate in the survey.

There was also severe time constraint for data collection. Survey teams covered several health facilities within a day. It is questionable whether a one-day visit was sufficient to provide reliable data on health facilities. This is especially true given the poor recording and reporting system in public health facilities. However, despite the aforementioned problems the results of the survey provides fairly balanced picture of the availability and quality health services in health facilities in Malawi. The results of the survey should therefore be interpreted as providing baseline data and a quick snapshot of health facilities in Malawi. In addition, tables on human resource capacity, drug availability, and services offered can be found in Appendix D

Study Districts	Population	All facilities	Selected facilities	Public facilities	Private facilities
Lilongwe	1,871,970	108	16	44	64
Rural	1,165,636	50	11	<b>24</b>	<b>64</b>
City	706,334	57	5	-	-
Chiradzulu	290,780	19	13	12	7
Karonga	243,666	26	8	17	9
Machinga	433,264	32	19	20	12
Mzimba	950,000	84	8	46	38
Nkhotakota	292,556	28	15	14	14
Zomba	699,186	47	10	26	21
Mwanza	173,384	17	12	14	3
Ntchisi	223,223	14	12	11	3
<b>Total</b>		<b>375</b>	<b>113</b>	<b>204</b>	<b>171</b>

**Note:** Private facilities include for and not-for-profit facilities and health facilities owned by statutory corporations.

Malawi has five tertiary hospitals of which four are in the sampled districts. Among the four hospitals only one was selected for the study in Zomba. Zomba Central Hospital was selected because it acts as third level referral for other districts but at the same time it provides second level referral services for Zomba District. The other three referral hospitals in the sampled district were not selected because they do not serve only their respective districts but also neighbouring districts.

There are a total of 37 second level hospitals in the sampled districts. The majority of these hospitals are not-for-profit mission hospitals. Out of the 37 hospitals, eight were selected representing 22 percent of second level facilities. Almost all of the selected facilities were district hospitals. In light of the small sample size, caution should be exercised in interpreting the results since they may not be representative of the entire population of facilities. In particular, the capacity of sampled public hospitals may not be the same as the capacity of not-for-profit mission hospitals that form the bulk of second level hospitals. It is widely believed that the quality of health care services at the not-for-profit mission hospitals is higher than the quality of services offered at public hospitals.

The nine sampled districts host 331 primary facilities. Two hundred and sixty out of 331 primary facilities are from rural areas. Eighty-three primary facilities were selected representing 25 percent. Out of 260 rural primary facilities, 78 facilities were sampled for the study. This

represents 30 percent of the total rural facilities in the nine districts. It is worth noting that in districts that are predominantly rural, all the facilities are categorized as rural.

Type of facility	District									Total
	Lilongwe	Chiradzulu	Karonga	Machinga	Mzimba	Nkhotakota	Zomba	Mwanza	Ntchisi	
Tertiary Care Third level (tertiary) hospital	0	0	0	0	0	0	1	0	0	1
Secondary Care Second level referral Hospital	15	13	6	18	8	15	8	12	12	107
First level Hospital	2	3	0	3	3	4	2	3	0	20
Urban Health Centre	3	1	0	0	0	0	1	0	0	5
Rural Health Center	9	8	5	14	5	10	5	7	11	74
Primary Care Dispensary	0	0	2	1	0	0	1	0	0	4
Number of facilities	0	0	2	1	0	0	1	0	0	4
Other	15	13	8	19	8	15	10	12	12	112
Total number of facilities	1	0.	0	0	0	0	0	0	0	1
	16	13	8	19	8	15	10	12	12	113.0

Table 1.6 reports the number of hospitals and beds per a population of 10,000. It shows that the number of hospitals per a population of 10,000 is less than one or zero. Mwanza district has the highest number of in-patient beds, maternity beds and hospital delivery beds per 10,000 population despite being categorized as a low density district. Lilongwe has the lowest number of inpatient, and hospital delivery beds per 10,000 population.

**Table 1.6 Hospital density.** Hospitals and hospital beds (in-patient, maternity, delivery) per 10,000 population by district, Malawi 2008

District	Population	Hospitals per 10,000 population	Hospital in-patient beds per 10,000 population	Hospital maternity beds per 10,000 population	Hospital delivery beds per 10,000 population	Hospitals	Hospital in-patient beds	Hospital maternity beds	Hospital delivery beds
<b>Type of District</b>									
<b>High</b>	<b>1,871,970</b>	<b>0.02</b>	<b>0.04</b>	<b>0.73</b>	<b>0.11</b>	<b>3</b>	<b>8</b>	<b>136</b>	<b>20</b>
Lilongwe	1,871,970	0.02	0.04	0.73	0.11	3	8	136	20
<b>Medium</b>	<b>2,909,452</b>	<b>0.07</b>	<b>1.51</b>	<b>1.31</b>	<b>0.27</b>	<b>20</b>	<b>439</b>	<b>382</b>	<b>79</b>
Chiradzulu	290,780	0.14	0.21	0.41	0.65	4	6	12	19
Karonga	243,666	0.04	0	1.56	0.25	1	0	38	6
Machinga	433,264	0.09	0.12	1.32	0.39	4	5	57	17
Mzimba	950,000	0.03	0.81	0.49	0.13	3	77	47	12
Nkhonkhotakota	292,556	0.17	10.84	5.37	0.44	5	317	157	13
Zomba	699,186	0.04	0.49	1.02	0.17	3	34	71	12
<b>Low</b>	<b>396,607</b>	<b>0.15</b>	<b>32.1</b>	<b>3.56</b>	<b>1.08</b>	<b>6</b>	<b>1,273</b>	<b>141</b>	<b>43</b>
Mwanza	173,384	0.29	73.42	6.52	2.19	5	1,273	113	38
Ntchisi	223,223	0.04	0	1.25	0.22	1	0	28	5
<b>Total</b>	<b>5,178,029</b>	<b>0.06</b>	<b>3.32</b>	<b>1.27</b>	<b>0.27</b>	<b>29</b>	<b>1720</b>	<b>659</b>	<b>142</b>

Table 1.7 shows that in all nine districts, the number of medical doctors per 10,000 populations is less than one or zero. Nkhonkhotakota has the highest number of clinical officers and registered nurses per 10,000 population while Mzimba has the lowest number of registered nurses per 10,000 population. Mwanza has more clinical officers and laboratory technicians than any of the sampled districts. The reason why Mwanza district might have more of these health professionals is that the district was recently divided into two districts. Since the district was divided more facilities have been established. All districts have less than one laboratory technicians and technologists and lab assistants.

Table 1.8 shows second level referral hospitals in Lilongwe and Nkhonkhotakota had the entire basic infrastructure on the day of the interview. Zomba urban health centre also had the basic infrastructure. Most second level referral hospitals did not have high level infrastructure with the exceptions of Chiradzulu, Karonga and Mwanza.

All second level referral hospitals had a complete set of basic supplies on the day of the interview except for Machinga, Mwanza, Mzimba and Zomba (Table 1.9). Lilongwe is the only first level hospital that had a complete set of basic supplies. Interestingly, the rural health centres had a high percentage reporting a complete set of basic supplies.

<b>Table 1.7 Health workforce density</b>								
Types of fulltime workforce per 10,000 population by district, Malawi 2008								
District	Population	Medical doctors physicians	Clinical officers/ assistant medical officers	Certified/ registered nurses	Nursing assistants / nursing aides	Certified/ registered midwives	Laboratory technicians/ technologists	Lab assistants
<b>Type of District</b>								
<b>High</b>	<b>1,871,970</b>	<b>0.05</b>	<b>0.3</b>	<b>0.66</b>	<b>0.15</b>	<b>0.61</b>	<b>0.04</b>	<b>0.05</b>
Lilongwe	1,871,970	0.05	0.3	0.66	0.15	0.61	0.04	0.05
<b>Medium</b>	<b>2,909,452</b>	<b>0.07</b>	<b>0.59</b>	<b>1.17</b>	<b>1.31</b>	<b>0.95</b>	<b>0.09</b>	<b>0.07</b>
Chiradzulu	290,780	0.1	1.2	1.1	1.07	0.76	0.21	0.03
Karonga	243,666	0.04	0.78	1.85	2.01	1.72	0.21	0
Machinga	433,264	0.02	0.42	0.65	1.64	0.62	0.02	0.35
Mzimba	950,000	0.01	0.16	0.52	0.64	0.48	0.01	0
Nkhonkhotakota	292,556	0.1	1.2	4.24	4.51	3.73	0.21	0.03
Zomba	699,186	0.14	0.72	0.89	0.53	0.41	0.1	0.04
<b>Low</b>	<b>396,607</b>	<b>0.15</b>	<b>1.26</b>	<b>2.85</b>	<b>2.6</b>	<b>1.97</b>	<b>0.23</b>	<b>0.08</b>
Mwanza	173,384	0.29	1.38	3.29	4.73	1.5	0.4	0.17
Ntchisi	223,223	0.04	1.16	2.51	0.94	2.33	0.09	0
<b>Total</b>	<b>5,178,029</b>	<b>0.07</b>	<b>0.54</b>	<b>1.11</b>	<b>0.99</b>	<b>0.9</b>	<b>0.08</b>	<b>0.06</b>

**Table 1.8 Readiness of facilities to provide services**

Percentage of health facilities on the day of the interview with basic and high-level infrastructure to provide services by district, Malawi 2008

Level of infrastructure	Districts									Total
	Lilongwe	Chiradzulu	Karonga	Machinga	Mzimba	Nkhotakota	Zomba	Mwanza	Ntchisi	
<b>Basic Level Infrastructure</b>										
Secondary Care	20.0	7.7	16.7	33.3	12.5	26.7	75.0	25.0	8.3	24.3
Second level referral Hospital	100.0	0.0	0.0	0.0	-	100.0	-	50.0	0.0	37.5
First level Hospital	50.0	0.0	-	66.7	0.0	50.0	50.0	33.3	-	35.0
Urban Health Centre	0.0	0.0	-	-	-	-	100.0	-	-	20.0
Rural Health Centre	11.1	12.5	20.0	28.6	20.0	10.0	80.0	14.3	9.1	20.3
Total	20.0	7.7	12.5	31.6	12.5	26.7	60.0	25.0	8.3	23.2
<b>High Level Infrastructure</b>										
Third level (tertiary) hospital	-	-	-	-	-	-	100.0	-	-	100.0
Secondary Care	0.0	7.7	16.7	0.0	12.5	0.0	0.0	8.3	0.0	3.7
Second level referral Hospital	0.0	100.0	100.0	0.0	-	0.0	-	50.0	0.0	37.5
First level Hospital	0.0	0.0	-	0.0	33.3	0.0	0.0	0.0	-	5.0
Total	0.0	7.7	12.5	0.0	12.5	0.0	10.0	8.3	0.0	4.5
Note: Basic Level Infrastructure DOESN'T INCLUDE those facilities having High Level Infrastructure										

<b>Table 1.9 Health facilities with a complete set of supplies</b>										
Percentage of health facilities on the day of the interview with a complete set of basic and high level supplies by district, Malawi 2008										
Level of supplies	District									Total
	Lilongwe	Chiradzulu	Karonga	Machinga	Mzimba	Nkhotakota	Zomba	Mwanza	Ntchisi	
<b>Basic Level Supplies</b>										
Secondary Care	66.7	46.2	50	77.8	75	60	75	66.7	66.7	65.4
Second level referral Hospital	100	100	100	0	-	0	-	50	100	62.5
First level Hospital	0	33.3	-	100	66.7	50	50	66.7	-	55
Urban Health Center	66.7	0	-	-	-	-	100	-	-	60
Rural Health Centre	77.8	50	40	78.6	80	70	80	71.4	63.6	68.9
Primary Care	-	-	50	100	-	-	100	-	-	75
Dispensary	-	-	50	100	-	-	100	-	-	75
<b>Total</b>	<b>66.7</b>	<b>46.2</b>	<b>50</b>	<b>78.9</b>	<b>75</b>	<b>60</b>	<b>70</b>	<b>66.7</b>	<b>66.7</b>	<b>65.2</b>
<b>High Level Supplies</b>										
Third level (tertiary) hospital	-	-	-	-	-	-	100	-	-	100
Secondary Care	13.3	7.7	0	5.6	12.5	20	12.5	8.3	0	9.3
Second level referral Hospital	0	0	0	100	-	100	-	50	0	37.5
First level Hospital	100	33.3	-	0	33.3	25	0	0	-	25
Rural Health Center	0	0	0	0	0	10	20	0	0	2.7
<b>Total</b>	<b>13.3</b>	<b>7.7</b>	<b>0</b>	<b>5.3</b>	<b>12.5</b>	<b>20</b>	<b>20</b>	<b>8.3</b>	<b>0</b>	<b>9.8</b>
Note: Basic Level Supplies DON'T INCLUDE those facilities having High Level Supplies										

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## 2.0 Data Sources and Quality

### 2.1. Description of HMIS

The Health Management Information System (HMIS) in Malawi is responsible for compiling HIV, TB and Malaria data from health zones. Data reporting for HIV is done by District health officers (DHO) who send data from the health zones to the HMIS at the Central level. For malaria data, the district malaria control co-ordinator is responsible for data compilation and reporting. The National Malaria Control Programme (NMCP) collates data from the district and sends it to four officers at the national level who form the core co-ordination team that receive data. Similarly, the District TB Officer is responsible for data compilation and reporting to the Zonal Officers who report to the Central level. This reporting system in the National TB Programme ensures that complete reports are received at the central level in a timely manner. Programme review meetings are held at the central unit, zonal and district levels on a quarterly basis.

The Health Information System in Malawi has experienced several problems with data quality from the HIV programme but the TB and malaria data are of reasonable quality. The sub-contractors faced challenges retrieving disaggregated data for age particularly in the years prior to 2000. This was attributed to lack of computerisation and consequently the sub-contractors had to rely on data from reports. Additionally, data storage at health facilities was an issue for the hospital record review particularly for the HIV counselling and testing data. Similarly, data on referrals was hard to abstract due to poor documentation. There was also the issue of double counting regarding HIV services. This was evident among people who attend both HTC and ANC clinics.

During the data abstraction process the sub-contractors found the following challenges particularly with the HIV data:

- Funds allocated to the data collection were very limited considering the amount of work that was required for the study.
- Districts were not well sensitized about the data collection activities so the team faced administrative challenges in accessing data.
- The data abstraction team came across several missing registers and in some cases there was no standard reporting format e.g. PMTCT.
- Pre-ART data was not collected because the existing health information system did not capture ART data before the roll out.
- The data abstraction team encountered incomplete data on CD 4 count during follow-up visits and other indicators because it was not recorded systematically.

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### 2.1.2 An Overview of HMIS

The Ministry of Health collects the bulk of the health information in Malawi. At each district hospital, the Ministry of Health has a statistician who collaborates with health workers to gather and compile all the health information from all the facilities in the district. The District Health Officer supervises the data collection and compilation at the district level. The gathered information is then dispatched to the Ministry of Health headquarters for aggregation. Each District Health office is expected to send the compiled data to the headquarters every quarter. At the headquarters, the disease-specific departments review the data and make their comments, which are then sent back to the District Health Officer's office for relevant action. The cleaned data is then sent back to the Ministry of Health after taking care of the comments and other suggestions. The data is finally aggregated in order to derive statistics at the national level.

Lack of human and financial resources and poor health records compromise the quality of data. In particular, comprehensive and well-updated data is not available due to financial and human resource bottlenecks. In most cases, there is only one statistician stationed at the district hospital who is charged with the responsibility of collecting all data in the district. The other challenge is due to the fact that the culture of keeping comprehensive health records is not yet developed in developing countries in general and Malawi in particular. It is common to find patient registers that are missing, incomplete or that have the wrong patient information. For example, during the national record review it was discovered that most records on women accessing PMTCT were missing in most public hospitals. The other difficulty is lack of fully fledged monitoring and data collection systems. For example, the majority of rural health facilities do not keep patient registers. This makes it hard to gather the information. One consequence of this is that the data reported at national level is highly underestimated since it does not capture all the data that is available at the grassroots of the health care delivery system. The government however is in the process of alleviating this problem by recruiting more statisticians to assist in data collection and compilation at the district, zonal and national levels.

### 2.1.3 HIV/AIDS

A large number of players are involved in data collection and compilation for HIV/AIDS. The main players are the Ministry of Health (MoH), the National AIDS Commission (NAC), health-related civil society organisations, not-for-profit mission hospitals and for-profit health facilities. As an HIV/AIDS managing authority, data collected by these organisations is sent to the NAC which works hand in hand with the MoH HIV/AIDS Unit.

At district level, the District HIV/AIDS Co-ordinator compiles HIV/AIDS data in collaboration with other health personnel. The compiled data is then sent to the HIV/AIDS Unit of the Ministry of Health. The HIV/AIDS Unit is directly involved in supervision and collection of data. For example, it conducts quarterly review of HIV/AIDS patients' registers in all the facilities offering ART treatment in the country and produces quarterly ART reports.

HIV/AIDS information is also collected through the Community Health Sciences' Epidemiology Unit (CHSU). This department conducts HIV/AIDS sentinel surveillance survey in antenatal care (ANC) clinics in all the districts in the country. It is from this data that the National AIDS Commission estimates the incidence and prevalence of HIV/AIDS. HIV/AIDS data is also collected through the not-for-profit mission hospitals. The NAC also collects data through the annual Situation Analysis Studies since 2006. Data is also gathered from special studies that are commissioned by NAC. Data from NAC is finally sent to the HIV/AIDS Unit for aggregation. There are also non-governmental organisations that collect information on

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HIV/AIDS that is finally forwarded to NAC for review and aggregation. HIV/AIDS is also gathered through for-profit (private) health facilities that are normally not included in the data that is reported by the Ministry of Health.

It is clear from the above discussion that the multiplicity of players and the lack of proper co-ordination in the HIV/AIDS data collection present an opportunity for over or under-reporting the data (HTC data for example). That is, the data that is reported at the national level may not represent the 'true' data that is available at grass-root level of the health delivery system. For example, there is double counting for data on VCT. Women who visited a VCT centre and tested positive are recorded at the VCT centre. If these women fall pregnant they are also recorded as positive cases at the ANC. The implication is that at national level these women are counted twice. If the work of VCT centres and antenatal clinics were co-ordinated the problem would be minimised.

#### **2.1.4 Tuberculosis**

The National Tuberculosis Control Programme (NTP) is responsible for collecting TB data in Malawi. The District TB Officers collect data at the district level with the help of other health workers. The Zonal TB Officers supervise and review the data before dispatching it to the Central Office of the NTP. The Data Management Officer at the NTP reviews the data and then aggregates it to derive TB statistics at the national level. The aggregated data is then sent to the Ministry of Health for records. In most cases, the data collection and reporting for TB is timely. This is a direct consequence of proper co-ordination of data collection. .

What has tarnished the good image of NTP is that NTP lost its data before 1999. NTP officials have reported that the backup computer crashed. Consequently, the data that is reported before 1999 relies on reports hence making it unreliable. This may also explain discrepancies between the NTP data and the TB data that is reported by the World Health Organization.

#### **2.1.5 Malaria**

The National Malaria Control Programme (NMCP) collects from health facilities and national surveys. District Malaria Co-ordinators compile data from hospital records and from other public health facilities in the district. The data is then sent to the District Health Officer who forwards it to the NMCP. The NMCP aggregates the data from all districts and then sends it to the MoH headquarters. Data collection for malaria is well-coordinated but the problem is that the NMCP is grossly understaffed. For example, it does not have a monitoring and evaluation officer who would be responsible for measuring the impact of the malaria interventions in the programme. Further, lack of proper records or incomplete records at the health facilities make it hard to compile data on some variables such as percentage of suspect malaria cases diagnosed with microscopy, number of slides taken and read, number of rapid diagnostic tests taken and read, and number of laboratory technicians trained in microscopy, among other variables.

### **2.2 Quality of HIV HMIS data**

There are some limitations of the data submitted by the HTC sites to the DHOs, but due to the design of the data collection tools, these had previously not been quantified. The Situation Analysis (SA) of 2006 assessed the completeness of routinely reported data on HTC utilization by comparing aggregates available at the DHO with aggregates that were obtained directly by visiting the facilities. Table 2.1 shows the aggregates for HTC encounters by managing authority of the respective sites, comparing the data available at the DHO with the data directly obtained from the sites. At the national level, information on 15 percent (89,927) of tests was not

available through reports submitted to the DHO. HTC sites managed by NGOs had the highest proportion of unreported tests (31 percent), followed by facilities managed by the MOH (12 percent)<sup>4</sup>.

**Table 2.1 Availability of data on total number of HTC encounters from reports found at DHO compared to aggregates obtained from HTC sites**

Managing authority	Total tests	Reported to DHO		
		Yes	No	
Ministry of Health	322,270	282,534	39,736	12%
Christian Health Association of Malawi (CHAM)	120,850	117,329	3,521	3%
Independent NGO	152,605	105,991	46,614	31%
Army	2,890	2,890	0	0%
Police	1,549	1,549	0	0%
Private sector	8,891	8,835	56	1%
Research	5,325	5,325	0	0%
Total	614,380	524,453	89,927	15%

Source: HMIS (2007)

## 2.3 Quality of TB data reported from the routine surveillance system

### 2.3.1 Completeness

The TB data from the National Tuberculosis Control Programme is of reasonable quality. There is a foolproof recording and reporting system that ensures timely reporting and completeness of data. Programme review meetings are held on a quarterly basis at the central unit, zonal and district levels. The only drawback however is that in earlier years of the TB programme some data was not available.

### 2.3.2 Completeness, Timeliness and Comprehensiveness of Reporting for TB

The NTP achieved 100 percent completeness of data from 1998 to 2007 (Table 2.2). Zone TB officers compile district TB data from district TB officers and cross-check with district TB registers data during supervision every quarter. In some isolated instances, like in the year 1999 age-related data are missing for the fourth quarter. This was at a time when data management was not computerized and there was no person designated to manage NTP data. This explains why there are discrepancies between data reported to WHO by NTP and NTP data. The quarterly TB review meetings, as earlier stipulated, are quite critical to achieving completeness of data and timely reporting. All expected quarterly reports from districts were received by NTP between 1998 and 2007.

<sup>4</sup> Situation Analysis Report (2006)

Reporting Regions	Percentage of districts providing information from all activity sites	Percentage of sites providing information on all variables	Total number of districts expected to report	Percentage of districts providing information from all activity sites	Percentage of districts providing information on all variables	Total number of districts expected to report
	Q4 1998	Q4 1998	Q4 1998	Q4 2007	Q4 2007	Q4 2007
North	100	100	5	100	100	5
Centre	100	100	9	100	100	9
South	100	100	10	100	100	12
<b>Total</b>	<b>100</b>	<b>100</b>	<b>24</b>	<b>100</b>	<b>100</b>	<b>26</b>

Source: NTP (2007)

### 2.3.3 Accuracy: Internal Consistency

Figure 2.1 shows a decline in notification rates in all forms of TB, except sputum smear negative TB. Recurrent TB cases, reported as 'other', were not reported before 2002 and are not included in the graph. There is, of course, a larger proportion of sputum smear negative TB cases throughout. Smear negative TB cases include children in whom TB diagnosis requires some skills which are lacking in most health care providers in different facilities. The impact of HIV may be another factor contributing to fluctuating numbers up to the year 2001 as seen in the graph below. Failure and default rates remain negligible and relapse rate has even reduced over time, possibly a sign of good programme performance.

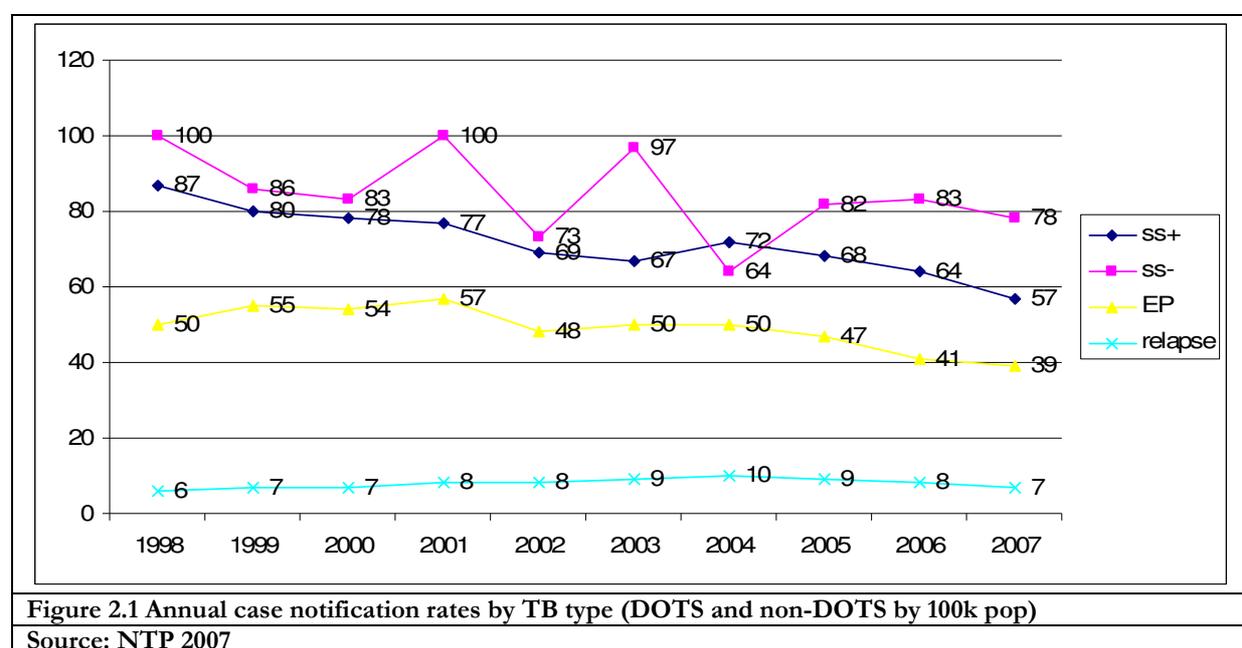


Figure 2.2 shows the proportion of all unfavourable outcomes combined is above the target of 15 percent in all the years. Death is the dominating unfavourable outcome. It however declined from 22 percent in 1998 to 13 percent in 2006. A high death rate may be explained by the fact that a disproportionate number of TB patients are also infected with HIV. Failure, default and transfer rates combined are equal to or less than 10 percent in all the years.

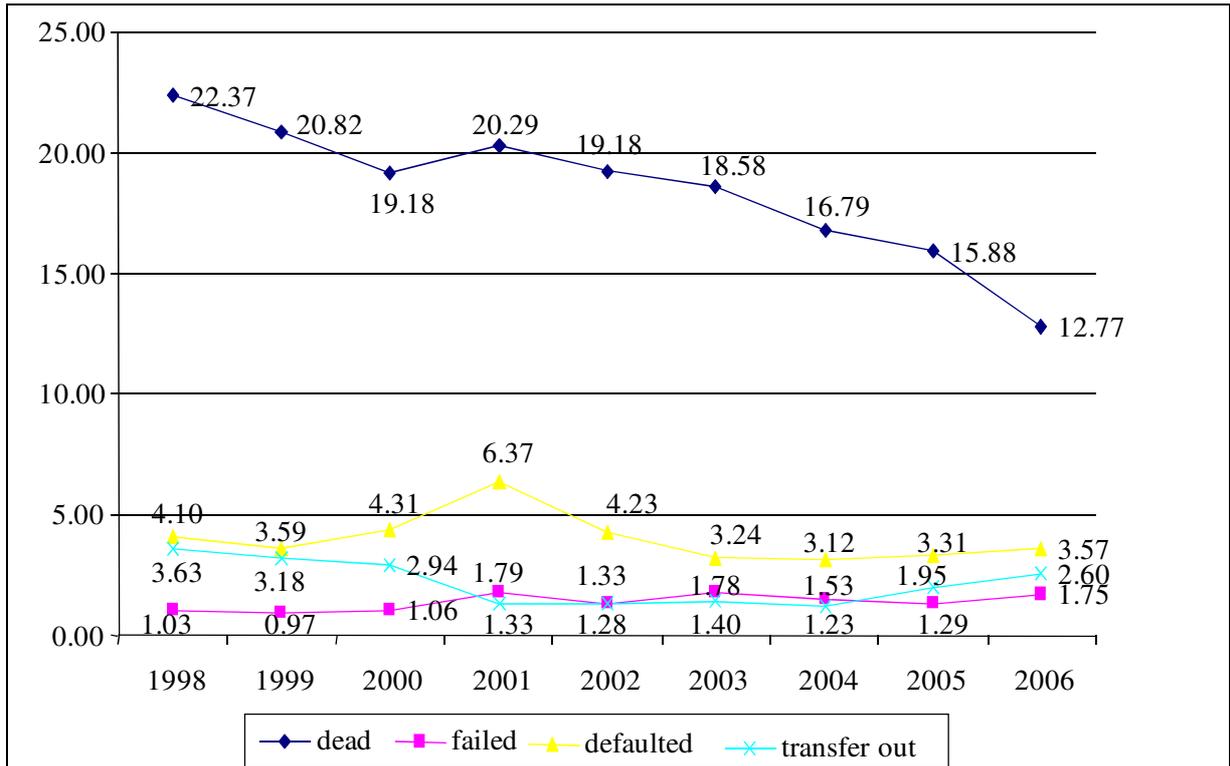


Figure 2.2 Trend in unfavourable treatment outcomes as a percentage of new ss+ (change numbering)

Source: NTP (2007)

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## 3.0 HIV/AIDS

### 3.1 HIV/AIDS in Malawi

#### 3.1.1 Historical Perspective

Malawi is one of the countries in Sub Saharan Africa that has been hit hard by the HIV/AIDS epidemic. The first case of HIV/AIDS was reported in 1985. The national HIV/AIDS prevalence estimated from antenatal clinic sentinel surveillance data among persons aged 15-19 years was estimated at 0.59 percent in 1985. It rose to 1 percent in 1986 and frog-jumped to 14.7 percent in 1999 (National AIDS Commission-NAC, 2003). The 2007 sentinel surveillance survey estimated the HIV prevalence rate among those aged 15-49 years to be at 12 percent (Ministry of Health, 2007).

There are spatial, gender and regional disparities in the prevalence of HIV/AIDS. The urban areas' HIV sero-prevalence is 17.8 percent (and for rural areas it is 12.3 percent. The southern region HIV sero-prevalence among antenatal women in urban areas is estimated at 19 percent while the central and northern regions is 13 and 10 percent respectively (Malawi Government, 2007)

Aggregated antenatal surveillance statistics further show that in 2005, antenatal HIV prevalence in the country peaked in the 25-29 age group at nearly 22 percent. In 2005, 14.3 percent of antenatal young women aged 15-24 years in the country were HIV infected. Among young teenage pregnant women aged 15-19 years, the HIV prevalence was already over 10 percent, while among young women aged 20-24 years, the prevalence of HIV infection was 16.4 percent. Although the annual trends in antenatal HIV sero-prevalence among young antenatal women in Malawi also indicate some declines in new infections, the prevalence levels are still very high. Despite the glimmer of hope from a lower prevalence in 2003, the HIV/AIDS prevalence rate picture is still gloomy. It points to high levels of new infections still occurring in the country and also the heightened risk of mother to child transmission of HIV (MTCT). These infections among young people who have only recently started sexual activity represent recent infections. It therefore signals the failure of prevention efforts to protect young people especially girls.

Gender-biased prevalence and incidence of HIV/AIDS among men and women were established early in the history of the epidemic. More women are infected than men and more girls are infected than boys. Girls between the ages of 15-24 years are twice more susceptible to HIV infection than are boys in the same age category. In 2000, HIV/AIDS among 15-24 year olds was estimated at 15.3 percent for females whereas the male's estimate staggered at 7 percent (United Nations Secretary General's HIV/AIDS Country Report)<sup>5</sup>.

Malawian women become infected with HIV at younger ages than men. HIV/AIDS prevalence peaks in females between 15 and 29 years whereas for men the peak age is greater than 30 years. This disparity in prevalence rate of HIV/AIDS between men and women has several implications. First, it suggests the existence of cross-generational sex between older males and young females.<sup>6</sup> Second, unless survival rates between infection and death are shorter for

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<sup>5</sup> United Nations (2004). *Facing the Future Together: Malawi*. Country Report of the United Nations Secretary-General's Task Force on Women, Girls and HIV/AIDS in Southern Africa.

<sup>6</sup> This view might not be true if post- infection survival rates for men are longer than for women.

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females, it would appear that prevention efforts are increasingly less effective in protecting females from infection and least effective in protecting adolescent girls and young women than it is for boys and men (UNSGHCR, 2004).

The gender differences in the susceptibility to HIV infection are largely attributed to the weak status of women and girls due to economic, cultural and social factors (Malawi Government, 2004). For cultural and economic reasons, many women are unable to negotiate the timing and the condition under which sex occurs, especially the use of condoms. Gender dynamics in Malawi society confers major decision-making powers in the hands of men. There are also biological reasons that make women more vulnerable to HIV infection than men.

HIV/AIDS has negatively impacted the quality of life in the country. Currently, life expectancy at birth in Malawi is estimated at 36.9 years, a decline from 48 years in the early 1990s and significantly less than the projected 54 years that it would have been in the absence of HIV/AIDS in 2000. AIDS now ranks among the three leading causes of death among adults in the country. The economic impact of the epidemic has been felt at macro and micro-economic levels through mortality and morbidity during the prime productive lives of adults, profoundly reduced economic productivity, decimating the labour force and critical skilled human capital required for provision of services and development activities. The resources of the health sector have also been strained by the added demand to provide care, treatment and prevention services for HIV/AIDS diverting scarce resources from other pressing health needs including child and maternal care. This has implications on strengthening the health sector to cope and also for community-based health care to alleviate health facility burden. The social impact of AIDS has been profound and felt all over the country through increased widowhood and orphans leading to impoverished households, disrupting schooling of children especially girls. It is currently estimated that Malawi is home to about one million orphans and other vulnerable children (OVCs), with slightly over 50 percent orphaned by AIDS. This has implications on programming for OVCs.

A mathematical model developed by Tim Hallett, Geoff Garnett and Neff Walker was used to estimate the prevalence of HIV in Ghana for the sexually active population (aged 15-49 years) from 1998 to 2010. The estimations were done based on two scenarios: with behavior change and without behavior change. A detailed description of the methodology used for the model and the results are represented in Annex B and C.

### **3.1.1.1 National Response to HIV/AIDS**

To reverse further spread of HIV and mitigate the health and economic consequences of HIV/AIDS, the Government of Malawi has designed and implemented a comprehensive national response in the past 20 years. It established the National AIDS Control Programme in 1988 to co-ordinate the national response to HIV/AIDS. To do this, the National HIV/AIDS Control Programme was guided by the Medium Term Strategic Plans 1989-1999.

In July 2001, the National AIDS Commission (NAC) was established and replaced the National AIDS Control Programme. The work of NAC has been guided by the National HIV and AIDS Strategic Framework (2000-2004) and the National HIV and AIDS Action Framework (NAF) (2005-2009). The goal of Malawi's NAF is to prevent the spread of HIV infection among Malawians, provide access to treatment and care for PLHIV; and mitigate the health, socio-economic and psychosocial impacts of HIV/AIDS on individuals, families, communities and the

country. The nine priority areas or components of the NAF underpin the strategies for HIV prevention and control in Malawi 2005-09<sup>7</sup>. These include:

- Prevention and behaviour change,
- Treatment, care and support,
- Mitigation of socio-economic and psychosocial impact,
- Mainstreaming, partnerships and capacity building,
- Research and Development,
- Monitoring and Evaluation,
- Resource mobilization, tracking and utilization and national policy co-ordination and programme planning.

NAC also draws its inspiration from the National HIV/AIDS Policy (NHAP) that was developed in 2004. NHAP provides technical guidelines for the design, implementation and management of HIV/AIDS intervention, programmes and activities at all levels of the Malawian society (NAC, 2004). The National HIV/AIDS Policy tilted HIV/AIDS prevention landscape towards the provision of treatment and care to all medically eligible individuals. Much of the treatment impetus has been provided by generous funds from the United Nations Global Fund to Fight HIV/AIDS, Tuberculosis (TB) and Malaria. The Global Fund started disbursing funds to Malawi in 2003 (Table 3.1).

	<b>Round 1</b>	<b>Round 2</b>	<b>Round 5</b>	<b>Round 5</b>
Component	HIV/AIDS	Malaria	HIV/AIDS OVC	HSS
Approved funding	Phase: \$41,751,500 Phase2: \$136,862,764	\$18,815,810	\$7,708,331	\$22,645,798
Principal Recipient	NAC Trust	MOH	NAC Trust	MOH
Grant Agreement signed	10 <sup>th</sup> February 2003	19 <sup>th</sup> Sept. 2005	9 <sup>th</sup> May 2006	Not signed
Grant start date	1 <sup>st</sup> October 2003	1 <sup>st</sup> October	-	-
First disbursement date	24 <sup>th</sup> April 2003			N/A
Total disbursed as of 1 <sup>st</sup> June 2006 (% total)	Phase 1: \$41,444, 923 (99%) Phase 2: None	\$6,363,507 (33.8%)	\$1,984,730 (25.7%)	0
<b>Notes: OVC = Orphans and other Vulnerable Children; HSS = Health systems strengthening, National AIDS Commission; MOH = Ministry of Health</b>				

There have been several achievements and challenges to the national response. For instance, near universal blood transfusion safety has been achieved and universal awareness of HIV/AIDS attained in the general population. However, HIV prevalence remains very high and there are deep-seated misconceptions about HIV transmission, and cultural and gender disparities that promote HIV transmission. A critical shortage of human resources necessary to provide HIV prevention, care, treatment and support services also prevails in the country. The war against HIV/AIDS is also hampered by inadequate health care resources.

<sup>7</sup> Malawi Government (2006). Report of a Country-Wide Survey of HIV/AIDS Services in Malawi for the Year 2006. Ministry of Health, Lilongwe.

### 3.1.2 Study Question 1: Has funding/spending increased for HIV prevention and treatment programmes?

	2002/03	2003/04	2004/05	2005/06
<b>General government units</b>	1,022,135,548	1,158,626,230	1,503,322,895	1,709,483,039
Territorial government	1,022,135,548	1,158,626,230	1,503,322,895	1,709,483,039
Central government revenue (Ministry of Finance)	1,022,135,548	1,146,342,205	1,495,156,177	1,696,419,412
Regional and municipal government revenue (Local Government)	0	12,284,025	8,166,718	13,063,627
All other public units	0	0	0	0
Return on assets held by a public entity	0	0	0	0
Other	0	0	0	0
<b>Private sector</b>	347,005,003	372,976,285	520,696,515	1,349,368,706
Employer funds	173,737,326	160,343,030	179,223,122	766,766,870
Households	173,267,677	208,065,757	341,473,393	582,601,836
Non-profit institutions serving individuals	0	0	0	0
Other private funds	0	4,567,498	0	0
Return on assets held by a private entity	0	0	0	0
Other	0	0	0	0
<b>Rest of the world</b>	1,167,728,252	4,764,883,775	5,503,304,040	9,463,763,493
GFATM	0	n/a	n/a	2,732,284,464
Donor A	0	n/a	n/a	n/a
Donor B...	0	n/a	n/a	n/a
<b>TOTAL HIV</b>	<b>2,536,868,803</b>	<b>6,296,486,290</b>	<b>7,527,323,450</b>	<b>12,522,615,238</b>
<b>Source: National records, Malawi NHA 2002-2004 Report and NHA HIV/AIDS Subaccounts for 2002/03 and 2005/06</b>				

As shown in Table 3.2 government revenue has increased steadily over the years with the central government allocating the majority of HIV funds from the government. In the private sector a substantial allocation of funds towards HIV took place between 2004 and 2005 with a doubling of funds during this period. Donor finances including GFATM contributed to more than 50% of the overall budget for HIV prevention and treatment programmes between 2003 and 2006.

The allocation of funds towards HIV programmes has increased significantly between 2002 and 2006. Table 3.3 below shows an increase in disbursement of public funds by government to central and district hospitals, health centres, public health programmes and health administration and insurance. Similarly household spending on HIV more than doubled in the same period. The majority of household finances were spent in CHAM and district hospitals. Expenditure on traditional healers was less than 1%. Funding from external resources also increased over the 5-year period with the majority of funds allocated to district and central hospitals, laboratories, general administration and health insurance.

<b>Table 3.3 National HIV funding by financing agent and type of provider, 2002/03 and 2005/06 Malawian Kwacha</b>								
<b>Provider</b>	<b>FS.1 Government</b>		<b>FS.2 Private</b>				<b>FS.3 External Resources</b>	
			<b>FS.2.1 Households</b>		<b>FS.2.2 Private</b>			
	<b>2002/03</b>	<b>2005/06</b>	<b>2002/03</b>	<b>2005/06</b>	<b>2002/03</b>	<b>2005/06</b>	<b>2002/03</b>	<b>2005/06</b>
<b>Government general hospitals</b>								
Central hospitals	320,541,324	845,542,164	6,892,433	27,803,814		10,974,850	0	607,068,600
District hospitals	399,287,493	744,048,201	36,786,666	128,465,633		0	0	837,336,000
<b>Private not-for-profit hospitals</b>								
Private not-for-profit hospitals (Other)	0	0	0	0	8,200,150	0	0	0
Private not-for-profit hospitals (CHAM)	0	0	53,532,488	212,414,214	94,884,025	118,830,389	0	293,067,600
Private-for-profit hospitals	0	0	20,950,006	73,161,178	27,830,000	189,055,806	0	20,933,400
<b>Providers of ambulatory health care</b>								
Offices of physicians	0	0	7,265,129	13,305,030	31,331,680	58,406,801	0	62,800,200
Health centres/dispensaries/maternity	183,268,607	528,747,961	15,322,770	42,705,461	141,834,325	219,229,259	143,532,280	272,134,200
Medical and diagnostic laboratories	0	21,576,109	0	0	0	0	0	459,746,974
Traditional healers	0	0	3,496,586	6,403,491	0	0	0	0
<b>Retail sale and other providers of medical goods</b>	0	0	18,648,459	34,151,949	5,120,000	19,824,000	0	0
<b>Provision and administration of public health programmes</b>	329,077,401	800,297,608	0	0	104,779,973	340,735,584	267,910,539	365,833,258
<b>General health administration and insurance</b>	71,948,174	607,963,611	0	0	15,029,363	136,397,611	29,361,279	428,565,063
Institutions providing health-related services	0	1,036,771,200	0	0	0	132,162,000	54,257,451	729,205,000
Non-health expenditures	18,274,842	1,401,649,036	0	0	0	258,000,000	121,029,120	67,905,000
<b>TOTAL HIV</b>	<b>1,322,403,841</b>	<b>6,079,063,778</b>	<b>169,370,777</b>	<b>571,702,943</b>	<b>429,009,516</b>	<b>973,616,001</b>	<b>616,090,669</b>	<b>4,342,326,548</b>

Source: NHA HIV/AIDS Subaccounts for 2002/03 and 2005/06, financing agent by provider tables

<b>Table 3.4 National HIV funding by financing source and functions 2002/03 and 2005/06 Malawian Kwacha</b>											
		FS.2. Private				FS.3. External Resources					
		FS.1 Government		FS.2.1 Households *		FS.2.2 Private		FS.3.1 GFATM		FS.3.2 Other	
Function and disease		2002/03	2005/06	2002/03	2005/06	2002/03	2005/06	2002/03	2005/06	2002/03	2005/06
HC.1.1	Inpatient curative care	2,118,623,846	2,919,381,108			1,199,880,210	3,270,654,185	0	438,326,976	816,592,163	3,076,636,818
GBD.1.A.1	HIV/AIDS	745,159,114	499,989,504			223,572,768	595,268,443	0	438,326,976	157,139,689	783,816,616
HC.1.3	Outpatient curative care			2002/03	2005/06	2002/03	2005/06	2002/03	2005/06	2002/03	2005/06
GBD.1.A.1	HIV/AIDS			2,118,623,846	2,919,381,108			1,199,880,210	3,270,654,185	0	438,326,976
HC.1.9	Other curative care	0	164,807,183			55,346,885	104,049,024	0	0	0	1,224,926,253
GBD.1.A.1	HIV/AIDS	0				0	33,292,173	0	0	0	197,731,252
HC.4	Ancillary services to medical care		47,647,242								502,000,189
GBD.1.A.1	HIV/AIDS	0	11,435,338	0		0		0		0	469,887,746
HC.5	Medical goods dispensed to outpatients	0		0		286,076,451	648,524,480	0		0	
GBD.1.A.1	HIV/AIDS	0		0		0	52,588,269			0	
HC.5	Medical goods dispensed to outpatients	0				286,076,451	648,524,480	0		0	
HC.5.1	Pharmaceuticals and other medical nondurables	0		0		286,076,451	648,524,480	0		0	
GBD.1.A.1	HIV/AIDS	0		0		23,768,459	52,588,269	0		0	
HC.5.2	Therapeutic appliances and other medical durables										
GBD.1.A.1	HIV/AIDS										
<b>Subtotal 1: Personal health expenditure</b>		<b>3,347,026,959</b>	<b>4,941,916,254</b>			<b>2,492,315,969</b>	<b>6,216,541,126</b>		<b>2,732,284,464</b>	<b>1,479,565,020</b>	<b>7,301,807,749</b>
HC.6	Prevention and public health services	376,451,021	1,666,268,476			136,256,661	195,342,667		771,309,000	3,481,908,189	5,938,816,156
GBD.1.A.1	HIV/AIDS	5,563,779	611,510,945			0	141,770,000		0	696,204,134	753,585,505
HC.7	Health administration and health insurance	702,972,539	1,091,299,199			108,740,770	290,187,023			1,199,179,059	5,497,571,054
GBD.1.A.1	HIV/AIDS	44,680,678	337,626,267			0				71,658,138	835,300,337
<b>Subtotal 2: Current health expenditure</b>		<b>4,426,450,519</b>	<b>7,699,483,928</b>			<b>2,737,313,400</b>	<b>6,702,070,817</b>		<b>3,503,593,464</b>	<b>6,160,652,268</b>	<b>18,738,194,959</b>
HC.R.1	Capital for health care provider institutions	747,086,167	373,897,094			0	135,136,736			545,636,439	458,083,747
GBD.1.A.1	HIV/AIDS	0	52,771,947			0	45,905,670			0	43,459,757
<b>Subtotal 3: Total health expenditure</b>		<b>5,173,536,686</b>	<b>8,073,381,022</b>			<b>2,737,313,400</b>	<b>6,837,207,553</b>		<b>3,503,593,464</b>	<b>6,706,288,707</b>	<b>19,196,278,707</b>
Health related <sup>1</sup>		496,556,700	1,740,819,156			0			40,937,382	0	3,653,185,308
GBD.1.A.1	HIV/AIDS	0	4,567,670			0				0	1,893,570,530
Non-Health			64,457,612				258,000,000			139,303,962	1,405,096,424
GBD.1.A.1	HIV/AIDS	0	64,457,612			0	258,000,000	0		139,303,962	1,405,096,424

<sup>1</sup> No subtotal since data are not collected for all diseases, \*household data is contained under the private column as GFATM target table data does not separate the two

Source: National Health Accounts GFATM Target Tables, 2002/03 and 2005/06

Table 3.4 and 3.5 illustrate that since 2002/03 financial year the funding for HIV/AIDS has risen rapidly. This is due to the increase of funding resources from the Global Fund facility. The GFATM resources have risen from zero in 2002/03 when there was no GFATM funding in Malawi to 30 percent of the Total Health Expenditure (THE) for HIV/AIDS. In 2005/6, 44.32 percent of the total external funding from HIV/AIDS came from GFATM. The resources for HIV/AIDS rose from 16.03 percent (2002/03) to 23.66 percent (2005/06). Administration for HIV/AIDS as a percentage of THE increased during this period from 0.80 percent to 3.12 percent, due most likely to the increased human and financial requirements to administer and co-ordinate the national response brought about by the additional funding.

	2002/03	2005/06
GFATM resources for HIV/AIDS as % of THE for HIV/AIDS	0	30.71
GFATM resources for HIV/AIDS as % of Total external funds for HIV/AIDS	0	44.32
Total expenditure on HIV as % of THE	16.03	23.66
Inpatient curative care for HIV/AIDS as % of THE	7.7	6.16
Outpatient curative care for HIV/AIDS as % of THE	2.17	7.96
Pharmaceuticals for HIV/AIDS as % of THE	0.16	0.14
Prevention and Public Health services for HIV/AIDS as % of THE	4.8	4.01
Administration for HIV/AIDS as % of THE	0.8	3.12
Capital formation for HIV/AIDS as % of THE	0	0.38
Out of pocket expenditure on HIV/AIDS as % of THE	1.16	1.52
Out of pocket expenditure on HIV/AIDS AS % of PvtHE	6.19	8.36
External expenditure on HIV/AIDS as % of THE	6.66	16.39

## 3.2 HIV/AIDS: Counselling and Testing

### 3.2.1 Study Question 1: Has funding/spending increased for HIV counselling and testing programmes?

The current report for NHA does not include disaggregated data on funding by activities. However table 3.5 above shows that the general trend in HIV/AIDS funding since 2002/03 has increased. Funding for VCT programmes increased substantially between 2002 and 2004. This is likely to have been due to the scale up of HIV prevention and care programmes in the country. Tables 3.6 and 3.7 illustrate the contributions the public and private sector make toward public health programmes.

	2002/03	2003/04	2004/05	2005/06
<b>General government units</b>				
Ministry of Health	46,496,329	120,678,034	80,690,642	25,858,421
National AIDS Commission	89,021,889	320,544,604	868,600,535	60,056,702
Other Ministries	0	0	0	0
Local Authorities	0	0	0	0
<b>Private sector</b>				
Private Insurance Scheme	0	0	0	0
House out of pocket payments	0	0	0	0
CHAM	4,209,436	9,185,316	7,010,878	11,754,530
Other NGOs	40,917,279	121,417,978	69,065,522	31,956,764
Private Firms/Employers	0	0	0	0
<b>Rest of the world</b>	115,383,906	393,065,288	223,585,172	73,166,652
<b>TOTAL HIV VCT</b>	<b>296,028,839</b>	<b>964,891,220</b>	<b>1,248,952,749</b>	<b>202,793,069</b>

Source: Malawi NHA 2002-2004 Report and NHA HIV/AIDS Subaccounts for 2002/03 and 2005/06

	2002/03	2003/04	2004/05	2005/06
<b>General hospitals</b>				
Government general hospitals	0	0	0	0
Central hospitals	0	0	0	0
District hospitals	0	0	0	0
<b>Private Not-for-profit hospitals</b>				
Private not-for-profit hospitals (Other)	0	0	0	0
Private not-for-profit hospitals (CHAM)	0	0	0	0
Private-for-profit hospitals	0	0	0	0
<b>Providers of ambulatory health care</b>				
Offices of physicians	0	0	0	0
Health centres/dispensaries/maternity	0	0	0	0
Medical and diagnostic laboratories	0	0	0	0
Traditional healers	0	0	0	0
<b>Retail sale and other providers of medical goods</b>	0	0	0	0
<b>Provision and administration of public health programmes</b>	296,028,838	964,891,219	1,248,952,749	202,793,068
<b>General health administration and insurance</b>	0	0	0	0
Institutions providing health-related services	0	0	0	0
Non-health expenditures	0	0	0	0
<b>TOTAL HIV VCT</b>	296,028,838	964,891,219	1,248,952,749	202,793,068
<b>Source: Malawi NHA 2002-2004 Report and NHA HIV/AIDS Subaccounts for 2002/03 and 2005/06</b>				

### 3.2.2 Study Question 2: Has the availability of quality HIV counselling and testing services increased?

#### 3.2.2.1 Has the quantity of HIV counselling and testing services increased? And are they distributed equitably (*geographic, gender, age*)?

Type of District	1998	1999	2000	2001	2002	2003	2004	2005 <sup>8</sup>	2006 <sup>9</sup>	2007
<b>High Intensity</b>										
Lilongwe							5	10	18	19
<b>Medium Intensity</b>										
Chiradzulu							2	2	2	3
Karonga							0	1	2	2
Machinga							0	1	1	1
Mzimba							5	6	10	12
Nkhotakota							0	3	3	4
Zomba							3	4	7	7
<b>Low Intensity</b>										
Mwanza							0	1	2	2
Ntchisi							0	1	1	1
Total							15	29	46	51
<b>Source: DCA-Facility Record Review and Facility Census</b>										

There has been a general increasing trend in the number of sites providing HTC sites from 2003. However, due to changes in HMIS reporting, data for 2005 and 2006 was not available from published reports.

<sup>8</sup> From 2005 – 2007, HMIS reporting format changed so data on number of clinics not available from published reports.

<sup>9</sup> From 2005 – 2007, HMIS reporting format changed so data on number of clinics not available from published reports.

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As shown in Table 3.9 above, a higher proportion of HTC services are available in rural areas. In Machinga, Mzimba and Mwanza there are more private than public sites where people can access HIV testing services. This might be the case because the sample contains more rural facilities than urban facilities. Ntchisi registered the highest percentage with 91.7 percent of facilities providing counselling and testing services. In Chiradzulu and Zomba all sampled public sites were providing VCT services

<b>Table 3.9 District geographic distribution and administration of sites offering HIV counselling and testing services</b>													
Percentage of sites providing HIV counselling and testing services in 2008 that are urban and rural and are administrated publicly or privately, by type of district, Malawi, 2008													
District of districts	Geographic		Administration				Government Facility- Public	Government facility Not public (military, etc)	NGO/ (Faith-Based)	Community	Private (for profit)	Other	Total number of clinics providing HIV counselling and testing
	Percentage of urban sites	Percentage of rural sites	Percentage of public sites**	Percentage of private sites	Total number of clinics								
<b>High intensity</b>													
Lilongwe	43.8	56.3	92.0 (13)	67.0 (3)	16	80	6.7	6.7	0	0	6.7	15	
<b>Medium intensity</b>													
Chiradzulu	38.5	61.5	100.0 (9)	100.0 (4)	13	69.2	7.7	23.1	0	0	0	13	
Karonga	37.5	62.5	60.0 (5)	0.0 (3)	8	100	0	0	0	0	0	3	
Machinga	26.3	73.7	50.0 (12)	86.0 (7)		53.8	0	38.5	0	7.7	0	13	
Mzimba	37.5	62.5	83.0 (6)	100.0 (2)	8	62.5	0	25	12.5	0	0	8	
Nkhotakota	33.3	66.7	88.0 (8)	57.0 (7)	15	63.6	0	27.3	0	0	9.1	11	
Zomba	50	50	100.0 (5)	60.0 (5)		62.5	0	37.5	0	0	0	8	
<b>Low intensity</b>													
Mwanza	41.7	58.3	88.0 (8)	100.0 (4)	12	63.6	0	27.3	0	9.1	0	11	
Ntchisi	8.3	91.7	92.0 (12)	0	12	100	0	0	0	0	0	11	
Total					84	71	2.2	21.5	1.1	2.2	2.2	93	
<b>Source: Facility Census; *All districts in Malawi are categorized as rural. **Figures in parentheses are the total number of facilities providing VCT services in each district</b>													

Background characteristic	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>Type of District</b>										
Mzimba District							1825	12914	15183	11630
Karonga District										
Lilongwe District										10797
Ntchisi District								2104	1939	1146
Nkhota-kota District							205	5910	13240	9361
Zomba District							2379	8882	30145	3668
Chiradzulu District							4845	10327	12892	37820
Mwanza District							1699	2831	3867	2385
Machinga District								2087	2279	892
<b>Total</b>										
<b>Source: DCA-Facility Record Review</b>										

Table 3.10 above shows that there is an increasing trend in accessing HTC services between 2004 and 2006. Zomba, Lilongwe, Mzimba and Chiradzulu reported high numbers of clients accessing VCT services.

Background characteristic	1998	1999	2000	2001	2002	2003	2004	2005	2006 <sup>10</sup>	2007
<b>High Intensity</b>										
Lilongwe						3.4	2.1	1.9	3.3	
<b>Medium Intensity</b>										
Chiradzulu						2.0	8.3	8.4	10.8	
Karonga						0.3	1.4	3.0	5.9	
Machinga						0.4	1.9	2.6	4.8	
Mzimba						7.3	3.8	2.1	4.7	
Nkhotakota						0.7	1.3	2.2	7.4	
Zomba						0.2	1.1	3.7	7.4	
<b>Low Intensity</b>										
Mwanza						-	2.4	3.5	11.3	
Ntchisi						1.5	1.5	3.2	11.8	
<b>Source: DCA-Facility Record Review</b>										

HIV services are usually collated at the end of each year. For 2007 the results are not available yet and the report below only presents the results up to 2006. By the end of 2006 there were 351 static HTC facilities in Malawi of whom 61, 112 and 178 were located in the Northern, Central and Southern Region, respectively (Table 3.12). Seventy-two percent (254 sites) was located in rural areas and 28 percent (97) was in urban locations. The Ministry of Health (MOH) managed 201 (57 percent) of all HTC facilities, CHAM managed 67 (19 percent) and independent NGOs managed 57 (16 percent) facilities. The remaining sites were managed by private clinics (12), Malawi Defence Force (6), research organizations (4), Police (3) and local government (1). The number of sites offering HTC services has been improving: there were only 14 sites in 2001 and this increased to 70, 118, 146, 250 and 351 in 2002, 2003, 2004, 2005 and 2006 respectively. Figure 3.1 shows the progress in number of sites offering HTC. Whereas only 2.2 percent of the estimated 638 health facilities nationally were providing HTC services, by the end of 2006, 55 percent of the facilities was providing HTC services. The Government of Malawi's universal access target is to 94 percent (600 sites) of facilities offering HTC by 2010.

<sup>10</sup> Data based on July to Dec 2006 only, HMIS semi-annual draft report 2006

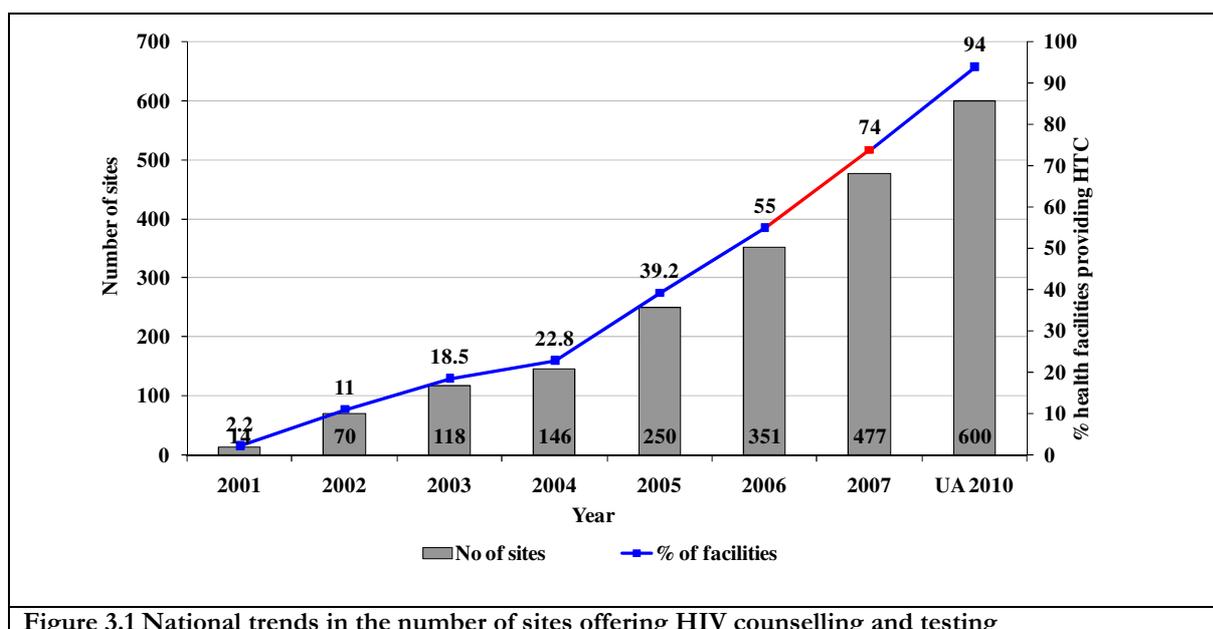


Figure 3.1 National trends in the number of sites offering HIV counselling and testing

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
North					16	20		28	61	
Central					27	45		44	112	
South					27	53		74	178	
Total Sites				14	70	118	146	250	351	600

Source: National HMIS

Table 3.13 shows that Lilongwe has the highest capacity of staffing that offers HTC services. Karonga was the only district that had all the necessary equipment and supplies at their HTC sites although it had the least number of facilities that offer HTC.

District	Element			Number of facilities offering HIV testing and counselling
	Infrastructure	Staff	Equipment and supplies	
<b>High</b>	<b>0.0</b>	<b>80.0</b>	<b>53.3</b>	<b>15.0</b>
Lilongwe	0.0	80.0	53.3	15.0
<b>Medium</b>	<b>10.7</b>	<b>42.9</b>	<b>58.9</b>	<b>56.0</b>
Chiradzulu	46.2	76.9	46.2	13.0
Karonga	0.0	66.7	100.0	3.0
Machinga	0.0	46.2	38.5	13.0
Mzimba	0.0	0.0	75.0	8.0
Nkhotakota	0.0	18.2	81.8	11.0
Zomba	0.0	50.0	50.0	8.0
<b>Low</b>	<b>0.0</b>	<b>68.2</b>	<b>68.2</b>	<b>22.0</b>
Mwanza	0.0	63.6	45.5	11.0
Ntchisi	0.0	72.7	90.9	11.0
Total	6.5	54.8	60.2	93.0

Type of district	Rapid HIV Test	NVP	AZT	Number of facilities offering HIV testing and counselling
High	60	80	46.7	15
..Lilongwe	60	80	46.7	15
Medium	64.3	71.4	44.6	56
..Chiradzulu	46.2	84.6	84.6	13
..Karonga	100	100	66.7	3
..Machinga	53.8	53.8	15.4	13
..Mzimba	87.5	75	12.5	8
..Nkhotakota	81.8	54.5	27.3	11
..Zomba	50	87.5	75	8
Low	72.7	50	18.2	22
..Mwanza	45.5	27.3	27.3	11
..Ntchisi	100	72.7	9.1	11
<b>Total</b>	<b>65.6</b>	<b>67.7</b>	<b>38.7</b>	<b>93</b>

As shown in Table 3.14 above, all facilities in Karonga provide Rapid HIV test and NVP. Ntchisi, Machinga and Mzimba had the least number of sites that offer AZT. Overall, most facilities offered rapid HIV test and NVP compared to AZT.

In terms of ownership of facilities, there are three types namely: those belonging to the public sector, private and CHAM. As of 2006, there were 351 facilities providing HTC services in Malawi. Of these 201 belonged to the public sector, 12 belonged to the private for profit and 124 belonged to CHAM. This means that the largest provider of HTC services in Malawi is the public sector at 57 percent and this is followed by CHAM at 35 percent. Table 3.15 shows the number of sites offering HTC in 2006 by managing authority and by mode of operation. The MoH was the main provider of HTC services and managed 57 percent of the static, 66 percent of the outreach and 69 percent of the mobile HTC sites in 2006<sup>11</sup>.

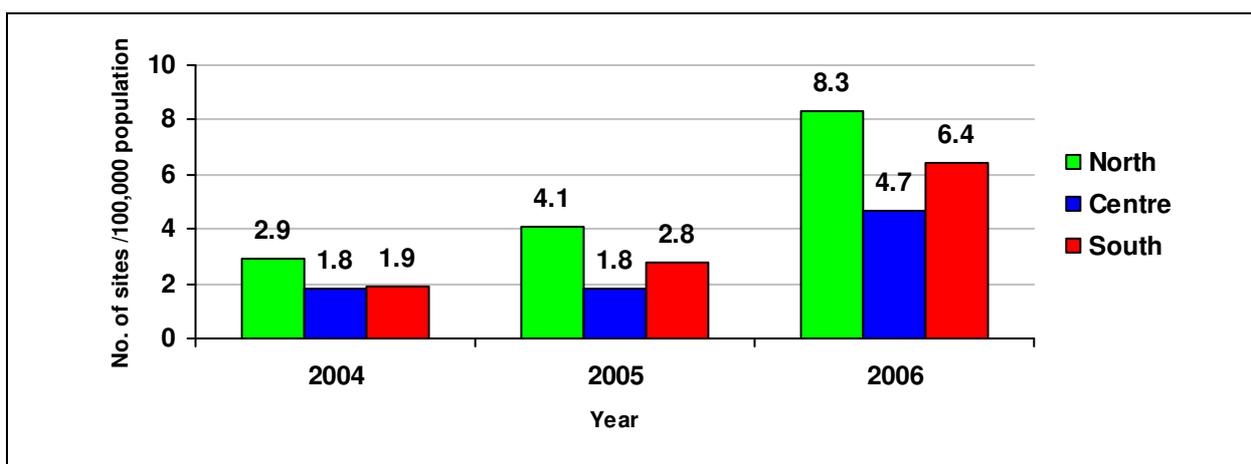
Managing authority	Static	Outreach	Mobile
MoH	201	191	190
CHAM	67	33	63
Independent NGO	57	63	21
Army	6	1	0
Police	3	1	0
Private sector	12	0	0
Local government	1	1	0
Research	4	0	0
Total	351	290	274
<b>Geographical distribution of the HTC sites</b>			

There are also variations in the number of facilities providing HTC services at regional level. Figure 3.2 shows that there are more health facilities providing HTC services in the South, followed by the centre and then the north. When expressed as number of HTC sites per 100,000 population<sup>12</sup>, HTC coverage is better in the northern region which by 2006 had 8 sites per 100, 000 population followed by the

<sup>11</sup> Situation Analysis (2006)

<sup>12</sup> Number of sites from situation analysis of HIV services for each of the years. Regional population from HMIS data (Ministry of Health. Malawi Health Management Information Bulletin for years 2003 to 2006)

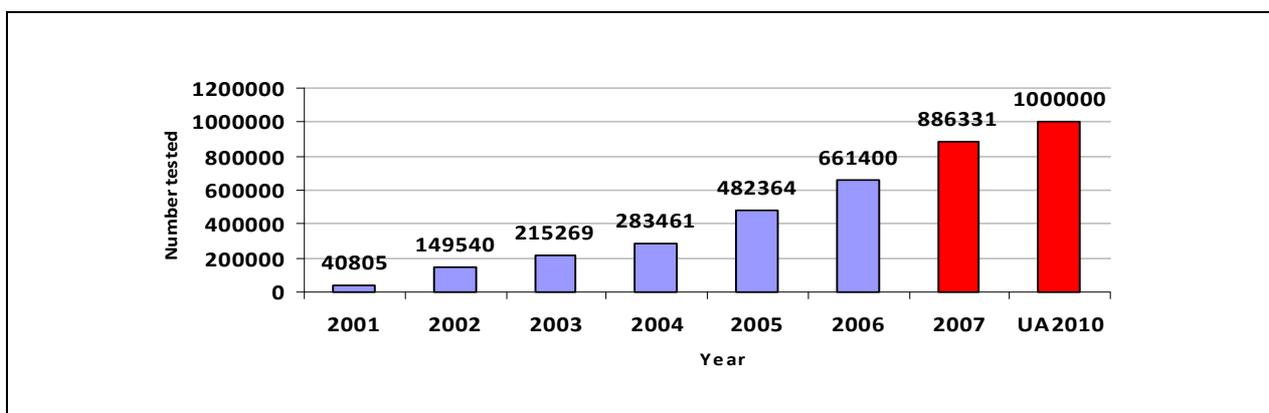
southern region with 6 sites per 100, 000 population. The central region had the lowest coverage with 5 sites per 100, 000 population.



**Figure 3.2 National trends in the number of sites offering HIV counselling and testing per 100,000 population within the regions**  
 Source: National HMIS

The majority of government health facilities in Malawi operate HTC outreach services. The number of tests performed at outreach and mobile sites are usually included in the reports from the respective static sites and it is therefore not possible to distinguish between the number of HTC encounters<sup>13</sup> in static, outreach and mobile settings. Figure 3.3 below shows the number of HTC encounters recorded at these sites from 2001 to 2006.

The trend in HTC utilisation shows an exponential rise in the number of the sexually active population going for HTC. It has to be noted that these numbers include all HTC encounters irrespective of reason for accessing HTC. In 2001 only 40,805 people were counselled and tested for HIV in Malawi and this number rose to 149,540 in 2002, 215,269 in 2003, 283,461 in 2004, 482,364 in 2005 and then 661,400 in 2006. The universal access targets for 2008 and 2010 are 900,000 and 1,000,000 people being counselled and tested for HIV, respectively. The current figures for HTC appear on track to meet the set universal access targets. For 2006, the reported figures represent about 75 percent of the universal access target for that year. With the introduction of an opt-out policy for PMTCT, the testing figures are expected to increase further and preliminary data for 2007 suggest that the majority of pregnant women are undergoing HTC.



**Figure 3.3 National trends in the number of HTC encounters recorded at these sites from 2001 to 2007**

<sup>13</sup> Note that the national totals reflect HTC encounters, not individuals, as HTC clients being HIV tested more than once in the year would be counted one time for each encounter

<b>Table 3.16 HIV Testing and Counselling (HTC) and HIV status, Malawi. July 2006-June 2007</b>															
District	Total Population	15-49 years population	Persons 15-49 years receiving HTC and serostatus results		Persons 15-49 years tested and positive for HIV		Expected Pregnancies	Pregnant women receiving VCT and serostatus results		Pregnant women tested HIV positive		HIV positive pregnant women administered Nevirapine for PMCT		No. of HIV positive persons receiving ARVs	No. of sites providing ART Number
			Number	%	Number	%		Number	%	Number	%	Number	%		
Chitipa	168,880	82751	7271	8.8	715	9.8	8444	3044	36	139	4.6	79	56.8	416	4
Karonga	250,775	122880	5817	4.7	860	14.8	12539	2043	16.3	151	7.4	99	65.6	596	4
Nkhata Bay	210,177	102987	8783	8.5	1556	17.7	10509	5311	50.5	452	8.5	258	57.1	1024	4
Rumphi	156,616	76742	13585	17.7	1537	11.3	7831	5467	69.8	423	7.7	222	52.5	10977	6
Mzimba	764,518	374614	30935	8.3	3488	11.3	38226	15272	40	810	5.3	648	80	5884	12
Kasungu	650,103	318550	29316	9.2	3137	10.7	32505	8472	26.1	790	9.3	360	45.6	2478	4
Nkhotakota	301,604	147786	11988	8.1	1900	15.8	15080	3265	21.7	468	14.3	425	90.8	780	6
Ntchisi	231,165	113271	10256	9.1	837	8.2	11558	5367	46.4	144	2.7	27	18.8	480	3
Dowa	511,448	250610	23027	9.2	2303	10	25572	9687	37.9	304	3.1	164	53.9	5676	7
Salima	342,979	168060	13502	8	2367	17.5	17149	9988	58.2	886	8.9	336	37.9	1277	5
Lilongwe	1,951,278	956126	31203	3.3	5583	17.9	97564	25094	25.7	2126	8.5	2104	99	11169	21
Mchinji	440,162	215679	12728	5.9	1934	15.2	22008	8468	38.5	587	6.9	331	56.4	1396	4
Dedza	646,292	316683	16873	5.3	2551	15.1	32315	4977	15.4	462	9.3	271	58.7	7109	4
Ntcheu	493,207	241671	12413	5.1	2855	23	24660	4021	16.3	453	11.3	74	16.3	1157	5
Mangochi	778,338	381386	15384	4	4704	30.6	38917	8194	21.1	924	11.3	375	40.6	2220	6
Machinga	440,492	215841	8971	4.2	2443	27.2	22025	3799	17.2	520	13.7	245	47.1	1040	4
Zomba	723,020	354280	23946	6.8	5473	22.9	36151	12067	33.4	1680	13.9	843	50.2	6227	8
Chiradzulu	299,738	146872	21205	14.4	6446	30.4	14987	9017	60.2	1270	14.1	1725	135.8	3806	4
Blantyre	1,158,047	567443	37253	6.6	10319	27.7	57902	28420	49.1	5169	18.2	3761	72.8	19826	13
Mwanza	179,019	87719	9112	10.4	1324	14.5	8951	2850	31.8	167	5.9	532	318.6	415	3
Thyolo	592,630	290389	46459	16	11237	24.2	29632	15647	52.8	3800	24.3	1992	52.4	56580	5
Mulanje	557,138	272998	14065	5.2	3440	24.5	27857	3800	13.6	685	18	527	76.9	3433	6
Chikwawa	463,888	227305	24803	10.9	4857	19.6	23194	8328	35.9	899	10.8	287	31.9	1679	5
Nsanje	239,972	117586	14444	12.3	3241	22.4	11999	6284	52.4	807	12.8	268	33.2	1740	5
Phalombe	311,250	152513	11622	7.6	3021	26	15563	5206	33.5	826	15.9	341	41.3	1071	3
Balaka	324,896	159199	14671	9.2	2606	17.8	16245	6847	42.1	730	10.7	119	16.3	1379	4
<b>Malawi</b>	<b>13,187,632</b>	<b>6,461,940</b>	<b>469,632</b>	<b>7.3</b>	<b>90,734</b>	<b>19.3</b>	<b>659,382</b>	<b>220,935</b>	<b>33.5</b>	<b>25,672</b>	<b>11.6</b>	<b>16,413</b>	<b>63.9</b>	<b>149,835</b>	<b>157</b>

Source: Ministry of Health (2007)

### 3.2.2.2 Has the quality of HIV counselling and testing services improved?

#### *Quality of Service Level 1. Availability of basic elements: commodities, guidelines, systems, trained staff*

<b>Table 3.17 Sites with capacity to provide quality HIV testing and counselling</b>						
Percentage of sites offering HIV counselling and testing with the infrastructure, staff, guidelines, equipment and supplies, and registers to offer quality services by type of district, 2008						
Type of District	Element					Number of facilities offering HIV testing and counselling
	Infrastructure <sup>1</sup>	Staff <sup>2</sup>	Guidelines <sup>3</sup>	Equipment and supplies <sup>4</sup>	All elements	
<b>High intensity</b>						
Lilongwe	6.3	81.2	81.3	50	6.3	6
<b>Medium intensity</b>						
Chiradzulu	15.4	76.9	76.9	46.2	7.7	5
Karonga	25	75	75	50	12.5	3
Machinga	10.5	63.2	63.2	31.6	0	5
Mzimba	12.5	87.5	50	75	0	2
Nkhotakota	26.7	80	73.3	60	13.3	8
Zomba	30	70	70	40	10	4
<b>Low intensity</b>						
Mwanza	0	66.7	66.7	41.7	0	4
Ntchisi	8.3	66.7	58.3	91.7	0	7
<sup>1</sup> Infrastructure: Working electricity source; accessible, protected water source; and adequate infection control resources						
<sup>2</sup> Staff: trained in HIV counselling and testing in the past two years						
<sup>3</sup> Guidelines: on HIV counselling and testing						
<sup>4</sup> Testing supplies and equipment						
Source: DCA-Facility Census						

Table 3.17 shows that a small percentage of facilities have infrastructure for HIV testing and counselling services. A high proportion of facilities have staff trained in HIV testing and counselling. Guidelines are available in most facilities. Data on unknown or indeterminate HIV test results from HIV counselling and testing sites are not available in Malawi.

#### *Quality of Services Level 2. Adherence to treatment guidelines*

<b>Table 3.18 National trends in the percentages of HIV positive counselling and testing clients who were referred for other services, 1998-2007.</b>										
Percentage of HIV positive counselling and testing clients who were referred for other services = (Annual total number of persons testing positive referred for other care and support services) / (Annual total number of persons testing positive for HIV) x 100										
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>Region</b>										
North					2.5	3.4	4.4	9.6	10.7	
Centre					1.3	1.7	2.3	4.7	7.7	
South					1.3	2.3	3.3	6.4	9.4	
<b>National</b>										
Source: National HMIS										

The number of clients getting referrals is low and may be due to lack of reporting at the health facilities (Table 3.18).

<b>Table 3.19 District trends in the proportion of HIV positive counselling and testing clients who were referred for other services, 1998-2007</b>										
Percentage of HIV positive counselling and testing clients who were referred for other services = (Annual total number of persons testing positive referred for other care and support services)/(Annual total number of persons testing positive for HIV) x 100										
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>High Intensity</b>										81.5
Lilongwe										
<b>Medium Intensity</b>										
Chiradzulu										
Karonga										
Machinga										
Mzimba										
Nkhotakota								21.9	21.2	17.1
Zomba								22.6	14.3	19.4
<b>Low Intensity</b>										
Mwanza							3.6	10.3	20.4	21.7
Ntchisi										
<b>Source: DCA-Facility Record Review</b>										

### *Quality of Services Level 3. Adherence with services provided*

<b>Table 3.20 National trends in the proportion of HIV counselling and testing clients that complete the testing and counselling process, 1998 – 2007.</b>										
Percentage of HIV counselling and testing clients that complete the testing and counselling process = (Annual total number of clients who receive HIV test result and post-test counselling)/(Annual total number of clients provided with HIV pre-test counselling) x 100										
Region	1998	1999	2000	2001	2002	2003	2004	2005	2006	
North					2.5	3.4	4.4	9.6	10.7	
Centre					1.3	1.7	2.3	4.7	7.7	
South					1.3	2.3	3.3	6.4	9.4	
<b>National</b>										
<b>Source: National HMIS.</b>										

In the version of the national HTC register used in 2006, aggregates were provided by sex and two age groups<sup>14</sup>. These standard age groups are defined as ‘adults’ (15-49 years) and children (0-14 years) combined with older adults (50 years and older). However, the actual age in years is recorded in the register. There were data on HTC utilisation from a total of 391 sites (345 static and 46 outreach sites) and aggregates for the standard age groups were available for 350 sites. At these sites a total of 466,602 HTC encounters were recorded (excluding July) and 417,859 (90 percent) of these were adults 15-49 years; 113 sites had classified more than 95 percent of their HTC encounters as adults 15-49 years. This standard classification of age does not allow the quantification of children tested, as they are combined with the older adults. In 2006 an attempt was made to quantify children, adults, males, females and test results from the HTC registers at 154 visited facilities. For practical reasons, tallies were limited to the fourth quarter in 2006.

<sup>14</sup> An updated version (V2) of the National HIV Testing and Counselling Register was developed and disseminated in mid-2007, however all encounters in 2006 were recorded in the first version of this register.

Table 3.21 shows the age- and sex-specific analysis of HTC utilisation and the proportion of positive test results by facility type. A total of 78,224 HTC encounters were counted and 4,492 (6 percent) of these represented children under 15 years. There was a similar number of boys and girls among the children tested (47 percent of children were boys); the overall proportion of positive test results was 35 percent among boys and 34 percent among girls. Most children were tested at district / major CHAM hospitals (49 percent) or central hospitals (25 percent) and the high proportion of positive test results (43 percent at central hospitals; 33 percent at district / major CHAM hospitals) indicate that children were mainly tested as patients (diagnostic testing). Paediatric testing was very uncommon at lower level health facilities and only 3 percent of all HTC encounters at community / rural hospitals, health centres and dispensaries represented children.

<b>Table 3.21: National trends in percentage of age- and sex-specific distribution of HTC encounters and proportions of positive test results by facility type</b>												
Facility type	Total		Children (<15 years)				Column% of total children tested	Adults (15 years and older)				Column% of total adults tested
	Test	Test	Boys Positive	Girls Positive	Boys Positive	Girls Positive		Men		Women		
	Test	Test	Positive	Test	Positive		Tests	Positive	Tests	Positive		
Central hospitals	7,190	588	42%	543	45%	25%	2,304	45%	3,755	48%	8%	
District/ major CHAM hospitals	37,261	1,013	33%	1,166	33%	49%	13,392	27%	21,690	27%	48%	
Community/ rural hospitals	5,618	75	32%	127	25%	4%	1,920	16%	3,496	17%	7%	
Private hospitals	1,678	47	19%	43	30%	2%	661	41%	927	37%	2%	
Health centres	24,398	376	34%	445	28%	18%	6,915	18%	16,662	18%	32%	
Dispensaries	253	2	-100%	4	0%	0%	127	6%	120	17%	0%	
Special/ other	1,826	26	23%	37	14%	1%	746	9%	1,017	19%	2%	
<b>Total</b>	<b>78,224</b>	<b>2,127</b>	<b>35%</b>	<b>2,365</b>	<b>34%</b>	<b>100%</b>	<b>26,065</b>	<b>25%</b>	<b>47,667</b>	<b>25%</b>	<b>100%</b>	
Analysis from conditional tallies from HTC registers of 154 visited facilities for tests performed October to December 2006. (Ministry of Health Malawi (2006) Report of a countrywide survey of HIV/AIDS Services in Malawi for the year 2006. HIV Unit, National TB Control Programme, Lighthouse Trust, Centre for Disease Control and Prevention (CDC) Malawi)												

### 3.2.2.3 Has the coverage of HIV counselling and testing services improved (overall and equitably)?

<b>Table 3.22: National coverage of prior HIV testing</b>		
Percentage of the population [15-24] ever tested and percentage their test results the last time they were tested for HIV		
Coverage indicator	2004/DHS	
	Male	Female
Percentage of general population [15-24] receiving an HIV test	12.6	14.8
Percentage of those who received an HIV test who also received their results	11.7	12.5
<b>Source: National Survey Review</b>		

Findings from the 2004 DHS show that more females than males get tested for HIV however there were no major differences in gender. Levels of testing were below 15 percent and indicate that more people need to get tested so that they become aware of their HIV status (Table 3.22).

	Know where to get HIV test		Ever tested		Total
	Count	%	Count	%	
<b>Table 3.23 District coverage of prior HIV testing for women</b>					
Percentage of women age 15-49 years who know where to get an HIV test, percent distribution age 15-49 by testing status and by whether they received the results of the last test, the percentage of women ever tested, and the percentage of women age 15-49 who received their test results the last time they were tested for HIV in the past 12 months, according to background characteristics, [Malawi, 2008]*					
<b>Age group</b>					
15-24	996	91	1,064	97	1,099
25-49	1,713	90	1,857	98	1,898
Missing	231	89	253	97	260
<b>Mother's Education</b>					
None	466	86	526	97	541
Nursery	2	100	2	100	2
Primary	1,954	91	2,106	98	2,155
Secondary	329	93	335	95	352
Higher	7	78	8	89	9
Missing	182	92	197	99	198
<b>Wealth Quintile</b>					
Lowest	412	85	471	97	484
2	522	90	569	98	582
3	528	89	579	98	590
4	536	92	568	98	582
Wealthiest	488	93	508	97	523
Missing	454	92	479	97	496
<b>District</b>					
<b>High intensity</b>					
Lilongwe rural	391	84	460	98	468
Lilongwe city	262	94	264	94	280
<b>Medium intensity</b>					
Mzimba	237	92	254	98	258
Nkhotakota	272	94	283	98	288
Ntchisi					
Machinga	260	96	263	97	270
Zomba	257	86	295	98	300
Karonga	304	94	322	99	324
Chiradzulu	367	98	363	97	376
<b>Low intensity</b>					
Ntchisi	326	86	371	97	381
Mwanza	264	85	299	96	312

Over 90 percent of women aged 15 to 24 years in the sampled districts indicated knowledge of a place where they could go and get a test of HIV. Similarly 97 percent said they had ever tested for HIV. Those who were from wealthier households were more knowledgeable than their poor counterparts about where to get an HIV test. Lilongwe rural shows the least proportion of women [84 percent] with knowledge of the places (Table 3.23).

### 3.3 HIV/AIDS: Prevention of Mother to Child Transmission (PMTCT)

#### 3.3.1 Study Question 1: Has funding/spending increased for PMTCT programmes?

Table 3.24 Trends in national funding for PMTCT, by financing source 1997 – 2007 Malawian Kwacha				
	2002/03	2003/04	2004/05	2005/06
<b>General government units</b>				
Ministry of Health	0	0	2,933,643	778,629
National AIDS Commission	0	0	31,579,422	2,183,462
Other Ministries	0	0	0	0
Local Authorities	0	0	0	0
<b>Private sector</b>				
Private Insurance Scheme	0	0	0	0
House out of pocket payments	0	0	0	0
CHAM	0	0	254,893	7,836,353
Other NGOs	0	0	2,510,993	0
Private Firms/Employers	0	0	0	0
<b>Rest of the world</b>	0	0	8,128,812	36,583,326
<b>TOTAL HIV PMTCT</b>	<b>0</b>	<b>0</b>	<b>45,407,763</b>	<b>47,381,770</b>
Source: Malawi NHA 2002-2004 Report and NHA HIV/AIDS Subaccounts for 2002/03 and 2005/06 (Financing agent by function tables)				

Funding for PMTCT programmes slightly increased between 2004 and 2005 as shown in Table 3.24 and 3.25. Funding from the Ministry of Health and the National AIDS Commission decreased significantly during this period. Conversely, Christian Health Association of Malawi and donors made significant contributions towards the PMTCT programmes in 2005.

Table 3.25 National funding for PMTCT by type of provider, 2002/03-2005/06 Malawian Kwacha				
	2002/03	2003/04	2004/05	2005/06
<b>Government general hospitals</b>				
Central hospitals	0	0	0	0
District hospitals	0	0	0	0
<b>Private Not-for-profit hospitals</b>				
Private not-for-profit hospitals (Other)	0	0	0	0
Private not-for-profit hospitals (CHAM)	0	0	0	0
Private-for-profit Hospitals	0	0	0	0
<b>Providers of ambulatory health care</b>				
Offices of physicians	0	0	0	0
Health centres/dispensaries/maternity	0	0	0	0
Medical and diagnostic laboratories	0	0	0	0
Traditional healers	0	0	0	0
Retail sale and other providers of medical goods	0	0	0	0
<b>Provision and admin of public health programmes</b>	<b>0</b>	<b>0</b>	<b>45,407,760</b>	<b>47,381,769</b>
<b>General health administration and insurance</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Institutions providing health-related services</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Non-health expenditures</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>TOTAL HIV PMTCT</b>	<b>0</b>	<b>0</b>	<b>45,407,760</b>	<b>47,381,769</b>
Source: Malawi NHA 2002-2004 Report and NHA HIV/AIDS Subaccounts for 2002/03 and 2005/06 (Provider by function tables)				

### 3.3.2 Study Question 2: Has the availability of quality PMTCT services increased?

#### 3.3.2.1 Has the quantity of PMTCT services increased? And are they distributed equitably (geographic, gender, age)?

The results from Table 3.26 show that a higher percentage of rural sampled facilities are providing PMTCT services than their urban counterparts. Further results show that more public facilities are providing PMTCT services than private facilities. In Mzimba and Machinga 50 percent of facilities are providing PMCT services.

<b>Table 3.26 Geographic distribution and administration of district ANC clinics offering PMTCT services</b>						
Percentage of ANC clinics providing the minimum package of PMTCT services in 2008 that are urban and rural and are run publicly or privately, by type of district [Malawi, 2008]						
Type of District	Percentage of population that is urban	Geographic		Administration		Total number of clinics
		Percentage of urban sites	Percentage of rural sites	Percentage of public sites	Percentage of private sites	
<b>High intensity</b>						
Lilongwe		50	50	85.7	14.3	14
<b>Medium intensity</b>						
Chiradzulu		36.4	63.6	63.6	36.4	11
Karonga		33.3	66.7	100	0	3
Machinga		40	60	50	50	10
Mzimba		50	50	50	50	4
Nkhotakota		42.9	57.1	57.1	42.9	7
Zomba		37.5	62.5	62.5	37.5	8
<b>Low intensity</b>						
Mwanza		50	50	70	30	10
Ntchisi		11.1	88.9	100	0	9

**Source: HMIS**

All government ANC clinics in Karonga and Ntchisi offered the minimum package of PMTCT services. Among the NGOs, Machinga had the highest proportion of clinics with PMTCT services as shown in Table 3.27 below. Fewer than 10 percent of the private government facilities in Chiradzulu and Lilongwe had PMTCT services.

<b>Table 3.27 Geographic distribution and administration of district ANC clinics offering PMTCT services</b>					
Percentage of ANC clinics providing the minimum package of PMTCT services in 2008 that are urban and rural and are run publicly or privately by district, Malawi 2008					
District	Administration				Total number of clinics providing the minimum package of PMTCT
	Government facility-public	Government facility not public (military, etc)	NGO/ (Faith-based)	Other	
<b>High</b>	<b>85.7</b>	<b>7.1</b>	<b>0.0</b>	<b>7.1</b>	<b>14.0</b>
Lilongwe	85.7	7.1	0.0	7.1	14.0
<b>Medium</b>	<b>62.2</b>	<b>2.2</b>	<b>33.3</b>	<b>2.2</b>	<b>45.0</b>
Chiradzulu	63.6	9.1	27.3	0.0	11.0
Karonga	100.0	0.0	0.0	0.0	3.0
Machinga	54.5	0.0	45.5	0.0	11.0
Mzimba	60.0	0.0	40.0	0.0	5.0
Nkhotakota	57.1	0.0	28.6	14.3	7.0
Zomba	62.5	0.0	37.5	0.0	8.0
<b>Low</b>	<b>84.2</b>	<b>0.0</b>	<b>15.8</b>	<b>0.0</b>	<b>19.0</b>
Mwanza	70.0	0.0	30.0	0.0	10.0
Ntchisi	100.0	0.0	0.0	0.0	9.0
Total	71.8	2.6	23.1	2.6	78.0

There is a challenge of availability of data on PMTCT services in Malawi. From limited information available, there is an indication of steady progress in number of ANC sites providing PMTCT. Because of the different entry points there may also be an element of double counting which may inflate figures. For example, one pregnant woman might be tested positive from both HTC generic services and ANC. The HTC result of the same client is recorded as if two clients were tested. The 2006 HIV and AIDS situation analysis reports ANC and maternity HTC results separately. Since this was not the case previously it is difficult to comment on trends. However, even with the new system the levels are low. Part of the problem may be because of the requirement for certification and the general human resource crisis which renders most facilities not able to provide PMTCT.

When the PMTCT programme started in 2002 only 7 facilities in Malawi were providing PMTCT services and the figure rose to 17 facilities in 2003, thirty-one in 2004, forty in 2005 and then 60 in 2006 (Figure 3.4). There are 542 facilities in Malawi that provide ANC services. The universal access target for this indicator is 100 percent of the ANC facilities providing PMTCT services by 2010. The Ministry of Health has put in place measures to accelerate the provision of PMTCT services which include increasing the number of sites and instituting an opt-out policy for testing pregnant women which means that every pregnant woman has to be tested for HIV and this may enhance achievement of the universal access targets.

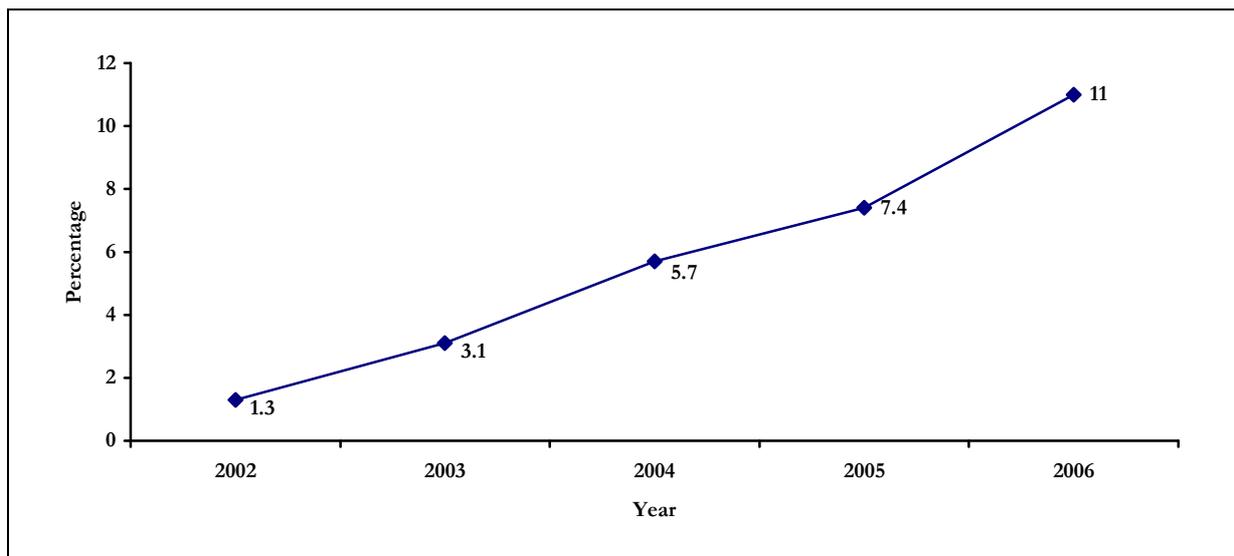


Figure 3.4 National trends in the number and percentage of ANC clinics offering the minimum package of PMTCT services, 2002- 2006

Source: Ministry of Health, HIV/AIDS Unit (2007)

At present however, uptake of HTC among pregnant women is still low. The number of women attending antenatal clinics who have been counselled in PMTCT, tested and received results has been increasing over the past few years from 5,000 in 2002 to 26,700 in 2003 and then 43,345 in 2004 and rising up to 137,996 women by 2006 (Figure 3.5).

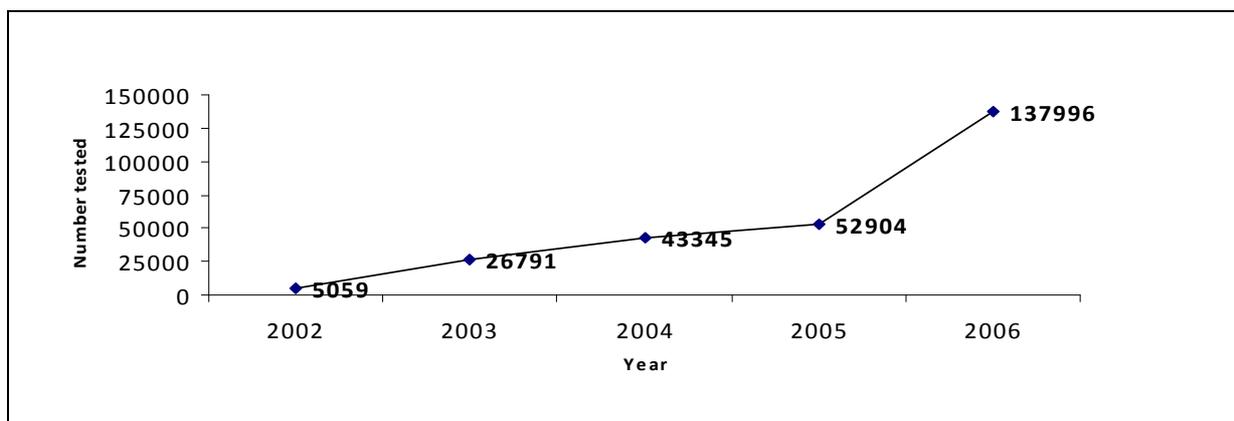


Figure 3.5 National trends in number of pregnant women receiving HIV testing services, 2002-2006

Source: Ministry of Health (2007)

### 3.3.2.2 Has the quality of PMTCT services improved?

#### *Quality of Service Level 1. Availability of basic elements: commodities, guidelines, systems, trained staff*

The facilities in Nkhotakota, Mzimba, Lilongwe, and Ntchisi respectively reported the highest proportion of infrastructure, the staff, guidelines, equipment and supplies that are required for PMTCT quality services. More than 10 percent of the clinics in Karonga and Nkhotakota had all of the elements for quality PMTCT services (Table 3.28).

Type of District	Elements					Number of ANC clinics offering PMTCT services
	Infrastructure <sup>1</sup>	Staff <sup>2</sup>	Guidelines	Equipment and Supplies <sup>3</sup>	All elements	
<b>High intensity</b>						
Lilongwe	6.3	75	75	50	6.3	14
<b>Medium intensity</b>						
Chiradzulu	15.4	69.2	69.2	46.2	7.7	11
Karonga	25	50	50	50	12.5	3
Machinga	10.5	52.6	52.6	31.6	0	10
Mzimba	12.5	87.5	50	75	0	4
Nkhotakota	26.7	60	53.3	60	13.3	7
Zomba	30	70	70	40	10	8
<b>Low intensity</b>						
Mwanza	0	66.7	66.7	41.8	0	10
Ntchisi	8.3	58.3	50	91.7	0	9
<b>Total</b>	14.2	64.6	60.2	52.2	5.3	76
<sup>1</sup> Infrastructure: electricity, water, and adequate infection control						
<sup>2</sup> Staff: trained in PMTCT and in HIV testing						
Equipment and supplies: HIV testing equipment and nationally recommended ARVs for PMTCT.						
<b>Source: DCA-Facility Survey, 2008</b>						

### 3.3.2.3 Has the coverage of PMTCT improved (overall and equitably)?

Representing National and District populations, by background characteristics, the following indicators regarding counselling and testing for all women age 15-49 years who gave birth in the two years preceding the 2008 survey:

- Percentage who received HIV counselling during antenatal care for their most recent birth;
- Percentage who were offered and accepted an HIV test during antenatal care and who received results;
- Percentage who were offered and accepted an HIV test during antenatal care and who did not receive results;
- Percentage who were counselled, were offered and who accepted an HIV test during antenatal care, and who received results

### 3.4 HIV/AIDS: Anti-retroviral Treatment (ART)

#### 3.4.1 Study Question 1: Has funding/spending increased for ART programmes?

	2002/03	2003/04	2004/05*	2005/06
<b>General government units</b>				
Ministry of Health	58,691,950	0	0	0
National AIDS Commission	0	0	0	0
Other Ministries	0	0	0	0
Local Authorities	0	0	0	0
<b>Private sector</b>				
Private Insurance Scheme	0	0	0	0
House out of pocket payments	0	0	0	0
CHAM	0	0	0	0
Other NGOs	0	0	0	0
Private Firms/Employers	0	0	0	0
<b>Rest of the world</b>	0	1,967,475,960	0	2,093,340,000
<b>TOTAL ART</b>	<b>58,691,950</b>	<b>1,967,475,960</b>	<b>0</b>	<b>2,093,340,000</b>
<b>Note: Expenditure on ARVs for 2004/05 was zero because all ARVs were bought and paid for in 2003/04 financial year, even though part of the consignment was used in 2004/05. NHA uses the accrual method; hence the zero in 2004/05.</b>				
<b>Source: Malawi NHA 2002-2004 Report and NHA HIV/AIDS Subaccounts for 2002/03 and 2005/06</b>				

	2002/03	2003/04	2004/05*	2005/06
General hospitals				
<b>Government general hospitals</b>				
Central hospitals	58,691,950	580,493,126	0	607,068,600
District hospitals	0	855,554,376	0	837,336,000
<b>Private Not-for-profit hospitals</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Private not-for-profit hospitals (Other)	0	0	0	0
Private not-for-profit hospitals (CHAM)	0	272,472,844	0	293,067,600
Private-for-profit Hospitals	0	0	0	20,933,400
<b>Providers of ambulatory health care</b>				
Offices of physicians	0	0	0	62,800,200
Health centres/dispensaries/maternity	0	258,955,614	0	272,134,200
Medical and diagnostic laboratories	0	0	0	0
Traditional healers	0	0	0	0
<b>Retail sale and other providers of medical goods</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Provision and administration of public health programmes</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>General health administration and insurance</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Institutions providing health-related services</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Non-health expenditures	0	0	0	0
<b>TOTAL ART</b>	<b>58,691,950</b>	<b>1,967,475,960</b>	<b>0</b>	<b>2,093,340,000</b>
<b>*Note: Expenditure on ARVs for 2004/05 was zero because all ARVs were bought and paid for in 2003/04 financial year, even though part of the consignment was used in 2004/05. NHA uses the accrual method; hence the zero in 2004/05.</b>				
<b>Source: Malawi NHA 2002-2004 Report and NHA HIV/AIDS Subaccounts for 2002/03 and 2005/06 (Provider by Function table)</b>				

The preliminary analysis of resource tracking only gives us the aggregate trend on funding for HIV/AIDS activities, curative and preventive. The ART scale-up falls under the curative component. It is clear that between 2002/03 and 2005/06 there has been a tremendous increase in expenditure towards curative activities. Further analysis will be undertaken to show the actual resources used for ART scale-up.

<b>Table 3.31 Trends in national funding for ART, by financing source 2002-2006</b>		
	2002/03	2005/06
GFATM resources for HIV/AIDS as % of THE for HIV/AIDS	0	30.71
GFATM resources for HIV/AIDS as % of Total external funds for HIV/AIDS	0	44.32
Total expenditure on HIV as % of THE	16.03	23.66
Inpatient curative care for HIV/AIDS as % of THE	7.7	6.16
Outpatient curative care for HIV/AIDS as % of THE	2.17	7.96
Pharmaceuticals for HIV/AIDS as % of THE	0.16	0.14
Prevention and Public Health services for HIV/AIDS as % of THE	4.8	4.01
Administration for HIV/AIDS as % of THE	0.8	3.12
Capital formation for HIV/AIDS as % of THE	0	0.38
Out of pocket expenditure on HIV/AIDS as % of THE	1.16	1.52
Out of pocket expenditure on HIV/AIDS AS % of PvtHE	6.19	8.36
External expenditure on HIV/AIDS as % of THE	6.66	16.39
<b>Source: NHA (2007)</b>		

As shown above, resources towards outpatient curative services for HIV/AIDS increased by 2005/06 compared to 2002. This has translated into increase in ART scale-up activities.

### **3.4.2 Study Question 2: Has the availability of ART services increased?**

#### **3.4.2.1 Has the quantity of ART services increased? And are they distributed equitably (geographic, gender, age)?**

All of the government facilities in Karonga, Mwanza and Ntchisi provide ART services. Fewer than half of the NGOs in most of the medium intensity districts had ART services. Additionally fewer than 10 percent of the private government facilities in Chiradzulu and Lilongwe had ART services. Overall, government facilities had the highest number of facilities providing ART services (Table 3.22). Most ART facilities are in Lilongwe and Chiradzulu and the fewest number of ART clinics are in Mwanza.

The results from Table 3.33 show that sampled rural facilities have more facilities offering ART than urban facilities except for Lilongwe. In Lilongwe, only 22.2 percent of rural facilities offered ART facilities compared to 77.8 percent in urban areas. The result that more facilities in rural offer ART treatment should be interpreted with caution since the sample contained more rural facilities. It is also clear that the bulk of ART clinics are public clinics.

District	Administration					Total number of clinics providing ART services
	Government facility-public	Government facility not public (military, etc)	NGO/ (Faith-Based)	Community	Other	
<b>Type of District</b>						
<b>High</b>	<b>76.9</b>	<b>7.7</b>	<b>7.7</b>	<b>0.0</b>	<b>7.7</b>	<b>13.0</b>
Lilongwe	76.9	7.7	7.7	0.0	7.7	13.0
<b>Medium</b>	<b>65.2</b>	<b>2.2</b>	<b>28.3</b>	<b>2.2</b>	<b>2.2</b>	<b>46.0</b>
Chiradzulu	66.7	8.3	25.0	0.0	0.0	12.0
Karonga	100.0	0.0	0.0	0.0	0.0	3.0
Machinga	63.6	0.0	36.4	0.0	0.0	11.0
Mzimba	50.0	0.0	33.3	16.7	0.0	6.0
NkhotaKota	57.1	0.0	28.6	0.0	14.3	7.0
Zomba	71.4	0.0	28.6	0.0	0.0	7.0
<b>Low</b>	<b>100.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>14.0</b>
Mwanza	100.0	0.0	0.0	0.0	0.0	5.0
Ntchisi	100.0	0.0	0.0	0.0	0.0	9.0
Total	74.0	2.7	19.2	1.4	2.7	73.0

Type of District	Geographic			Administration		Total number of clinics
	Percentage of population that is urban	Percentage of urban sites	Percentage of rural sites	Percentage of public sites	Percentage of private sites	
<b>High</b>						
Lilongwe		77.8	22.2	66.7	33.3	9
<b>Medium</b>						
Chiradzulu		33.3	66.7	66.7	33.3	12
Karonga		33.3	66.7	100	0	3
Machinga		33.3	66.6	66.7	33.3	6
Mzimba		100	0	0	100	1
Nkhotakota		50	50	50	50	4
Zomba		40	60	80	20	5
<b>Low</b>						
Mwanza		40	60	100	0	5
Ntchisi		33.3	66.7	100	0	3

**Source: Census and DCA Facility Census, 2008**

In 2002 there were only three facilities providing ART in Malawi but the number increased to 163 in 2007 (Table 3.34). By December 2005, every district in Malawi had at least one ART service delivery point. Although the private sector is actively engaged in provision of ART since 2005, the public sector has the largest contribution to the total number of ART delivery points in Malawi. The number of sites is highest in the southern region followed by the centre and northern regions respectively as illustrated in the figure below. The scale-up of number of sites

providing ART is therefore on target in the public sector where 90 new sites were expected in 2007. The private sector however did not achieve the target of 50 sites in 2007.

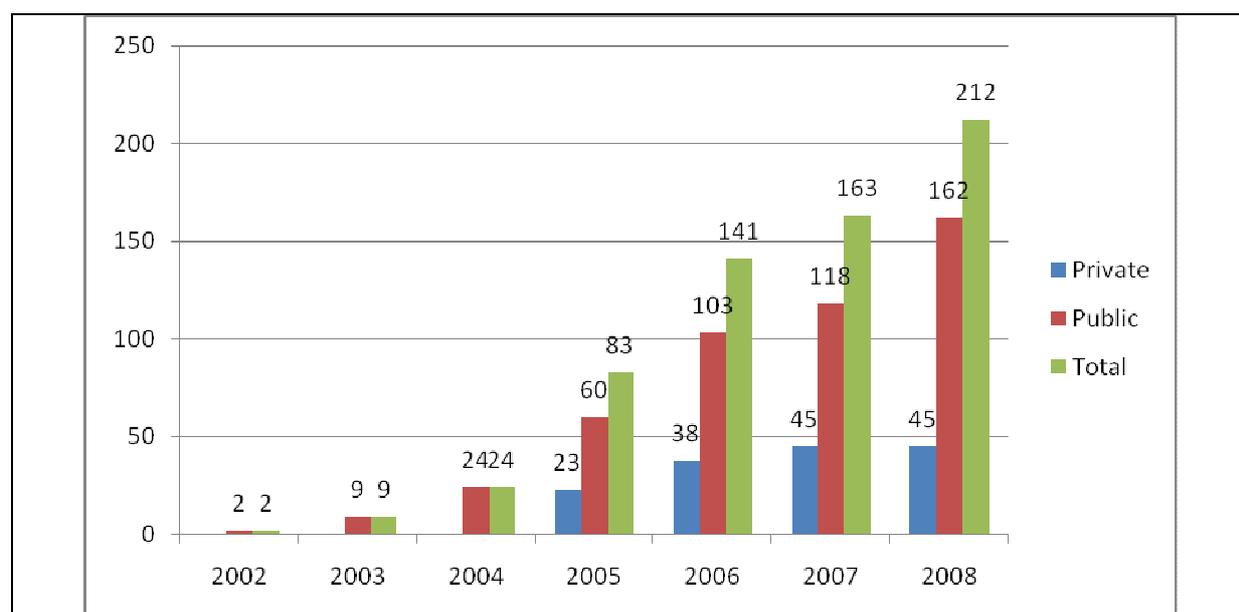


Figure 3.6 National trends in the number of clinics providing ART services by year, according to region, 2002-2007

Table 3.34 Number of clinics providing ART services by year, according to ownership, 2002-2007

Owner	2002	2003	2004	2005	2006	2007
Private			0	23	38	45
Public			24	60	103	118
Total sites	3	9	24	83	141	163

Source: National HMIS (2007)

### Geographical distribution of ART sites, 2005-2007

Table 3.35 Geographic distribution and administration of national clinics providing ART services by region  
Percentage of clinics offering ART services in 2007 that are urban and rural and are run publicly or privately, by region [Malawi, 2007]

Region	Geographic			Administration		Total number of clinics
	Percentage of population that is urban	Percentage of urban sites	Percentage of rural sites	Percentage of public sites	Percentage of private sites	
North						22
Centre						39
South						48
<b>Total</b>				118 (72.4%)	45 (27.6%)	163

Note: Use results from first reporting period (month or quarter) of 2007

Source: Ministry of Health (HIV/AIDS unit)

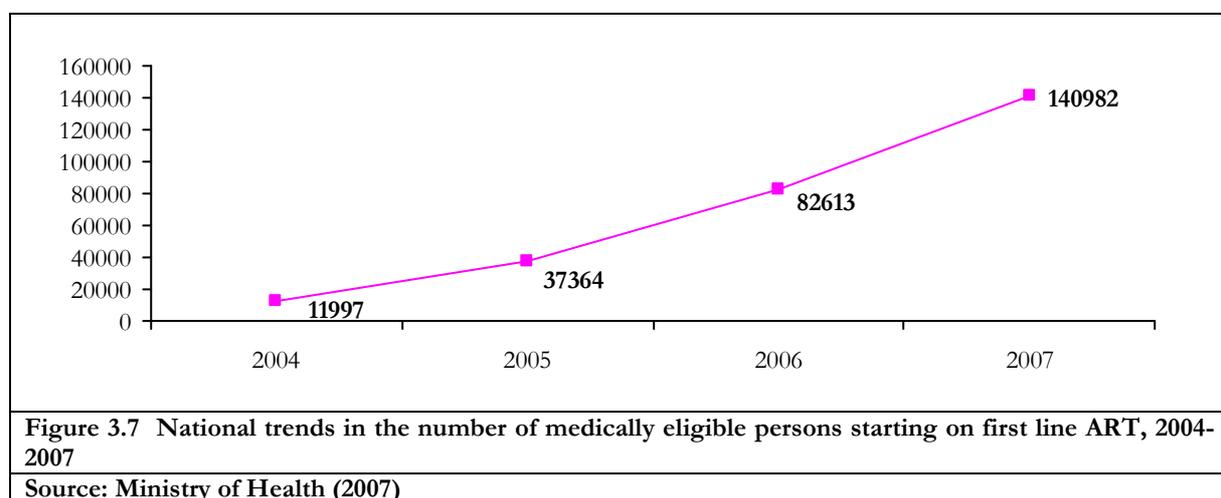
## Coverage of ART in Malawi

The increase in number of new service delivery points between 2004 and 2007 has resulted in an exponential increase in cumulative registration of patients initiating ART between 2002 and 2007 (Table 3.38, Figures 3.7, 3.8). Geographically, more people from the Southern Region of Malawi are on ART followed by the Central Region. These statistics mirror the epidemiology of HIV/AIDS in Malawi. In particular, the Southern Region has the highest prevalence rate of HIV/AIDS.

More women than men have been registered on ART. In 2004, 40 percent of ART registrations were among men and the proportion of men among those ever started ART has remained fairly constant at around 40 percent. No regional differences are noted in terms of access to ART by gender.

The provision of ART to children started later after provision to adults was started. Since 2004 the percentage of children on the ART programme has steadily increased and by June 2007, the universal access target of 8 percent by end of 2008 had already been achieved. In 2004 and 2005; 5 percent of those starting ART were children. This increased to 7 percent and 10 percent in 2006 and 2007, respectively.

Estimates of annual need of ARV based on Spectrum Projections suggest that there are 252,720 people in need of ART in Malawi. In 2007, the number newly in need of ART was 45,005 while pediatric ART need was 23,441. Further analysis of the MOH quarterly reports indicate that unmet need for ART in 2007 is 60 percent for adults and 66 percent for children. This is despite the fact that current coverage levels are within and in some cases have exceeded the universal access targets that the country set. Although the majority of ART registrations are in the Southern Region, published reports indicate that unmet need in the south may be even worse than the central and northern region where HIV prevalence and hence AIDS cases are lower.



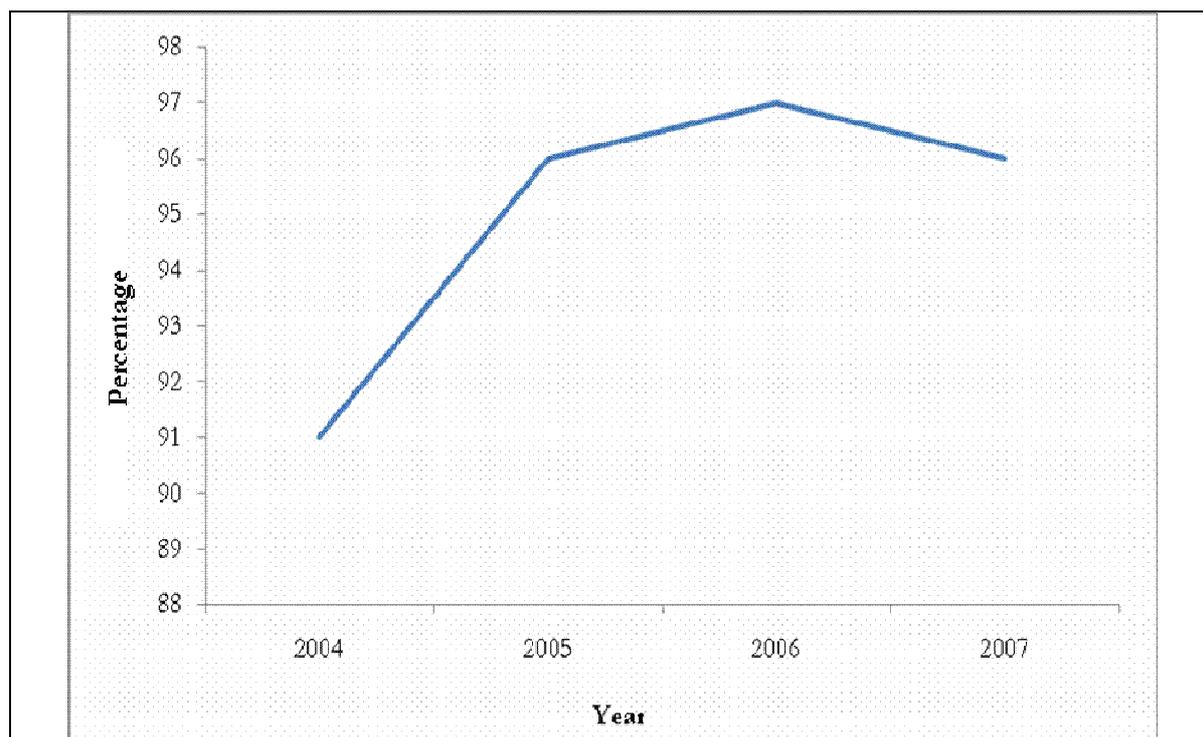


Figure 3.8 Percentage of patients on first line ART regimen, 2004-2007

Source: Ministry of Health (2007)

Table 3.36 Public And Private Sector: Cumulative patients on ART by March 31<sup>st</sup>, 2008

Total Started	Total number of patients started on ART	165,187	
<b>Sex</b>	Number (%) males	64,687	39%
	Number (%) females	100,500	61%
<b>Age</b>	Number (%) adults aged 15 years and above	151,662	92%
	Number (%) children aged 14 years and below	13,525	8%
<b>Occupation</b>	Housewife	32,397	20%
	Farmer	45,603	29%
	Forces	1,843	1%
	Teacher	4,826	3%
	Business	20,306	13%
	HCW	2,174	1%
	Student	7,432	5%
	Other	44,887	28%
	Occupation Unknown	5,719	
	<b>Reasons for starting ART</b>	Number (%) with Stage III	105,452
Number (%) with Stage IV		32,791	20%
Number (%) with low CD4 count		26,944	16%
Number (%) of patients started on ART due to TB		20,770	13%
<b>Patient Outcomes</b>	Total number of patients started on ART	165,187	
	Number (%) alive and on ART	110,790	67%
	Number (%) dead	18,425	11%
	Number (%) defaulted	17,344	10%
	Number (%) stopped treatment	861	<1%
	Number (%) transferred out permanently to another site	17,567	11%
<b>ART Regimen</b>	Of those alive and on ART:-	110,790	
	Number (%) on first line regimen	105,906	96%
	Number (%) on alternative first line regimen	4,377	4%

<b>Ambulatory Status</b>	Number (%) on second line regimen	507	<1%
	Number with ambulatory status known	108,735	
<b>Work Status</b>	Number (%) ambulatory	97,802	90%
	Number with work status known	108,735	
<b>Side Effects</b>	Number (%) at work	96,511	89%
	Number with side effects counted	99,658	
<b>Adherence</b>	Number (%) with significant side effects	4,958	4%
	Number where pill count has been done	68,973	
<b>Death</b>	Number (%) with pill count showing 95% adherence	64,711	94%
	Of those who died with date of death recorded	18,347	
	Number (%) dying in the first month	5,827	32%
	Number (%) dying in the second month	3,914	21%
	Number (%) dying in the third month	2,111	12%
	Number (%) dying after the third month	6,495	35%

**Table 3.37 Percentage of medically eligible persons starting on first line ART by background characteristics, according to year (2003-2007)**

Background characteristic	2003	2004	2005	2006	2007
<b>Sex</b>					
Male		40	39	39	39
Female		60	61	61	61
<b>Age</b>					
Under 15 years		5	5	7	8
15 years +		95	95	93	92
<b>Region</b>					
North			17	14	12
Central			36	33	31
South			49	53	56
Total					

**Source: National HMIS data and based on spectrum projection of number in need for each of the years.**

**Table 3.38 Background characteristics of national clients receiving ART services, 1997 – 2007**

Percentage of patients receiving ART services at the end of the year (last month or quarter) by background characteristics, according to year

Background characteristic	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>Sex</b>											
Female									60.8	62	61.1
Male									39.2	38	38.9
<b>Age</b>											
Children (<15 years)									7.1	17	18.3
Adults (15+ years)									9.6	16.4	15.6
<b>Other characteristics</b>											
<b>Region</b>											
North									15.9	15.4	13.1
Centre									35.6	32.4	30.4
South									48.6	52.2	56.5
<b>Total</b>											

**Source: HIV Unit**

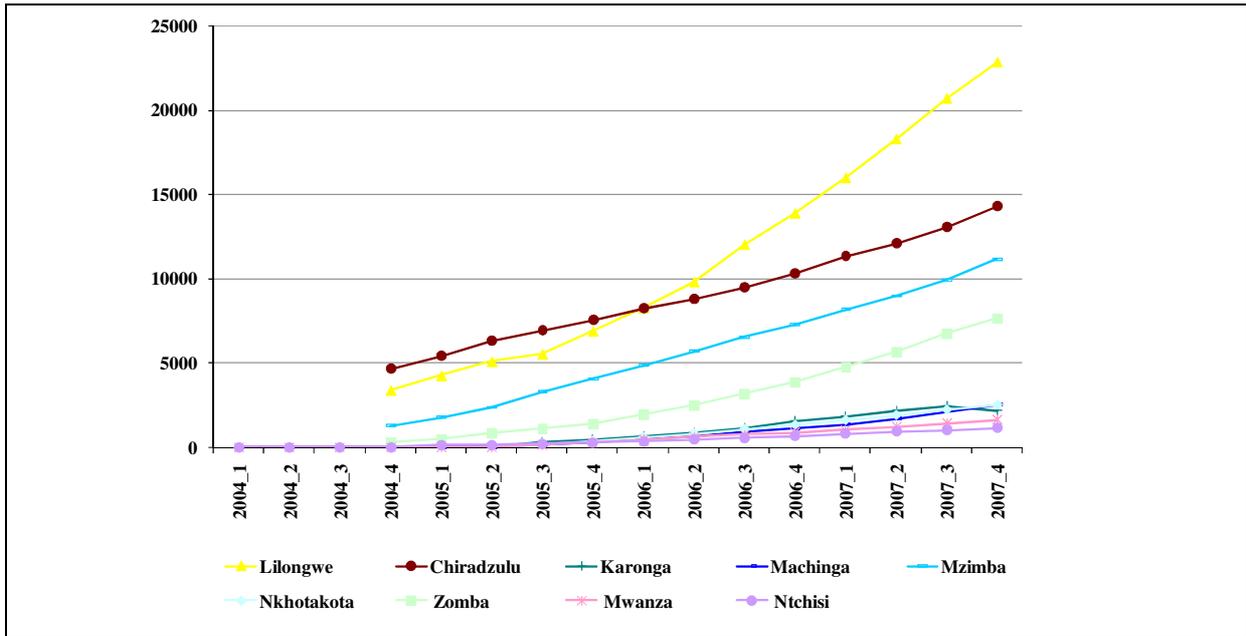


Figure 3.9 District trends in number of persons currently receiving ART by quarter, 2005-2007<sup>15</sup>

Source: District Assessment Study

As shown in figure 3.10 below, there is a bigger percentage of children on ART than adults. Overall there is a general increase in the provision of ART to both adults and children

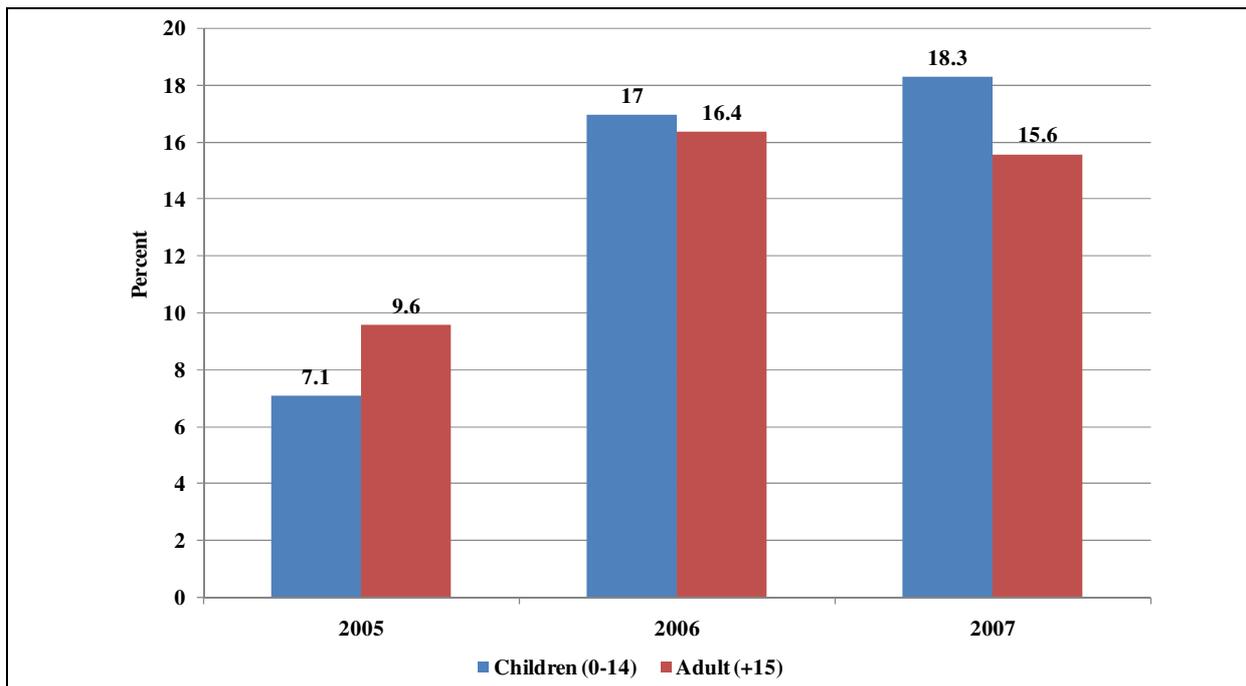
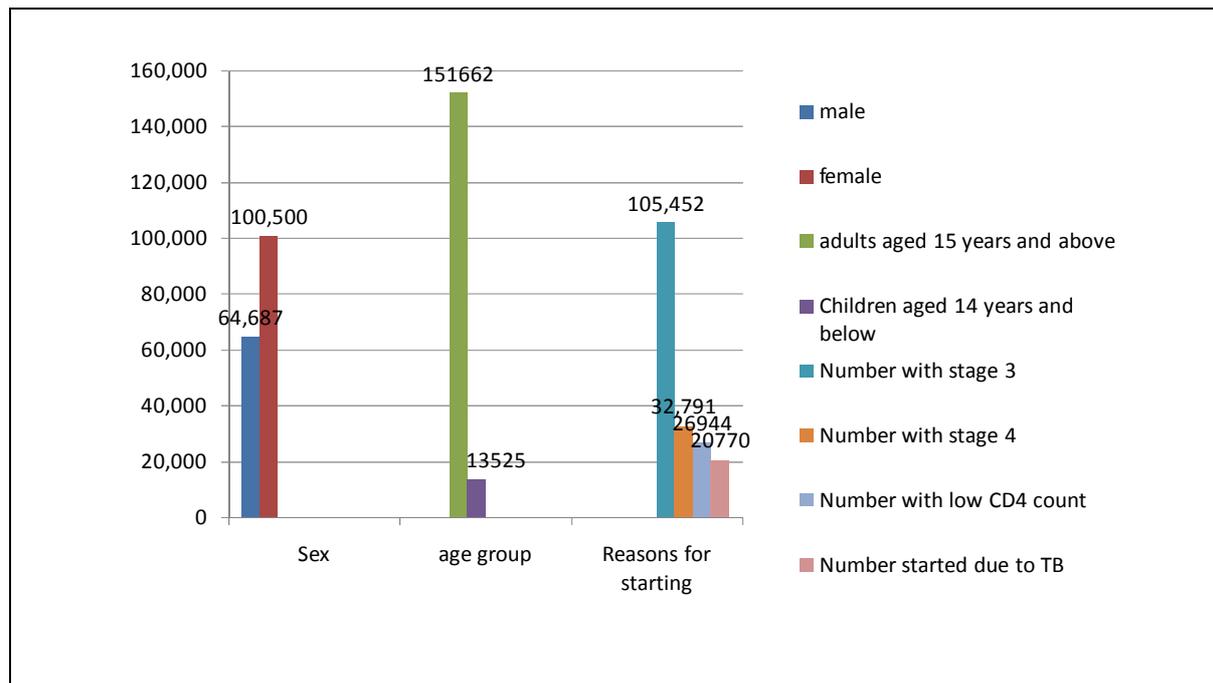


Figure 3.10 Percent of children and adults currently on ART

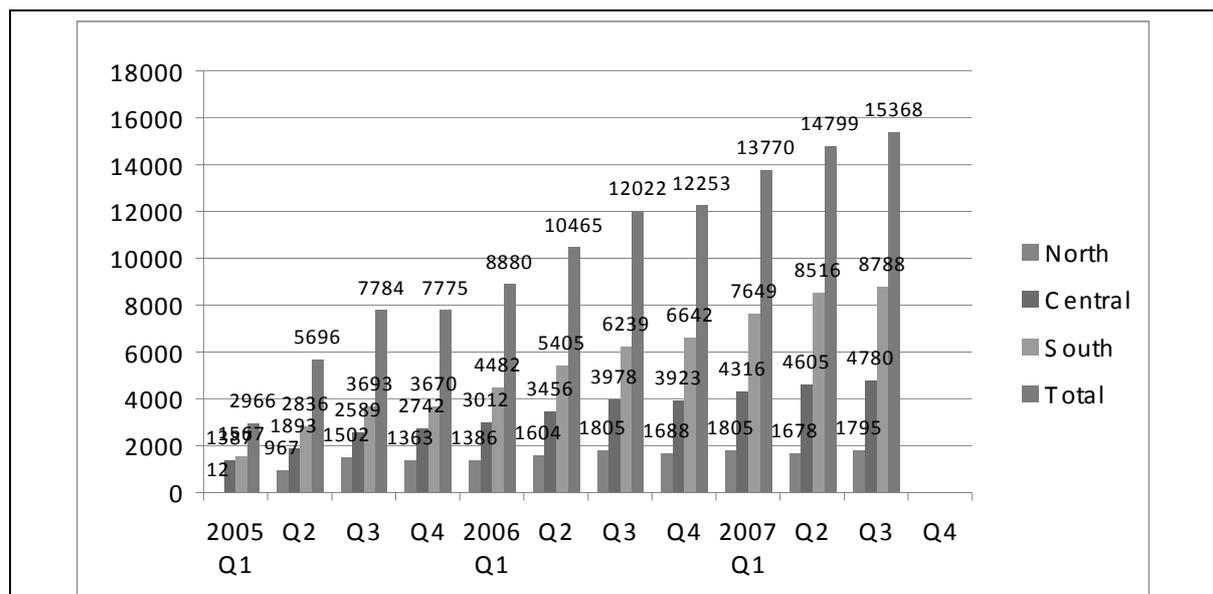
Source: Ministry of Health (2007)

<sup>15</sup> Value labels have not been included because there are so many that they make the graph look cloudy

As of March 2008 there were more female patients on ART than males. As indicated in figure 3.11, there were more adults aged 15 years and above on ART than children aged 14 and below. Among the reasons given for starting treatment included low CD4 count, suffering from TB and the disease being at a stage that needed treatment (stages 3 and 4). But the majority of patients who were on treatment were in stage 3 followed by those on stage 4 and the least who started because they were suffering from TB. Numerically, the Southern region which apparently has the largest population as well as the highest HIV prevalence, has had the highest number of patients on ART since 2005, followed by the Central region and lastly the Northern region (Figure 3.12).



**Figure 3.11: Characteristics of all ART patients ever started on treatment by March 2008 by sex, age and reasons for starting treatment**



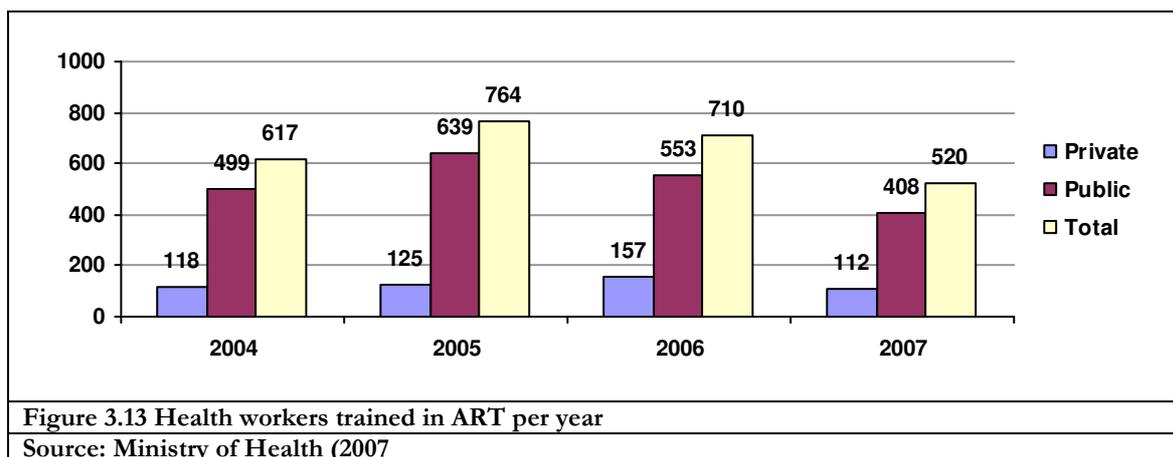
**Figure 3.12: National trends in number ever started on ART by quarter, 2005-2007**

### 3.4.2.2 Has the quality of ART services improved?

#### *Quality of Service Level 1. Availability of basic elements: commodities, guidelines, systems, trained staff*

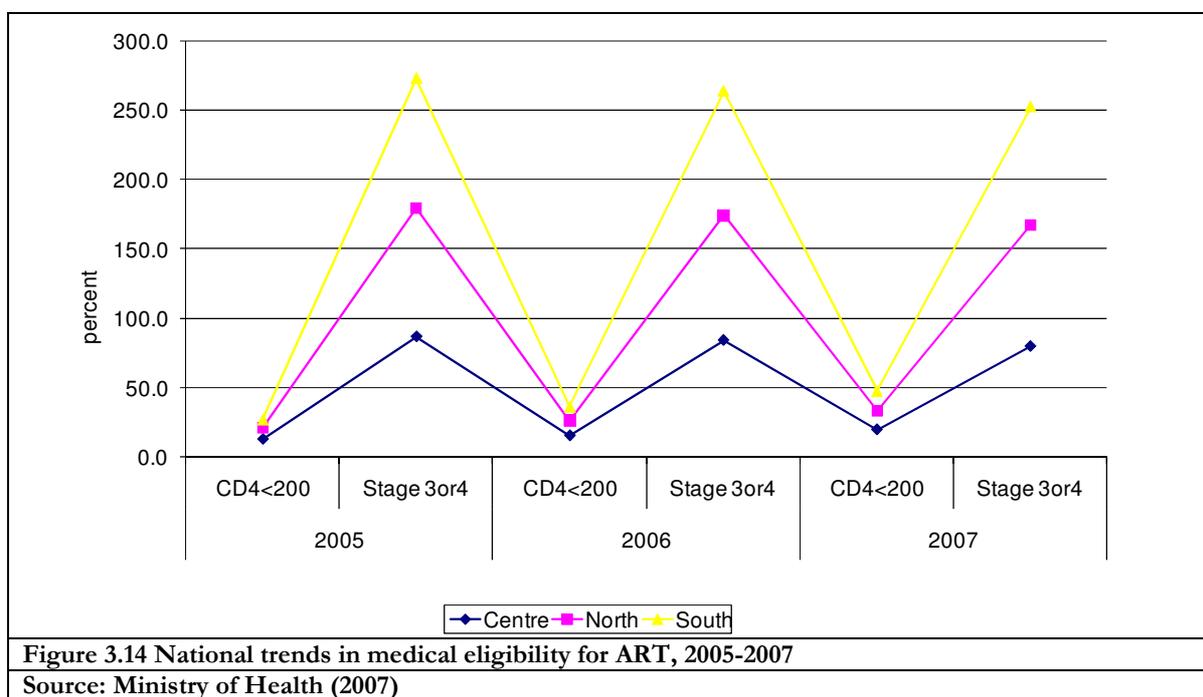
District	Elements					Number of facilities offering ART services
	Infrastructure <sup>1</sup>	Staff <sup>2</sup>	Guidelines <sup>3</sup>	Equipment and supplies <sup>4</sup>	All elements	
<b>High</b>						
Lilongwe	6.3	25	43.75	6.25	0	15
<b>Medium</b>						
Chiradzulu	15.4	46.2	23.1	7.7	0	12
Karonga	25	0	0	0	0	3
Machinga	10.5	5.3	5.3	0	0	12
Mzimba	12.5	0	0	0	0	5
Nkhotakota	26.7	0	0	6.7	0	7
Zomba	30	10	0	10	0	8
<b>Low</b>						
Mwanza	0	0	0	8.3	0	10
Ntchisi	8.3	0	0	8.3	0	10
<sup>1</sup> Infrastructure: electricity, water, adequate infection control						
<sup>2</sup> Staff: Trained in HIV/AIDS opportunistic infection treatment and care and in management of TB/HIV co-infection						
<sup>3</sup> Guidelines: HIV/AIDS opportunistic infection treatment and care and in management of TB/HIV co-infection						
<sup>4</sup> Equipment and supplies: laboratory monitoring equipment, nationally recommended first-line ART, and drugs for opportunistic infection prophylaxis available on day of visit,						
<b>Source: DCA-Facility Census</b>						

The trainings were intense between 2004 and 2007 and resulted in 2,611 health care workers (HCW) being trained and certified in ART provision. More HCWs have been trained in public facilities as opposed to private facilities. As the scale-up advances it is expected that the number of new people to train and certify should go down unless output of the training institutions in Malawi substantially improves. By the end of 2007, 2611 health care workers had been trained and certified in ART. This included 269 doctors, 652 Clinical Officers (CO), 194 Medical Assistants (MA) and 1,496 nurses. But comparatively, more HCWs were trained in 2006 than in 2007 and the majority were trained in 2005 (Figure 3.13).



**Quality of Services Level 2. Adherence to treatment guidelines**

Most persons starting ART do so using WHO clinical staging criterion with no significant differences between the regions and between the Q4 2004 & 2007 cohorts. Nationally, in 2004, only 16% of persons initiated ART due to CD4 criteria compared to 21 in 2007. This may be attributable to increased capacity to perform CD4 counting in ART centres. The trend at district level (2005-2006) and individual in the districts assessment and follow-up studies were similar to the national trend. Detailed information is shown in figure 3.13 and tables 3.38 (national), 3.39 (district) and 3.4 (follow-up study). Lilongwe and Chiradzulu districts have improved over the years, with more patients being initiated on ART using CD 4 count. This might be due to the contribution of NGOs within the district such as the Light House and MSF.



Region	2005		2006		2007	
	CD4<200	Stage 3or4	CD4<200	Stage 3or4	CD4<200	Stage 3or4
Centre	13.3	86.7	15.9	84.1	20.2	79.8
North	7.6	92.4	10.2	89.8	12.9	87.1
South	6.4	93.6	10.3	89.7	14.6	85.4
<b>Total</b>	9.0	91.0	12.1	87.9	16.1	83.9

Type of District	2005			2006			2007		
	WHO clinical stage III or IV	CD4 <200	Total Number	WHO clinical stage III or IV	CD4 <200	Total Number	WHO clinical stage III or IV	CD4 <200	Total Number
<b>High</b>									
Lilongwe	83	19	4123	81	19	6653	76	24	8902
<b>Medium</b>									
Chiradzulu	95	8	2436	79	21	2901	60	40	4143
Karonga	97	3	468	98	2	1059	97	3	1148
Machinga	87	13	300	89	11	809	85	15	1412
Mzimba	89	12	2273	82	18	3213	76	24	2864
Nkhotakota	94	6	121	98	2	290	98	2	530
Zomba	93	7	1803	90	10	3716	84	16	6323
<b>Low</b>									
Mwanza	98	2	253	99	1	727	99	1	933
Ntchisi	97	3	283	99	1	391	98	2	466

Table 3.42 below shows the percentage of patients within the cohort who were started on treatment due to WHO staging rather than CD4 count. As shown by the table, it is clear that very few patients are initiated on treatment due to CD4 count. Reliance on WHO staging for initiating patients can lead due to high death rates (during the first months) due to late initiation when the immunity is very low. Ninety-four percent of the patients within the follow-up sample started ART due to WHO staging.

Table 3.42 ARV treatment following national guidelines																			
Percentage of patients who received specific treatments based on national guidelines, according to type of District [Malawi, 2007]																			
Type of District	Appropriate first line therapy	WHO staging at ART initiation				WHO staging at 1st follow-up visit			WHO staging at 2nd follow-up visit			WHO staging at 3rd follow-up visit			WHO staging at 4th follow-up visit			Number of patients	
		1	2	3	4	2	3	4	2	3	4	2	3	4	2	3	4		
<b>High</b>																			
Lilongwe	98	2	3	53	20	0	0	0	0	0	0	0	0	0	0	0	0	0	188
<b>Medium</b>																			
Chiradzulu	82	4	14	48	8	16	47	7	14	27	5	15	22	3	10	26	3	73	
Karonga	99	0	1	61	33	-	16	11	-	3	2	-	1	2	-	1	2	93	
Machinga	98	0	0	83	11	0	31	5	1	27	3	1	26	3	1	25	3	197	
Mzimba	99	0	0	72	28	0	0	0	0	0	0	0	0	0	0	0	0	162	
Nkhotakota	99	0	0	70	28	0	7	2	0	5	2	0	5	2	0	5	2	135	
Mzuzu	98	0	11	58	29	0	2	0	0	0	0	0	0	0	0	0	0	45	
Zomba	100	0	6	73	20	0	0	0	0	0	0	0	0	0	0	0	0	145	
<b>Low</b>																			
Ntchisi	59	0	0	87	9	0	83	9	0	0	0	0	0	0	0	0	0	99	
<b>Total</b>	<b>95</b>																	<b>971</b>	
<b>Source: DCA-ARV Outcomes Study or other national study</b>																			

Districts	CD4 count at specific stages				Weight at specific stages				
	CD4 count at initiation stage	1 <sup>st</sup> follow-up CD4 count	2 <sup>nd</sup> follow-up CD4 count	3 <sup>rd</sup> follow-up CD4 count	Weight at initiation stage	1 <sup>st</sup> follow-up weight	2 <sup>nd</sup> follow-up weight	3 <sup>rd</sup> follow-up weight	4 <sup>th</sup> follow-up visit weight
<b>High</b>									
Lilongwe	229.54	-	-	-	51	52	53	56	56
<b>Medium</b>									
Machinga	94	-	-	-	43	46	48	49	50
Mzimba	185	-	-	-	48	50	49	47	48
Mzuzu	197	409	-	-	45	44	48	48	51
Nkhotakota	188	-	-	-	44	45	47	48	49
Zomba	143	-	-	-	47	48	49	50	50
Karonga	-	-	-	-	49	50	61	61	61
Chiradzulu	223.57	245	267	313	52	53	52	53	55
<b>Low</b>									
Ntchisi	307	-	-	-	47	51	-	-	
Mwanza					47	48	49	50	51

Source: DCA-ARV Outcomes Study or other national study

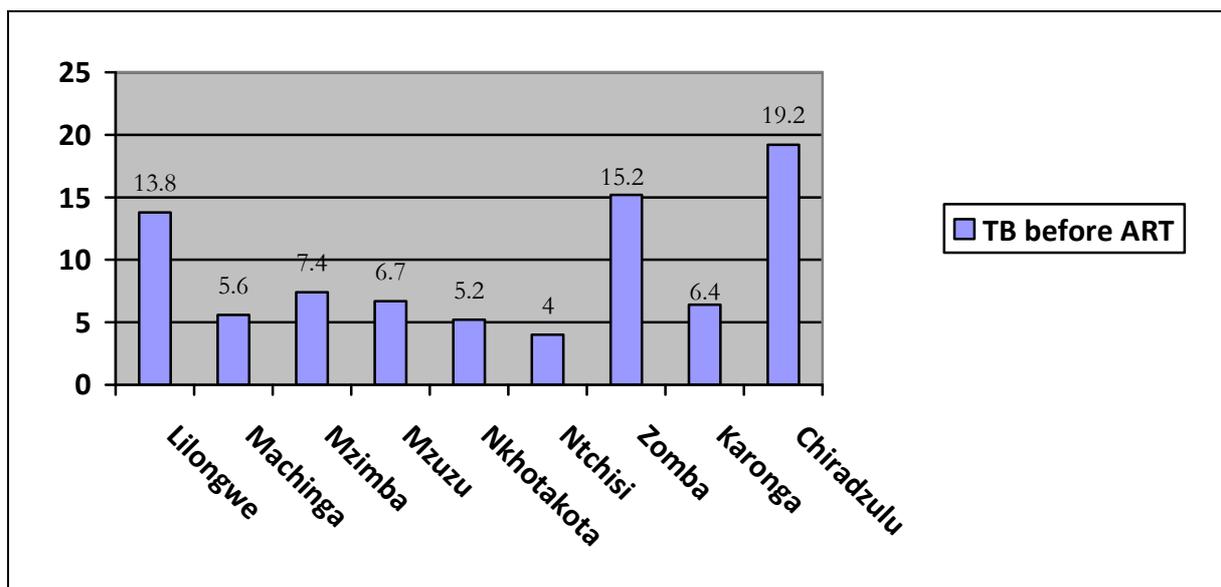


Figure 3.15 Percentage of ART patients who had TB before initiation of treatment

As shown in Figure 3.15 above 8.7 percent of all ART patients in the ART Outcomes study had TB before they started treatment. Lilongwe (13.8 percent) and Zomba (15.2 percent) reported the highest proportion of patients who had TB before initiating treatment. Once they started treatment very few patients were diagnosed with TB. This shows the positive impact of ART in boosting the immunity for patients. Out of 963 patients with recorded information only 3.5 percent were diagnosed of TB. Lilongwe and Zomba recorded highest figures, at 5.4 percent and 13 percent respectively as shown in Figure 3.16. Health providers in the facilities have observed that recording the TB status of patients who initiate ART remains a challenge.

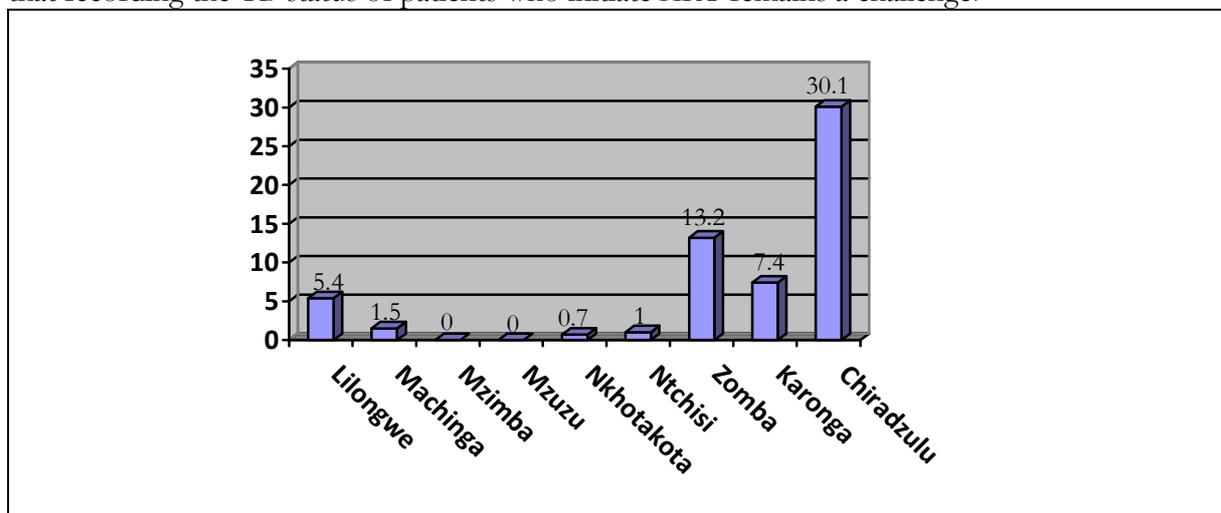


Figure 3.16 Percentage of patients diagnosed with TB during ART treatment

### *Quality of Services Level 3. Adherence to services provided and related treatment outcome*

Of the 146,856 patients who ever started on free ART by end of December, 2007, 69 percent were alive and on ART at the site of registration, 12 percent had died, 10 percent were lost to follow-up, 10 percent had transferred out to another facility (and were presumably alive) and <1

percent had stopped treatment (Figure 3.17). The general picture since the start of the ART service has remained largely the same except for the transfer-outs which have increased over time. This is expected as more ART sites are opened, people move to access ART at sites closer to their homes.

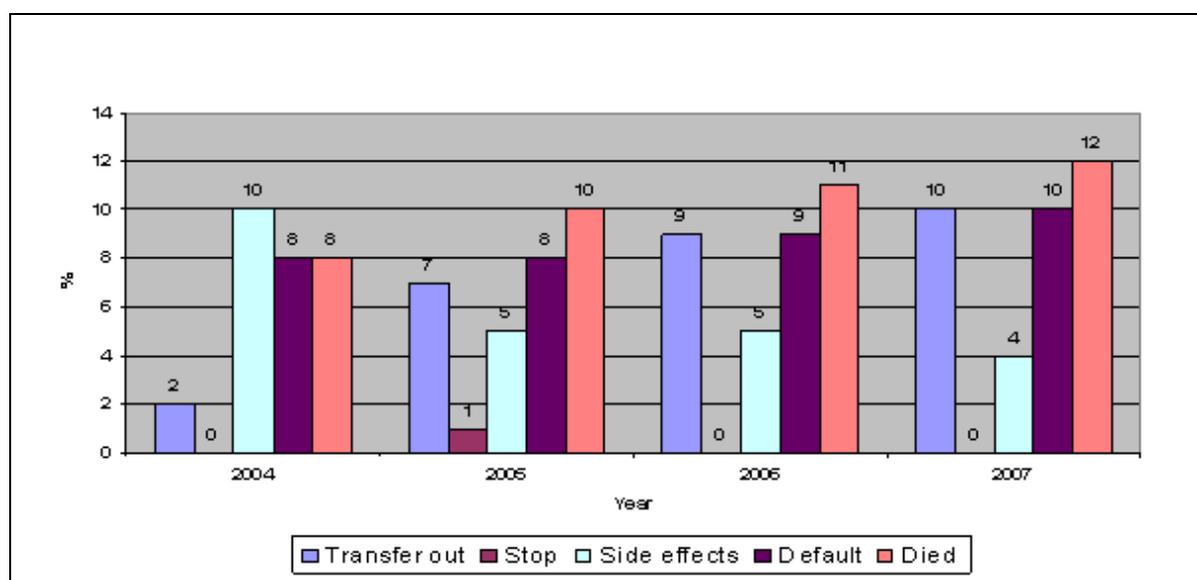


Figure 3.17 Treatment outcomes for patients pre-ARV, 2004 – 2007 (%).

Source: Ministry of Health (2007) (HMIS)

The outcome for patients within the cohort were as follows: The death rate amongst the patients was 8.6 percent, default/lost to follow-up rate was 10.9 percent and transfer-out was 4.1 percent. The highest death rates were observed in Machinga, Karonga and Mzuzu. The explanation for this trend might be late initiation of patients on treatment. The highest default rate was observed in Machinga (25.9 percent) and Nkhotakota, (18.5 percent) (Table 3.44).

	Dead	Lost to follow-up	Transferred	Number of patients
Lilongwe	5.9	5.3	1.1	188
Machinga	14.2	25.9	9.6	197
Mzimba	13.6	6.8	8.6	162
Mzuzu	24.4	8.9	11.6	45
Nkotakota	5.2	18.5	1.5	135
Chiradzulu	-	-	-	73
Karonga	14.7	2.1	11.7	94
Ntchisi	3.0	0.0	1.0	99
Zomba	1.4	3.4	0.0	145
<b>Total</b>				1138

Source: DCA ART Outcomes Study

Fifty-five percent (55 percent) of patients were accessing facilities with follow-up person or programmes. Although Machinga had the highest default rate, the district had 100 percent patient receiving treatment from facilities with a health worker responsible for follow-up.

While the national trend of persons lost to follow-up has remained in the region of 8-10 percent between 2004 and 2007, there is significant variation between the regions. The southern region has shown an increased trend in persons lost to follow-up ranging from 5 percent in 2004 to 10.5

percent in 2007. The central and northern regions had initial very high numbers of persons lost to follow-up with a substantial reduction in subsequent years (Fig. 3.18).

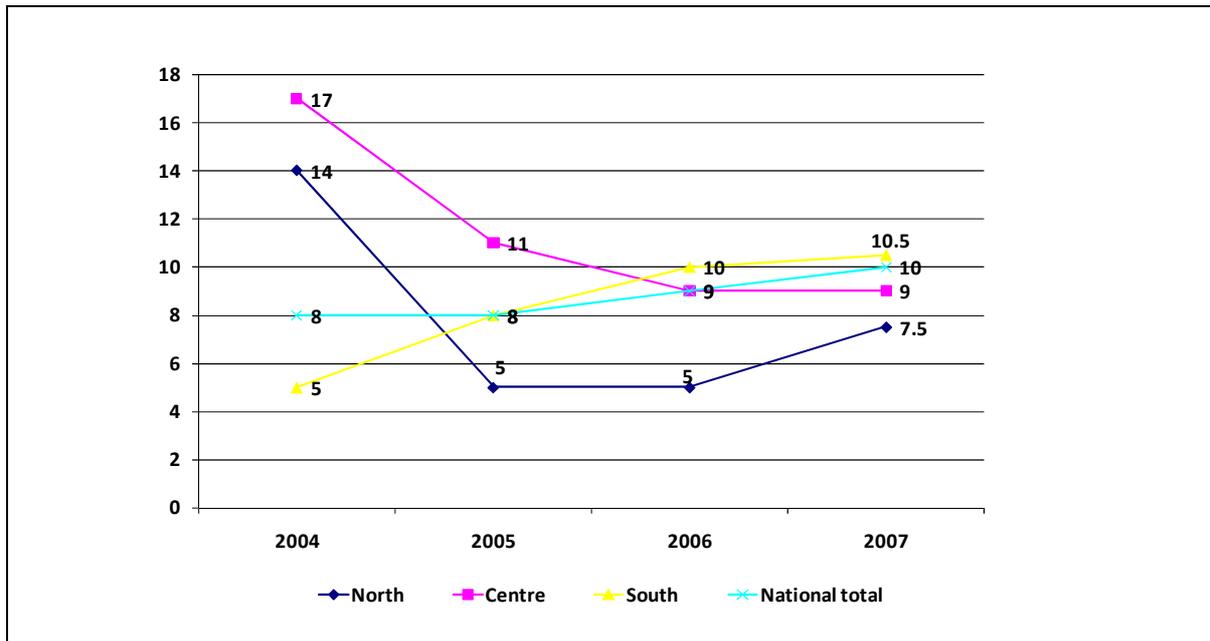


Figure 3.18 Lost to follow-up ART patients, 2004-2007  
Source: HMIS

The current rate of lost to follow-up within the districts ranges from less than 5 percent to slightly above 19 percent. The lowest rate was observed in Karonga district.

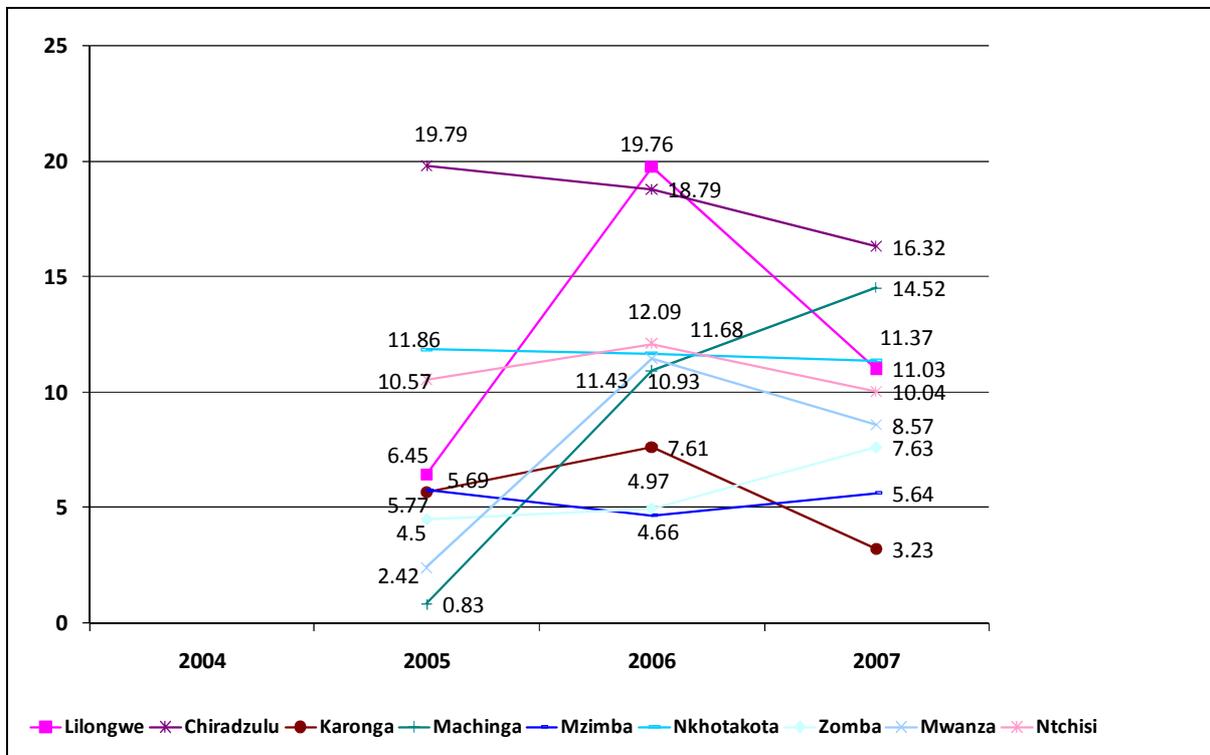


Figure 3.19 Lost to follow-up patients, 2004-2007, in the nine districts  
Source: District Comprehensive Assessment

The information from the follow-up study showed that a similar trend of outcomes as shown by Figure 3.20. Some districts like Ntchisi and Zomba reported very low default and death rates. The main explanation for Ntchisi district is that the District Health Office is operating the mobile ART clinic. This reduces challenges of transport and travelling over a long distance to access ART. Figure 3.20 further shows that Mzuzu had the highest death rate while Machinginga had the highest default rate.

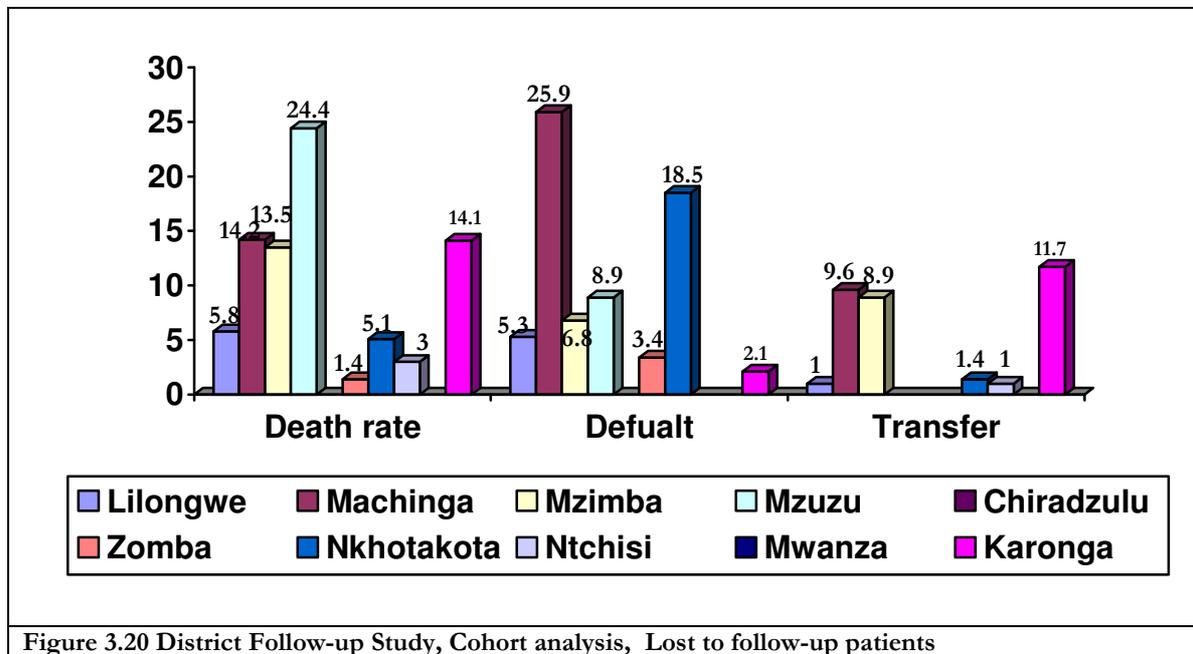


Figure 3.20 District Follow-up Study, Cohort analysis, Lost to follow-up patients

On average, there is a general decrease in the trend for the proportion of patients on ARV changing treatment for drug toxicity between 1998 and 2007 (Figure 3.21). Notably, Machinginga district registered a sharp decrease between 2005 and 2006 and a slight increase between 2006 and 2007.

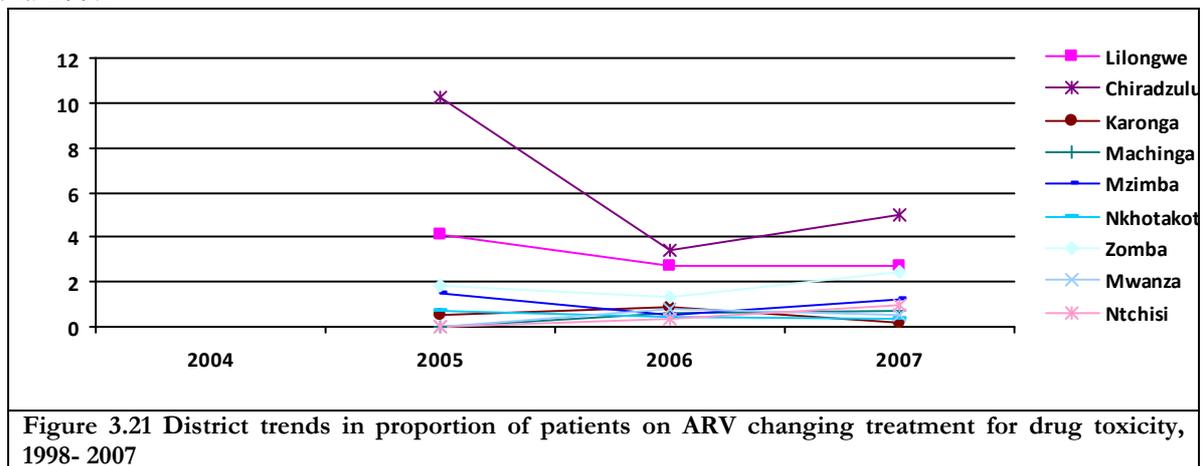


Figure 3.21 District trends in proportion of patients on ARV changing treatment for drug toxicity, 1998- 2007

<b>Table 3.45 Percentage of patients on ARV changing treatment for drug toxicity = (Annual total number of patients changing treatment for drug toxicity for the year)/(Total current number of patients on ARV in the 4<sup>th</sup> quarter/last month of the year) x 100</b>					
Type of District	2003	2004	2005	2006	2007
<b>High Intensity</b>					
Lilongwe			4.16	2.7	2.71
<b>Medium Intensity</b>					
Chiradzulu			10.21	3.39	4.99
Karonga			0.54	0.91	0.15
Machinga			0	0.62	0.67
Mzimba			1.5	0.53	1.22
Nkhotakota			0.68	0.42	0.32
Zomba			1.88	1.35	2.48
<b>Low Intensity</b>					
Mwanza			0	0.75	0.49
Ntchisi			0	0.39	0.96
Source: DCA-Facility Record Review					

### 3.5 HIV/AIDS: Other Services

#### 3.5.1 Study Question 1: Has funding/spending increased for other HIV/AIDS services?

The UNAIDS Matrix on AIDS spending by Financing Source and AIDS categories can be accessed through: <http://www.unaids.org/en/KnowledgeCentre/HIVData/Tracking/Nasa.asp>

#### 3.5.2 Study Question 2: Has the availability of other HIV/AIDS services increased?

##### 3.5.2.2 Has the quality of other HIV/AIDS services improved?

##### *Quality of Service Level 1. Availability of basic elements: commodities, guidelines, systems, trained staff*

Since the first DHS was conducted in 1992, subsequent surveys have shown that condom use has generally been increasing. These condoms are used for the prevention of HIV and STI infection as well as for prevention of pregnancy. In 1992, the condom was more known as a contraceptive method: 70.1 percent for the women and 88.8 percent for the men mentioned that they knew a condom as a contraceptive method. It was also found out that in the same survey 1.4 percent of the women and 7.2 percent of the men reported that at the time of the survey they were using condoms for contraceptive purposes. Disaggregating the data by marital status shows that in 1992, 1.6 percent and 6.3 percent of the females and males, respectively, were using condoms. There were more respondents in the urban areas (among women it was 2.9 percent in urban and 1.5 percent in rural; among men it was 8.0 percent in urban and 6.0 percent in rural) compared to rural areas. These findings show that more men than women in 1992 were using condoms. From the results that have been presented above for the period 1996-2004 there has been an increase in condom use among females in the age groups 15-19, 20-24 and 25-29 in the period between 1996 and 2000. For those aged 30-39 years there was an increase from 1996 to 2000, then a slight decrease in 2004. Overall it can be said that condom use among women at last high risk sex increased from 19.6 percent in 1996 to 28.7 percent in 2000 and 30.1 percent in 2004 indicating that over the same period a slightly higher proportion of women  $\geq 70$  percent were not using condoms during high risk sexual contacts. The results for males show that some significant increases in condom use were reported for the age groups 15-19, 20-24 and 25-29 in

the same period with overall figures at 37.5 percent for 1996, 38.9 percent for 2000 and 47.1 percent for 2004 indicating that more men reported having used a condom in the last high risk sexual contact.

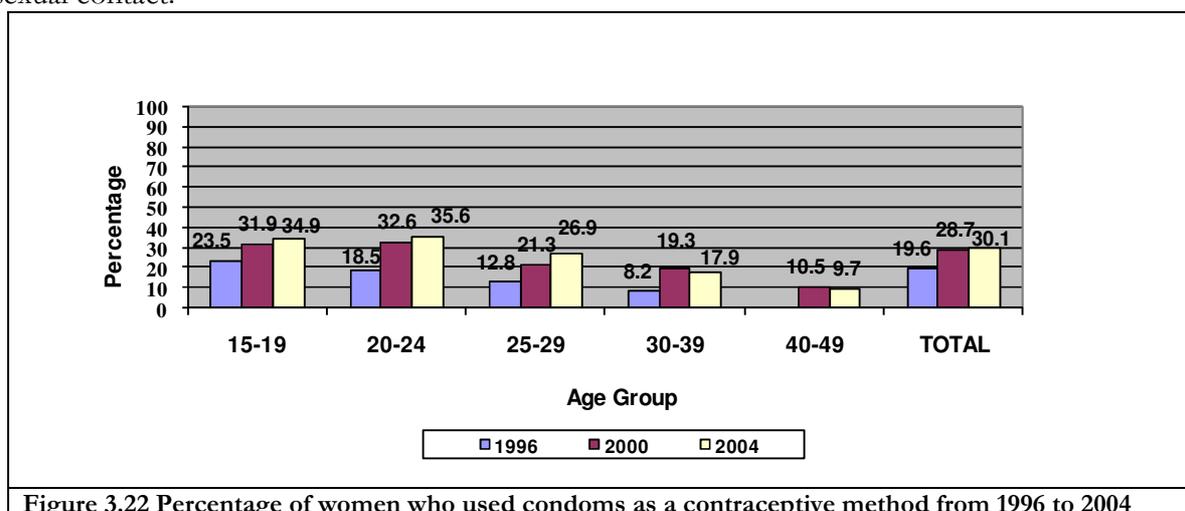


Figure 3.22 Percentage of women who used condoms as a contraceptive method from 1996 to 2004

The MoH and NGOs such as Population Services International (PSI) and Banja La Mtsogolo (BLM) are responsible for the distribution of condoms in Malawi. The MoH distributes condoms free of charge while the two NGOs are distributing socially marketed condoms. PSI distributes *Chishango* brand of condoms while BLM distributes *Manyuchi* brand and also *Chishango* condoms from PSI. In 2004, a total of 8,563,494 condoms were distributed by social marketing agents and BLM had a share of 6,575,000 condoms during this year. In 2005, PSI distributed 4,541,676 condoms. This number increased to 9,201,726 condoms in 2006. For the period January-June 2007, a total of 3,817,116 condoms were distributed by PSI. In 2005, BLM distributed 8,328,800 condoms and for the period January-June 2006, only 1,312,292 condoms were distributed. Generally, these trends show that the share of socially marketed condoms was steadily rising with increasing awareness on safe sex and family planning purposes. On the other hand, the Ministry of Health supply chain system supplies condoms directly to user units in the country. In 2004, GoM distributed 12,380,999 condoms which increased to 23,570,495 condoms in 2006 as can be seen in Figure 3.23 below, which also shows that the percentage of randomly-selected retail outlets and service delivery points that had condoms in stock increased between 2006 and 2007. In particular, 16 percent and 23 percent of outlets had condoms in stock in 2006 and 2007, respectively.

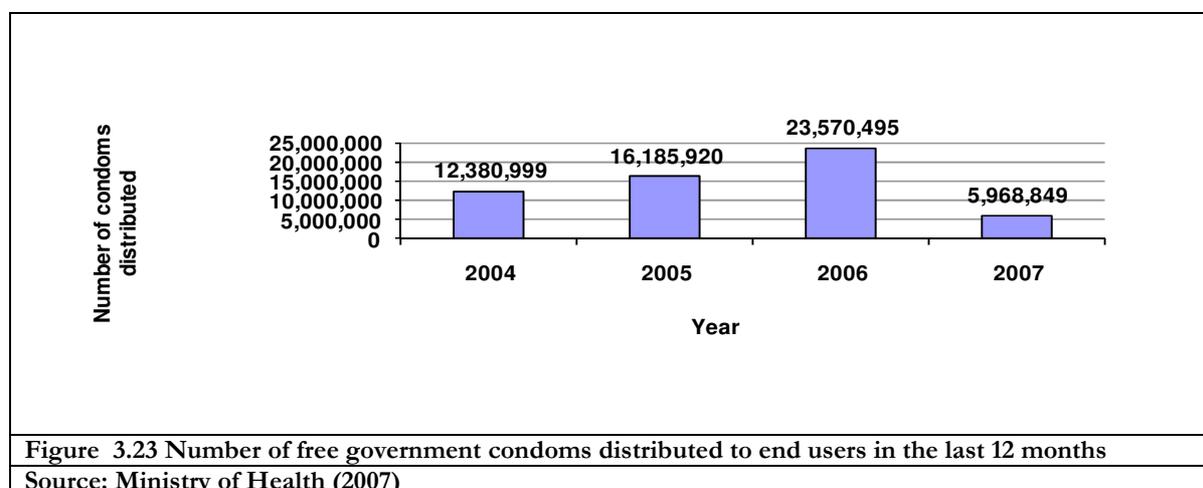


Figure 3.23 Number of free government condoms distributed to end users in the last 12 months

Source: Ministry of Health (2007)

	<b>2006</b>	<b>2007</b>
Percentage of randomly-selected retail outlets and service delivery points that have condoms in stock at the time of a survey, of all retail outlets and service delivery points selected for the survey	16% (24/151)	23% (46/200)

**Source: PSI/Malawi - Measuring access and performance (MAP)**

The availability of condoms in retail outlets needs much improvement as shown in the table above. Although there appears to be an increase in condom availability between 2006 and 2007, less than 25 percent of the outlets surveyed had condoms in stock. Table 3.47 shows that HIV/AIDS knowledge has increased and risk behaviours declined between 2004 and 2006. This could be a direct consequence of a comprehensive prevention and education campaign that has been mounted by the government in the past two decades. There is however gender disparity between men and women in their knowledge of HIV/AIDS, consistent use of condoms and having sexual intercourse with no-marital sexual partner.

		2004 (MDHS)	2006 (MICS)
Percentage of young people 15-24 who both correctly identify ways of preventing the sexual transmission of HIV and who reject major misconceptions about HIV	Women	23.6%	41.6%
	Men	36.3%	40.7%
Percentage of young people age 15-24 reporting the consistent use of condoms with non-regular sexual partners in the past year	Women	35%	39.6%
	Men	47%	59.6%
Percentage of young persons age 15-19 who had sex before age 15	Women	14%	14%
	Men	18%	18%
Percentage of young persons age 15-24 who had sex before age 15	Women	15%	N/A
	Men	14%	
Percentage of young women and men age 15-24 who had sex with a non-marital, non-cohabiting sexual partner	Women	13.9%	13.8%
	Men	62%	56.7%
Condom use rate of the contraceptive prevalence rate		1.80%	1.60%
Percentage of young women and men age 15-19 who never had sex	Women	75%	
	Men	49%	
Percentage of women and men age 15-49 (and age 15-19) who had sex with more than one partner in the past 12 months, of all people surveyed age 15-49 (and age 15-19) who report being sexually active in the past 12 months	Women	1.7%	1.7% (15-19yr)
	Men	13.2%	3.9% (15-19yr)

**Source: National Survey Review**

Table 3.48 shows that the percentage of large enterprises/companies which have HIV/AIDS workplace policies and programmes increased between 2006 and 2007. It rose from 65 percent in 2006 to 71 percent in 2007.

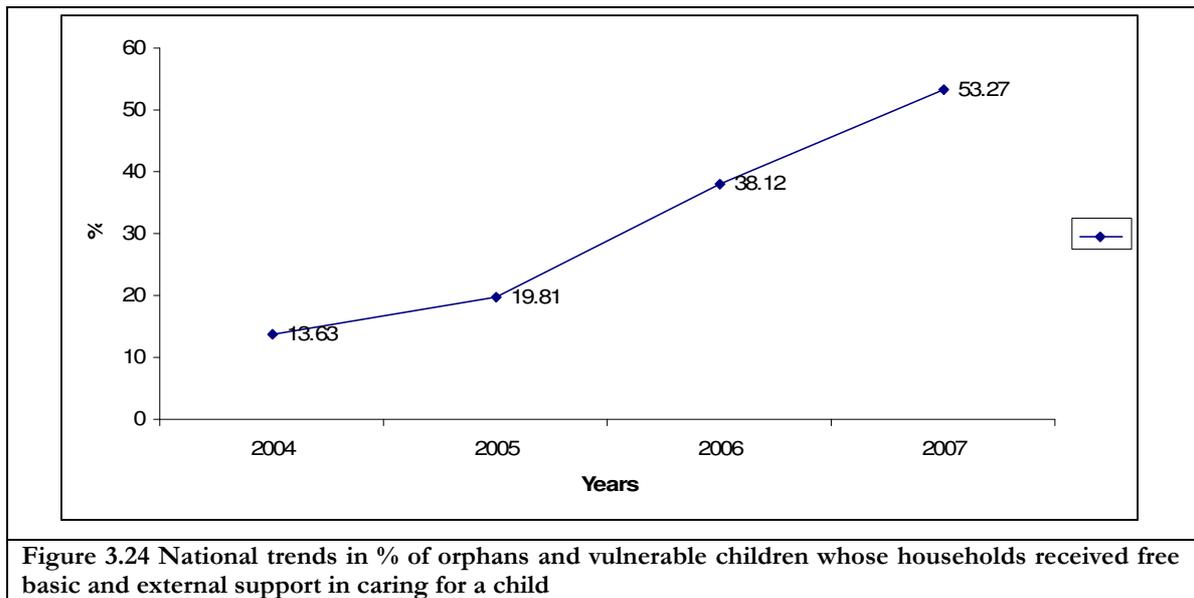
	2006	2007
Percentage of large enterprises/companies which have HIV/AIDS workplace policies and programmes	65%	71%

**Source: National Survey Review-NAC**

<b>Table 3.49 National trends in the percentage of orphans and vulnerable children whose households received free basic and external support in caring for the child</b>				
	2004	2005	2006	2007
Percentage of orphans and vulnerable children whose households received free basic and external support in caring for the child	13.63%	19.81%	38.12%	53.27%

**Source: National Survey Review-NAC**

Figure 3.24 shows a rising trend in percentage of orphans and vulnerable children whose households received free basic and external support in caring for a child. It rose from 13.63 percent in 2004 to 53.27 percent in 2007. This trend could be explained by the increase in funding for HIV/AIDS activities in the past few years in Malawi.



The population of orphans grew between 2000 and 2006. The number of orphaned children was less than the number of non-orphaned children in 2000. The population of orphans and non-orphans was the same in 2004. In 2006, non-orphaned children were more than orphaned children (Table 3.50).

<b>Table 3.50 National trends in the ratio of orphaned children compared to non-orphaned children age 10-14 who are currently attending school.</b>			
	2000/MDHS	2004/MDHS	2006/MICS
Ratio of orphaned children compared to non-orphaned children age 10-14 who are currently attending school, [Malawi]	0.94	1.00	0.97

**Source: National Survey Review**

Table 3.51 shows that a high percentage of facilities offering HIV services have a working relationship with NGOs or CBOs for prevention activities. For example, 92.3 percent of facilities in Chiradzulu district have a working relationship with any NGO or CBO. Of the nine districts, Machinga has the lowest proportion of facilities having a working relationship with any NGO or CBO.

<b>Table 3.51 Connection between HIV services and community prevention services</b>					
Percentage of all facilities and those offering HIV services with a working relationship with any NGO or CBO for HIV prevention activities, by district, Malawi 2008					
District	Percentage of all facilities	Percentage of all facilities with HIV-NGO relationship	Total number of facilities with HIV-NGO relationship	Percentage of facilities offering any HIV services	Total number of facilities offering any HIV services
<b>High</b>		<b>56.3</b>	<b>9</b>	<b>100</b>	<b>16</b>
Lilongwe	60	56.3	9	100	16
<b>Medium</b>		<b>60.3</b>	<b>44</b>	<b>89</b>	<b>65</b>
Chiradzulu	92.3	92.3	12	100	13
Karonga	37.5	37.5	3	50	4
Machinga	44.4	42.1	8	100	19
Mzimba	75	75	6	100	8
Nkhotakota	60	60	9	80	12
Zomba	66.7	60	6	90	9
<b>Low</b>		<b>58.3</b>	<b>14</b>	<b>100</b>	<b>24</b>
Mwanza	58.3	58.3	7	100	12
Ntchisi	63.6	58.3	7	100	12
Total		59.3	67	92.9	105

#### ***Quality of Services Level 4. Effectiveness of services***

In the DCA Household Survey women were asked if they have ever heard of HIV/AIDS. Table 3.52 shows the percentage of women who have heard of AIDS by background characteristics. Among all women aged 15-49, 98 percent said they have knowledge of the existence of HIV. This distribution doesn't change with the wealth status of the woman or her education level. Among the districts almost all women had ever heard of the disease though somehow in the districts of the southern region of the country around 5 percent indicated that they have never heard of HIV.

Most HIV/AIDS programmes that target the general population promote monogamy and condom use as the primary ways of avoiding HIV infection among sexually active men and women.

<b>Table 3.52 Knowledge of AIDS</b>						
Percentage of women age 15-49 who have ever heard of AIDS by background characteristics, Malawi, 2008]						
	% Have heard of AIDS		% Have not heard of AIDS		Total	
	%	Count	%	Count		
<b>Age group</b>						
15-24	76	1,296	24	402	1,698	
25-49	76	1,838	24	575	2,413	
40+	77	589	23	179	768	
Missing	77	350	23	102	452	
<b>Mother's Education</b>						
None	75	699	25	231	930	
Nursery	100	3	0	0	3	
Primary	76	2,498	24	779	3,277	
Secondary	78	519	22	144	663	
Higher	82	32	18	7	39	
Missing	77	322	23	97	419	
<b>Wealth quintile</b>						
Lowest	75	587	25	197	784	
2	75	658	25	217	875	
3	77	697	23	203	900	
4	77	720	23	220	940	
Wealthiest	77	722	23	217	939	
Missing	77	689	23	204	893	
<b>District</b>						
<b>High Intensity</b>						
Lilongwe rural	77	485	23	145	630	
Lilongwe city	76	367	24	116	483	
<b>Medium Intensity</b>						
Karonga	77	433	23	128	561	
Mzimba	76	414	24	134	548	
Nkhotakota	77	347	23	102	449	
Machinga	74	359	26	123	482	
Zomba	76	381	24	119	500	
Chiradzulu	78	476	22	133	609	
<b>Low Intensity</b>						
Ntchisi	75	431	25	141	572	
Mwanza	76	380	24	117	497	

Table 3.53 shows an increasing trend with increased education of women aged 15-24 years having their first sexual intercourse before age 15. The proportion of women who had their first sexual intercourse before age 18 was higher and decreased with increase in level of education for women. A higher proportion of wealthier women reported having their first sexual intercourse before age 18.

**Table 3.53 Age at first sexual intercourse among youths**

Percentage of women age 15-24 who had sexual intercourse before age 15 and age 18 by background characteristics, [Malawi, 2008]

	Women age 15-24		Women age 25-49			Total number of women	
	First sexual intercourse before age 15		First sexual intercourse before age 18		Missing		
	%	count	%	count	%		Count
<b>Mother's Education</b>							
None	15	141	78	733	7	62	936
Nursery	33	1	67	2	0	0	3
Primary	34	1,135	58	1,914	8	265	3,314
Secondary	43	290	49	328	8	53	671
Higher	36	14	59	23	5	2	39
Missing	32	135	50	209	18	77	421
<b>Wealth quintile</b>							
Lowest	36	284	56	446	8	64	794
2	40	351	53	474	7	62	887
3	33	304	63	569	4	35	908
4	28	265	67	638	5	44	947
Wealthiest	25	233	71	675	4	42	950
Missing	31	279	45	407	24	212	898
<b>District</b>							
<b>High Intensity</b>							
Lilongwe rural	32	205	59	375	9	55	635
Lilongwe city	35	170	54	264	11	53	487
<b>Medium Intensity</b>							
Karonga	37	206	56	316	7	40	562
Mzimba	26	145	66	364	8	42	551
Nkhotakota	28	129	65	299	7	30	458
Machinga	34	165	60	292	7	32	489
Zomba	31	155	61	311	8	42	508
Chiradzulu	30	184	61	371	9	57	612
<b>Low Intensity</b>							
Mwanza	36	179	53	267	11	55	501
Ntchisi	31	178	60	350	9	53	581

<b>Table 3.54 Premarital sexual and condom use during premarital sexual intercourse among youths [Never married, aged 15-24 years]</b>						
Among never married women age 15-24, the percentage who had never had sexual intercourse, the percentage who had sexual intercourse in the past 12 months, and among those who had premarital sexual intercourse in the past 12 months, the percentage who used a condom at their last sexual intercourse, by background characteristics, [Malawi, 2008]						
	Have you ever had sexual intercourse				The last time you had sexual intercourse (with this person), was a condom used	
	Never had sexual intercourse		Had sexual intercourse last 12 months		Used condom	
	Row %	Count	Row %	Count	Row %	Count
<b>Total</b>	<b>48</b>	<b>14499</b>	<b>40</b>	<b>13212</b>	<b>42</b>	<b>6905</b>
<b>The highest level of school attended</b>						
None	27	82	59	223	100	223
Primary	54	9207	36	6508	33	2713
Secondary	41	4681	46	5392	45	3046
Higher	13	188	58	1089	74	923
<b>Wealth Quintile</b>						
Lowest	50	2704	48	2642	31	830
2	52	2370	36	1786	31	764
3	51	1722	26	991	59	1051
4	56	2538	31	1524	41	776
Wealthiest	25	1782	54	4265	56	3018
<b>District</b>						
Karonga	54	495	35	321	38	159
Mzimba	69	2431	26	915	64	706
Nkhotakota	44	724	40	676	41	373
Ntchisi	34	598	58	1051	54	621
Lilongwe Rural	64	4914	26	2227	28	873
Lilongwe City	26	2096	66	5328	46	2849
Machinga	47	940	44	1081	52	628
Zomba	51	1842	28	1093	39	696
Chiradzulu	33	253	32	347	0	0
Mwanza	47	205	23	173	0	0

Information is collected in the DCA-Household Questionnaire on usual residents who died in the 24 months preceding the survey. In those households, additional questions are asked on external support received by the households free of charge: medical, emotional or psychological, material, social, and support for schooling. The results presented in Table 3.55 show the percentage of households with deaths in the past 24 months and among households with deaths, the percentage that received specific types of external support free of charge, by background characteristics. About 10 and 5 percent of male and female headed households respectively had death in the past 12 months. The proportion of households experiencing deaths was highest in Nkhotakota (15 percent) but lowest in Mzimba (3 percent).

### 3.5.2.3 Has the coverage of other HIV/AIDS services improved (overall and equitably)?

Information was collected in the DCA-Household Questionnaire on usual residents who died in the 24 months preceding the survey. In those households, additional questions were asked on external support received by the households free of charge: medical, emotional or psychological,

material, social, and support for schooling. The results presented in Table 3.55 show the percentage of household with deaths in the past 24 months, by background characteristics.

The results indicate that of households with at least one death, the female headed households had a greater proportion of deaths as compared to the male headed households. The distribution is random among the wealth quintile groups and among districts. The highest proportion of households which experienced death were observed in Nkhotakota (15 percent) and Chiradzulu (9 percent).

<b>Table 3.55 Percentage of households with deaths in the past 24 months</b>				
	<b>Had death</b>		<b>Had no death</b>	
	<b>Row %</b>	<b>Count</b>	<b>Row %</b>	<b>Count</b>
<b>Sex of Household Head</b>				
Male	6.16	245	93.84	3,735
Female	11.34	118	88.66	923
<b>Wealth Quintile</b>				
Lowest	9.2	79	90.8	780
2	6.57	63	93.43	896
3	7.51	76	92.49	936
4	6.68	71	93.32	992
Wealthiest	6.02	64	93.98	999
<b>District</b>				
<b>High Density</b>				
Lilongwe rural	7.1	43	92.9	563
Lilongwe city	4.87	23	95.13	449
<b>Medium Density</b>				
Karonga	5.07	25	94.93	468
Mzimba	2.5	13	97.5	507
Nkhotakota	15.16	89	84.84	498
Machinga	4.72	16	95.28	323
Zomba	7.71	38	92.29	455
Chiradzulu	9.12	53	90.88	528
<b>Low Density</b>				
Mwanza	7.71	37	92.29	443
Ntchisi	5.95	29	94.05	458

### 3.6 Study Question 3: Have the incidence, prevalence, morbidity, mortality and impact related to HIV changed?

#### 3.6.1 HIV Incidence

No data

<b>Table 3.56 National trends in HIV incidence</b>			
	Year/study	Year/study	Year/study
HIV incidence			
<b>Source: National Survey Review/Special Studies</b>			

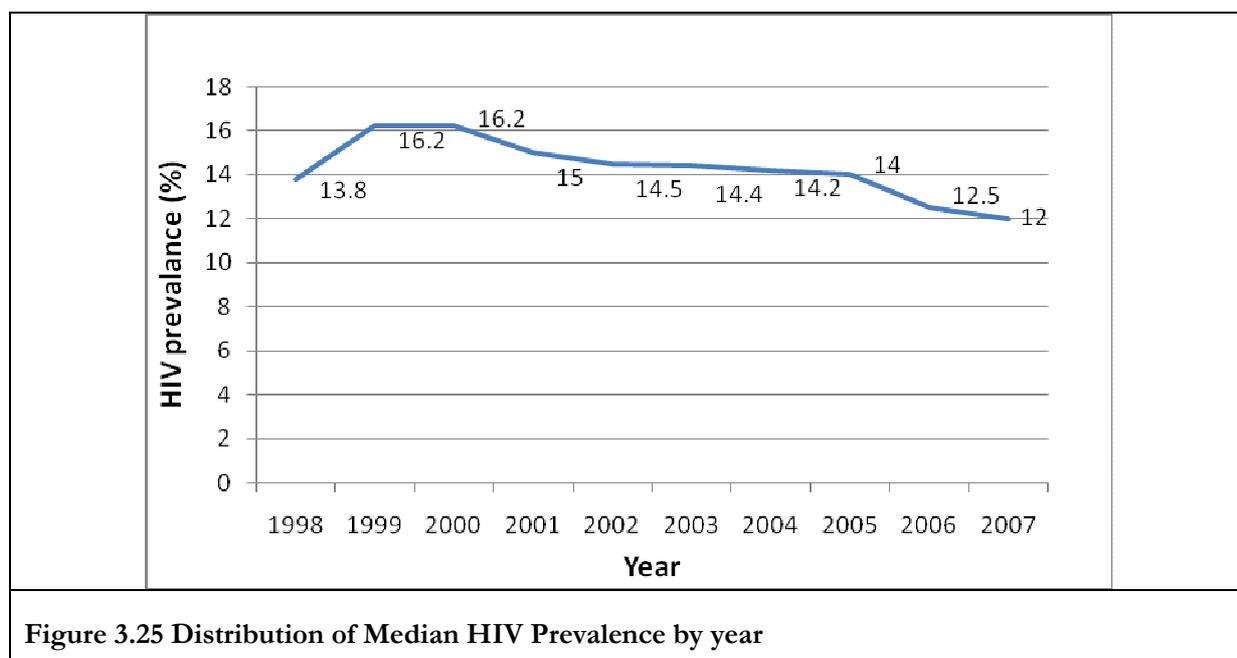
### 3.6.2 HIV Prevalence

#### 3.6.2.1 HIV Surveillance Trends

HIV sentinel surveillance in Malawi was conducted in 19 sites since 1994 and by 2007 the number of sites increased to 54 covering all districts in the country. Hence trend analysis in this report only covers the old 19 sites.

#### 3.6.2.2 Trend analysis of the national HIV median prevalence

There is a downward trend in HIV prevalence from antenatal clinics since 1999. The median HIV prevalence decreased from 16.2 in 1999 to 12 in 2007 as shown in figure 3.25. But between 1998 and 1999 there was an increase in the median HIV prevalence rising from 13.8 percent to 16.2 percent.



#### 3.6.2.3 Trend analysis of the 15-19 and 15-24 age groups

The trend analysis in those aged between 15 to 24 years shows a declining prevalence though the prevalence is consistently higher than the subgroup of women aged from 15 to 19 years as shown in Figure 3.26. Between 1998 and 1999 there was an increasing trend for both age groups while between 1999 and 2007 HIV prevalence rates for both age groups drastically decreased. The decline was more rapid for the younger age group especially during the 2001-2005 period.

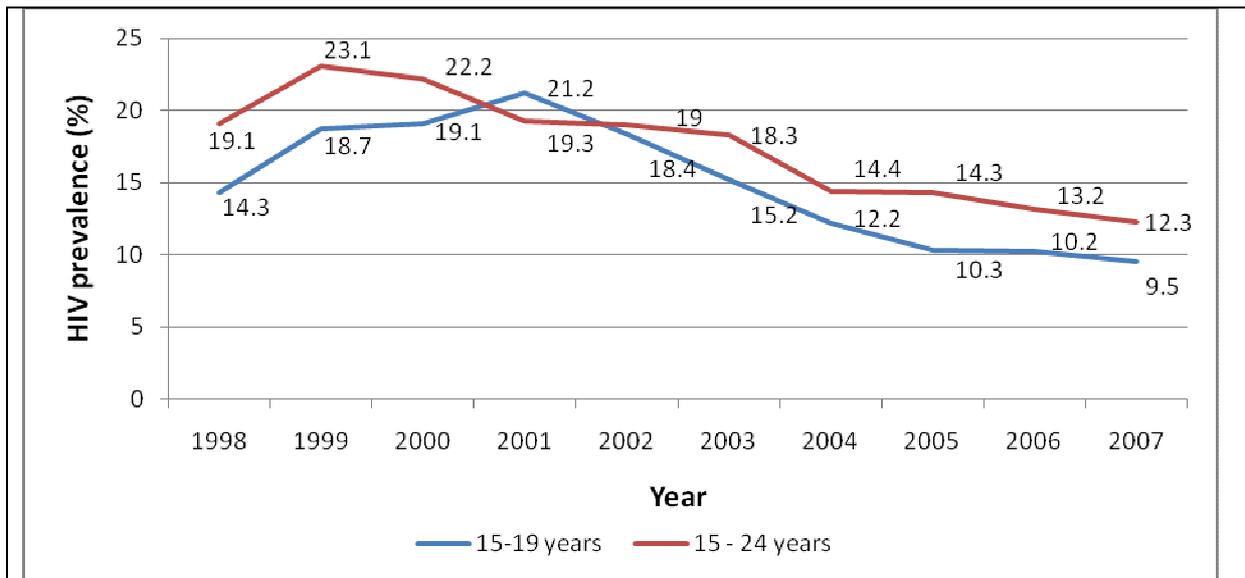


Figure 3.26 Trend analysis in HIV/AIDS prevalence in the 15-19 and 15-24 age groups

### 3.6.2.4 Trend analysis by locality and region

In order to get an urban-rural differential in HIV prevalence, analysis by locality showed that there was a marked downward trend in HIV prevalence in urban area from 1998 to 2007, while in rural area for the same period the prevalence . The prevalence rate is however still highest in urban areas followed by semi-urban and lastly rural (Figure 3.27)

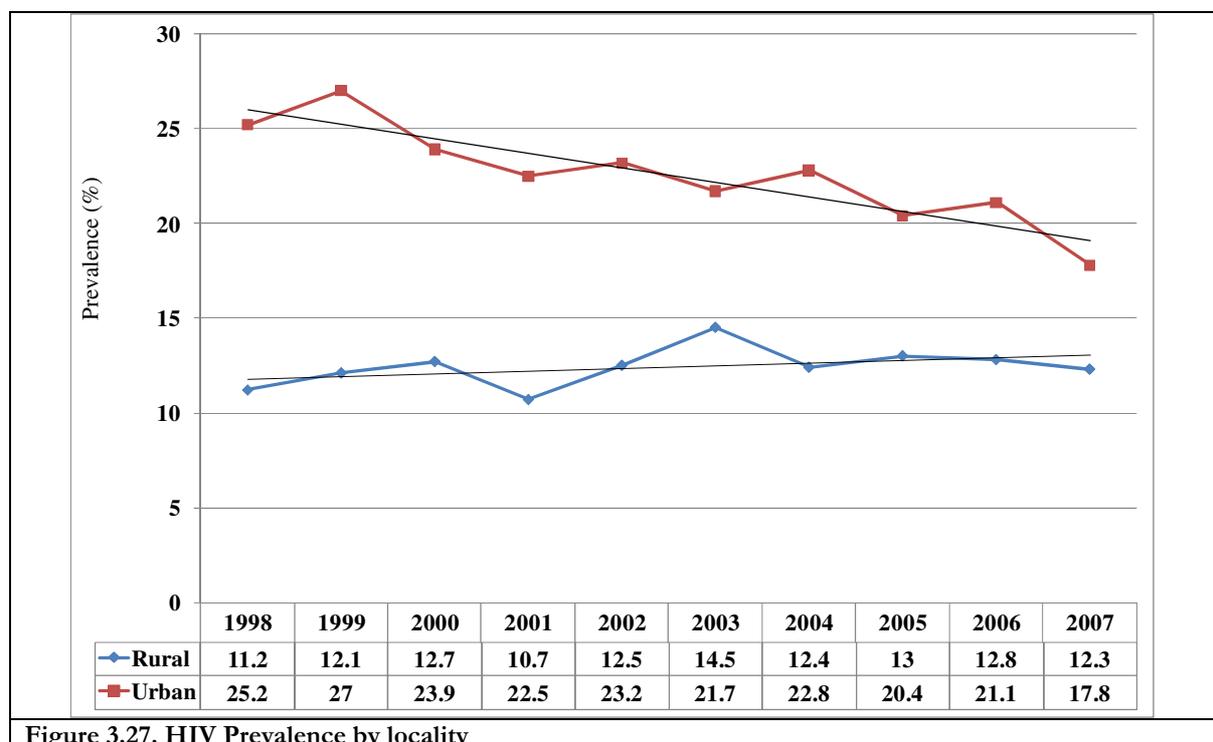


Figure 3.27. HIV Prevalence by locality

At regional level, similar downward trends were observed in all the three regions of Malawi. However, prevalence in the southern region was still higher than the other two regions with central region showing marked downward trend in HIV prevalence as shown in Figure 3.28.

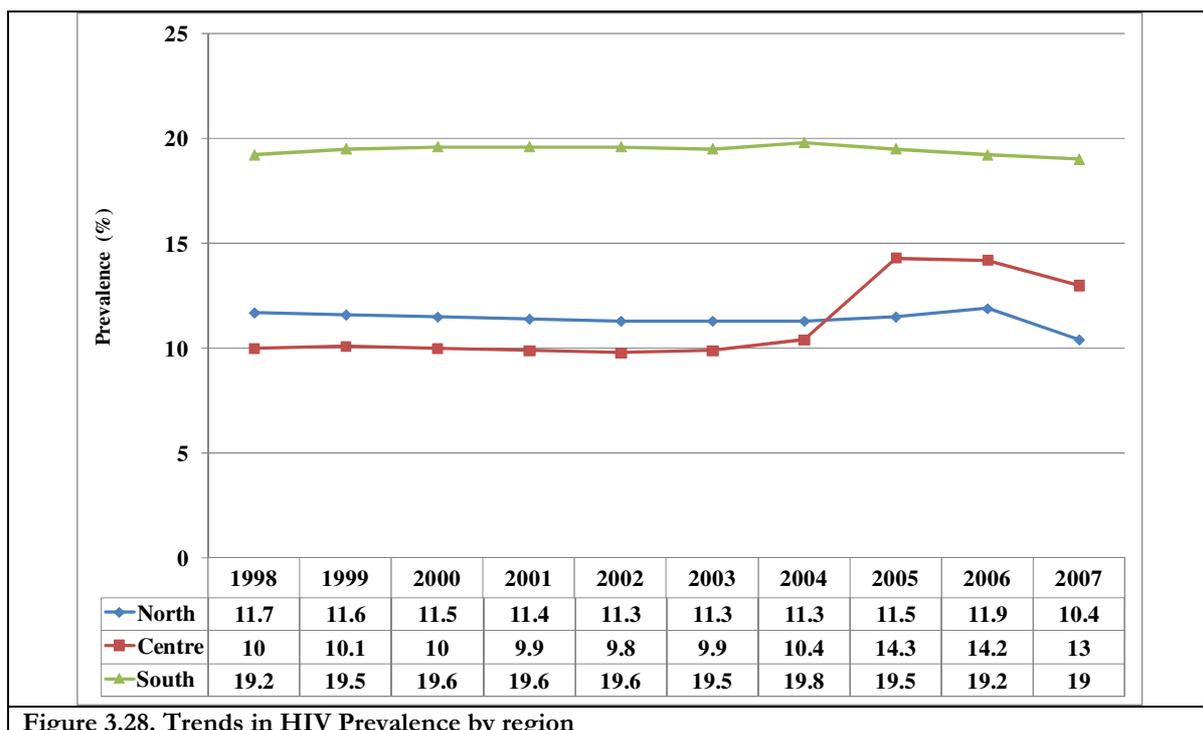


Figure 3.28. Trends in HIV Prevalence by region

Using the EPP, the trend shows that the national adult HIV prevalence has been stable since 1999 with some slight decline after peaking at 14 percent in 1999 to a stable level at 12 percent in 2007. There is an appreciable decline in urban HIV prevalence since 1999 while, rural HIV prevalence remains stable during the same period which consequently results in stable prevalence at national level because of their higher population size in the rural (Figure 3.29). The model with behaviour change in urban area shows a sharp increase of HIV prevalence from 1985 to 2000. From 2000 there is an impressive decrease of the prevalence due to behaviour change (Figure 3.30).

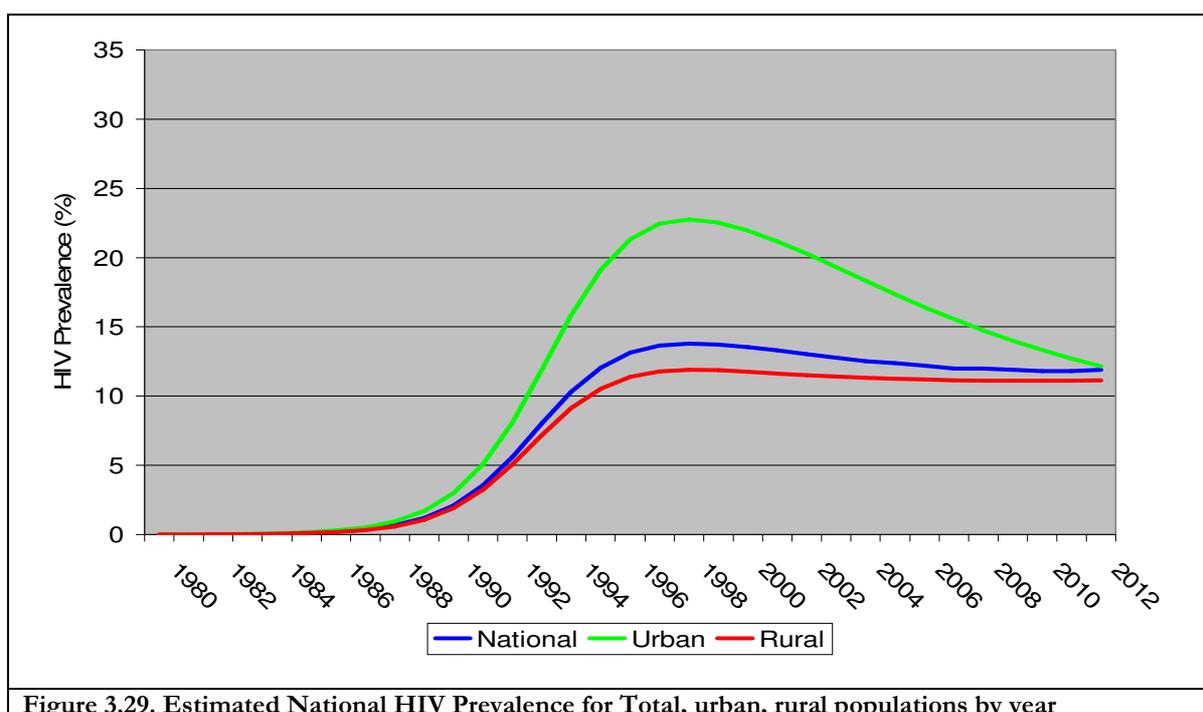
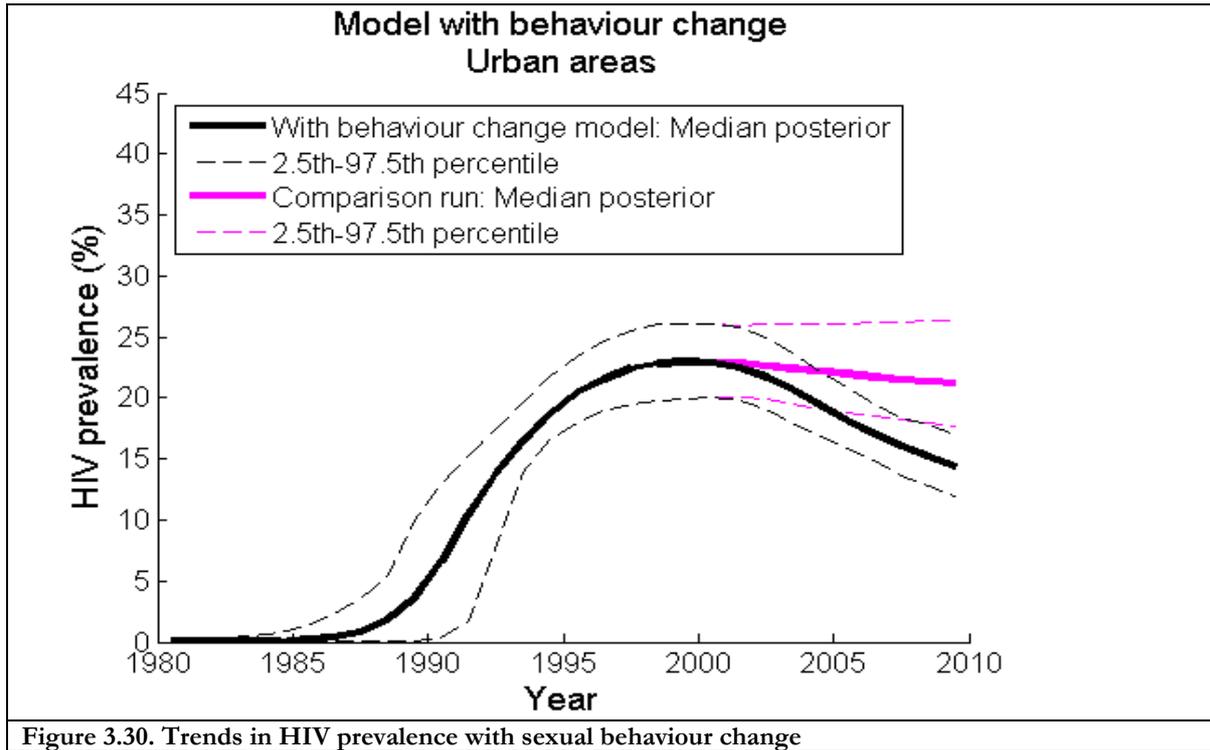
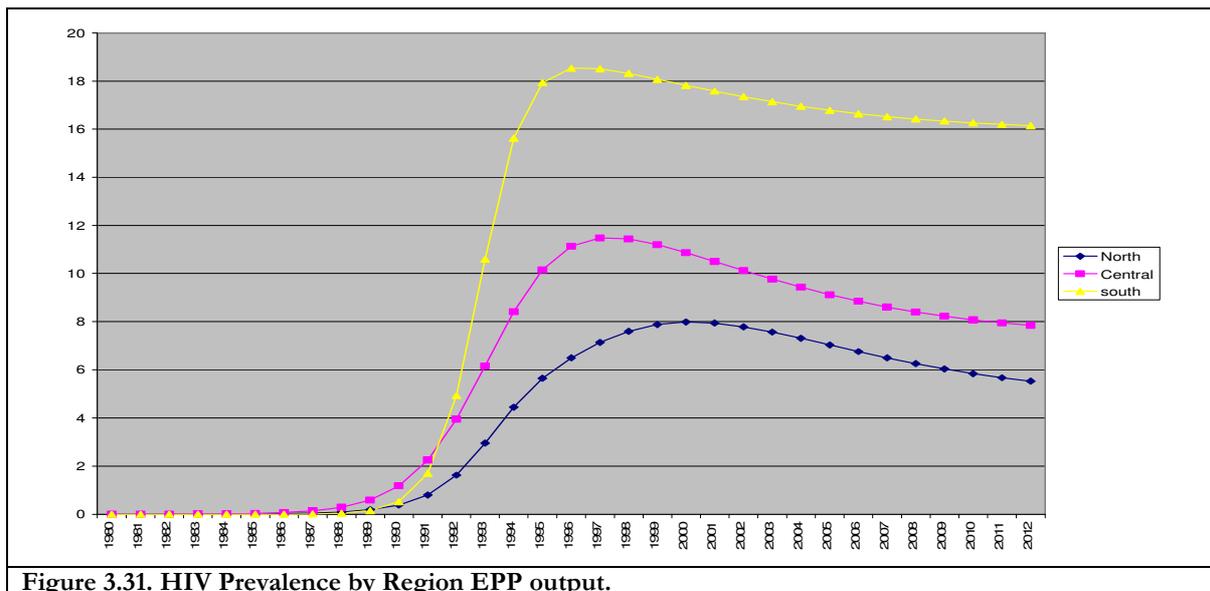


Figure 3.29. Estimated National HIV Prevalence for Total, urban, rural populations by year



### 3.6.2.5 Regional trends in adult HIV prevalence

Figure 3.31 shows that estimated HIV prevalence was stable in all the three regions until 1999 when it started rising sharply and started stabilizing again in 1996. The southern region stabilized at high HIV prevalence levels compared to the centre and northern regions. Projected trend until 2012 reveals that the trend will be stable in all the three regions.



**Table 3.57 Background characteristics of HIV-positive pregnant women at ANC surveillance sites, 1998 – 2007 Percentage of pregnant women at ANC surveillance sites who are HIV-positive by background characteristics, according to year 2008, Malawi**

Background characteristic	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>Age</b>										
15-24	19.1	23.1		9.3		18.3		14.3		12.3
25+										
<b>Residence</b>										
Urban	25.3	25.6		22.5		21.7		20.4		17.6
Semi-urban	20.9	27.0		21.1		20.8		17.0		16.0
Rural	11.2	12.1		10.7		14.5		13.0		12.3
<b>Region</b>										
North						20		14.0		
Centre	20.6	23		17.5		15.5		14.3		13.4
South	23.8	27.6		24.1		23.7		21.7		19.4

Source: National Record Review/ANC Surveillance

### 3.6.3 HIV Mortality

Since the roll-out of ART started in 2004, there has been a decrease in HIV/AIDS related mortality. Figure 3.32 shows that the number of HIV/AIDS deaths decreased from 70,121 in 2003 to 60,932 in 2007 although the highest was in 2004 (72,005) followed by 2005 (70,501). A potential explanation is the scale-up of ART services.

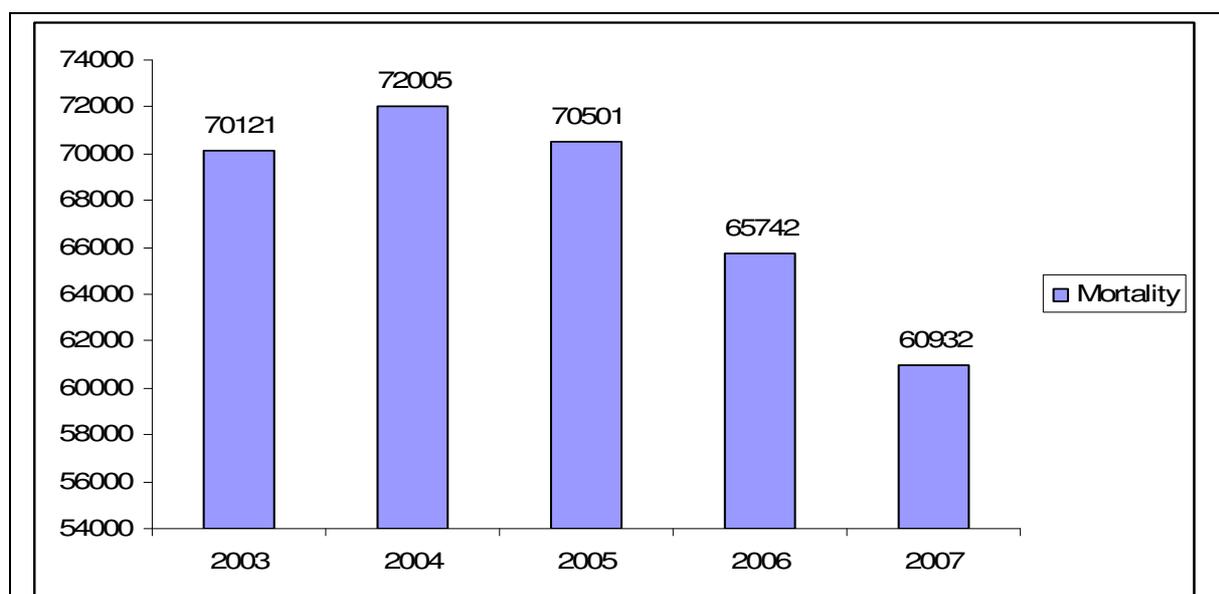


Figure 3.32. Trends in HIV/AIDS Mortality

Source: Ministry of Health (2007)

### 3.6.4 HIV Impact

The number of orphans averted due to scale-up in ART has increased over the years. It was 59,146 in 2003 and rose to 112,707 in 2007 (Figure 3.33) with cumulative infections averted between 2001 and 2008 following the same trend (Figure 3.34).

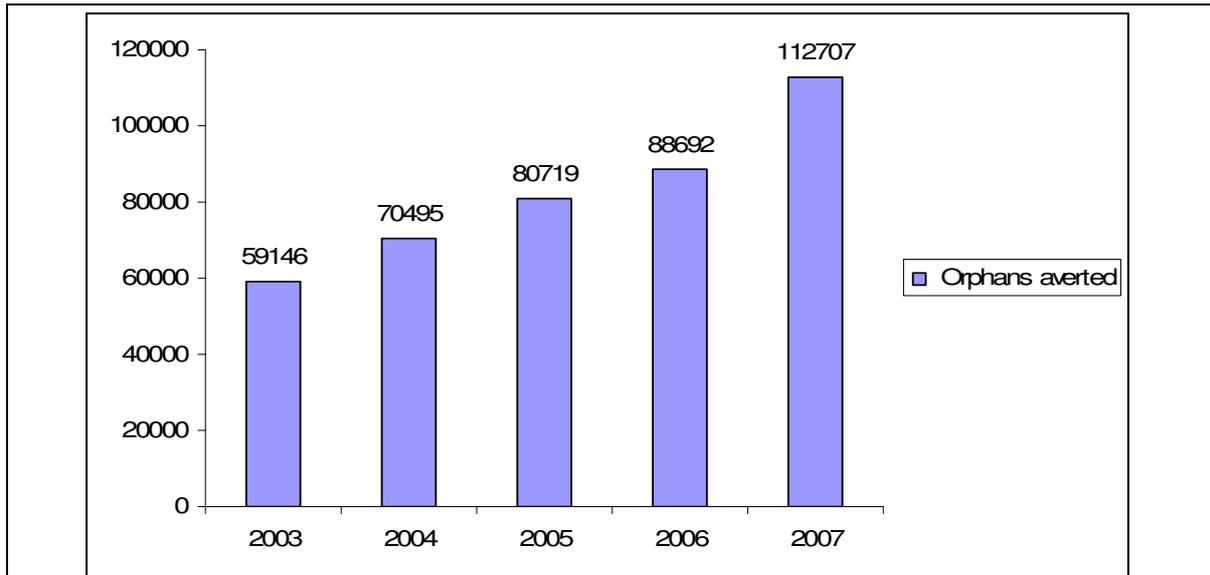


Figure 3.33. National Trends in Orphans Averted

Source: Ministry of Health (2007)

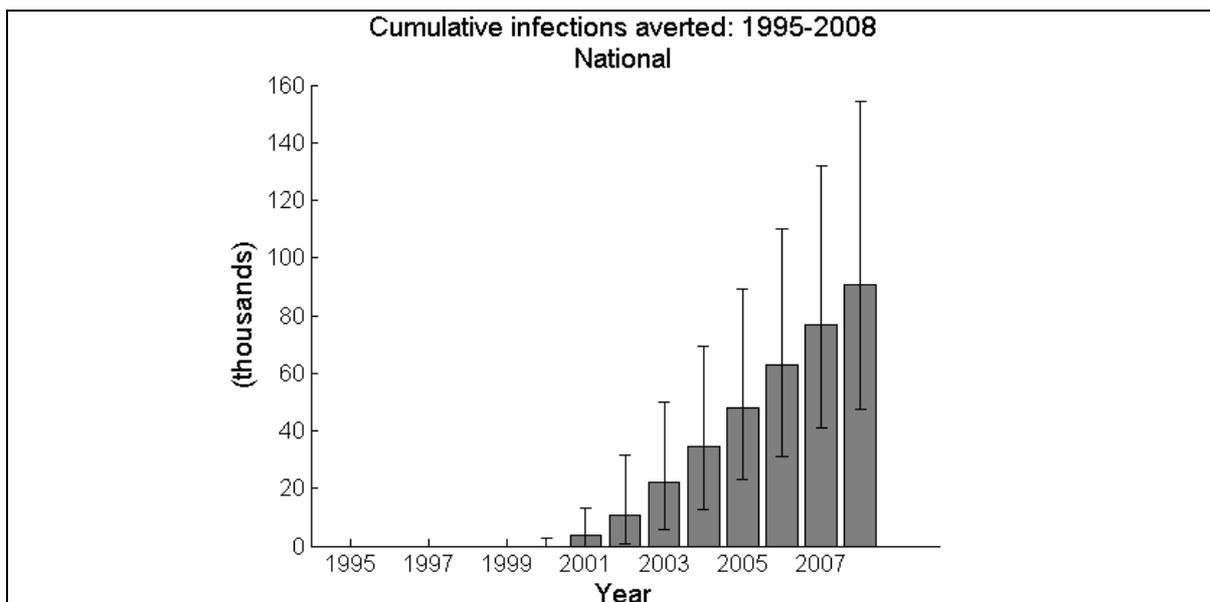


Figure 3.34. HIV infections averted in Malawi (2001-2008)

Modelling estimations show that the number of HIV infections averted has dramatically increased between 2001 and 2008 due to observed changes in sexual behaviour in urban regions in Malawi. The 95 percent confidence intervals are large due to limited data and as the model gives predictions for the future, there is a higher uncertainty of the number of HIV infections averted (Figure 3.34).

		Table 3.58 Children's living arrangements and orphanhood																	
		Living with mother but not with father						Living with father but not with mother						Not living with either parent					
		Live with both parents	%	Father still alive	%	Father dead	%	Mother still alive	%	Mother dead	%	Both parents alive	%	Only mother alive	%	Only father alive	%	Both parents dead	
<b>Total</b>		10,517	65	1688	10	885	6	381	2	132	1	1185	7	321	2	370	2	607	16,080
<b>Sex</b>	Male	5,340	66	864	11	436	5	190	2	71	1	527	7	161	2	195	2	314	8,098
	Female	5,106	65	811	10	444	6	189	2	60	1	646	8	157	2	170	2	277	7,860
	Missing	71	55	13	10	5	4	2	2	1	1	12	9	3	2	5	4	16	128
<b>Age at last birthday (years)</b>	<2	1676	82	235	11	25	1	46	2	3	0.1	30	1	7	0.3	2	0.1	26	2050
	2-4	2357	75	387	12	87	3	53	2	11	0.4	157	5	26	0.8	20	0.6	37	3135
	5-9	3174	66	513	10	212	4	108	2	30	0.6	392	8	94	2	122	3	141	4786
	10-14	2500	55	427	9	402	9	128	3	57	1	449	10	128	3	164	4	248	4503
	15-17	810	5	126	8	159	10	46	3	31	2	157	10	66	4	62	4	155	1612
<b>Sex of household head</b>	Male	9,869	79	496	4	147	1	360	3	130	1	669	5	178	1	185	1	389	12,423
	Female	575	16	1,160	33	732	21	19	1	2	0	502	14	139	4	176	5	209	3,514
	Missing	73	49	32	21	6	4	2	1	0	0	14	9	4	3	9	6	9	149
<b>Wealth quintile</b>	Lowest	1,377	51	486	18	248	9	48	2	18	1	260	10	67	2	89	3	125	2,718
	2	1,727	58	439	15	214	7	59	2	19	1	247	8	70	2	71	2	121	2,967
	3	2,177	69	323	10	170	5	62	2	22	1	208	7	42	1	71	2	91	3,166
	4	2,474	74	191	6	119	4	110	3	20	1	207	6	63	2	58	2	104	3,346
	Wealthiest	2,540	72	196	6	122	3	95	3	52	1	236	7	67	2	67	2	156	3,531
	Missing	222	62	53	15	12	3	7	2	1	0	27	8	12	3	14	4	10	358
<b>District</b>																			
<b>High</b>	Lilongwe rural	1,415	74	191	10	75	4	29	2	2	0	108	6	31	2	30	2	23	1,904
	Lilongwe city	947	74	58	5	57	4	25	2	10	1	93	7	16	1	22	2	56	1,284
<b>Medium</b>	Chiradzulu	969	54	285	16	152	9	27	2	8	0	156	9	51	3	48	3	82	1,778
	Karonga	940	64	87	6	82	6	66	4	21	1	122	8	27	2	44	3	84	1,473
	Machinga	816	63	137	11	92	7	8	1	10	1	116	9	36	3	31	2	42	1,288
	Mzimba	1,087	69	136	9	79	5	41	3	13	1	88	6	22	1	39	2	65	1,570
	Nkhotakota	1,198	59	297	15	101	5	86	4	15	1	173	9	48	2	43	2	54	2,015
	Zomba	873	55	234	15	120	8	14	1	19	1	151	10	48	3	54	3	73	1,586
<b>Low</b>	Mwanza	1,001	65	186	12	66	4	59	4	12	1	86	6	28	2	35	2	78	1,551
	Ntchisi	1,271	78	77	5	61	4	26	2	22	1	92	6	14	1	24	1	50	1,637

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The information on the living arrangements of children under 18 years is presented in Table 3.58. Only 65 percent currently live with both their biological parents and more orphans live with their mother (6 percent) compared to those who live with their father only (1 percent). Among those who do not live with either of their natural parents a higher proportion are non-orphans (7 percent). No major differences in gender existed among the orphans however most were from the poorest households. Chiradzulu, Zomba, Nkhonkhotakota, Karonga and Machinga had the highest number of orphans.

### **3.7 Overall Study Question: Has increased HIV/AIDS funding led to a reduction in the burden of disease?**

Even though we do not have long time series data on funding and that the funding data available is up to 2005/2006, there is strong evidence from both the secondary and primary data analysis that suggest that since 2004 there has been an increased funding for HIV/AIDS activities in Malawi. Funding has mainly increased due to the Global Fund Facility. Most of the funding is being managed by the public sector; this is in line with the service delivery pattern. For example HTC, ART scale-up and PMTCT are mainly provided by the public health facilities. Since 2004 the country has expanded the number of ART sites increasing uptake. In addition the number of sites offering HIV testing and counselling (HTC) services and the number of people tested have exponentially risen over the period from 2002 to 2007.

There are several biomedical interventions that the Government of Malawi has instituted to mitigate the impact of the national HIV/AIDS response in Malawi. These are HIV testing and counselling (HTC), provision of Antiretroviral therapy (ART), Prevention of mother to child transmission (PMTCT) through provision of nevirapine, provision and promotion of use of condoms, screening of blood donors and treatment of sexually transmitted infections and opportunistic infections including Tuberculosis. This study has generally demonstrated that with regard to HTC the number of sites providing this service has increased significantly as has been the number of people going for HTC. HTC is being promoted as an entry point for accessing other HIV and AIDS services such as PMTCT and ART hence ensuring that the majority of sites including outreach and mobile clinics are providing these important services. There has also been an increase in the number of people accessing PMTCT services and ART. There are still geographical inequities in provision of HTC services. Nine districts had a relatively low uptake of HTC in 2006. These were Dedza, Mangochi, Phalombe, Ntcheu, Mulanje, Machinga, Mchinji, Zomba, and Nkhonkhotakota. With some overlap, 6 districts had a relative low uptake of HIV testing of pregnant women at ANC sites in the same year (Dedza, Mangochi, Phalombe, Ntcheu, Nkhonkhotakota, and Balaka). Six districts also had a relative low uptake of ART services, notably Dedza, Mangochi, Phalombe, Ntcheu, Mulanje, and Machinga. In addition, the proportion of sites providing PMTCT still remains low and disparities in uptake of HTC and ANC testing have been noted. The study has also shown that the Southern and Central regions have consistent low uptake of HTC, ANC testing, and ART services. The evidence from the household survey showed high utilisation of PMTCT services by women across the districts. However the proportion of women counselled is higher than those who receive the results. There is need to put in place interventions that can motivate and enable mothers to go through the whole pathway from counselling, receiving results to uptake of the treatment.

With regard to condoms, there are also some challenges for both the distributors as well as the end users especially with respect to logistics and usage. There is no regular procurement of female condoms hence quantities are small and could not be rolled out to the whole country.

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The female condom is also very expensive, hence the need to ensure their acceptability. The use of non-human condom dispensers in Malawi needs to be promoted. The placing of non-human dispensers helps people who would not have bought condoms from a shop assistant to buy them. At the same time, it is easy to monitor condom consumption patterns if non-human condoms dispensers are used. In order to promote condom use, there is a need for scaling up the usage of non-human condom dispensers. The other challenge is promoting use of condoms to avoid contracting HIV/AIDS. Currently knowledge of the source of condoms seems to be high. However the level of practising safe sex using condoms is still very low as observed by the household survey.

The availability of human resources trained to provide HIV care is critical in ART scale-up efforts. It is clear that the intensive phase of ART trainings for the public as well as private sectors in Malawi that took place between 2004 and 2006 made a significant impact in ART provision. Unfortunately, the training of providers has not kept pace with the huge demand for ART at all levels. The decision to decentralize ART trainings to the district level has impacted negatively on total numbers trained. There has been a steady decline in total numbers of health care workers (HCW) trained between 2005 and 2007 both in the private as well as the public sectors. As a consequence of this, the demand for ART in the medium and long term will by far outstrip the capacity to deliver the service.

The ART programme is currently centralized with at least one service delivery point in every district of Malawi. There is therefore a potential for ART expansion beyond district level to involve primary health care facilities. However, this relies upon availability of adequate human resources and infrastructure to meet the demands of ART provision. Another opportunity is further expansion of private sector facilities which at present contribute only 4 percent of all ART registrations. Malawi has made significant progress in meeting the ART targets set in the 2006-2010 plan. In fact the 2007 set target of recruiting 40,000 new patients on ART was surpassed by more than 50 percent (i.e. targeted figure exceeded by 21,688 patients). If facilities continue to perform at full capacity and with new sites being prepared, it is likely that Malawi will outdo the set targets for 2008- 2010. The private sector, though important, makes a relatively small contribution to patient recruitment. While efforts should therefore be directed more at the public sector where most patients are being looked after, it is important to explore modalities of improving access to ART in private clinics.

Treatment outcomes so far have been favourable in Malawi. A 3-year survival analysis has revealed that 66 percent of the patients that were recruited in 2004 are still presumed alive and on treatment. A similar trend was observed among patients with the retrospective cohort within the nine districts. The retention rate over six, twelve and twenty-four months was high. This clearly demonstrates the integrity of the first line regimen being used in Malawi and the fact that 96 percent of patients remain on first line regimen. Furthermore, it is worth noting that most facilities have recorded drug adherence rates of at least 95 percent. However, more needs to be done to reduce mortality in those initiating ART. The default rate has remained at 8-9 percent from 2004 to 2007 which could be a result of new sites opening up and patients receiving treatment closer to their homes or could also be due to death.

There is a disproportion in numbers of males and females initiating ART. There is need to engage men more in health seeking behavior and promotion of HIV testing and counselling as a gateway of accessing HIV care. Similarly, there is a low uptake of ART among children in Malawi. According to the projections, the met need for pediatric ART is of the order of 34 percent which is lower than adult met need. This is not surprising as adult ART roll-out

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preceded pediatric roll-out. However, more effort is necessary to address the gender and age disparities in ART uptake.

It is encouraging that of all those patients alive and on ART, 96 percent were ambulatory; 95 percent were fit to work; 4percent had one or more major side effects and that 95 percent of patients showed 95 percent or more adherence to therapy based on pill counts. Most patients are being recruited on ART based on clinical staging as opposed to a CD4 criterion. The need to start patients on ART based on CD4 criterion has declined substantially from 2004 to 2007. It is possible that most of the people accessing ART due to clinical symptoms may have lower CD4 counts and worse outcomes.

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## **4.0 Tuberculosis**

### **4.1 Historical Perspective**

#### **4.1.1 Epidemiology**

Tuberculosis remains one of the public problems in Malawi and stands on the 5<sup>th</sup> position among the country's ten most important Essential Health Package (EHP) conditions/diseases (NTP, 2006). In the past 12 years, TB case numbers in Malawi have increased by between 300 percent and 400 percent mainly because of HIV that increases the risk of disease reactivation in people with latent TB infection. According to the 2006 tuberculosis case finding statistics 27,011 cases were reported countrywide. This is a slightly less number of cases than were reported in 2005 (27,610). However, this figure remains one of the highest caseloads in sub-Saharan Africa.

DOTS coverage remains at 100 percent in all districts. Both TB case detection and cure rates targets set at 70 percent and 85 percent are yet to be achieved. WHO maintains that case detection in Malawi stands at 50 percent. This estimate is however based on projected calculations using epidemiological data from 20-30 years ago.

The country seems to be making a steady upward improvement towards the 85 percent cure and treatment success target set by WHO. Treatment success rate stands at 78 percent for new smear positive cases and 77 percent for re-treatment cases. Treatment completion rate among new smear negative cases is 75 percent and 73 percent for extra pulmonary cases. Death rate remains high. It stand at 16 percent for new smear negative cases, 19 percent for relapse cases, 18 percent for both smear negative and extra-pulmonary cases. Most of these deaths are attributable to complications due to HIV/AIDS.

#### **4.1.2 Programming**

The National TB Control Programme (NTP) was established in 1964 with technical assistance from the World Health Organisation (WHO). The core responsibility of NTP is to reduce the incidence and prevalence of TB in Malawi (to reduce morbidity and mortality). To achieve this, the NTP is:

- Integrated into the general health services provided by the Ministry of Health including Christian Health Association of Malawi (CHAM) services;
- Providing countrywide access as close to the community as possible;
- Having a long-term perspective because of the nature of the disease.

The NTP is led by the Programme Director and its structure is as follows:

- It has a Central Unit which over the past four years has expanded to include the following focal officers on TB/HIV, IEC, Training and Research Officers;
- Regional Officers (4) who are responsible for evaluation, supervision and training;
- District TB officers (26) who are responsible for co-ordination of TB control activities at the district level.

In 1984, Malawi became a recognized Directly Observed Treatment Short-course – DOTS programme. In order to give more weight to the TB control effort, the Malawi Government through the Ministry of Health declared TB a national emergency on 27<sup>th</sup> March 2007. The declaration was a direct response to the recommendation by the African Health Ministers who declared TB an emergency in Africa in August 2005.

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NTP launched its second-generation 5-year strategic plan (2007-2011) in 2007. The main elements of this plan are:

- Expansion of the new sputum microscopy network;
- Countrywide expansion and decentralization of TB/HIV collaborative activities;
- Development of a nationwide public/private mix;
- Development and maintenance of surveillance system on multi-drug resistant tuberculosis and extremely drug resistant tuberculosis and;
- Execution of tuberculosis prevalence survey.

The bulk of TB activities have traditionally been funded by donors. In 1984, Malawi received assistance from the International Union against Tuberculosis and lung disease (IUTLD) and became recognised as “DOT” Programme (Ministry of Health, 2002). DFID (UK) provided assistance to the NTP, which supplemented IUTLD support in 1996. In 1999, IUTLD formally ended its long term assistance to Malawi. From 1999, the Department for International Development (DFID), the Norwegian Agency for International Co-operation and Royal Netherlands TB Association provided assistance. These three organisations are still currently providing support to NTP.

In recent years, TB control services have been financed by funds from the Sector Wide Approach mechanism. This basket funding ensures that all resources are pooled together with the aim of providing uninterrupted quality services. The National TB control Programme has also applied for funding from the Global Fund for HIV/AIDS, Tuberculosis and Malaria.

In the last 20 years, the main outputs of the NTP have been:

- Early health seeking behaviour promoted through advocacy, communication and social mobilization;
- Equitable case finding and good diagnostic practices improved and maintained;
- NTP capacity for effective programme management including TB/HIV collaborative activities strengthened capacity of the NTP enhanced to effectively monitor and support the delivery of TB treatment, including TB/HIV control and treatment;
- Collaboration with health training institutions and the private sector increased and maintained;
- Human resource capacity improved and maintained at all levels to effectively manage, monitor and evaluate the NTP.

## **4.2 Study Question 1: Has funding/spending increased for tuberculosis programmes?**

### **4.2.1 Funding History**

The NTP was first launched in 1964 following recommendations from the World Health Organisation (WHO). In 1984, Malawi received assistance from the International Union against Tuberculosis and Lung Disease (IUATLD), and became a recognized Directly Observed Treatment Short-course – DOTS programme. In 1996, the Department for International Development (DFID), UK provided assistance to the NTP, which supplemented IUATLD support. In 1999, IUATLD formally ended its long term assistance to Malawi. In its place, donor assistance was provided by DFID, the Norwegian Agency for Technical Co-operation (NORAD) and the Royal Netherlands TB Association (KNCV). These three organizations have provided support to the NTP up to the present time.

The NTP has been jointly supported by DFID, Norway and KNCV under the basket mechanism since 2002. The main outputs have been an extensive programme of operational research which has fed into policy, revision of diagnostic and treatment protocols; an extensive programme of staff and community training; an improved management information system and strengthened management and supervisory capacity at all levels. Ministry of Health and DFID and Norway had signalled their expectation that the NTP would be fully integrated into SWAp funding mechanism once the SWAp was established.

#### 4.2.2 Trends in National TB funding

Up to 2004, the National TB Control Programme activities in Malawi were funded by four major donors: DFID, Norway, KNCV and USAID. From 2004, TB control activities are funded through the Sector Wide Approach (SWAp) basket funding by the Malawi government. Between 2002/03 and 2005/06 there has been a decrease in the proportion of TB control programme expenditure against the Total Health Expenditure (Table 4.1). The figure below shows a reduction from 2 percent to 1 percent. The main explanation for this is lack of funding from the Global Fund and integration of funding in SWAp basket which led to reduction of direct support from other donors.

	2002/03	2005/06
<b>General government units</b>		
Territorial government		
Central government revenue (Ministry of Finance)	202,717,582	287,228,933
Regional and municipal government revenue (Local Government)	0	0
All other public units	0	0
Return on assets held by a public entity	0	0
Other	0	0
<b>Private sector</b>	0	0
Employer funds	0	0
Households	0	0
Non-profit institutions serving individuals	0	0
Other private funds	0	0
Return on assets held by a private entity	0	0
Other	0	0
<b>Rest of the world</b>	133,490,179	190,491,088
GFATM	0	0
Donor A	0	0
Donor B	0	0
<b>TOTAL TB</b>	<b>336,207,761</b>	<b>477,720,021</b>

Source: NHA TB Subaccounts for 2002/03 and 2005/06

Code	Functions X Diseases	FS.1 Government		FS.2. Private				FS.3. External Resources			
				FS.2.1 Households		FS.2.2 Private		FS.3.1 GFATM		FS.3.2 Other external resources	
		2002/03	2005/06	2002/03	2005/06	2002/03	2005/06	2002/06	2005/06	2002/03	2005/06
HC.1											
HC.1.1	Inpatient curative care	2,118,623,846	2,919,381,108			1,199,880,210	3,270,654,185		438,326,976	816,592,163	3,076,636,818
GBD.1.A.3	Tuberculosis	103,224,033	120,677,301			0				5,449,142	67,440,814
HC.1.3	Outpatient curative care	1,228,403,113	1,624,244,350			951,012,423	2,193,313,437		2,293,957,488	542,672,742	2,333,446,199
GBD.1.A.3	Tuberculosis	22,476,529	16,733,259			0				6,538,971	11,004,269
HC.1.9	Other curative care	0	164,807,183			55,346,885	104,049,024			0	1,224,926,253
GBD.1.A.3	Tuberculosis										
HC.3	Services of long-term nursing care										
GBD.1.A.3	Tuberculosis										
HC.4	Ancillary services to medical care		47,647,242								502,000,189
GBD.1.A.3	Tuberculosis		2,876,815								1,618,208
HC.5	Medical goods dispensed to outpatients					286,076,451	648,524,480				
GBD.1.A.3	Tuberculosis										
HC.5	Medical goods dispensed to outpatients					286,076,451	648,524,480				
HC.5.1	Pharmaceuticals and other medical non durables					286,076,451	648,524,480				
GBD.1.A.3	Tuberculosis										
HC.5.2	Therapeutic appliances and other medical durables										
GBD.1.A.3	Tuberculosis										
Subtotal 1: Personal health expenditure		3,347,026,959	4,941,916,254			2,492,315,969	6,216,541,126		2,732,284,464	1,479,565,020	7,301,807,749
HC.6	Prevention and public health services	376,451,021	1,666,268,476			136,256,661	195,342,667		771,309,000	3,481,908,189	5,938,816,156
GBD.1.A.3	Tuberculosis	12,900,985	29,120,626							63,698,715	52,971,958
HC.7	Health administration and health insurance	702,972,539	1,091,299,199			108,740,770	290,187,023			1,199,179,059	5,497,571,054
GBD.1.A.3	Tuberculosis	60,059,177	77,804,444							29,900,018	30,119,973
Subtotal 2 : Current health expenditure		4,426,450,519	7,699,483,928			2,737,313,400	6,702,070,817		3,503,593,464	6,160,652,268	18,738,194,959
HC.R.1	Capital formation for health care provider institutions	747,086,167	373,897,094				135,136,736			545,636,439	458,083,747
GBD.1.A.3	Tuberculosis	4,056,858	40,016,489							24,064,401	24,379,606
Subtotal 3 : Total health expenditure		5,173,536,686	8,073,381,022			2,737,313,400	6,837,207,553		3,503,593,464	6,706,288,707	19,196,278,707
Health related		496,556,700	1,740,819,156						40,937,382		3,653,185,308
GBD.1.A.3	Tuberculosis									3,838,931	2,956,260
No subtotal because we will not collect for all diseases											
Non-Health			64,457,612				258,000,000				1,405,096,424

Source: GFATM Target Tables for 2003/03 and 2005/06

Table 4.3 National TB funding by Financing Source and type of provider, 2002/03 and 2005/06, Malawian Kwacha								
	FS.1		FS.2 Private					
	Government		FS.2.1		FS.2.2		FS.3.2	
	2002/03	2005/06	Households		Private		External Resources	
	2002/03	2005/06	2002/03	2005/06	2002/03	2005/06	2002/03	2005/06
<b>General hospitals</b>								
Government general hospitals								
Central hospitals	36,364,875	92,563,902	0	0	0	0	0	0
District hospitals	55,662,047	83,940,399	0	0	0	0	0	0
<b>Private not-for-profit hospitals</b>	0	0	0	0	0	0	0	0
Private not-for-profit Hospitals (Other)	0	0	0	0	13,330,813	19,289,023	0	0
Private-for-profit Hospitals (CHAM)	0	0	0	0	0	0	0	0
<b>Providers of ambulatory health care</b>	0	0	0	0	0	0	0	0
Offices of physicians	0	0	0	0	0	0	0	0
Health centres/dispensaries/maternity	20,144,559	36,772,599	0	0	4,255,127	10,148,792	11,988,113	0
Medical and diagnostic laboratories	0	4,495,023	0	0	0	0	0	0
Traditional healers	0	0	0	0	0	0	0	0
<b>Retail sale and other providers of medical goods</b>	0	0	0	0	0	0	0	0
<b>Provision and administration of public health programmes</b>	29,717,539	26,567,986	0	0	6,841,739	9,795,441	40,040,422	45,729,157
<b>General health administration and insurance</b>	53,150,177	100,947,517	0	0	6,909,000	6,976,900	29,900,018	0
Provider not specified by kind	24,064,401	37,537,024	0	0	0	0	0	0
Institutions providing health-related services	3,838,931	2,956,260	0	0	0	0	0	0
<b>TOTAL TB</b>	222,942,528	385,780,709	0	0	31,336,679	46,210,155	81,928,554	45,729,157
<b>Source NHATB Subaccounts for 2002/03 and 2005/06, Financing Agent by provider tables</b>								

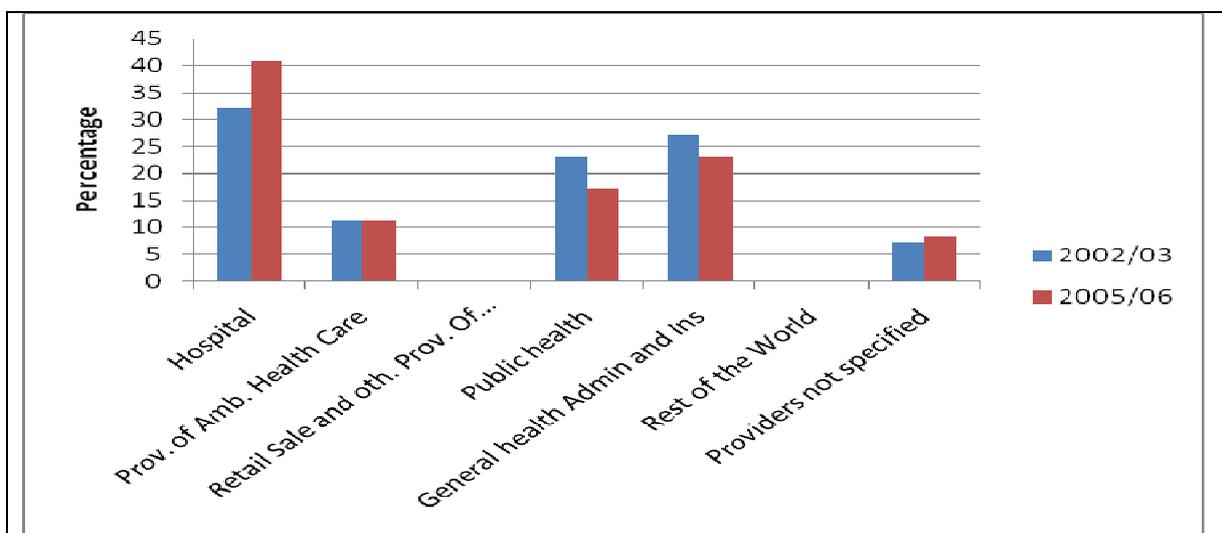
**Table 4.4 Trends in national funding for TB, by financing sources 1998 – 2007**

Indicators	2002/03	2005/06
GFATM resources for TB as % of THE for TB	0	0
GFATM resources for TB as % of Total external funds for TB	0	0
GFATM resources for TB as % of THE for Malaria	0	0
Total expenditure on TB as % of THE	2.27	1.26
inpatient curative care of TB as % of THE	0.74	0.50
Outpatient curative care for TB as % of THE	0.20	0.07
Pharmaceuticals as % of THE for TB	0	0
Prevention and Public Health services for TB as % of THE	0.52	0.22
Administration for TB as % of THE	0.62	0.29
Capital formation for TB as % of THE	0.19	0.17
Out of pocket expenditure on TB as % of THE	0	0
Out of pocket expenditure on TB as % of private health expenditure	0	0
External expenditure on TB as % of THE	2.08	0.50

**Source: National Health Accounts (1998)**

Most of the resources for TB control activities are managed by the Ministry of Health, through its National TB Control Programme. The MOH is also the biggest financier for the activities, contributing 62 percent and 50 percent in 2002/03 and 2005/06 respectively. The decline in the ministry's share is explained by devolution of TB expenditure to local authorities, whose share rose from 2 percent in 2002/03 to 25percent in 2005/06. Although the current NHA analysis puts a 0 percent figure for out-of-pocket costs, there are studies conducted by Research for Equity and Community Health Trust which show that patients incur a lot of costs in accessing TB diagnosis. The studies' reports were submitted to the NHA team to consider incorporating in the analysis of funding and expenditure for TB. The largest proportion of expenditure for TB was incurred by hospitals (which include central, district and specialised hospitals) which were the largest contributor to TB total health expenditure by provider type accounting for 32 percent and 41 percent in 2002/03 and 2005/06 respectively. The possible explanation for the largest proportion of expenditure at the hospitals is due to admissions and centralisation of diagnosis in some districts.

Compared to other diseases such as HIV/AIDS, general health administration and insurance of TB was 27percent in 2002/03 and 23percent in 2005/06 (the figure for HIV/AIDS was 5percent and 13percent respectively and 9percent for malaria during the same period). The Figure 4.1 below highlights the expenditure in detail.

**Figure 4.1 Percentage of distribution of TB expenditure by provider. Source: NHA (2008)**

### 4.3 Study Question 2: Has the availability of quality tuberculosis services increased?

#### 4.3.1 Has the quantity and coverage of TB services increased? And are they equitably distributed?

District	District Population	Percentage of all health facilities that offer TB services	Density of facilities with TB services per 100,000 population	Number of all facilities
<b>High</b>	<b>1,871,970.00</b>	<b>93.33</b>	<b>0.75</b>	<b>15.00</b>
Lilongwe	1,871,970.00	93.33	0.75	15.00
<b>Medium</b>	<b>2,909,452.00</b>	<b>94.20</b>	<b>2.23</b>	<b>69.00</b>
Chiradzulu	290,780.00	100.00	4.47	13.00
Karonga	243,666.00	100.00	2.46	6.00
Machinga	433,264.00	94.44	3.92	18.00
Mzimba	950,000.00	100.00	0.84	8.00
Nkhotakota	292,556.00	86.67	4.44	15.00
Zomba	699,186.00	88.89	1.14	9.00
<b>Low</b>	<b>396,607.00</b>	<b>100.00</b>	<b>6.05</b>	<b>24.00</b>
Mwanza	173,384.00	100.00	6.92	12.00
Ntchisi	223,223.00	100.00	5.38	12.00
<b>Total</b>	<b>5,178,029.00</b>	<b>95.37</b>	<b>1.99</b>	<b>108.00</b>

DCA Facility survey, Malawi 2008

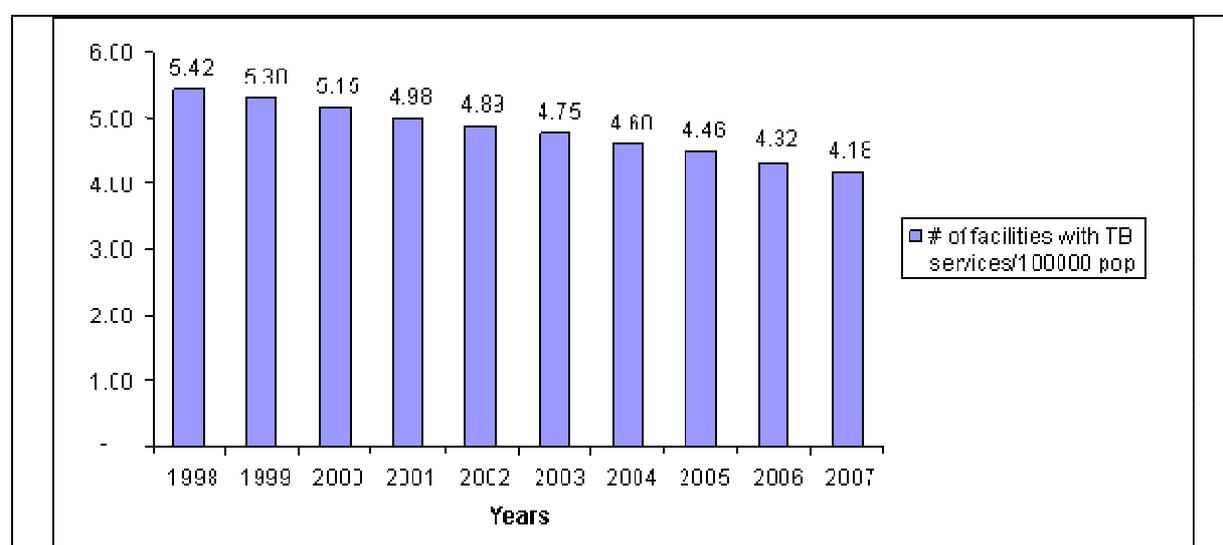
Almost all health facilities offer TB services as shown in Table 4.5 with Mwanza and Chiradzulu offering the most facilities per 100,000 population. As with HIV/AIDS, Table 4.6 and 4.7 indicate that a higher proportion of rural and government facilities are offering TB services. As argued earlier, these results might not reflect the true picture given the fact the sample is small and that it is biased towards rural areas.

Type of District	Percentage of population that is urban	Geographic		Administration		Total number of facilities
		Percentage of urban sites	Percentage of rural sites	Percentage of public sites	Percentage of private sites	
<b>High</b>						
Lilongwe		46.7	53.33	80	20	15
<b>Medium</b>						
Chiradzulu		38.5	61.5	69.2	30.8	13
Karonga		20	80	100	0	5
Machinga		18.8	81.3	75	25	16
Mzimba		42.9	57.1	71.4	28.6	7
Nkhotakota		41.7	58.3	58.3	41.7	12
Zomba		50	50	62.5	37.5	8
<b>Low</b>						
Mwanza		41.7	58.3	66.7	33.3	12
Ntchisi		9.1	90.9	100	0	11

Source: DCA Facility Census and census information

District	Administration						Total number of facilities
	Government Facility-Public	Government facility Not public (military, etc)	NGO/ (Faith-Based)	Community	Private (for profit)	Other	
<b>Type of District</b>							
High	80.0	6.7	6.7	0.0	0.0	6.7	15.0
..Lilongwe	80.0	6.7	6.7	0.0	0.0	6.7	15.0
Medium	65.7	3.0	28.4	1.5	0.0	1.5	67.0
..Chiradzulu	69.2	7.7	23.1	0.0	0.0	0.0	13.0
..Karonga	83.3	0.0	16.7	0.0	0.0	0.0	6.0
..Machinga	66.7	0.0	33.3	0.0	0.0	0.0	18.0
..Mzimba	62.5	0.0	25.0	12.5	0.0	0.0	8.0
..Nkhotakota	61.5	0.0	30.8	0.0	0.0	7.7	13.0
..Zomba	55.6	11.1	33.3	0.0	0.0	0.0	9.0
Low	83.3	0.0	12.5	0.0	4.2	0.0	24.0
..Mwanza	66.7	0.0	25.0	0.0	8.3	0.0	12.0
..Ntchisi	100.0	0.0	0.0	0.0	0.0	0.0	12.0
Total	71.7	2.8	21.7	0.9	0.9	1.9	106.0

Figure 4.2 shows that number of health facilities providing any TB services per 100,000 population slightly decreased between 1998 and 2003. According to the National Control Programme (NTP) Strategic Plan (2007-2011), the NTP is in a process of decentralising TB services to rural areas. The NTP has established microscopy centres and sputa collection points in rural villages in order to achieve universal access to TB services. This action will increase the number of health facilities providing TB services in Malawi.



**Figure 4.2 Number of health facilities providing any TB services per 100,000 population**

Source: NTP (2007)

The DOTS coverage in Malawi is 100 percent and TB treatment has been decentralized using the DOT approach. Although the national trend shows an increase in number of diagnostics centers (Figure 4.3) from 83 in 1998 to 140 in 2007, access to diagnostic facilities remains a big challenge. Some of the districts only have 2 microscopy centres for TB diagnosis. This creates a

lot of geographical and economic challenges for people suffering from TB in Malawi. In fact, the World Health Organisation estimates that Malawi is only detecting 49 percent of all TB cases.

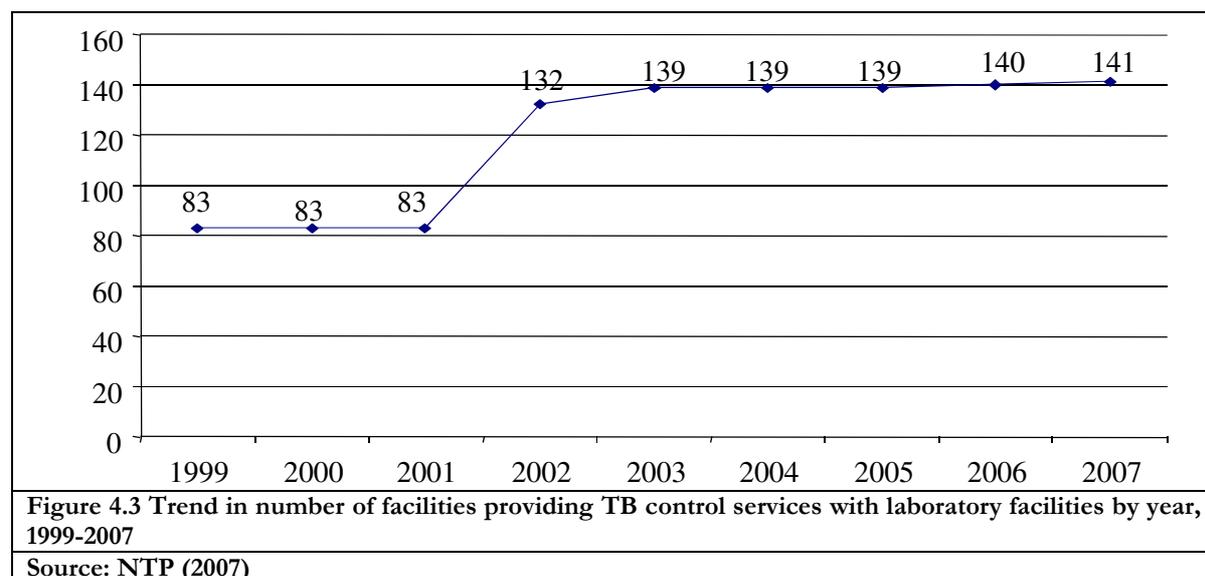


Table 4.8 shows that some districts have more diagnostic centres than others. For example, Lilongwe, Blantyre and Zomba have more than 12 diagnostics centres. The difference in the number of diagnostic centres may be explained by the differences in epidemiology of TB in different districts. In particular, some districts have more notified TB cases than others.

<b>District</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
Dedza	3	3	3	3	3	3	3	3	3	3
Dowa	3	3	3	3	5	5	5	5	5	5
Kasungu	2	2	2	2	6	6	6	6	6	6
Lilongwe	12	12	12	12	12	18	18	18	18	18
Mchinji	3	3	3	3	3	3	3	3	3	3
Nkhotakota	3	3	3	3	7	7	7	7	7	7
Ntcheu	2	2	2	2	2	2	2	2	2	2
Ntchisi	2	2	2	2	2	2	2	2	2	2
Salima	2	2	2	2	7	7	7	7	7	7
Chitipa	2	2	2	2	6	6	6	6	6	6
Karonga	2	2	2	2	2	2	2	2	2	2
Mzimba	4	4	4	4	8	8	8	8	8	8
Nkhatabay	4	4	4	4	5	5	5	5	5	5
Rumphi	2	2	2	2	3	3	3	3	3	3
Balaka	4	4	4	4	4	4	4	4	4	4
Blantyre	8	8	8	8	12	12	12	12	12	12
Chikwawa	2	2	2	2	3	3	3	3	4	4
Chiradzulu	2	2	2	2	2	2	2	2	2	2
Machinga	2	2	2	2	2	2	2	2	2	2
Mangochi	3	3	3	3	6	6	6	6	6	6
Mulanje	3	3	3	3	5	5	5	5	5	5
Mwanza	2	2	2	2	2	2	2	2	2	2
Nsanje	2	2	2	2	2	3	3	3	3	3
Phalombe	1	1	1	1	1	1	1	1	1	1
Thyolo	3	3	3	3	6	6	6	6	6	6
Zomba	5	5	5	5	16	16	16	16	16	16
Malawi	83	83	83	83	132	139	139	139	140	140

**Source: NTP (2008)**

### 4.3.2 Has the quality of TB services improved?

#### *Quality of Service Level 1. Availability of basic elements: commodities, guidelines, systems, trained staff*

A high proportion of facilities are offering DOTS and TB follow-up services (Table 4.9). It is difficult to explain the low coverage of DOTS in Lilongwe since it is the government recommended treatment policy. It is also surprising that a good proportion of facilities are offering follow-up of TB patients. The expectation is that it would be difficult to make regular follow-ups of patients because of the shortage of health care workers. A disappointing result is that the majority of facilities do not offer smear-microscopy services.

District	DOTS	Smear-microscopy	Follow-up of TB patients	All 3 elements	Number of facilities offering TB services
<b>High</b>	<b>6.7</b>	<b>60</b>	<b>93.3</b>	<b>6.7</b>	<b>15</b>
Lilongwe	6.7	60	93.3	6.7	15
<b>Medium</b>	<b>83.6</b>	<b>26.9</b>	<b>95.5</b>	<b>25.4</b>	<b>67</b>
Chiradzulu	30.8	23.1	84.6	23.1	13
Karonga	100	16.7	100	16.7	6
Machinga	88.9	27.8	94.4	22.2	18
Mzimba	100	25	100	25	8
Nkhosato	100	30.8	100	30.8	13
Zomba	100	33.3	100	33.3	9
<b>Low</b>	<b>50</b>	<b>25</b>	<b>83.3</b>	<b>20.8</b>	<b>24</b>
Mwanza	91.7	33.3	91.7	33.3	12
Ntchisi	8.3	16.7	75	8.3	12
Total	65.1	31.1	92.5	21.7	106

**Source: DCA-Facility Census**

Table 4.10 indicates that the majority of health facilities have health workers that been trained in TB diagnosis and treatment. Lilongwe has the highest number (75%) of health workers that has been trained in TB diagnosis and treatment while Machinga has the lowest proportion of health workers trained in TB diagnosis and treatment. On the other hand, most facilities do not have health workers that have been trained in management of MDR-TB, management of HIV/TB co infection, drug and supplies and management.

District	Training				All training	Number of facilities offering TB services
	Diagnosis and treatment of TB	Management of MDR-TB	Management of TB/HIV co-infection	Drug and supplies management		
<b>High</b>	<b>73.3</b>	<b>20.0</b>	<b>46.7</b>	<b>60.0</b>	<b>13.3</b>	<b>15.0</b>
Lilongwe	73.3	20.0	46.7	60.0	13.3	15.0
<b>Medium</b>	<b>44.8</b>	<b>9.0</b>	<b>13.4</b>	<b>20.9</b>	<b>3.0</b>	<b>67.0</b>
Chiradzulu	61.5	7.7	46.2	30.8	0.0	13.0
Karonga	50.0	0.0	0.0	0.0	0.0	6.0
Machinga	22.2	11.1	5.6	16.7	5.6	18.0
Mzimba	75.0	12.5	0.0	25.0	0.0	8.0
Nkhosakota	38.5	0.0	7.7	23.1	0.0	13.0
Zomba	44.4	22.2	11.1	22.2	11.1	9.0
<b>Low</b>	<b>45.8</b>	<b>4.2</b>	<b>0.0</b>	<b>50.0</b>	<b>0.0</b>	<b>24.0</b>
Mwanza	33.3	8.3	0.0	33.3	0.0	12.0
Ntchisi	58.3	0.0	0.0	66.7	0.0	12.0
Total	49.1	9.4	15.1	33.0	3.8	106.0

Table 4.11 below shows that most facilities do not have the guidelines to offer quality TB services. Eighty-one percent of facilities in Lilongwe have guidelines on the diagnosis and treatment of TB. Compare this with 21.1 percent of facilities in Machinga district. In all the nine

districts a small number of facilities have guidelines on the management of MDR-TB, management of TB/HIV co-infection and drug and supplies management.

Type of District	Guidelines				All guidelines	Number of facilities offering TB services
	Diagnosis and treatment of TB	Management of MDR-TB	Management of TB/HIV co-infection	Drug and supplies management		
<b>High</b>						
Lilongwe	81.3	37.5	50.0	62.5	31.3	15
<b>Medium</b>						
Chiradzulu	61.5	7.7	84.6	38.5	0.0	13
Karonga	50.0	12.5	0.0	0.0	0.0	5
Machinga	21.1	15.8	15.8	21.1	5.3	16
Mzimba	75.0	12.5	0.0	12.5	0.0	7
Nkhotakota	33.3	0.0	20.0	26.7	0.0	12
Zomba	40.0	20.0	40.0	20.0	10.0	8
<b>Low</b>						
Mwanza	33.3	8.3	58.3	33.3	0.0	12
Ntchisi	58.3	0.0	0.0	58.3	0.0	11
<b>Total</b>	<b>48.7</b>	<b>13.3</b>	<b>31.9</b>	<b>32.7</b>	<b>6.2</b>	<b>99</b>

**Source: DCA-Facility Census**

Table 4.12 shows that fewer than half of the facilities can perform TB sputum tests and stock all first-line drugs. It was only in Lilongwe where 46.7 percent of facilities could perform sputum tests. A good proportion of facilities in Nkhotakota, Mwanza, Machinga, Chiradzulu and Zomba stocked all first-line drugs but most of them could not perform TB sputum tests. It is worth noting that all the facilities in Nkhotakota and Mwanza stock first-line drugs but relatively few perform sputum tests.

District	Equipment and supplies			Number of facilities offering TB services
	TB Sputum Tests	All first-line drugs	Both elements	
<b>Type of District</b>				
<b>High</b>	<b>46.7</b>	<b>53.3</b>	<b>26.7</b>	<b>15.0</b>
..Lilongwe	46.7	53.3	26.7	15.0
<b>Medium</b>	<b>20.9</b>	<b>85.1</b>	<b>19.4</b>	<b>67.0</b>
..Chiradzulu	23.1	84.6	23.1	13.0
..Karonga	16.7	66.7	16.7	6.0
..Machinga	11.1	83.3	5.6	18.0
..Mzimba	12.5	75.0	12.5	8.0
..Nkhotakota	23.1	100.0	23.1	13.0
..Zomba	44.4	88.9	44.4	9.0
<b>Low</b>	<b>25.0</b>	<b>66.7</b>	<b>20.8</b>	<b>24.0</b>
..Mwanza	33.3	100.0	33.3	12.0
..Ntchisi	16.7	33.3	8.3	12.0
<b>Total</b>	<b>25.5</b>	<b>76.4</b>	<b>20.8</b>	<b>106.0</b>

Table 4.13 shows that almost all the sampled facilities do not have the capacity to provide quality TB services. Of the 113 sampled facilities, 14.2 percent had infrastructure, 48.7 percent had

trained staff, 52.2 percent had guidelines, 29.2 percent had equipment and supplies and 6.2 percent had all the elements.

<b>Table 4.13 Health facilities with capacity to provide quality TB services</b>						
Percentage of facilities offering TB services with the infrastructure, staff, guidelines, equipment and supplies, and registers to offer quality services, by type of district [Malawi, 2008]						
Type of District	Elements					Number of facilities offering TB services
	Infrastructure <sup>1</sup>	Staff <sup>2</sup>	Guidelines <sup>3</sup>	Equipment and Supplies <sup>4</sup>	All elements	
<b>High</b>						
Lilongwe	6.3	81.3	87.50	56.3	6.3	15
<b>Medium</b>						
Chiradzulu	15.4	61.5	61.5	23.1	0.0	13
Karonga	25.0	50.0	50.0	12.5	12.5	5
Machinga	10.5	21.1	31.6	26.3	0.0	16
Mzimba	12.5	75.0	75.0	12.5	12.5	7
Nkhotakota	26.7	33.3	33.3	26.7	13.3	12
Zomba	30.0	40.0	40.0	40.0	10.0	8
<b>Low intensity</b>						
Mwanza	0.0	33.3	33.3	33.3	0.0	12
Ntchisi	8.3	58.3	66.7	16.7	8.3	11
<b>Total</b>	14.2	48.7	52.2	29.2	6.2	99
<sup>1</sup> Infrastructure: Electricity, water, adequate infection control						
<sup>2</sup> Staff: see Table 4.10						
<sup>3</sup> Guidelines: see Table 4.11						
<sup>4</sup> Equipment and Supplies: see table 4.12						
<b>Source: DCA-Facility Census</b>						

The treatment of TB patients has been decentralized to all health centres but as indicated above coverage of diagnostics facilities is still low. On average, each district has two or more health workers trained in TB activities (Table 4.14). All TB workers are full-time except in peripheral health centres. Lower level public health facilities are largely staffed with Health Surveillance Assistants (HSAs) whose main job is to immunise children aged less than five years and to teach health education to the communities. It is worth noting that the increase in staffing levels has not been matched by the increase in number of facilities offering TB services.

<b>Table 4.14 Number of full-time TB staff at district, region and central level</b>										
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Central unit	7	7	7	7	8	10	11	13	13	14
Region	5	5	5	6	6	8	8	10	10	10
District	61	61	63	64	68	68	78	80	88	108
Other(drivers,...)	5	5	5	5	5	6	6	7	8	8
<b>Source: NTP (2007)</b>										

#### 4.3.2.1 Trends in case notification

Apart from the low case detection rate, the major challenge for TB control has been a constant high mortality rate among TB patients. Although the death rate is declining (22 percent in 1998; 13 percent and 2007: Figure 4.6) the majority of patients die within the first months of treatment implying late presentation or complications brought by HIV/AIDS co-infection (Squire et al

2002)<sup>16</sup>. The late diagnosis can be explained through the following factors; long pathways to care seeking due to lack of availability of diagnostic facilities in most communities (Nhlema Simwaka et al 2007)<sup>17</sup>. The default rate is quite low, and this is due to the good monitoring and follow-up system in place (Figure 4.4).

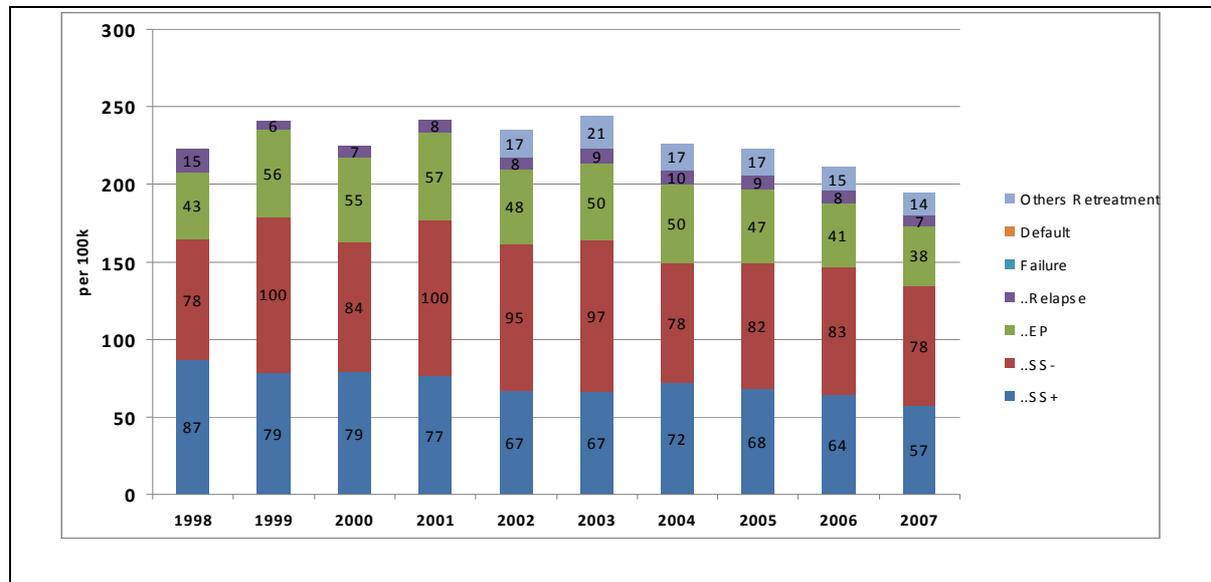


Figure 4.4 Annual case notification rates by TB type (DOTS and non-DOTS by 100k population)  
Source: NTP (2007)

Figure 4.5 shows trends in unfavourable outcomes among TB patients. It is clear that death rate is very high. This may be due to the fact that TB patients are co-infected with HIV which in turn increases case fatality.

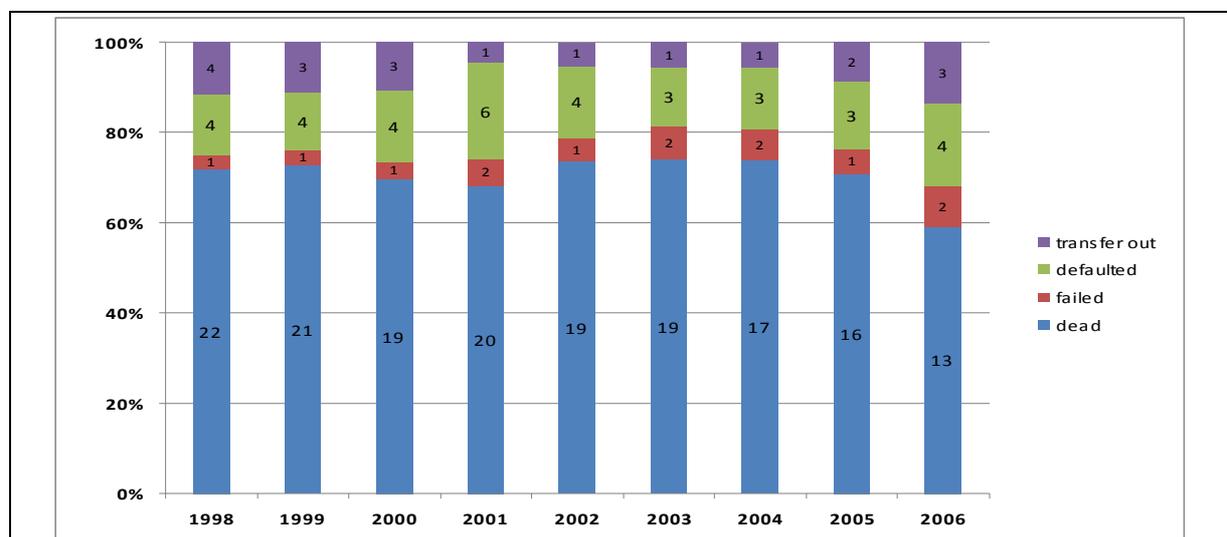


Figure 4.5 Trend in unfavourable outcomes for TB  
Source: NTP (2007)

<sup>16</sup> Squire S.B, Belyae A, Kashoti A, Salaniponi F, Mundy C, Theobald S *et al.*: "Lost" smear positive pulmonary tuberculosis cases. Where are they and why did we lose them? *Int J Tuberc Lung Dis* 2005, 9: 1-7

<sup>17</sup> Nhlema Simwaka et al 2007. The Malawi National TB Control Programme: An equity analysis. *International Journal for Equity in Health*

#### 4.5 Overall Study Question: Has increased tuberculosis funding led to a reduction in the burden of the disease?

In the last decade funding for TB increased substantially. It has however remained constant in recent years. It decreased from 2.27 percent in 2002/03 to 1.26 percent in 2004/2005. The stagnation in the funding for TB in the face of high demand for TB services has led to stagnation in the number of facilities offering TB services per 100,000 population (in absolute value the number of facilities has increased). The GFATM has not yet provided a TB grant to Malawi although about US\$17.9 million has been approved under Round 7. Despite the attenuated funding momentum, the NTP has registered generous improvements in the provision of TB services. Tuberculosis notification rates have stabilized (Figure 4.6)

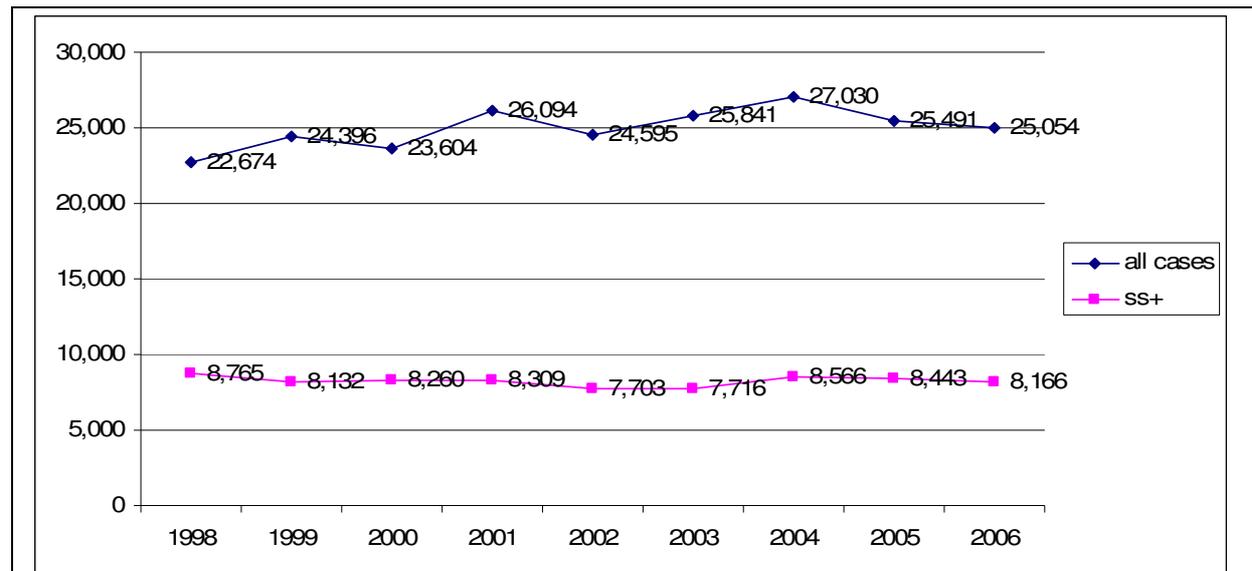


Figure 4.6 Trend in Number of notified TB (all types) and Sputum Smear Positive TB

Source: WHO Global Tuberculosis Control (2008)

Figure 4.7 shows that SS+ as a percentage of all types of TB remained fairly constant between 1998 and 2006. In particular, the proportion is less than the cut-off 45 percent implying that the TB data is of high quality. This is also a crude indicator of good TB control programme performance.

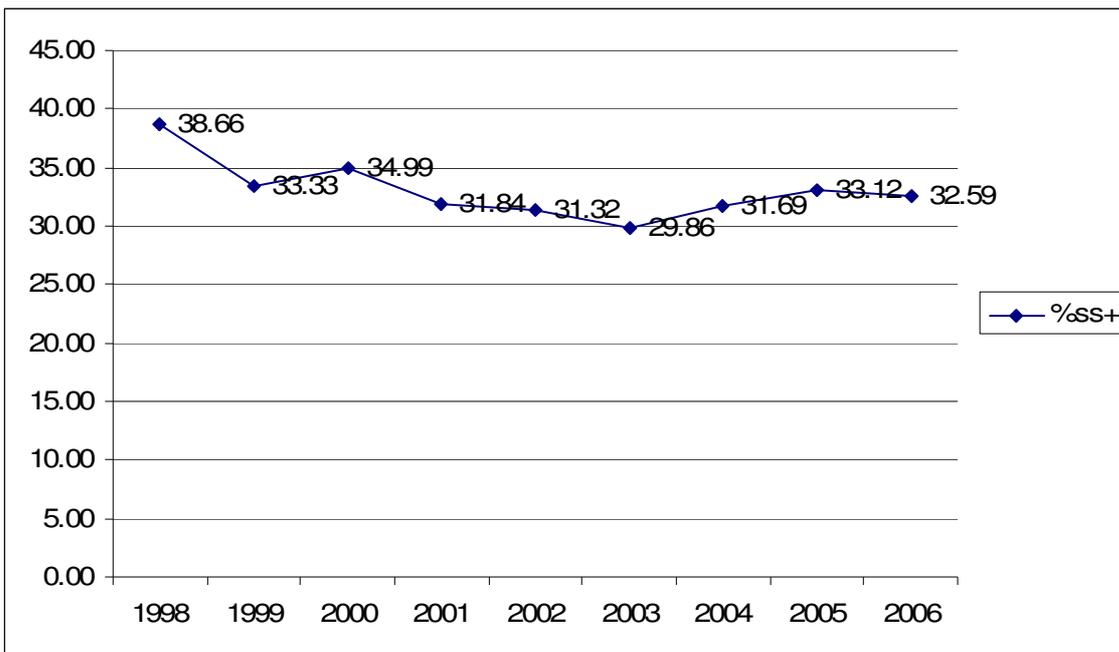


Figure 4.7 Sputum smear positive tuberculosis as a percentage of all notified Tuberculosis, 1998-2006  
Source: WHO Global Tuberculosis Control (2008)

The country seems to be making a steady upward improvement towards the 85 percent cure and treatment success target set by the World Health Organisation. Treatment success rate stands at 75 percent for new smear positive cases and 77 percent for re-treatment cases (Figure 4.10). Treatment completion rate among new smear negative cases is 75 percent and 73 percent for extra pulmonary cases. The problem, however, is that death rate remains high. It stands at 16 percent for new smear negative cases, 19 percent for relapse cases, 18 percent for both smear negative and extra-pulmonary cases. Most of these deaths are attributable to complications due to the HIV/AIDS pandemic.

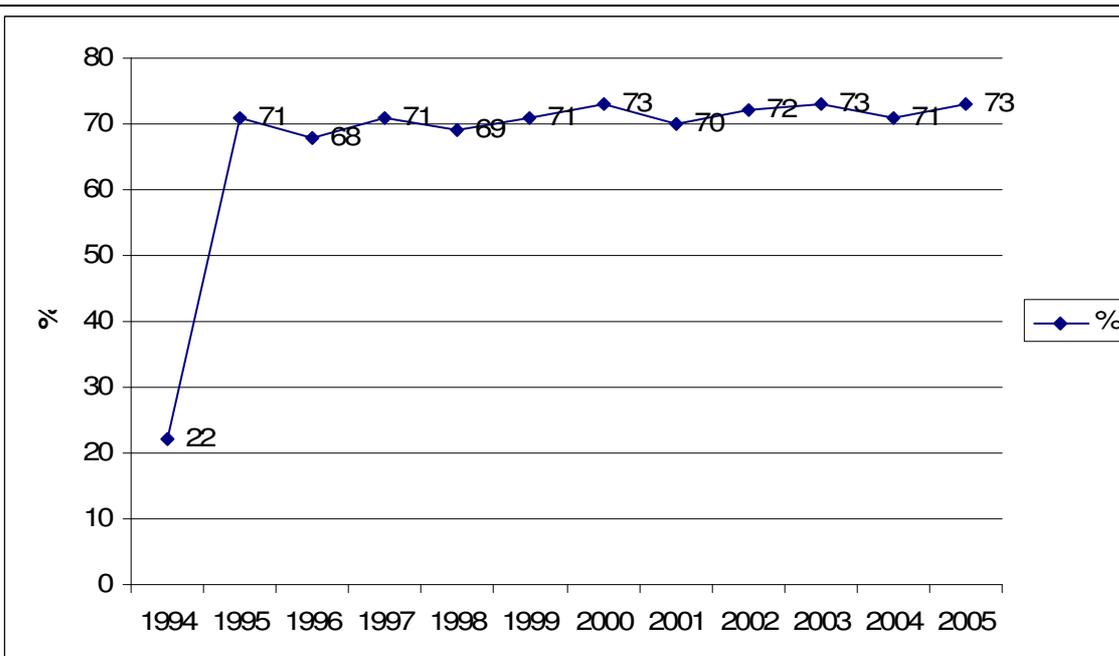


Figure 4.8 Tuberculosis treatment success rate, 1994-2006  
Source: WHO Global Tuberculosis Control (2008)

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#### 4.5.1 The Burden of Tuberculosis in Malawi

Despite the fact that it is hard to make a conclusive statement about trends in the burden of TB in Malawi without long funding times series data and lack of TB incidence and prevalence data, we can crudely infer the TB burden from the increase in quantity and quality of TB services. The lack of trend data for funding makes it hard to correlate funding and the prevalence of TB. It is however safe to say much groundwork has been done in Malawi that makes the future bright for TB control efforts.

##### *Quality of Services Level 4. Effectiveness of services*

In terms of the effectiveness of TB prevention measures, knowledge and attitudes concerning tuberculosis are shaped to reduce stigma and facilitate treatment seeking. Knowledge and attitudes concerning tuberculosis are presented in Table 4.15. The table shows the following indicators:

- Among all women aged 15-49, the percentage who have heard of tuberculosis (TB).
- Among women who have heard of TB, the percentage who know that TB is spread through the air by coughing
- The percentage who believe that TB can be cured
- The percentage who would want to keep secret that a family member has TB, by background characteristics

**Table 4.15 Knowledge and attitudes concerning TB**  
Percentage of women aged 15-49 who had ever heard of TB and among those who have ever heard of TB the percentage who said TB is spread through the air by coughing, the percentage who believe TB can be cured, and those that would keep it a secret, by background characteristics, [Malawi, 2008]

		% Who have heard of TB			% Who report that TB can be spread		% Who believe TB can be cured		% Who would want a family member's TB kept secret		
		%	Count	Total	%	Count	%	Count	%	Count	Total
Age group	15-24	90	1,549	1,716	78	1,212	9	147	9	144	1,549
	25-49	94	2,288	2,436	81	1,842	10	233	9	214	2,288
	40+	92	713	773	79	564	9	67	10	73	713
	Missing	90	412	459	81	333	11	45	12	51	412
Mother's Education	None	91	855	936	76	651	8	71	10	82	855
	Nursery	100	3	3	100	3	0	0	0	0	3
	Primary	94	3,106	3314	79	2,453	10	311	10	321	3,106
	Secondary	97	652	671	87	569	8	52	8	50	652
	Higher	95	37	39	92	34	8	3	3	1	37
	Missing	73	309	421	78	241	18	55	9	28	309
	Lowest	91	724	794	77	559	9	68	12	85	724
Wealth quintile	2	91	807	887	79	640	9	74	10	78	807
	3	94	850	908	78	666	10	87	10	86	850
	4	94	887	947	80	706	12	110	11	100	887
	Wealthiest	93	885	950	83	737	8	71	8	74	885
	Missing	90	809	898	79	643	10	82	7	59	809
	District										
<b>High</b>	Lilongwe rural	92	584	635	82	481	0	0	10	58	584
	Lilongwe city	96	469	487	82	385	0	2	10	49	469
<b>Medium</b>	Karonga	89	498	562	81	404	32	160	10	48	498
	Mzimba	93	515	551	80	413	0	1	10	50	515
	Nkhotakota	96	441	458	77	341	1	3	7	30	441
	Machinga	90	442	489	81	359	1	3	10	46	442
	Zomba	84	429	508	64	275	33	140	11	47	429
<b>Low</b>	Chiradzulu	96	589	612	98	576	0	1	10	56	589
	Ntchisi	96	555	581	75	415	32	180	9	49	555
	Mwanza	88	440	501	69	302	0	2	11	49	440

About 94 percent of women aged 15-49 had ever heard of TB disease. There are no big differences when comparing within age groups, wealth quintiles or within levels of education and among districts. About 80 percent reported that TB can be spread through the air by coughing and about 76 percent said that they believed that TB could be cured. About 24 percent said they would want a family member's TB kept secret. This proportion is more among women with formal education as compared to those with higher formal education. Among the other levels of desegregations there are no major differences.

### TB Follow-up study

TB patients who were lost to follow-up and those who did not return for final examination of sputum were followed and interviewed. Among 111 patients, 54 were defaulters and 57 had completed treatment. Thirty-one percent of patients who had defaulted were dead at the time the researchers visited their households and 3.5 percent of those who completed treatment were dead (Figure 4.9). The most common cause of death mentioned by relatives was tuberculosis (16.7 percent). In addition among defaulters, 16.9 percent at the time of visit had relocated.

Patients who had defaulted from treatment were interviewed to understand the factors leading to defaulting and lack of adherence, for those who did not return for sputum examination. The major challenge linked to defaulting was lack of follow-up of patients by health workers. For example, only 33 percent were visited by the health worker after defaulting. Another factor was related to side effects with about 39 percent indicated experience of side effects during treatment, which might have led to stopping or dropping out.

Among patients who had completed treatment but did not go back for sputum examination, 33 percent were coughing, and sputum was requested for examination. Only one patient who submitted a sputum sample was diagnosed with TB.

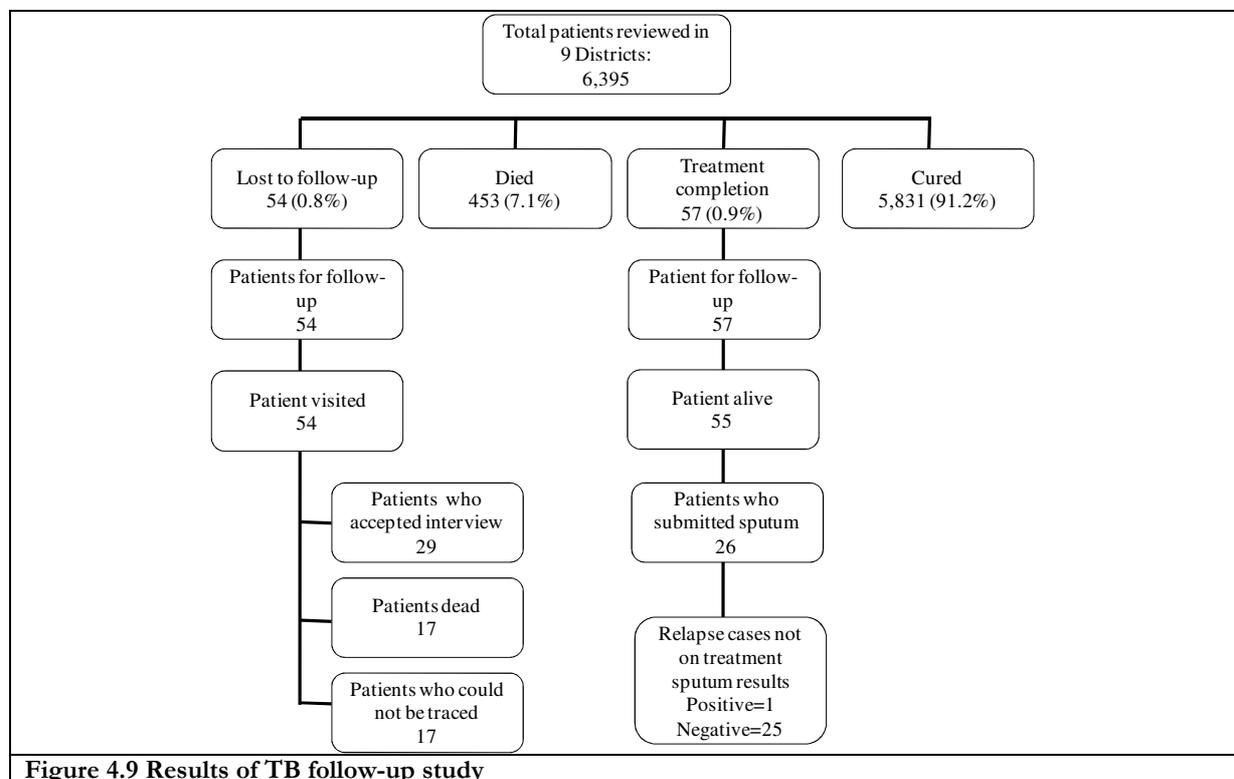


Figure 4.9 Results of TB follow-up study

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Included in the cohort were 6,395 patients. Among these patients 54 (0.8 percent) had been lost to follow-up. 453 patients had died (7.1 percent), 57(0.9 percent) had completed treatment and 5,831 (91.2percent) were cured. Of 57 patients available for follow-up, interview data was obtained for 55. Among these patients, 26 agreed to submit sputum samples (Figure 4.9).

#### **4.6 Overall Study Question: Has increased TB funding led to a reduction in the burden of disease?**

As highlighted, upto now the National TB Control Programme has not conducted any prevalence survey which can be used as a benchmark for monitoring progress and impact of financial investment. The resources allocated to the programme in figures have increased but as a relative percentage of the total health expenditure it has decreased.

Although the DOTS programme is claimed to have 100 percent coverage, the number of diagnostic facilities per 100,000 population has decreased over the years. This might be due to an increase in population against sites which have predominantly remained constant. The quality of services is relatively good for tuberculosis in Malawi. The rate for both relapse and default is very low. The major challenge for TB control is the high death rate among the patients, which according to several studies might be attributed to high HIV/AIDS prevalence and late presentation to health facilities. The late presentation can also be attributed to low coverage of diagnostic centres. Although the survey showed high knowledge of tuberculosis, lack of diagnostic facilities hinders early access.

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## 5.0 Malaria

### 5.1 Historical Perspective

#### 5.1.1 Epidemiology

Malaria is a major public health problem in Malawi. It is the leading cause of morbidity and mortality in children under five years of age and pregnant women. The 2004-2005 Health Management and Information System (HMIS) Bulletin indicate that 200,000 malaria outpatients were being reported monthly throughout health facilities in Malawi. This translates into 3.5 million episodes of malaria reported in the outpatient departments between 2004 and 2005. However, according to a recent report of the community survey, more than 50 percent of malaria cases are not treated at the health facilities. Therefore, it can be estimated that Malawi experiences 6 million episodes of malaria annually.

Over 85 percent of malaria infections in Malawi are due to *plasmodium falciparum*. This type of malaria can lead to death. However, the most severe cases are typically limited to those who are not immune or have low immunity. Malaria is the cause of pregnancy loss, low birth weight and neo-natal mortality. Malaria is hyper-endemic and transmission occurs throughout the year in most places in Malawi, except in the mountainous areas in the north and south. Transmission is greatest during rainy season and along the low-lying areas. Due to great variations in rainfall and population movement, a substantial portion of the population is at risk of malaria epidemic.

Malaria accounts for 40 percent of outpatient visits and 18 percent of all hospital deaths (Malawi Government, 2005). It is a major cause of anaemia in under-fives. Anaemia in turn is responsible for 40 percent of all under-five hospitalisations and 40 percent of all hospital deaths.

Malaria transmission is largely determined by climatic factors. These factors are temperature, humidity and rainfall. The extent and distribution of these factors (distribution of risk maps) influences the prevalence rate of malaria. Malaria transmission is higher in areas with high temperatures and during rainy season (October-April).

Malawi has experienced a downward trend in the estimated number of malaria cases per 100,000 population between 1990 and 2006 (Figure 5.1). This is evident from the trend line that measures the average number of cases over the period 1990-2006. The highest number of malaria cases was reported in 1993 soon after Malawi changed its drug policy from chloroquine as first line drug to sulfadoxine pyrimethamine. A candidate explanation for this outcome is the increasing drug resistance to chloroquine. The small number of cases estimated for 2006 is however disturbing since the 2004 Drug Efficacy Study (Plowe et al. 2004) showed a substantial reduction in efficacy of sulfadoxine pyrimethamine. We speculate here that the fall in malaria cases might have been as the direct result of a scale-up in vector control interventions such as insecticide treated nets occasioned by phenomenal increase in malaria funding.

#### 5.1.2 Programming

The National Malaria Control Programme (NMCP) was established in 1984. The goal of NMCP is to reduce the burden of malaria in Malawi. The NMCP is domiciled at the Community Health Sciences Unit (CHSU), which also houses other disease control programmes. The NMCP has four officers at the national level who form the core management and co-ordination team. There

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are three zonal officers who are responsible for their respective districts in each of the three zones. At district level, the District Malaria Control Co-ordinator (DMCC) co-ordinates malaria control activities under the District Health Officer (DHO). The DHO is the head of district health services.

The advent of the Roll Back Malaria partnership has attracted many donors into malaria control activities in Malawi. These include the WHO, UNICEF, World Bank, UNDP and DFID, USAID/CDC, JICA, Malaria Alert Centre (MAC), among others. There is also co-ordination with line ministries and government departments such as Education, Environmental Affairs, Fisheries, Defense, Internal Security, Information, Finance, Malawi Broadcasting Corporation and other media houses.

In a bid to scale up malaria control interventions, the NMCP developed a second-generation malaria strategic plan (2005-2010) in 2005. Its mission is to reduce the malaria burden to a level of no public health significance (NMCP, 2005). Three strategic areas have been identified for scale-up of malaria control activities. These are:

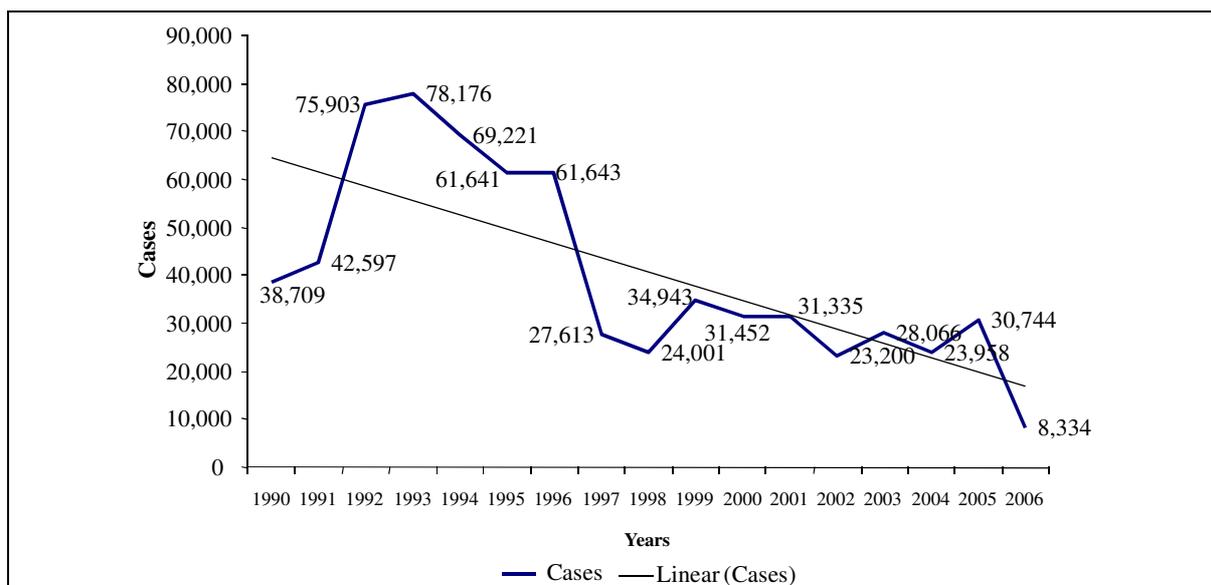
- Case management,
- Intermittent preventive treatment (IPT),
- Insecticide-treated mosquito nets (ITN).

The 2005-2010 Malaria Strategic Plan also identifies strategies for implementation of 2005-2010 malaria control activities. These strategies are:

- Improving case management at health facilities;
- Improving community and family practices for malaria case management;
- Provision of adequate dose of SP to pregnant women;
- Scaling up of ITN distribution and use;
- Introduction of IRS in 4 selected areas,
- Effective monitoring of malaria vector control;
- Developing human resource capacities;
- Strengthening IEC and advocacy for malaria control;
- Improving communication and logistics;
- Supporting operational research and monitoring and evaluation.

The programme targets that are contained in the Abuja Declaration are:

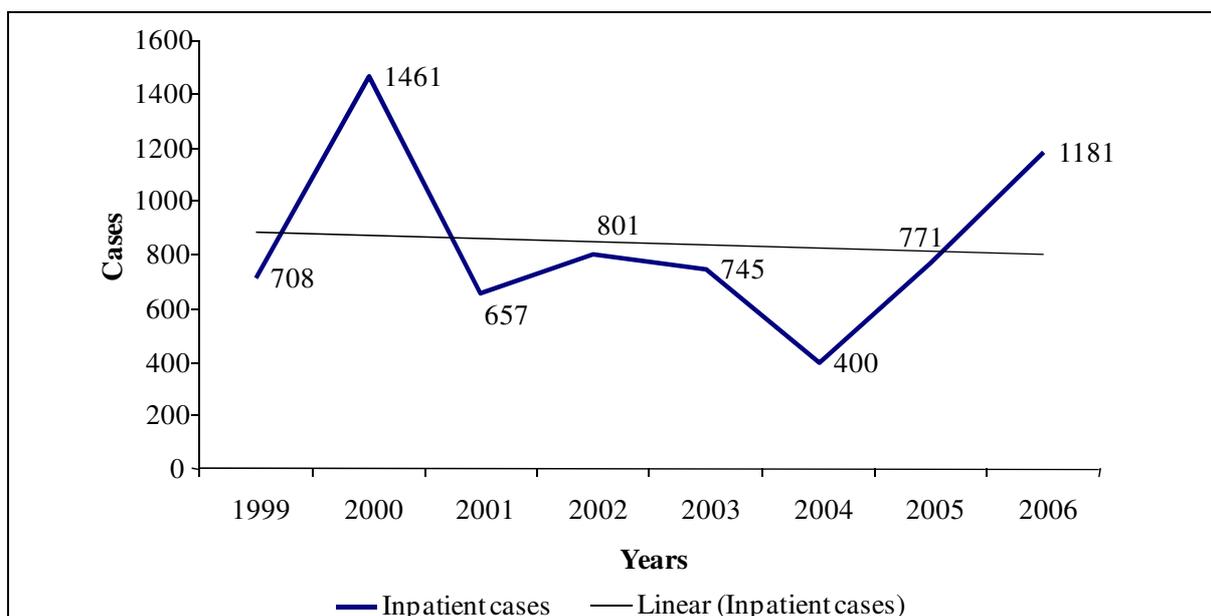
- The general target is to halve malaria mortality and morbidity by the year 2010 with further reduction of morbidity and mortality figures of 2001 by 75 percent by 2015.
- Specific targets are to have:
  - At least 80 percent of those suffering from malaria fever access to and able to use correct and appropriate treatment within 24 hours of onset of fever;
  - At least 80 percent of the population access to appropriate treatment by 2010;
  - At least 80 percent of pregnant women access to malaria prevention by 2010; and
  - At least 80 percent of children under five and pregnant women sleep under insecticide treated nets by 2010.



**Figure 5.1 Estimated number of malaria cases per 100,000 population (1990-2006)**

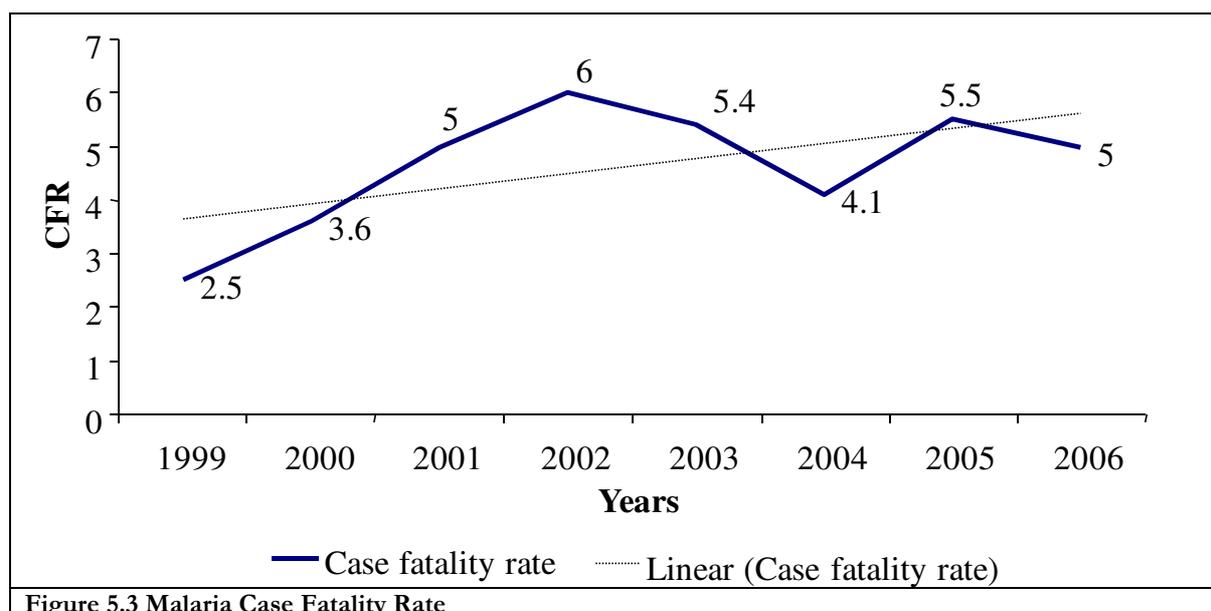
Source: Malaria Control Programme (2007)

Figure 5.1 and 5.2 report wide fluctuations in malaria cases between 1999 and 2006. The malaria cases fell between 2001 and 2004 and rose between 2004 and 2006. The highest number of cases of 1,461 per 100,000 population occurred in the year 2000. A potential explanation for the rising trend in malaria from 2006 is the development of drug resistance to SP.



**Figure 5.2 In-patient malaria cases per 100,000 population**

The rising trend in the number of in-patient malaria cases corresponds to the general increase in the average case fatality rate (CFR) of malaria over the years (Figure 5.3). The malaria CFR rose between 1999 and 2003. It fell between 2002 and 2004. The downward trend in CFR mirrors the trend in malaria cases since 2006.



## 5.2 Study Question 1: Has funding/spending increased for malaria programmes?

In recent years, there has been a substantial increase in funding for malaria in Malawi. The malaria-related Millennium Development Goals and the Roll Back Malaria Partnership have stimulated much interest among the donor community to unlock resources for malaria control. Table 5.1 reports total expenditure on malaria as a percentage of total health expenditure. It is clear that total expenditure on malaria as a percentage of total health expenditure increased from 19.9percent in 2002/03 to 22.03percent in 2005/06. It is also evident that out-of-pocket expenditure increased between 2002/03 and 2005/06. It rose from 10.46percent in 2002/03 to 11.73percent in 2005/06. External expenditure on malaria also increased from 10.28percent in 2002/03 to 12.18percent in 2005/06. Expenditures on prevention and public health services however declined from 10.78percent to 8.99percent between 2002 and 2006.

	2002/03	2005/06
General government units		
Territorial government		
Central government revenue (Ministry of Finance)	1,022,189,547	2,222,468,116
Regional and municipal government revenue (Local Government)	0	19,371,606
All other public units	0	0
Return on assets held by a public entity	0	0
Other	0	0
Private sector		
Employer funds	94,830,127	645,953,478
Households	288,679,521	818,121,241
Non-profit institutions serving individuals	0	0
Other private funds	0	0
Return on assets held by a private entity	0	0
Other	0	0
Rest of the world	1,760,241,734	3,888,234,209
GFATM	0	771,309,000
<b>TOTAL Malaria</b>	<b>3,165,940,929</b>	<b>8,365,457,650</b>

Source: Malawi NHA 2002-2004 Report and NHA Malaria Sub-accounts for 2002/03 and 2005/06

<b>Table 5.2: National malaria funding by Financing Agent and type of provider, 2002/03 and 2005/06, Malawian Kwacha</b>								
	<b>FS.1 Government</b>		<b>FS.2 Private</b>				<b>FS.3.2 External Resources</b>	
	<b>2002/03</b>	<b>2005/06</b>	<b>FS.2.1 Households</b>		<b>FS.2.2 Private</b>		<b>2002/03</b>	<b>2005/06</b>
	<b>2002/03</b>	<b>2005/06</b>	<b>2002/03</b>	<b>2005/06</b>	<b>2002/03</b>	<b>2005/06</b>	<b>2002/03</b>	<b>2005/06</b>
General hospitals								
<b>Government general hospitals</b>								
Central hospitals	119,151,563	487,433,281	9,527,867	21,145,446	0	15,921,971	0	0
District hospitals	184,493,154	435,469,695	52,932,594	117,474,700	0	0	0	0
<b>Private not-for-profit hospitals</b>								
Private not-for-profit hospitals					0	9,359,037		
Private not-for-profit Hospitals (CHAM)	0	0	74,370,295	165,051,953	47,049,930	120,473,587		0
<b>Private-for-profit hospitals</b>			19,594,323	40,141,105	8,970,000	124,945,362	0	0
Providers of ambulatory health care								
Offices of physicians	0	0	14,847,593	69,669,210	29,373,450	335,239,844	0	0
Health centres/dispensaries/maternality	193,880,067	558,672,635	58,755,179	137,848,169	68,330,049	163,613,416	106,803,191	0
Medical and diagnostic laboratories	0	11,687,059	0	0	0	0	0	0
Traditional healers			7,145,900	33,530,636		0		0
Retail sale and other providers of medical goods	0	0	38,111,468	178,830,057	4,800,000	61,124,000	0	0
Provision and administration of public health programmes	1,344,130,705	2,915,874,063	0	0	117,792,030	191,932,413	114,401,207	274,374,943
General health administration and insurance	147,484,605	384,026,683	0	0	40,377,451	276,210,999	85,428,623	107,141,266
Provider not specified by kind	0	519,431,652	10,939,403	38,498,139	129,974	127,215,636	0	373,512,379
Institutions providing health-related services	257,761,272	78,967,350	0	0	0	0	0	0
Non-health expenditures	-	-	-	-	-	-	-	-
<b>TOTAL Malaria</b>	<b>2,246,901,366</b>	<b>5,391,562,418</b>	<b>286,224,621</b>	<b>802,189,415</b>	<b>326,181,921</b>	<b>902,906,162</b>	<b>306,633,020</b>	<b>755,028,587</b>

**Source: NHA Malaria Sub-accounts for 2002/03 and 2005/06, Financing Agent by Provider tables**

**Table 5.3 National malaria funding by financing sources and function, 2002/03 and 2005/06 , Malawian Kwacha**

Function and disease		FS.2. Private						FS.3. External Resources		
		FS.1 Government		FS.2.1 Households*		FS.2.2 Private		FS.3.1 GFATM		FS.3.2 Other
		2002/03	2005/06	2002/03	2005/06	2002/03	2005/06	2002/03	2005/06	2002/03
HC.1.1	Inpatient curative care	2,118,623,846	2,919,381,108			1,199,880,210	3,270,654,185	0	438,326,976	816,592,163
GBD.1.A.8	Malaria	227,092,872	322,659,579			115,597,666	299,876,732	0	0	10,341,427
HC.1.3	Outpatient curative care	1,228,403,113	1,624,244,350			951,012,423	2,193,313,437	0	2,293,957,488	542,672,742
GBD.1.A.8	Malaria	321,659,817	519,898,236			210,692,992	830,038,095	0	0	107,608,394
HC.1.9	Other curative care	0	164,807,183			55,346,885	104,049,024	0	0	0
GBD.1.A.8	Malaria	0	275,298,777			11,069,377	38,498,139	0	0	0
HC.2	Rehabilitative care	0	185,836,371			0	0	0	0	120,300,115
HC.3	Services of long-term nursing care	0	0	0	0	0	0	0	0	0
HC.4	Ancillary services to medical care	0	47,647,242	0	0	0	0	0	0	0
GBD.1.A.8	Malaria	0	6,194,141	0	0	0	0	0	0	0
HC.5	Medical goods dispensed to outpatients	0	0	0	0	286,076,451	648,524,480	0	0	0
GBD.1.A.8	Malaria	0	0	0	0	0	239,954,057	0	0	0
HC.5	Medical goods dispensed to outpatients	0	0	0	0	286,076,451	648,524,480	0	0	0
HC.5.1	Pharmaceuticals and other medical nondurables	0	0	0	0	286,076,451	648,524,480	0	0	0
GBD.1.A.8	Malaria	0	0	0	0	42,911,468	239,954,057	0	0	0
Subtotal 1: Personal health expenditure		3,347,026,959	4,941,916,254			2,492,315,969	6,216,541,126	0	2,732,284,464	1,479,565,020
HC.6	Prevention and public health services	376,451,021	1,666,268,476	0	0	136,256,661	195,342,667	0	771,309,000	3,481,908,189
GBD.1.A.8	Malaria	294,621,229	825,555,275	0	0	0	9,802,025		771,309,000	1,278,464,567
HC.7	Health administration and health insurance	702,972,539	1,091,299,199	0	0	108,740,770	290,187,023	0	0	1,199,179,059
GBD.1.A.8	Malaria	167,224,605	233,255,736	0	0	0	0	0	0	106,066,074
Subtotal 2 : Current health expenditure		4,426,450,519	7,699,483,928	0	0	2,737,313,400	6,702,070,817	0	3,503,593,464	6,160,652,268
HC.R.1	Capital formation for health care provider institutions	747,086,167	373,897,094	0	0	0	135,136,736	0	0	545,636,439
GBD.1.A.8	Malaria	11,591,024	58,977,979	0	0	0	35,670,280	0	0	0
Subtotal 3 : Total health expenditure Health related <sup>1</sup>		5,173,536,686	8,073,381,022	0	0	2,737,313,400	6,837,207,553	0	3,503,593,464	6,706,288,707
GBD.1.A.8	Malaria	0	0	0	0	0	0	0	0	257,761,272

<sup>1</sup> No subtotal since data are not collected for all diseases, \*the column for household data is blank because this expenditure is part of the private expenditure as per format of the GFATM tables.

Source: Malawi GFATM Target Tables for 2002/03 and 2005/06

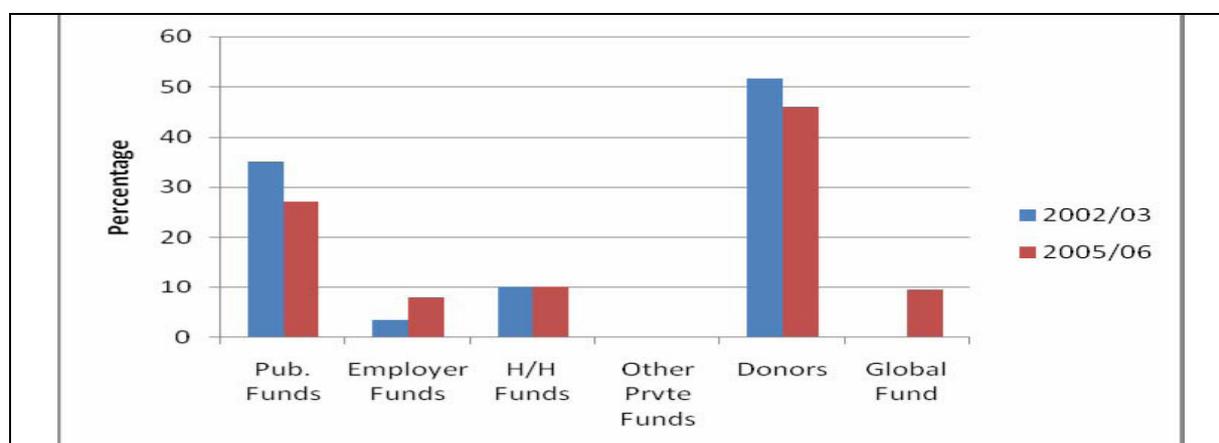
<b>Indicator</b>	<b>2002/2003</b>	<b>2005/2006</b>
Global Fund malaria resources as % of total external funds for malaria	N/A*	16.84
Total expenditure on malaria as % of Total Health Expenditure (THE)	19.9	22.03
Inpatient curative care for malaria as % of total health expenditure	2.42	2.64
Outpatient curative care for malaria as % of total health expenditure	4.38	4.93
Pharmaceutical for malaria as % of total health expenditure	0.29	0.64
Prevention and public health services as % of total health expenditure	10.78	8.99
Administration for malaria as % of total health expenditure	1.87	2.04
Capital formation for malaria as % of total health expenditure	0.08	0.41
Out-of-pocket expenditure on malaria as % of private health expenditure	10.46	11.73
External expenditure on malaria as % of total health expenditure	10.28	12.18

**\*Not Available**  
**Source: National Health Accounts (2008)**

Between 2002/03 and 2005/06, the largest financing source was donors who accounted for 51.7percent and 45.97percent in 2002/03 and 2005/06, respectively (Figure 5.4). The second largest source was public funds which were at 35.1percent in 2002/03 and at 27.05percent in 2005/06. Among the major donors for malaria control programme activities are the United States Government support and the Global Fund to Fight HIV/AIDS, Tuberculosis and Malaria (GFATM). The GFATM contribution made up 9.31percent of total financing sources in 2005/06. The reduction in donor financing might have resulted from the new resources from the Global Fund (Table 5.5). Households as a financing source remained fairly steady during this time at 9.9percent and 9.9percent, respectively. Employer funds doubled from 3.3percent to 7.8percent during this period.

Approved funding	\$18,815,810
Principal recipient	Ministry of Health (MOH)
Local Fund Agent	PriceWaterhouse Coopers
Grant agreement signed	19 <sup>th</sup> September, 2005
Grant start date	1 <sup>st</sup> October 2005
First disbursement	27 <sup>th</sup> January 2006
Total Disbursed as of 18 <sup>th</sup> January 2008	\$17,957,714.00

**Source: National Health Accounts (2008)**



**Figure 5.4 Malaria Health Financing Sources, 2002/2003 and 2005/2006**

**Source: NHA (2008)**

Health care functions are services or activities delivered by providers. These include curative care, rehabilitative care and prevention and public health services. The largest proportion of malaria total health expenditures (THE) by health care function is on prevention and public health services accounting for 54.2 percent and 40.8 percent of THE in 2002/03 and 2005/06, respectively. Curative care was the second largest function accounting for 34.1 percent and 34.4 percent in 2002/03 and 2005/06, respectively (Figure 5.5). The large shares are due to the fact that malaria requires provision of a high degree of prevention and public health services and also as malaria accounts for 39 percent of all in-patient admissions.

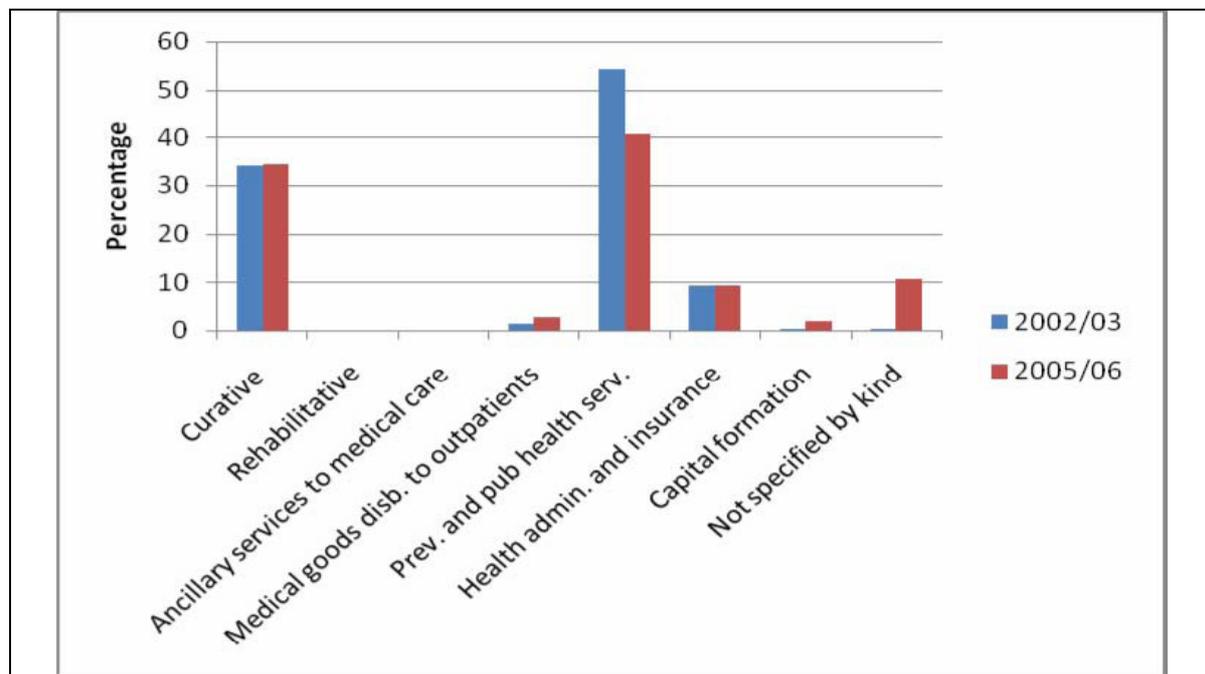


Figure 5.5 Percentage distribution of malaria total expenditure by health care function, 2002/03 and 2005/06

Sources: NHA (2008)

## 5.3 Study Question 2: Has the availability of quality malaria services increased?

### 5.3.1 Has the quantity of malaria services increased? And are they equitably distributed?

#### 5.3.1.1 Quality of Service Level 1. Availability of basic elements: commodities, guidelines, systems, trained staff

**Table 5.6 Total number of health facilities visited, proportion of visited facilities that offer malaria diagnostic services, density of facilities per 10,000 with malaria diagnostic services and presence of diagnostic equipment in facilities that provide diagnostic services by district, Malawi 2008**

District	District Population	Total N° of Facilities visited	Malaria Related Characteristics			
			Proportion of Facilities w/ Malaria Diagnostic Services	Density of Malaria Diagnostic Clinics	Percent w/availability of Microscope & Slides & Giemsa or field stain	Percent w/availability of rapid test
<b>Total</b>	<b>5,178,029</b>	<b>108</b>	<b>0.44</b>	<b>0.09</b>	<b>9.26</b>	<b>10.19</b>
<b>Type of District</b>						
<b>High</b>	<b>1,871,970</b>	<b>15</b>	<b>0.47</b>	<b>0.04</b>	<b>0.00</b>	<b>0.00</b>
..Lilongwe	1,871,970	15	0.47	0.04	0.00	0.00
<b>Medium</b>	<b>2,909,452</b>	<b>69</b>	<b>0.49</b>	<b>0.12</b>	<b>11.59</b>	<b>14.49</b>
..Chiradzulu	290,780	13	0.92	0.41	7.69	69.23
..Karonga	243,666	6	0.17	0.04	0.00	0.00
..Machinga	433,264	18	0.44	0.18	11.11	0.00
..Mzimba	950,000	8	0.13	0.01	12.50	0.00
..Nkhotakota	292,556	15	0.33	0.17	0.00	0.00
..Zomba	699,186	9	0.78	0.10	44.44	11.11
<b>Low</b>	<b>396,607</b>	<b>24</b>	<b>0.25</b>	<b>0.15</b>	<b>8.33</b>	<b>4.17</b>
..Mwanza	173,384	12	0.42	0.29	16.67	8.33
..Ntchisi	223,223	12	0.08	0.04	0.00	0.00

Source: DCA Facility survey, 2008

**Table 5.7: Total number of health facilities visited, proportion of visited facilities that offer malaria treatment services,**

Density of facilities with malaria treatment services, percent of facilities with malaria treatment with health worker trained in malaria management in the past two years, percent with guidelines for the treatment of malaria by district, Malawi 2008

DISTRICT	District Population	Total N° of Facilities visited	Proportion of Facilities w/ Malaria treatment	Density of Malaria treatment clinics	Percent w/ health worker trained past 2 years	Percent w/ guidelines for malaria management
Total	5,178,029.00	108.00	0.98	0.20	84.26	11.11
<b>Type of District</b>						
<b>High</b>	<b>1,871,970.00</b>	<b>15.00</b>	<b>0.93</b>	<b>0.07</b>	<b>93.33</b>	<b>0.00</b>
..Lilongwe	1,871,970.00	15.00	0.93	0.07	93.33	0.00
<b>Medium</b>	<b>2,909,452.00</b>	<b>69.00</b>	<b>0.99</b>	<b>0.23</b>	<b>79.71</b>	<b>10.14</b>
..Chiradzulu	290,780.00	13.00	1.00	0.45	92.31	0.00
..Karonga	243,666.00	6.00	1.00	0.25	66.67	16.67
..Machinga	433,264.00	18.00	0.94	0.39	66.67	0.00
..Mzimba	950,000.00	8.00	1.00	0.08	87.50	25.00
..Nkhotakota	292,556.00	15.00	1.00	0.51	86.67	13.33
..Zomba	699,186.00	9.00	1.00	0.13	77.78	22.22
<b>Low</b>	<b>396,607.00</b>	<b>24.00</b>	<b>1.00</b>	<b>0.61</b>	<b>91.67</b>	<b>20.83</b>
..Mwanza	173,384.00	12.00	1.00	0.69	83.33	33.33
..Ntchisi	223,223.00	12.00	1.00	0.54	100.00	8.33

As shown in Tables 5.6 and 5.7 Chiradzulu had the most facilities with diagnostic services, availability of rapid test, and a higher proportion of health workers who had been trained in the

previous two years. Conversely 1 percent of the facilities in Mzimba had diagnostic services. The majority of health facilities were not adequately equipped with guidelines for malaria management and Lilongwe, Karonga, Nkhotakota, Ntchisi and districts did not have microscopes, slides, or field stains.

### 5.3.1.2 Quality of malaria services: Case management - diagnostics

Note that all indicators should be modified according to relevant data that is available in the country. The categories of Coverage, Outputs, Process, Inputs should each have an indicator if that is possible.

<b>Table 5.8 National trends in diagnostics</b>							
	2002	2003	2004	2005	2006	2007	Comments
<b>Coverage</b>							
% of Health Facilities with laboratory diagnosis capacity							Data not available
% of suspect malaria cases diagnosed (with microscopy or rapid diagnostic test [RDT])							Data not available
Other							
<b>Outputs</b>							
# of HF with functioning microscope							Data not available
# of slides taken and read							Data not available
# of RDTs taken and read							Data not available
Other							
<b>Process</b>							
# laboratory technicians trained in microscopy and/or RDT use							Data not available
#HW trained in RDT use							Data not available
Malaria diagnosis guidelines distributed	Yes	Yes	Yes	Yes	Yes	Yes	
<b>Inputs</b>							
Finances made available for diagnostic work (yes/no for given year)	Yes	Yes	Yes	Yes	Yes	Yes	
Diagnosis guidelines developed (yes in given year)	Yes	Yes	Yes	Yes	Yes	Yes	
#Microscopes purchased							Data not available
#RDTs purchased							
<b>Source:</b>							

### 5.3.1.3 Quality of Malaria Services: Case management -- Treatment

Note that all indicators should be modified according to relevant data that is available in the country. The categories of Coverage, Outputs, Process, Inputs should each have an indicator if that is possible.

<b>Table 5.9 National trends in case management</b>					
	2000	2004	2006	2007	2008
<b>Coverage</b>					
% receiving prompt effective treatment according to national policy (under-5s in Africa; general population elsewhere)	20.8	23.5	19.9		
Other					
<b>Outputs</b>					
# people (children) with uncomplicated malaria receiving antimalarial treatment (per policy)	N/A				
# people (children) with severe malarial receiving antimalarial treatment	N/A				
# facilities with no reported stock outs of antimalarial drugs in the last 3 months	N/A				
Other					
<b>Process</b>					
# antimalarial treatment guidelines distributed	Yes	Yes	Yes	Yes	Yes
# health care workers trained in antimalarial guidelines	Yes	Yes	Yes	Yes	Yes
# antimalarial treatments delivered (per population for a ratio)	N/A				
Other					
<b>Inputs</b>					
Finances available	Yes	Yes	Yes	Yes	Yes
Anti-malarial treatment guidelines developed	Yes	Yes	Yes	Yes	Yes
# antimalarial drugs purchased	N/A				
Other					
N/A = Not available					
Yes: Means the activity undertaken but there are no records of number/coverage.					

### Box 1: Case Management in Malawi

Case management is one of the core strategies for the control of malaria in Malawi. In line with the overall aim of the Roll Back Malaria Initiative, the main goal of case management is to ensure that at least 80 percent of people suffering from malaria fever have access to and are able to use correct and appropriate treatment within 24 hours of the onset of symptoms (National Malaria Control Programme, 2007). To ensure early diagnosis and prompt treatment, the Malaria Treatment Guideline (2007) stipulates that all children under five years of age presenting at a facility with febrile malaria should be treated for malaria.

Over the past two decades, Malawi has undergone many changes in national malaria treatment policy. Malawi adopted chloroquine as the first line therapy for uncomplicated malaria in 1984. The decision was informed by the results from drug efficacy studies between 1996-1990 that showed declining levels of efficacy of chloroquine (Heyman et al., 1987). In 1990, the decision was made to change the national policy from chloroquine to SP. The change was effected in 1993 and chloroquine was removed from the national drugs list.

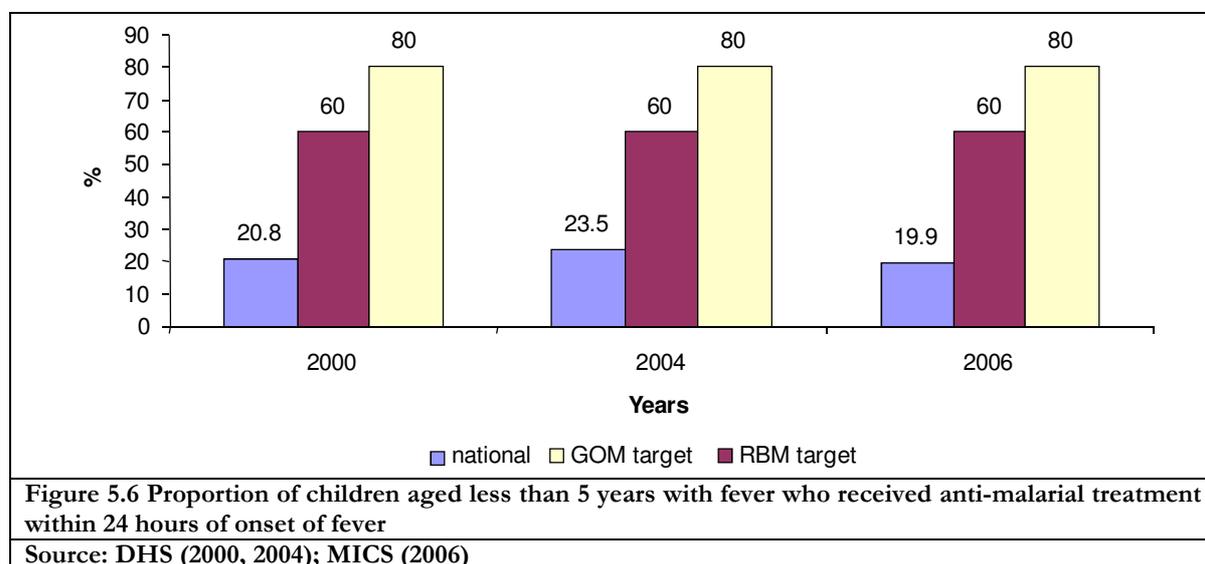
Between 1993 and 2006, there was dramatic growth of resistance of the *plasmodium falciparum* to SP. To counter the threat of resistance of *P. falciparum* to monotherapies (SP), and to improve treatment outcome, the National Malaria Control Programme of Malawi and its supporting committees decided to switch from SP to artemisinin combination therapy (ACT) in 2007. The first line drug is artemether-lumefantrine; the second line drug is amodiaquine artesunate while quinine retained its previous position as the third line drug.

## Analysis of Inputs and Processes of Case Management

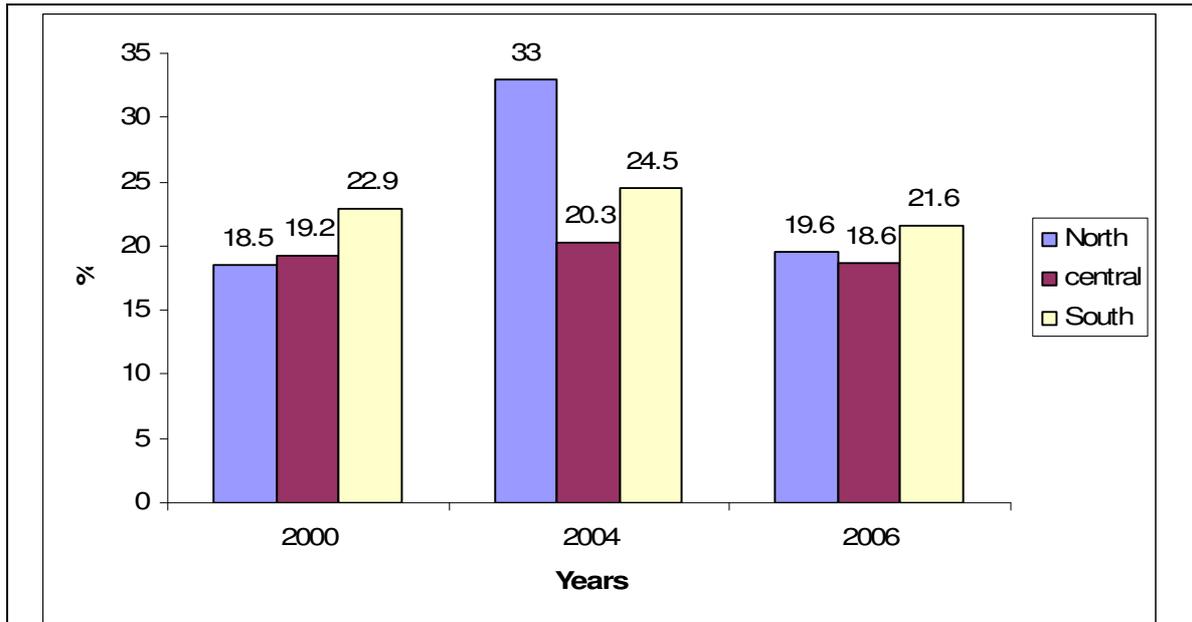
The Malawi Government through the NMCP has provided all the necessary ingredients for the successful implementation of case management in Malawi. It has developed policies, strategies and guidelines for diagnosis and treatment of malaria. Examples of key policies are the National Malaria Control Policy (2002), malaria treatment policies (1984, 1990 and 2007) and treatment guidelines and Malaria strategic plans for periods 2001-2005 and 2005-2010. These policies have provided strategies and activities that have remarkably improved case management in Malawi. The NMCP (2005) claims that over the past seven years, there has been a substantial improvement in the case management as evidenced by few stock-outs of antimalarial drugs in health facilities. Well-thought out malaria policies have also strengthened the collaboration and co-ordination with Integrated Management of Childhood Illness (IMCI) in case management. With this collaboration, NMCP has been responsible for training health workers in severe case management in secondary health facilities while IMCI covers primary health facilities.

## Analysis of Outputs and Outcomes of Case Management in Malawi

Figure 5.6 shows that the proportion of children aged less than five years who received treatment within 24 hours of onset of fever is still low. In 2000, 2004 and 2006 the proportions were 20.8 percent, 23.5 percent and 19.9 percent, respectively. The likely explanation why children are not treated within 24 hours is that self treatment is widespread. In particular, the Malawi Government (2003) estimated that more than 50 percent of all malaria cases in Malawi are not treated at formal health facilities. It is also clear that more work needs to be done on treating children aged under five in order to meet the RBM target of treating 60 percent and GOM target of treating 80 percent of all children within 24 hours of onset of fever.



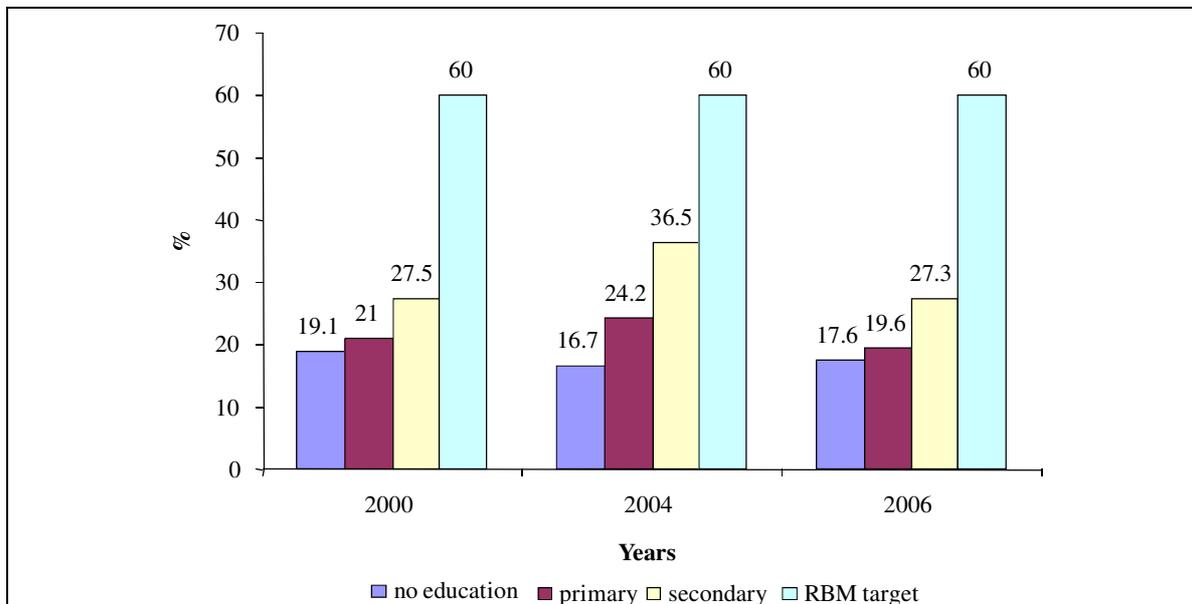
There are regional variations in the proportion of children who access treatment within 24 hours of onset of fever (Figure 5.7). In 2000, the South had the highest proportion of children who were treated within 24 hours of the onset of fever. In 2004, the North assumed this position with 33 percent of its under-fives treated within 24 hours of onset of fever. In 2006, there was a remarkable decline in the proportion of children who were treated within 24 hours of onset of fever. It was 19.6 percent, 18.6 percent and 21.6 percent in the North, Centre and South, respectively.



**Figure 5.7** Proportion of children aged less than 5 years with fever who received anti-malarial treatment according to the national policy within 24 hours of onset of fever by region

Source: DHS (2000, 2004), MICS (2006)

Figure 5.8 shows a higher proportion of children from educated mothers are treated within 24 hours of the onset of fever than the ones from uneducated mothers. Almost 19 percent of children from households with no education accessed treatment within 24 hours in 2000. This rose to 17.6 percent in 2006. On the other hand, 21 percent, 24.2 percent and 27.3 percent of children of educated mothers were treated within 24 hours of the onset of fever. Notice that despite the influence of education on accessing treatment, RBM target of treating 60 percent of all the fevers was not met in all the years.



**Figure 5.8** Proportion of children aged less than 5 years with fever who received anti-malarial treatment according to the national policy within 24 hours of onset of fever by level of education

Source: DHS (2000, 2004), MICS (2006)

#### 5.3.1.4 Quality of malaria services: Insecticide-treated mosquito nets

Note that all indicators should be modified according to relevant data that is available in the country. The categories of Coverage, Outputs, Process, Inputs should each have an indicator if that is possible.

## Box 2: Insecticide-treated nets in Malawi

The Malawi Government started the first nationwide ITN social marketing programme in Africa in 2001. Much of the impetus of the ITN programme, as it has been stated elsewhere, is the WHO three-pronged approach to malaria control and the RBM Partnership. The National Malaria Control Policy recognises ITNs as an important intervention for the control of malaria in Malawi. This is also evident from the Malaria Strategic Plan 2005-2010 whose objective is to scale up malaria vector control interventions. It intends to do this by, among other things, procuring and distributing at least one million nets and insecticides per year, increase awareness of appropriate use of nets, develop and distribute Information Education Campaign materials, conduct annual re-treatment campaigns, training nurses on ITN management and conduct community surveys to assess ITN coverage and utilization.

<b>Table 5.10 National trends in insecticide-treated nets</b>						
	2000	2004	2006	2007	2008	Comments
<b>Coverage</b>						
HH ITN possession (%)	13	42	41			
ITN use in children <5s	5.5	15.4	23			
ITN use in preg. Women	1.5	15.5	6.8			
<b>Outputs</b>						
# ITNs sold or distributed						
# nets (re-) treated						
Volume of insecticides used for re-treatment	N/A					
Other						
<b>Process</b>						
# trained in distribution/retreatment	N/A					
# distribution points established						
# ITN guidelines distributed	Yes	Yes	Yes	Yes	Yes	Numbers not available
Other						
<b>Inputs</b>						
Finances available						
ITN Guidelines developed	Yes	Yes	Yes	Yes	Yes	Number not available
# of ITNs purchased (LLITN and ITNs)	N/A					
Volume of insecticide or # of sachets purchased for ITN retreatment	N/A					
Other	N/A					

## Analysis of ITNs Inputs and Processes

To enhance the effectiveness of insecticide treated nets as a malaria vector control method, the Ministry of Health has developed and implemented a number of policies and strategies. These include the development of the National Malaria Policy in 2002; the development of ITN guidelines in 2002, the revision of ITN guidelines in 2007 and the development of the ITN training manual in 2007, the development of Malaria Strategic 2005-2010, among others.

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The National Malaria Control Policy has adopted use of ITNs as one of the main strategies in the control of malaria. The policy on ITN states that the Government of Malawi (GOM) will:

- Increase access to ITNs among people at risk of malaria, especially children under five years of age and pregnant women;
- Promote and support the channels and mechanisms for making ITNs widely available and accessible through under-fives and antenatal clinics (ANCs), special time-limited campaigns (e.g. EPI- measles, deworming and Vitamin A) and distribution to the poorest, community-based and commercial outlets.
- Regulate and register insecticides for public health use to ensure efficacy, effectiveness and safety.

The 2007 revised guidelines are intended to co-ordinate the malaria control efforts. In particular, they address factors related to the scaling-up of ITNs to achieve the national goal of 80 percent coverage rate of ITN. The revised ITNs also tackle key operational issues such as public-private partnership, standardisation of procurement procedures, assuring equity, and establishment of appropriate distribution channels and programme monitoring and evaluation.

To guide the allocation of resources and co-ordination of malaria control efforts, the Ministry of Health developed a five-year Malaria Strategic Plan (2005-2010) in line with the national health planning framework in 2005. The main focus of the Strategic Plan is to scale up malaria control interventions in Malawi. The three strategic areas to be scaled up are case management, insecticide treated mosquito nests and intermittent preventive treatment in pregnant women (Malawi Government, 2005). Each strategic area consists of a description of strategic objectives and associated activities to achieve the stated targets.

## **Analysis of ITN Outputs and Outcomes**

### **Net Distribution**

Figure 5.9 shows the total number of nets that were distributed in Malawi between 1998 and 2007. It indicates that the number of nets distributed annually has increased over the years. In particular, reasonable progress has been in distributing nets to the population at risk of malaria. The trend line, which captures average annual number of nets, reveals an upward trend in annual net redistribution. A potential explanation for the increase in the number of nets is the general increase in funding for malaria control due to the renewed commitment from national governments and the global community in the malaria control effort. The impressive trend was however reversed in 2007. In 2007, fewer nets were procured by UNICEF due to a procurement wrangle between the World Bank and UNICEF. The World Bank claimed that UNICEF does not follow World Bank procurement procedures in the procurement of nets. The World Bank therefore did not release its resources for net procurement.

The target of the Malawi Government, according to the Malaria Strategic Plan 2005-2010, is to distribute one million nets per year starting from 2005. This target was met in 2004 and 2006. However, the future prospects of net distribution is bright given the newfound global enthusiasm in making use of bed nets as key intervention for malaria control.

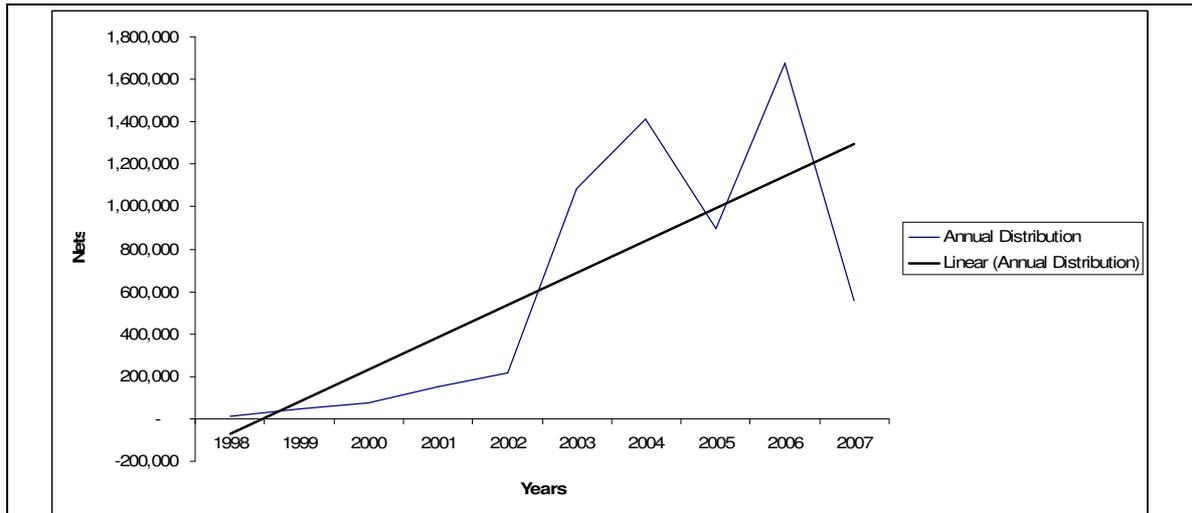


Figure 5.9 Trends in ITN distribution in Malawi, 1998-2007

Source: National Malaria Control Programme

### Net Ownership/Possession

Figure 5.10 shows trends in coverage of ITNs vis-à-vis RBM and Malawi Government targets. It reveals that ITN coverage increased substantially between 2000 and 2006. ITN coverage increased from 13 percent in 2000 to 41 percent in 2006. We speculate that the increase in ITN is a direct consequence of the increase in funding for malaria control.

The impressive increase in coverage of ITNs does not however reach the target set by the RBM target of 60 percent and the Government of Malawi target of 80 percent. In light of this, there is desperate need to increase coverage of ITNs through distribution of more ITNs. This is going to happen given the fact that since 2006, ITNs are distributed free of charge to children aged less than five years and pregnant women.

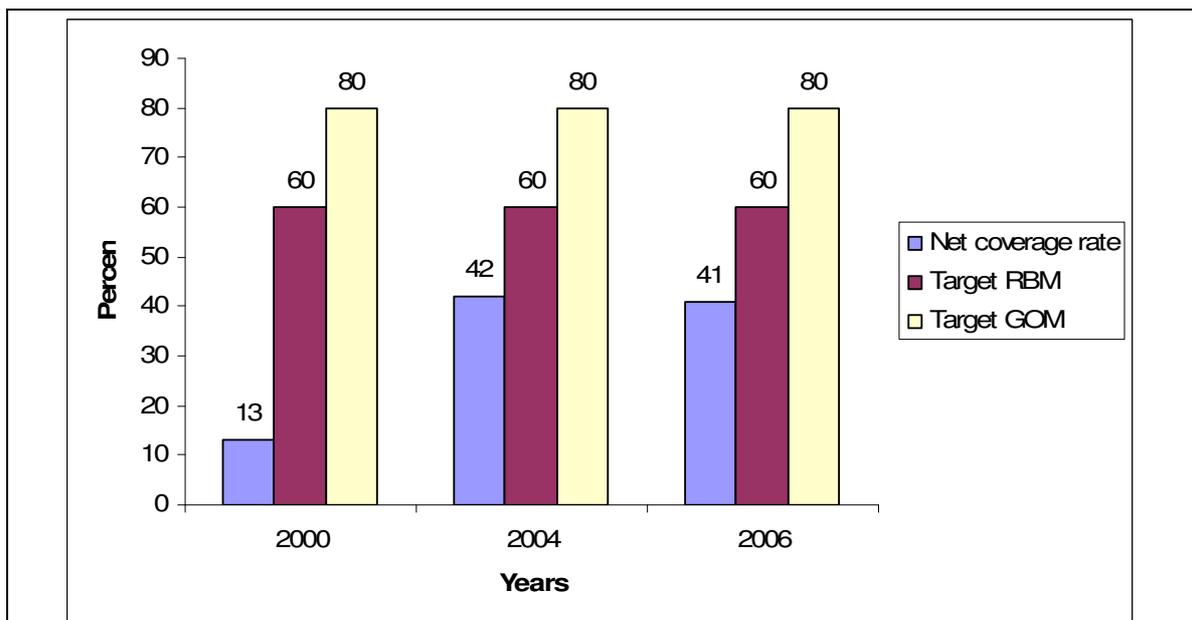
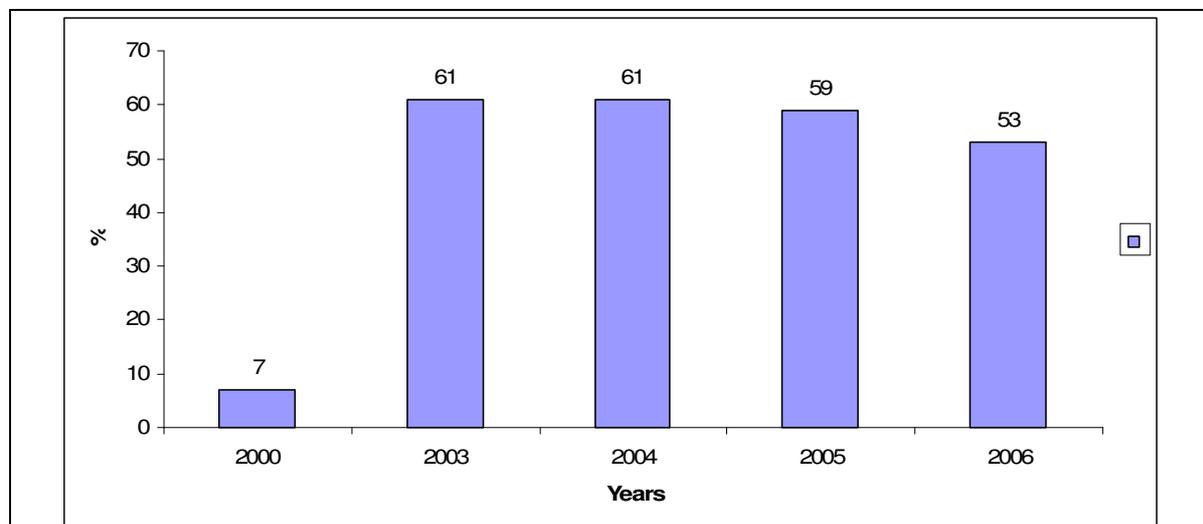


Figure 5.10 ITN Coverage Rate in Malawi

Sources: DHS (2000, 2004) and MICS (2006), UNICEF (2007)

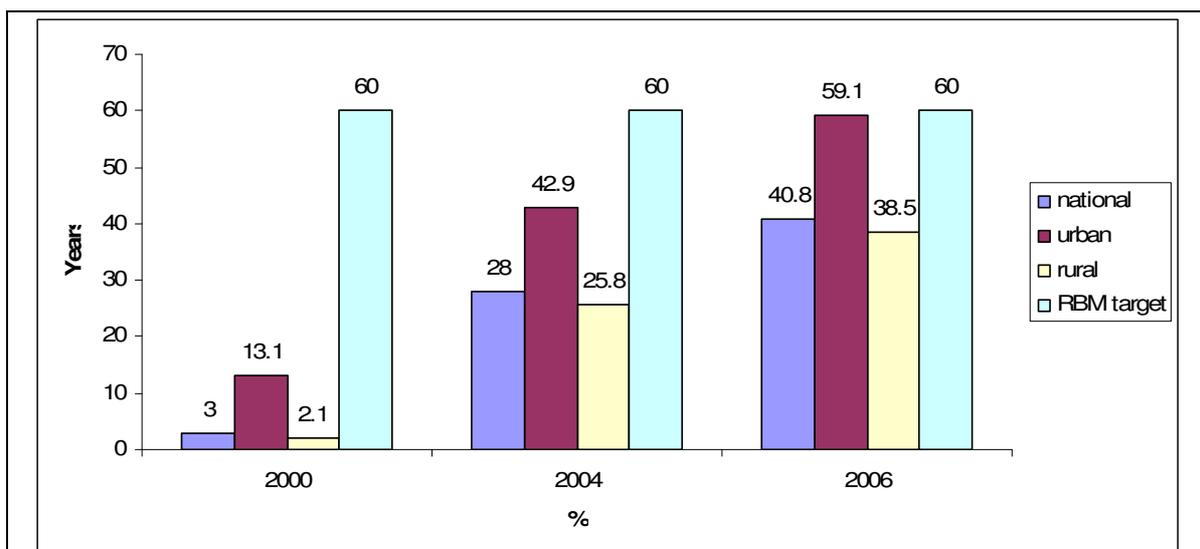
Retreatment of nets in Malawi has improved over time (Figure 5.11). Seven percent of nets were re-treated in 2000. This rose to 61 percent in 2003 and dropped to 59 percent in 2005. It further declined to 53 percent in 2006. The astronomical increase in the proportion of nets that are re-treated may be explained by the biannual treatment campaigns and an increase in funding for the purchase of treatment kits.



**Figure 5.11 National Net Re-Treatment Coverage 2000-2006**

Sources: National Malaria Control Programme (2007), UNICEF Report (2007), (DHS, 2000, 2004; MICS, 2006)

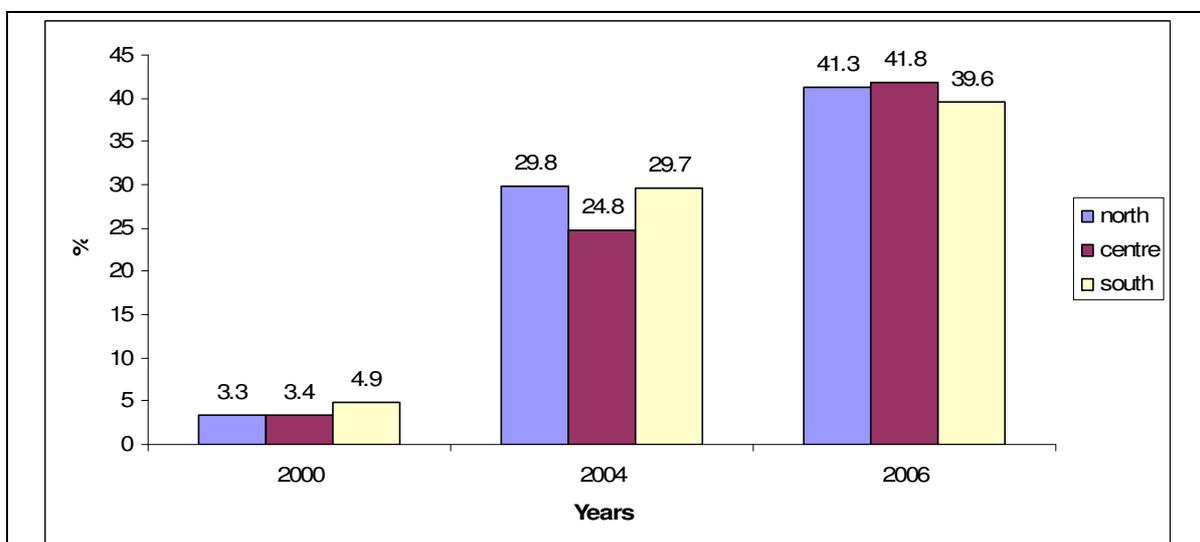
Figure 5.12 shows the proportion of households owning at least an ITN nationally and by areas of residence. It is clear that net ownership by background characteristics has been growing over time. At national level, 3 percent of households owned at least a single net in 2000 and it rose to 41 percent in 2006. This means that almost 13 times more households owned at least an ITN compared to the base year of 2000. However, a 41 percent national net ownership is less than the RBM target of 60 percent. A similar upward trend can be observed for rural and urban households. It is also clear from Figure 5.13, that a large proportion of urban households owned at least one ITN than rural households. Thirteen percent of urban households owned at least one ITN in 2000 compared to two percent for rural households. In 2006, more urban households owned at least one ITN but the magnitude of inequities in net ownership decreased. In particular, net ownership in urban areas was almost six times higher than in rural households in 2000 while in 2006, urban household net ownership was two times higher than rural households. A candidate explanation for urban-rural bias in net ownership is difference in income of rural and urban households. Generally speaking, urban households have higher incomes than rural households. On the other hand, rural households rely on subsistence income that is low and unstable. Thus urban households can afford to purchase bed nets at commercial prices. Rural households might also have poor access to ITNs because it might be difficult to reach them due to inaccessible roads (logistical and operational difficulties). There might also be a denser network of social marketing in urban areas compared to rural areas.



**Figure 5.12 Percentage of households with at least one insecticide treated mosquito net**

Source: UNICEF Report (2007); DHS (2000, 2004); MICS (2006)

Figure 5.13 shows that there is variation in net ownership by region. The Southern Region of Malawi has the highest proportion of households owning at least one ITN (4.9 percent) and the North had the lowest percentage of households owning at least one ITN (3.3 percent). In 2004, the Northern Region overtook the other two regions in net ownership. Almost 30 percent of its households owned at least one ITN. In 2006, all the three continued with their momentum towards moving to the RBM target of 60 percent.



**Figure 5.13 Proportion of households owning at least one ITN by region**

There is a direct correlation between income and net ownership by households (Figure 5.14). A quintile analysis of net ownership shows that a higher proportion of households in the richest 20 percent of the income distribution own at least one ITN than households in the poorest quintile (in the poorest 20 percent of the income distribution). In 2006, twenty-two percent of households in the poorest quintile own at least an ITN compared to the 56 percent of households in the richest quintile of the income distribution. It is of interest however to observe that the highest growth in net ownership was registered by households in the first 20 percent of the income distribution. To be sure, in 2006, the proportion of households owning at least ITN

was twice the proportion of households owning at least an ITN in 2004. The key implication is much more efforts in net distribution have been concentrated in households in the poorest quintile of the income.

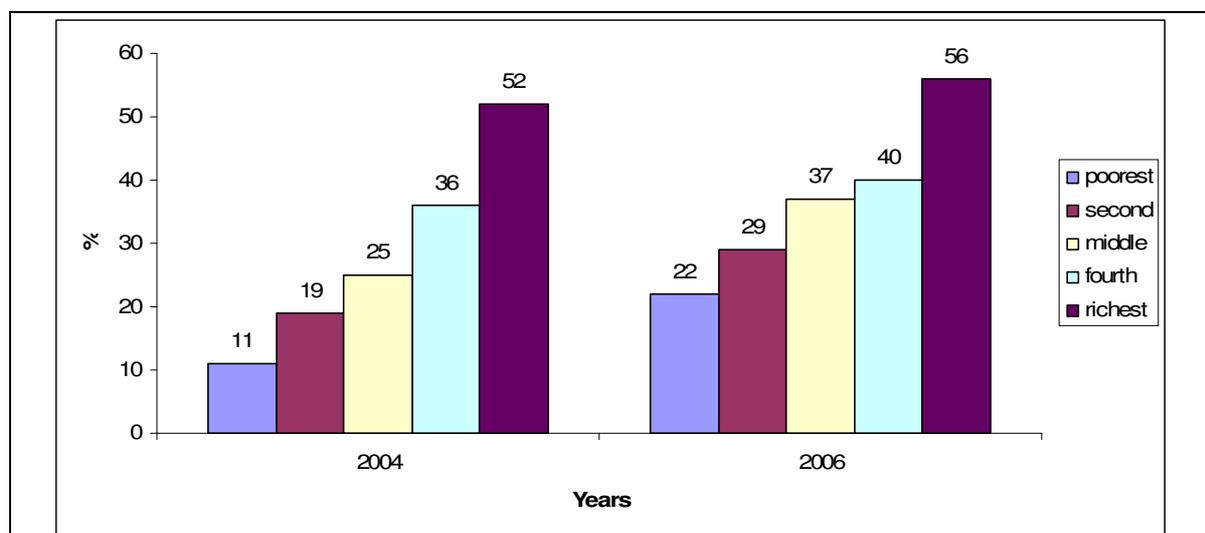


Figure 5.14 Percentage of household with at least one mosquito net (wealth index quintile)

Education of household head has a direct correlation with ITN ownership (Figure 5.15). Households with lower education have a lower net ownership than households with some education. In particular, a higher proportion of households with secondary school education own ITNs than households with no education. Almost 1 percent of households with no education owned at least an ITN in 2000 compared to 22.2 percent of households with secondary school education. By the year 2006, 27.2 percent of households with no education owned at least ITN compared to 58.8 percent of households with secondary school education. An interesting observation however is that education-based inequality in net ownership declined between 2000 and 2006. In 2000, net ownership in households with secondary education was almost 22 times that of households with no education. On the other hand, net ownership in households with secondary school education was twice that of households with no education.

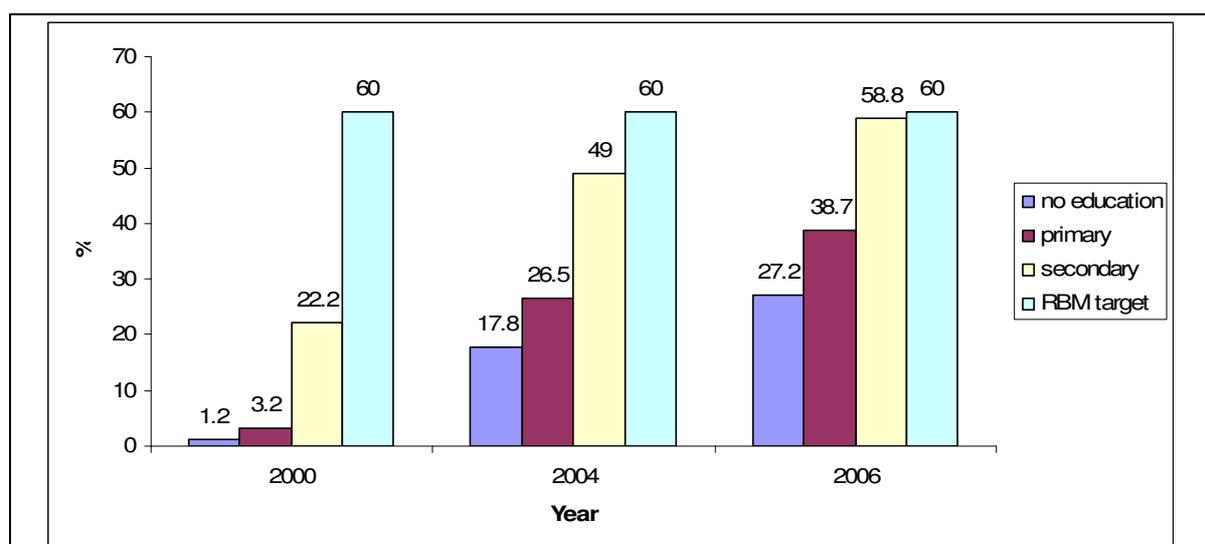


Figure 5.15 Proportion of households owning at least one ITN by level of education

Source: UNICEF Report; DHS (2000, 2004); MICS (2006)

## ITN use

The proportion of children aged less than five years sleeping under an ITN has been growing at national and regional levels (Figure 5.16). Almost six percent of under-fives were sleeping under an ITN at national level in the year 2000. This rose to 23 percent in 2006. There is wide variation in net use at regional level. The South had the highest proportion (6.4 percent) of under-fives who slept under an ITN in 2000. It was overtaken by the Central Region in the year 2000 with 30.2 percent of children sleeping under an ITN. The South performed slightly better than the Northern and Central Regions in 2006 (Figure 5.16). It is clear that the RBM targets of having 60 percent of children sleeping under an ITN by 2005 were not met. The new target of 80% net usage rate amongst under-fives by the year 2010 is ambitious but achievable given the local and global commitment to the widespread use of ITNs for malaria control.

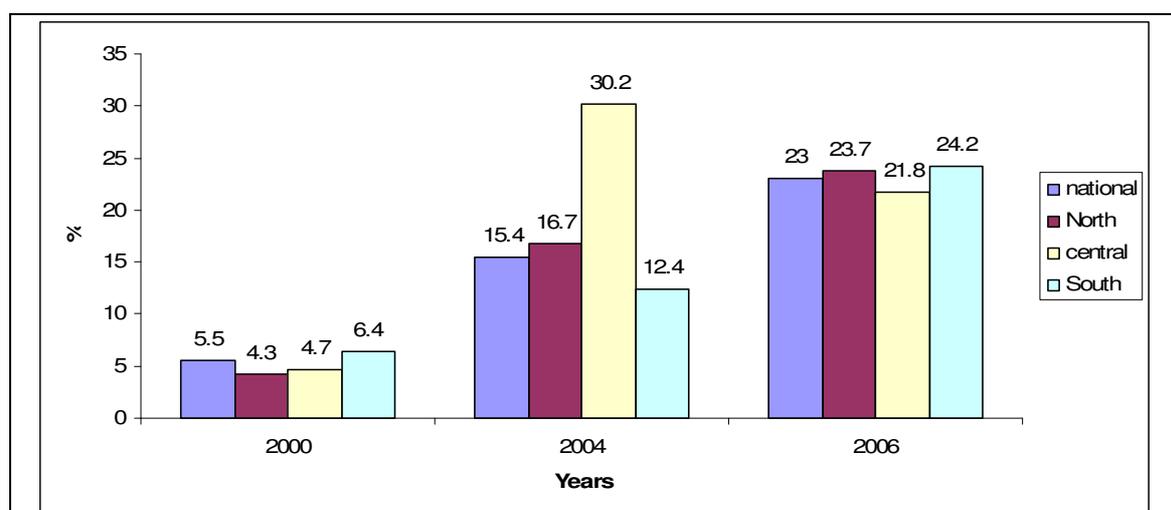
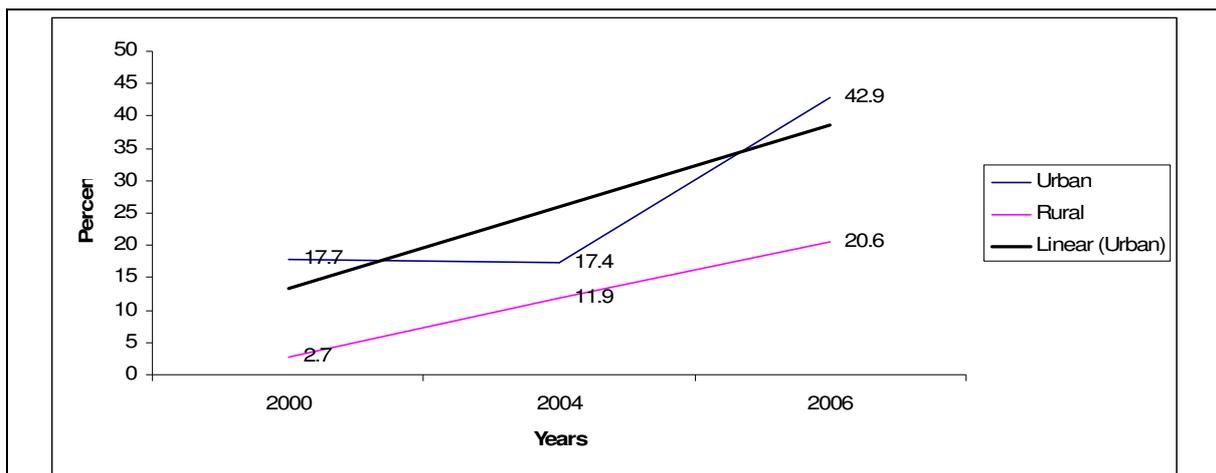


Figure 5.16 Proportion of children who slept under ITN the previous night

Source: DHS (2000, 2004), MICS (2006)

Substantial improvement in ITN use among children aged less than five years in rural and urban areas has been made in Malawi (Figure 5.17). In 2000, 2.7 percent of children aged less than five years slept under an ITN in the previous night compared to 20.6 percent in 2006. On the other hand, 17.7 percent and 42.0 percent of urban children slept under ITNs the previous night in 2000 and 2006, respectively. It appears however that more children in urban areas slept under ITN in 2000, 2004 and 2006. A potential explanation for the inequities in net usage is the differences in income of rural and urban households. Most household heads in urban are formally employed and hence their incomes are higher and more stable than rural households. In particular, rural households mainly depend on subsistence agriculture hence their income is lower compared to their counterparts in urban areas. ITNs are therefore more affordable to urban households than to rural ones. Urban areas might also have a denser network of outlets where nets may be purchased compared to rural areas, some of which are notoriously hard to reach due to inaccessible roads.

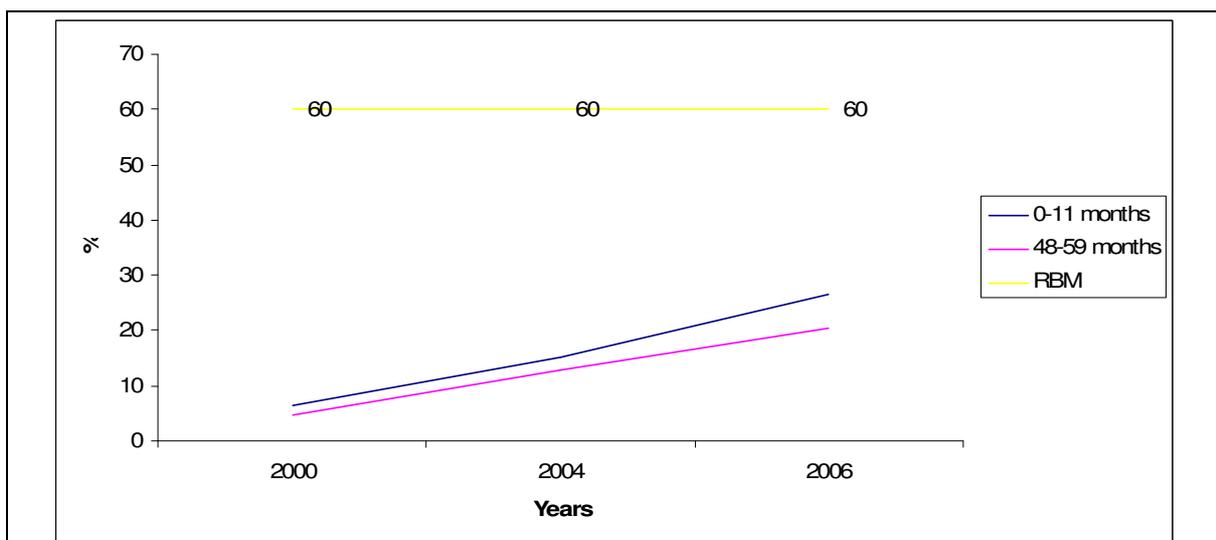
An interesting observation however is that the urban-rural disparities in net usage has decreased over time. In particular, ITN usage among under-fives in urban areas in 2000 was seven times higher than ITN usage in rural areas. In 2006, ITN usage was two times higher in urban areas than in rural areas. The main implication is that concerted efforts have been made in recent years to reduce the ITN use inequality between urban and rural areas.



**Figure 5.17 Proportion of children aged less than five years who slept under ITN the previous night by areas of residence**

Source: DHS (2000, 2004), MICS (2006)

There is also variation of net usage amongst different age groups (Figure 5.18). A higher percentage of children less than one year old used ITNs compared to their counterparts in the 48-59 months age bracket. A potential explanation for this discrepancy is that infants are more vulnerable to malaria infection than older children because they lack acquired immunity.



**Figure 5.18 Proportion of children of different age groups who slept under ITN the previous night**

Source: DHS (2000, 2004), MICS (2006)

Figure 5.19 below shows there is low usage of ITNs amongst pregnant women at both national and regional levels. Almost 2percent, 16percent and 6.8percent of pregnant women slept under ITNs the previous night in years 2000, 2004 and 2006, respectively. We speculate that a small proportion of pregnant women slept under an ITN because they could afford to purchase them at a subsidized cost. There is however light at the end of the tunnel because since 2006 pregnant women and children under five years of age are provided with ITNs free of charge. In particular, net usage in the three regions was 1.9percent, 1percent and 1.7percent in 2000. These proportions increased to 5.8percent in the North and 7.1percent in the Central and Southern Regions. Low usage of ITNs among pregnant women means that Malawi missed the RBM target of 60 percent ITN usage rate among pregnant women by the end of 2005. The current low ITN usage among pregnant women implies that it will be a daunting task for the Government of

Malawi to achieve an ITN coverage rate of 80 percent among pregnant women by the year 2015 as stipulated in the Malawi Strategic Plan 2005-2010. It will also be hard for Malawi to meet the Millennium Development Goals of reducing maternal mortality rate by three quarters and under-five mortality by two-thirds as malaria affects the course of these indicators.

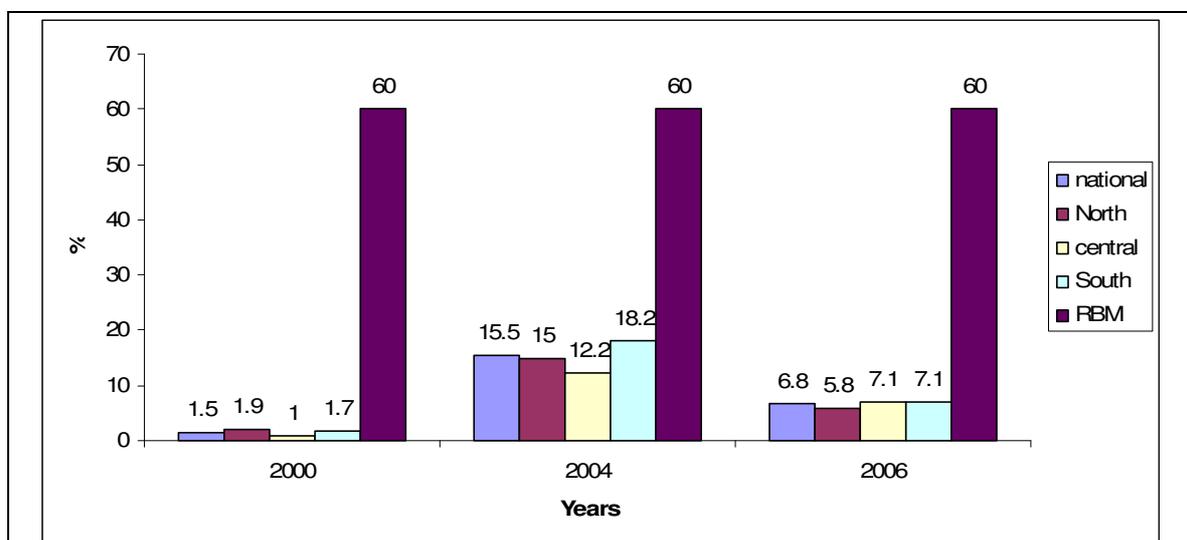


Figure 5.19 Proportion of pregnant women who slept under an ITN the previous night

Source: DHS (2000, 2004), MICS (2006)

As shown in Figure 5.20, the proportion of pregnant women in both rural and urban areas has increased. Further, more pregnant women used ITN than rural women. Three percent of pregnant women slept under an ITN the previous night in 2000. This proportion increased to 27.5 percent in 2004 and fell to 8.9 percent in 2006. On the other hand, the proportions of rural women who slept under an ITN were 1.1 percent, 13.9 percent and 6.5 percent in 2000, 2004 and 2006, respectively. Differences in income and population levels between rural and urban residents might explain disparities in ITN utilisation.

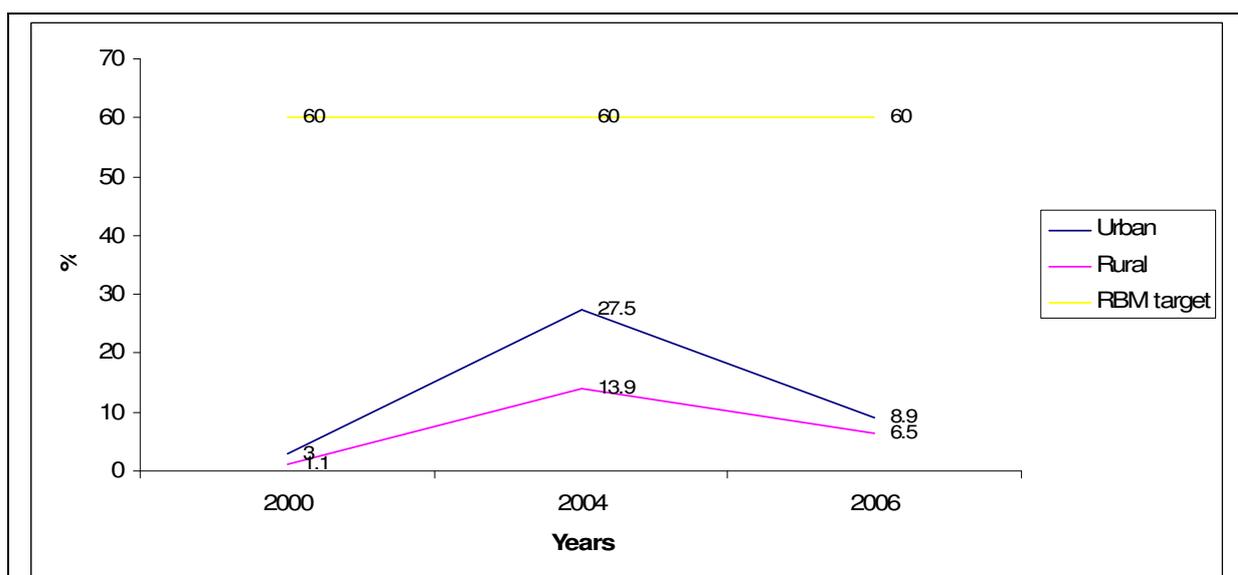


Figure 5.20 Proportion of pregnant women who slept under ITN the previous night by areas of residence

Source: DHS (2000, 2004), MICS (2006)

There is correlation between use of ITNs among pregnant women and level of education. More educated pregnant women use ITN than less educated women (Figure 5.21). Education of individuals may affect ITN use along several dimensions. First, the cost of information about malaria to better-educated people is lower than the cost of information to the people who are less educated (Glick et al., 2004; Glick and Sahn, 2005). For example, educated individuals are more likely to read newspapers and to visit private or public health services. To the extent that these are important or primary means of disseminating messages about malaria those with more schooling will be able to obtain this information easily. Thus educated people may have a higher awareness of malaria disease including the benefit of using ITNs.

Second, even without any particular advantage in access to information, educated people may be better able to process and understand the ITN information that they are confronted with. In other words, education and information may be complementary inputs in the production function for malaria knowledge. To this end, increases in schooling increases malaria awareness which, in turn, increases the desire to use ITNs (Glick et al., 2004; Glick and Sahn, 2005). But an opposite effect may occur if malaria prevention information is designed to be understood by those with little schooling. In this regard, schooling and information are a substitute, which implies that an increase in information reduces the benefit of easy access of information by educated individuals.

Finally, education may affect ITN use in the following manner. People with more schooling have already made larger investments in the future, since their future potential streams of earnings, hence their consumption and utility, is higher than people with little education (Glick et al., 2004; Glick and Sahn, 2005). They have therefore a greater incentive to protect their health and ensure their longevity by gathering or being attentive to information about malaria prevention.

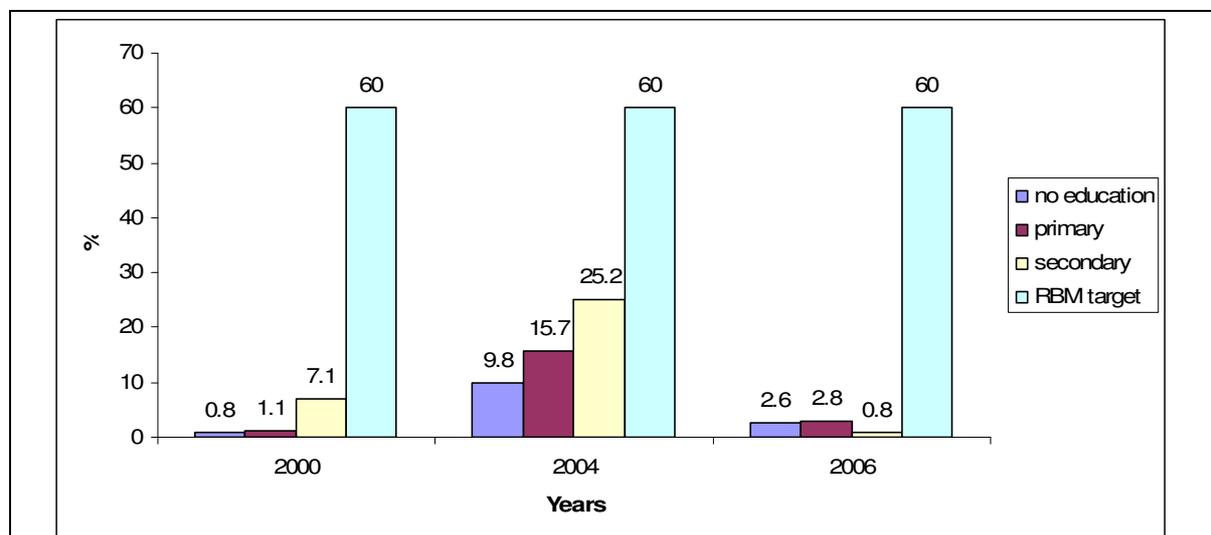


Figure 5.21 Proportion of pregnant women who slept under an ITN in the previous night by level of education

### 5.3.1.5 Quality of Malaria Services: Indoor Residual Spraying

Indoor residual spraying is not widely used in Malawi. It is only being piloted in Nkhotakota and Mzimba districts.

### 5.3.1.6 Quality of Malaria Services: Prevention in Pregnancy

#### Box 3: Intermittent Preventive Therapy in Malawi

Malawi has made great strides in prevention of malaria infection in pregnant women. It was the first country to adopt IPT<sub>p</sub> for pregnant women in Africa in 1993. The IPT policy recommends two doses of SP in the second and third trimesters of pregnancy. Following the adoption of IPT strategy SP has been made available to all health facilities. IPT is given under DOTS in over 80 percent of ANC health facilities as part of the focused ANC.

#### Analysis of IPT<sub>p</sub> Outputs and Outcomes

The percentage of pregnant women receiving IPT<sub>p</sub> increased between 2000 and 2006 (Table 5.11 & Figure 5.22). In 2000, 30.2 percent of pregnant women received IPT and it rose to 46 percent in 2004 and it decreased to 44.5 percent in 2006. In all the years, the RBM targets of 60 percent and the Government of Malawi target of 80 percent were not met (Figure 5.22). The low uptake of IPT<sub>p</sub> may be explained by frequent stock-outs of SP in public health facilities, lack of understanding of the importance of IPT<sub>p</sub> among pregnant women and health care workers, among other factors.

**Table 5.11 National trends in indoor prevention in Pregnancy**

	2000	2004	2006	Comments
<b>Coverage</b>				
% PW receiving IPT according to national policy	30.2	46	44.5	
Other				
<b>Outputs</b>				
# PW receiving IPT (1, 2 or 3)				
# facilities with no reported stock outs of IPT drugs in the past 3 months				
Other				
<b>Process</b>				
# health care workers trained in IPT				
# IPT drugs delivered to (antenatal) clinics (can be expressed per population: e.g., per X attendees)				
# IPT guidelines distributed				
Other				
<b>Inputs</b>				
Finances available				
IPT guidelines developed	Yes	Yes	Yes	Guidelines developed
# IPT drugs purchased (could be expressed as a ratio per population of pregnant women for better interpretation)				
Other				

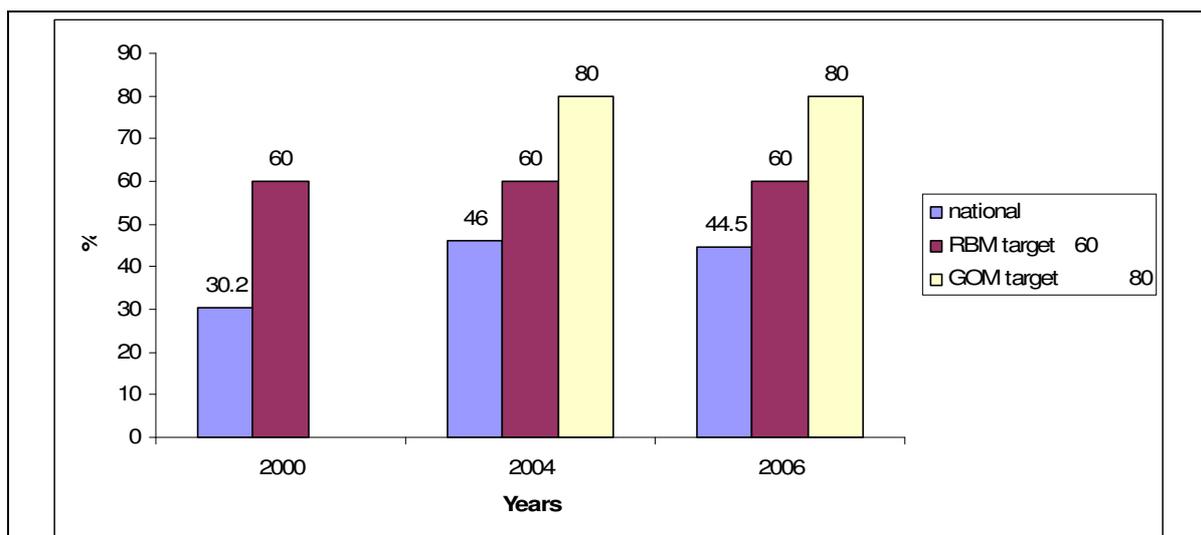


Figure 5.22 Proportion of pregnant women receiving IPT at national level

Source: DHS (2000, 2004), MICS (2006)

There are slight regional variations in access to IPT<sub>p</sub> (Figure 5.23). The South had the highest number of pregnant women on treatment (31.5 percent) followed by the Centre (29.8 percent) and then the North (27.3 percent). In 2004, the North overtook the other two regions with 49.3 percent of pregnant women accessing IPT<sub>p</sub>. Interestingly, regional disparities in coverage of IPT<sub>p</sub> were wiped out in 2006. All the three regions had similar coverage of IPT<sub>p</sub> of 43.6%.

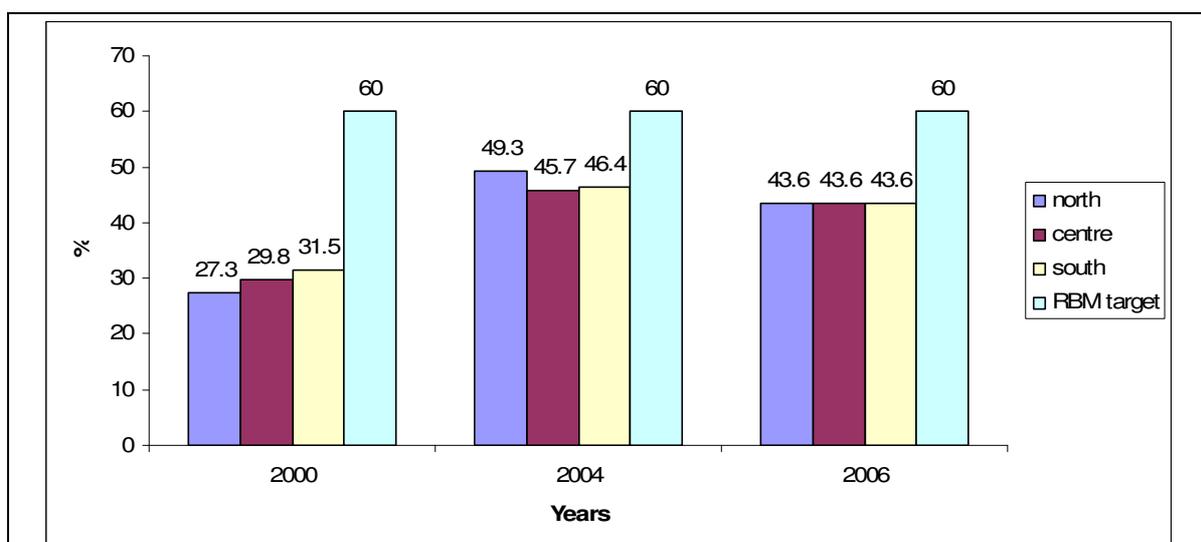


Figure 5.23 Proportion of pregnant women receiving IPT at regional level

Source: DHS (2000, 2004), MICS (2006)

A higher proportion of urban women have access IPT<sub>p</sub> than rural women (Figure 5.24). This disparity may be explained by the health care delivery system that favours urban areas. Only 46 percent of the population has access to a formal health facility within a five-kilometre radius. Twenty percent of the population lives within 25 kilometres of a hospital (Malawi Government, 2003b). The access problem in rural areas is exacerbated by the allocation of health personnel which is biased towards urban areas. Half of Malawi's medical doctors work in four referral hospitals together with 25 percent of nurses (Malawi Government, 2003a). While the majority of Malawians live in rural areas, 97 percent of government-employed clinical officers and 82 percent of government-employed nurses are in urban areas.

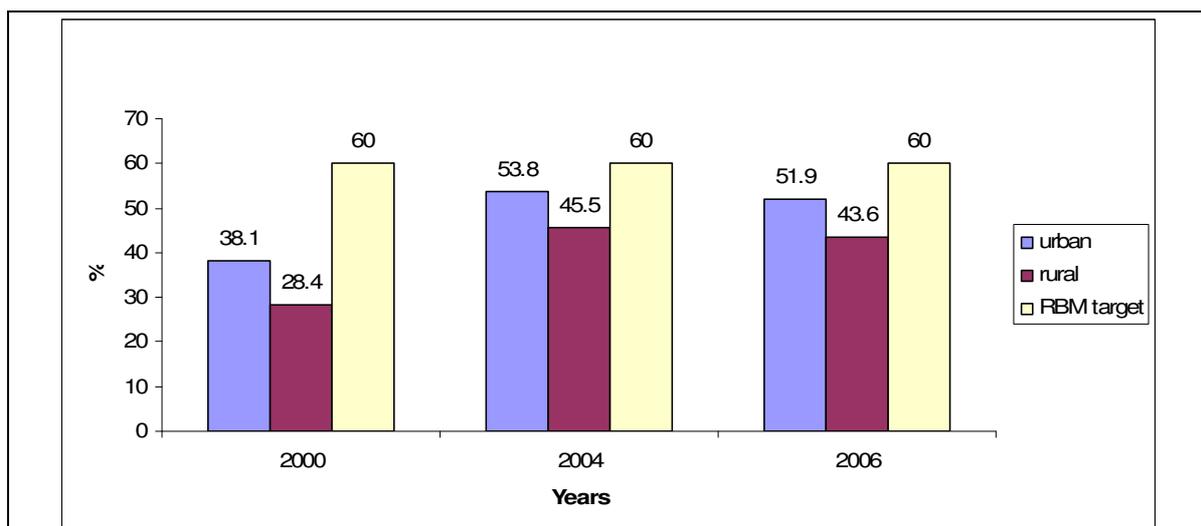


Figure 5.24 Proportion of pregnant women receiving IPT by area of residence

Source: DHS (2000, 2004), MICS (2006)

Pregnant women who are more educated have a better access to IPT than women who are less educated (Figure 5.25). In 2000, 26.6 percent of women with no education had access to IPT compared to 41.5 percent of women with secondary education. In 2006, a lower proportion of women were accessing IPT at all educational levels. An interesting observation is that education-induced disparities in access to IPT were wiped out in 2006. That is, the same proportion of women accessed IPT in 2006.

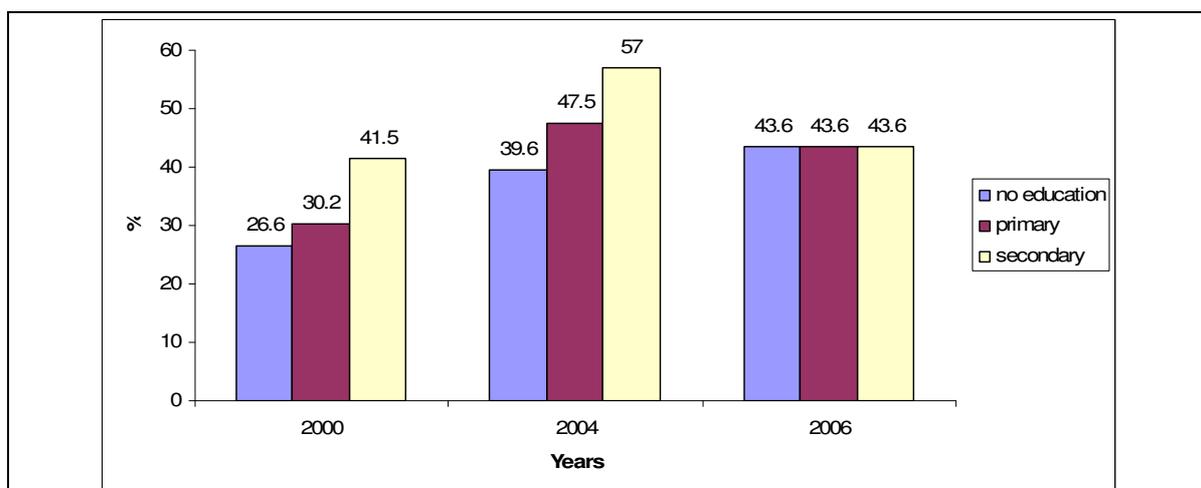


Figure 5.25 Proportion of pregnant women receiving IPT by level of education

Source: DHS (2000, 2004), MICS (2006)

### 5.3.2 Has the quality of malaria services improved?

#### 5.3.2.1 Quality of Service Level 1. Availability of basic elements: commodities, guidelines, systems, trained staff

Table 5.12 shows that most of the sampled facilities have the staff and guidelines but not the infrastructure and supplies to provide quality malaria services. Specifically, 14.2 percent of the facilities had the infrastructure, 84.1 percent had trained staff, and 86.7 percent had the guidelines and 5.3 percent had equipment and supplies. No facility had all the basic elements.

<b>Table 5.12 Health facilities with capacity to provide quality malaria services</b>							
<b>Percentage of facilities offering malaria services with the infrastructure, staff, guidelines, equipment and supplies to offer quality services, by type of district [Malawi, 2008]</b>							
Type of District	Elements					Number of facilities offering malaria services	
	Infrastructure <sup>1</sup>	Staff <sup>2</sup>	Guidelines <sup>3</sup>	Equipment and Supplies <sup>4</sup>	All elements		
<b>High</b>							
Lilongwe	6.3	93.8	100.0	0.0	0.00	8	
<b>Medium</b>							
Chiradzulu	15.4	92.3	92.3	30.8	0.00	12	
Karonga	25.0	75.0	75.0	0.0	0.00	2	
Machinga	10.5	68.4	68.4	0.0	0.00	8	
Mzimba	12.5	87.5	87.5	0.0	0.00	1	
Nkhotakota	26.7	86.7	93.3	6.7	0.00	5	
Zomba	30.0	70.0	80.0	10.0	0.00	7	
<b>Low</b>							
Mwanza	0.0	83.3	83.3	0.0	0.00	5	
Ntchisi	8.3	100.0	100.0	0.0	0.00	1	
<b>Total</b>	14.2	84.1	86.7	5.3	0.00	49	
<sup>1</sup> Infrastructure: Electricity, water, adequate infection control							
<sup>2</sup> Staff: Trained in diagnosis and management of malaria							
<sup>3</sup> Guidelines: Diagnosis and management of malaria							
<sup>4</sup> Equipment and Supplies: Malaria diagnostic test and nationally recommended first and second-line anti-malaria medications.							
<b>Source: DCA Health facility survey 2008</b>							

### 5.3.2.2 Quality of Services Level 3. Adherence to services provided

Fever is the symptom that most frequently presages the onset of an episode of malaria illness. Especially in malaria-endemic areas, it is important that children experiencing fever receive prompt and effective treatment for malaria. Although fever is associated with malaria, it also accompanies various other illnesses. While fever can occur year-round, malaria is more prevalent during rainy seasons. For this reason, temporal factors must be taken into account when interpreting fever as an indicator of malaria prevalence.

National pattern and current district-level results in the percentage of children experiencing an episode of fever during the two weeks preceding the survey are shown in Tables 5.13 and 5.14, respectively. From the results of the DCA-Household Survey, the percentage of children having fever for whom advice or treatment was sought from a health facility or provider; the percentage who received anti-malarial drugs; and the percentage treated the same or next day following the onset of fever are also shown. The types of anti-malarial drugs taken by children with fever in the two weeks preceding the DCA-Household Survey are detailed in Table 5.14

<b>Table 5.13 Prevalence and treatment of fever</b> . Among children under-5 the percentage of those that had a fever in the 2 weeks preceding the survey, and among children with fever, the percentage of children for whom advice was sought from a health facility or provider, the percentage who took anti-malarial drugs by background characteristics, [Malawi, 2008]								
	Among children under-5 with fever			Among children under 5 with fever who saw health provider		Among children under 5 with fever who took antimalarial drugs		
	Number of children	%	Total	%	Number of children	%	Number of children	Total
<b>Highest level of school attended</b>								
None	266	7	3,744	14	38	11	28	266
Nursery	1	8	12	0	0	0	0	1
Primary	1,086	8	13,256	16	172	8	90	1,086
Secondary	129	5	2,684	19	25	10	13	129
Higher	2	1	156	0	0	0	0	2
Missing	78	5	1,684	28	22	8	6	78
<b>District</b>								
<b>High Density</b>								
Lilongwe rural	201	8	2,540	1	29	1	16	2,540
Lilongwe city	103	5	1,948	1	20	1	12	1,948
<b>Medium Density</b>								
Karonga	76	3	2,248	2	35	0	9	2,248
Mzimba	107	5	2,204	1	14	0	11	2,204
Nkhotakota	191	10	1,832	2	36	1	25	1,832
Machinga	136	7	1,956	0	5	0	4	1,956
Zomba	202	10	2,032	1	26	1	14	2,032
Chiradzulu	228	9	2,448	1	17	0	9	2,448
<b>Low Density</b>								
Mwanza	125	6	2,004	1	25	1	14	2,004
Ntchisi	193	8	2,324	2	50	1	23	2,324

Source: DCA Health facility survey 2008

Among children under-5 years old with a fever in the two weeks preceding the survey who had attended secondary school, 19 percent saw a health care provider. The children with the highest prevalence of fever were reported in Zomba, Nkhotakota and Chiradzulu (Table 5.14).

<b>Table 5.14 Type of anti-malaria drugs taken by children with fever</b>								
Among the children aged under-5 with fever in the past two weeks preceding the survey, the percentage who took specific anti-malarial drugs by background characteristics, [Malawi, 2008]								
	SP/ fansidar	Chloro quine	Amodia quine	Quinine	Combination with artemisinin	Combination with coartem	Country specific CBF anti-malaria	Other anti- malaria
<b>The highest level of school attended</b>								
None	4	2	0	3	0	2	1	1
Primary	3	1	1	2	1	4	1	1
Secondary	3	0	0	2	1	3	0	2
Higher	0	0	0	0	0	0	0	0
<b>Wealth Quintile</b>								
Lowest	2	1	1	3	1	5	1	0
2	3	1	0	3	0	3	2	1
3	3	0	1	2	1	3	1	2
4	2	1	0	3	0	4	0	1
Wealthiest	5	2	1	2	1	4	1	1
<b>District</b>								
Karonga	2	1	0	5	0	4	0	2
Mzimba	2	0	3	3	1	12	1	4
Nkhotakota	8	2	0	2	0	12	1	2
Ntchisi	6	1	1	2	2	5	3	1
Lilongwe Rural	2	1	0	3	0	2	0	0
Lilongwe City	4	0	0	2	2	7	3	0
Machinga	1	1	0	1	0	0	1	1
Zomba	2	1	1	3	0	1	0	0
Chiradzulu	2	1	0	2	0	0	1	3
Mwanza	9	4	0	2	0	1	0	2

Source: DCA Health facility survey 2008

The results above (Table 5.14) indicate that there does not seem to be any drug preferred most among the children aged under-5 years with fever in the past two weeks preceding the survey and took drugs. More children took fansidar in Mwanza, Ntchisi and Nkhotakota. The results also indicate that a combination with coartem was also used commonly, especially in Mzimba and Nkhotakota. There seems to be no evidence of trends in drug intake according to educational level of woman or wealth quintile from which they belong.

Table 5.15 illustrates that more children aged under-5 years reported taking a pill, syrup or aspirin when they experienced fever. There seems to be no major differences among the age groups but the proportion of children taking the pill, syrup or aspirin is highest in Karonga.

<b>Table 5.15 Type of anti-malaria drugs taken by children with fever</b>		Among the children aged under-5 with fever in the past two weeks preceding the survey, the percentage who took other specific type of drugs by background characteristics, [Malawi, 2008]					
		Injection	Pill or syrup	Aspirin	Aceta- minophen	= "Ibuprofen"	Other
<b>The highest level of school attended</b>	None	2	7	8	1	1	0
	Primary	3	7	8	1	1	2
	Secondary	1	5	5	1	3	2
	Higher	0	0	0	0	0	0
<b>Wealth Quintile</b>	Lowest	2	9	8	2	2	2
	2	3	7	6	0	2	1
	3	2	7	8	2	2	3
	4	2	8	8	1	1	2
	Wealthiest	1	5	9	0	1	2
<b>District</b>	Karonga	7	22	24	0	1	3
	Mzimba	3	6	9	4	3	5
	Nkhotakota	1	10	10	0	2	1
	Ntchisi	5	10	8	2	2	2
	Lilongwe Rural	2	12	11	1	2	1
	Lilongwe City	5	8	6	0	0	0
	Machinga	1	1	5	0	1	1
	Zomba	1	2	6	1	0	3
	Chiradzulu	2	1	2	1	3	3
	Mwanza	2	5	7	0	0	1

Source: DCA Health facility survey 2008

### 5.3.3 Has the coverage of services improved (overall and equitably)?

The use of metal or plastic screens on windows was not highly prevalent among the sampled households. Fewer than 10 percent of the household reported using this strategy to prevent malaria (Table 5.16).

<b>Table 5.16 Use of metal or plastic screen on windows to keep mosquitoes out</b>							
	Yes	%	No	%	Missing	%	Number of Households
<b>Sex</b>							
Male	206	5	3,745	93	56	1.4	4,007
Female	39	4	988	94	24	2.3	1,051
Missing	3	7	29	67	11	25.6	43
<b>Wealth quintile</b>							
Lowest	25	3	825	95	19	2.2	869
2	35	4	920	95	16	1.6	971
3	40	4	957	94	22	2.2	1,019
4	66	6	989	93	13	1.2	1,068
Wealthiest	78	7	978	92	11	1.0	1,067
Missing	4	4	93	87	10	9.3	107
<b>District</b>							
Karonga	37	7	454	92	5	1.0	496
Mzimba	8	2	500	94	24	4.5	532
Nkhotakota	102	17	479	81	9	1.5	590
Ntchisi	24	5	457	93	8	1.6	489
Lilongwe rural	14	2	576	95	16	2.6	606
Lilongwe city	15	3	451	95	8	1.7	474
Machinga	6	2	331	98	2	0.6	339
Zomba	25	5	475	94	5	1.0	505
Chiradzulu	5	1	574	99	3	0.5	582
Mwanza	12	2	465	96	6	1.2	483
Missing	0	0	0	0	5	100	5

Source: DCA household survey 2008

The household survey showed that 65 percent of male headed households had at least one net. The data also showed that 43 percent of the households had more than one net. Further, 58 percent of the households owned at least one ever-treated mosquito net, and 38 percent of these households have more than one ever-treated net. The average number of mosquito nets per household is 3, while the average number of ever-treated mosquito nets per household is also 3. This information is shown in detail in table 5.17 below.

The data also showed that ownership of mosquito nets is related to the wealth status of the household; where better off households are more likely than poorer households to own a mosquito net. Notably, almost half of the household members from the poorest households reported owning at least one net. This is likely to be because nets are distributed to mothers with under-five children at a subsidised cost.

<b>Table 5.17 Percentage of households with any type of mosquito net and with ITN by background characteristics, Malawi, 2008</b>							
Background characteristics	<b>Any type of net possession</b>				<b>ITN possession</b>		
	Total number of households	% of HH with at least one net	% of HH with more than one net	Average nets per household	% of HH with at least one ITN net	% of household with More than one ITN	Average ITN nets
<b>Sex of household head</b>							
Male	4008	65	32	1	52	23	3
Female	1050	56	26	1	42	18	3
.	43	65	33		49	21	
<b>Wealth quintile</b>							
Lowest	869	46	15	1	35	9	3
2	970	58	20	1	44	13	3
3	1019	58	25	1	45	18	3
4	1068	70	35	1	57	26	3
Wealthiest	1067	80	53	2	67	41	4
Missing	108	66	40		53	31	
<b>District</b>							
<b>High Intensity</b>							
Lilongwe rural	606	61	23	1	46	14	3
Lilongwe city	474	66	31	1	56	24	3
<b>Medium Intensity</b>							
Karonga	496	82	56	2	59	39	4
Mzimba	532	43	19	1	35	15	3
Nkhotakota	590	73	43	1	60	33	4
Machinga	339	58	25	1	46	19	3
Zomba	505	69	35	1	52	22	3
Chiradzulu	582	65	26	1	52	20	3
<b>Low Intensity</b>							
Ntchisi	489	55	18	1	47	14	3
Mwanza	483	60	27	1	49	20	3
Missing	0	0	0		0	0	

Source: DCA household survey 2008

According to the household survey findings the use of mosquito nets by children is still low. The survey showed that 30 percent of children sleep under an ever-treated mosquito net, with the majority aged below 1 year. As expected, a higher number of children from more wealthy households sleep under nets. More than a third of the children from Karonga, Nkhonkhotakota, Lilongwe city and Mwanza slept under an ITN the previous night. All of the districts however reported less than half of their children sleeping under an ITN. Table 5.18 shows this information on use of mosquito nets in detail.

**Table 5.18: Use of mosquito nets by children. Percentage of children under-5 years of age who slept under a mosquito net [treated or untreated], an ever treated net, and an insecticide-treated net the night before the interview, by background characteristics [Malawi, 2008]**

Characteristics	Untreated net		Ever treated		ITN		Total number of children
	Number	%	Number	%	Number	%	
<b>Age of child in years</b>							
0	468	44	425	40	381	36	1,060
1	373	38	351	35	300	30	990
2	399	37	372	34	315	29	1,081
3	328	32	302	29	257	25	1,036
4	322	32	290	28	253	25	1,018
<b>Wealth quintile</b>							
Lowest	228	25	199	22	164	18	898
2	355	34	327	31	288	27	1,048
3	385	35	357	32	310	28	1,114
4	421	40	393	37	335	32	1,058
Wealthiest	463	49	428	45	375	40	943
Missing	38	31	36	29	34	27	124
<b>District</b>							
<b>High Intensity</b>							
Lilongwe rural	196	28	183	26	145	21	705
Lilongwe city	197	45	186	43	169	39	434
<b>Medium Intensity</b>							
Karonga	254	56	217	48	187	41	454
Mzimba	59	13	53	12	53	12	439
Nkhonkhotakota	320	49	285	43	250	38	658
Chiradzulu	218	36	209	35	174	29	599
Machinga	124	37	114	34	99	30	333
Zomba	159	31	155	30	130	25	518
<b>Low Intensity</b>							
Ntchisi	172	31	158	28	141	25	561
Mwanza	191	39	180	37	158	33	484
<sup>1</sup> An ever-treated net is 1) a pretreated net or 2) a non-pretreated net which has subsequently been soaked with insecticide at any time.; <sup>2</sup> An insecticide treated net (ITN) is (1) a factory treated net that does not require any further treatment or (2) a pretreated net obtained within the past 12 months or (3) a net that has been soaked with insecticide within the past 12 months.							
<b>Source: DCA-Household Survey 2008</b>							

In malaria-endemic areas adults usually have acquired some degree of immunity to severe, life-threatening malaria. However, pregnancy leads to a depression of the immune system, so that pregnant women, especially those in their first pregnancy, have a higher risk to malaria. During pregnancy women can reduce the risk of the adverse effects of malaria by sleeping under insecticide-treated mosquito nets. The use of mosquito nets by all women and pregnant women is shown in Table 5.19, according to type of net (ever treated, insecticide treated mosquito nets, and any net). Thirty-five percent of pregnant women reported sleeping under an ITN the previous night compared to their non-pregnant counterparts (30 percent). Women above the

age of 25 years reported a higher usage of nets. A higher use of ITNs was reported in the wealthier households and by women from Karonga, Lilongwe City, and Chiradzulu.

**Table 5.19 Use of mosquito nets by women. Percentage of all women aged 15-49 and pregnant women aged 15-49 who slept under a mosquito net [treated or untreated], an ever treated net, and an insecticide-treated net the night before the interview, by background characteristics [Malawi, 2008]**

Characteristics	Any type of net		Ever treated net		ITN		Total number of women
	Number	%	Number	%	Number	%	
<b>Age in years</b>							
<25	844	35	788	33	692	29	2,380
25+	1,408	42	1,303	39	1,124	33	3,369
<b>Wealth quintile</b>							
Lowest	257	27	227	24	194	20	953
2	356	34	327	31	283	27	1,052
3	415	36	387	34	334	29	1,139
4	508	42	483	40	416	35	1,196
Wealthiest	670	51	625	48	553	42	1,310
Missing	46	46	42	42	36	36	99
<b>District</b>							
<b>High Intensity</b>							
Lilongwe rural	193	28	184	27	154	22	689
Lilongwe city	264	49	252	47	221	41	540
<b>Medium Intensity</b>							
Karonga	344	63	299	55	264	48	548
Mzimba	101	17	89	15	87	14	605
Nkhotakota	381	54	343	48	301	42	710
Machinga	155	42	143	39	124	34	369
Zomba	210	37	203	35	160	28	575
Chiradzulu	234	37	225	35	189	30	640
<b>Low Intensity</b>							
Ntchisi	176	31	164	29	146	26	560
Mwanza	194	38	189	37	170	33	513

Source: DCA-Household Survey 2008

## 5.4 Study Question 3: Have the incidence, prevalence, morbidity, mortality and impact related to malaria changed?

### 5.4.1 Malaria Incidence

Malaria incidence and prevalence data are not available in Malawi. It can however be estimated from the National Micronutrient Survey (2001), the 2005 Malaria Survey and the Demographic and Health Surveys. The National Micronutrient Survey provides estimates of prevalence of malaria parasitaemia for various age groups: pre-school children, school children and old men and women. The results of the study show that preschool children had the highest prevalence of malaria parasitaemia. Almost 60 percent of subjects had trophozoites in their blood samples. Six percent of preschool children had gametocytes detected. The study showed significant differences in prevalence of parasitaemia by age group, socio-economic status and residence (rural vs. urban). That is, the young had a higher level of parasitaemia than old people; poorer households had a higher prevalence of parasitaemia than richer households; rural residents had a higher level of parasitaemia than their urban counterparts.

The other data on malaria prevalence in Malawi is from the Malaria Alert Centre. The Malaria Alert Centre estimates malaria prevalence in six districts of Malawi for the period 2006 and

2007.<sup>18</sup> The results show that 34.6 (32.9-36.4)<sup>19</sup> percent of the study population had presence of *plasmodium falciparum* in 2006. It fell to 19.8 percent in 2007.

According to the Malaria Alert Centre (MAC)<sup>20</sup> data the presence of anaemia in under-fives declined between 2005 and 2006. In 2005, 1.9 percent of children under the age of five years were anaemic and it decreased to 1.5 percent in 2006 and 0.8 percent in 2007. Notice that the trend line almost coincides with the graph implying that there has been a steady decline in the presence of anaemia among under-fives (Figure 5.26).

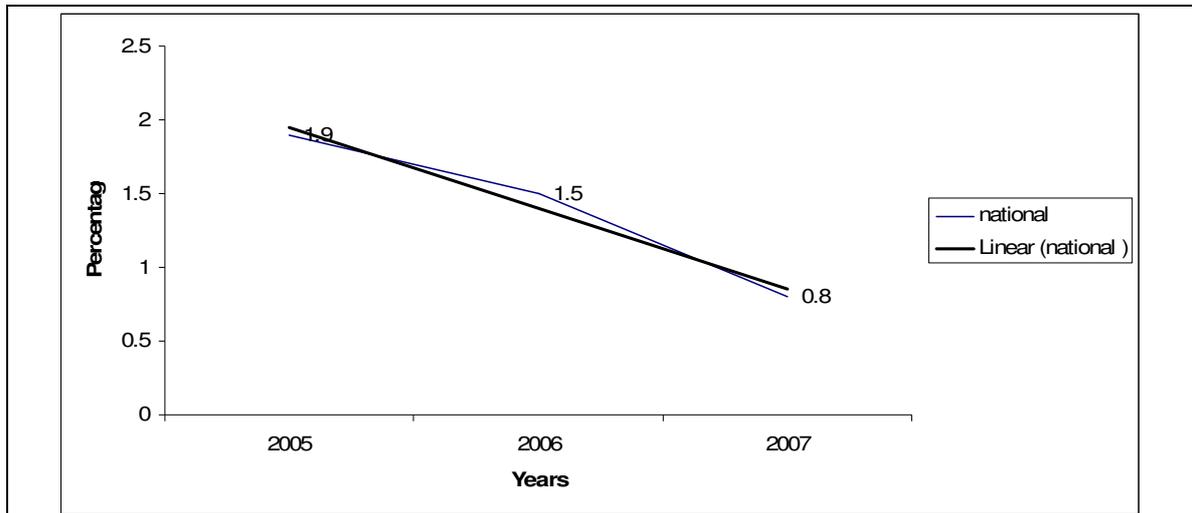


Figure 5.26 Presence of severe anaemia in children less than 5 Years old

Source: Malaria Alert Centre (2005, 2006, 2007)

There is a negative correlation between presence of anaemia and under-five mortality rate among children under five years old. As ITNs use increases among under-fives the presence of anaemia decreases (Figure 5.27).

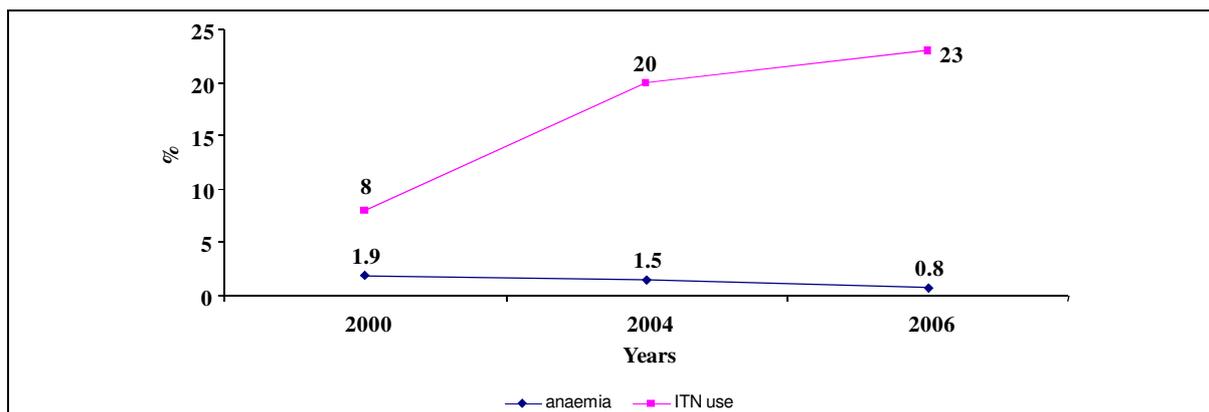


Figure 5.27 Correlation between presence of anaemia and coverage of ITN

Source: DHS (2000, 2004), Malaria Alert Centre (2007)

<sup>18</sup> These districts are Phalombe, Blantyre, Chiradzulu, Mwanza in the south, Lilongwe in the centre and Rumphi in the north. The results might not be representative of the malaria prevalence in Malawi because it covers more districts of the south (Phalombe, Blantyre, Chiradzulu, Mwanza). The results might also suffer from small sample biases.

<sup>19</sup> The numbers in parentheses represent confidence intervals; 5% confidence level.

<sup>20</sup> The Malaria Alert Centre (MAC) conducts studies in 6 districts of Malawi, four districts in the south and one district in the north and centre. MAC data is therefore not representative of the entire country.

Figure 5.28 correlates the presence of anaemia in children less than 5 and coverage of IPT among pregnant women. It is clear that there is an association between the presence of anaemia and coverage of IPT. In particular, an increase in coverage rate of IPT is associated with a decreasing trend in presence of anaemia in children less than five years old.

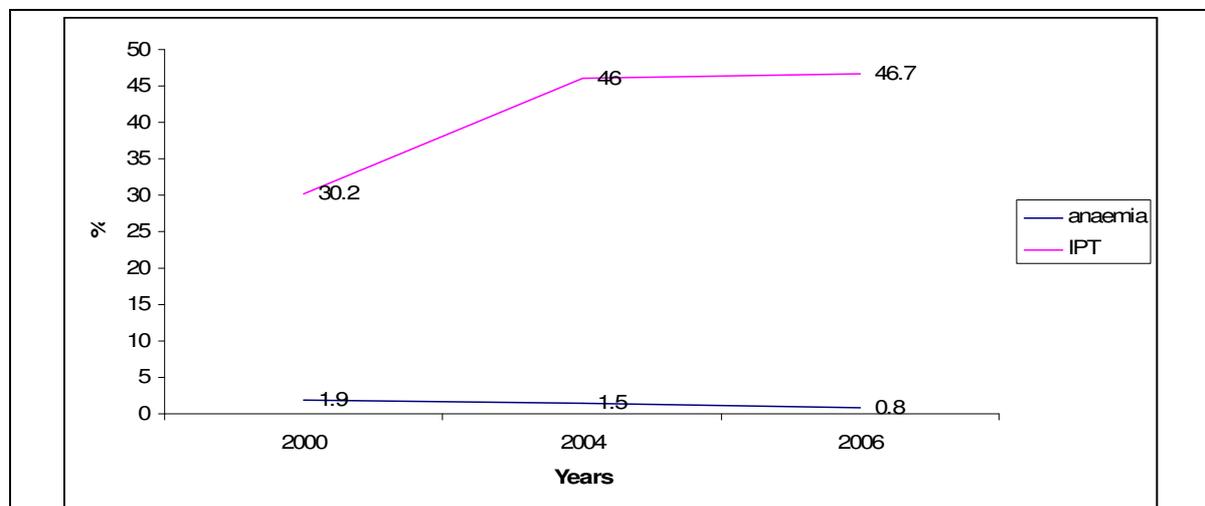


Figure 5.28 Correlation between presence of anaemia in children less than 5 and coverage of IPT

Source: DHS (2000, 2004), Malaria Alert Centre (2007)

Figure 5.29 shows a downward trend in all cause under-five mortality per 1,000 children. It decreased from 202/1,000 children in 2000 to 134/1,000 children in 2006. It looks however that under-five mortality rate is higher in rural than in urban areas. In 2000, 147.9 under-fives died per 1,000 compared to 210/1,000 children who died in rural areas. This trend persists for 2006 even though there was substantial decline in the urban-rural disparities. The trend line, which captures the average decline in under-five mortality rate, confirms the declining trend in under-five mortality rate.

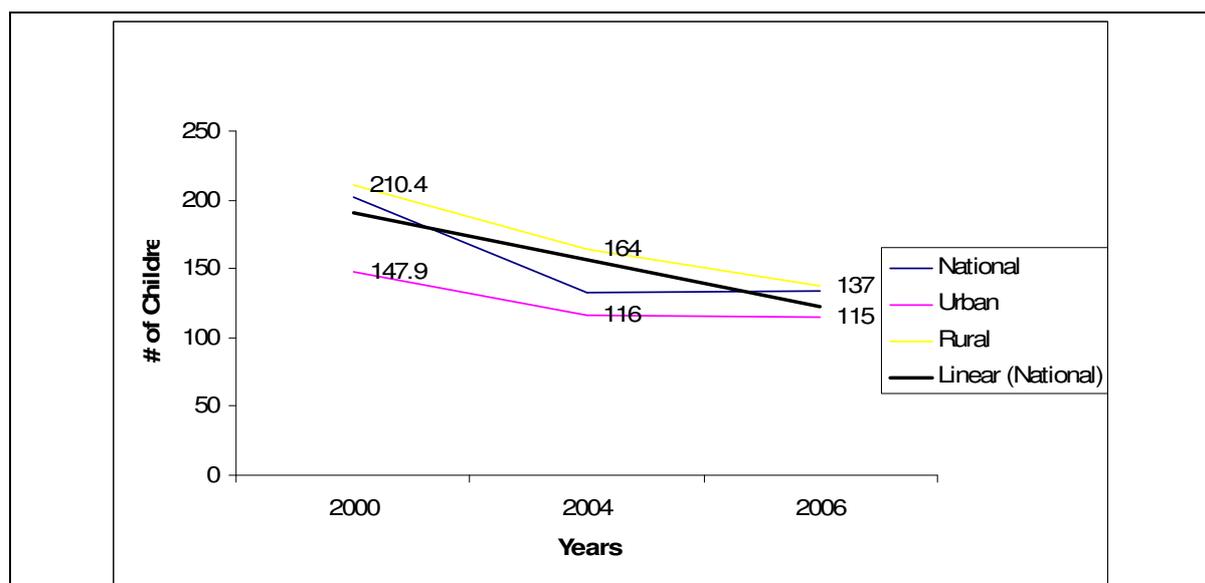


Figure 5.29 All cause under five mortality per 1,000 children

Source: DHS (2000, 2004), MICS (2006)

Figure 5.30 correlates under-five mortality rate and usage rate of ITNs by children less than five years. It is evident that there exists a negative correlation between under-five mortality rate and ITN coverage rate among children less than five years old. As ITN coverage increases all cause under-five mortality rate declines.

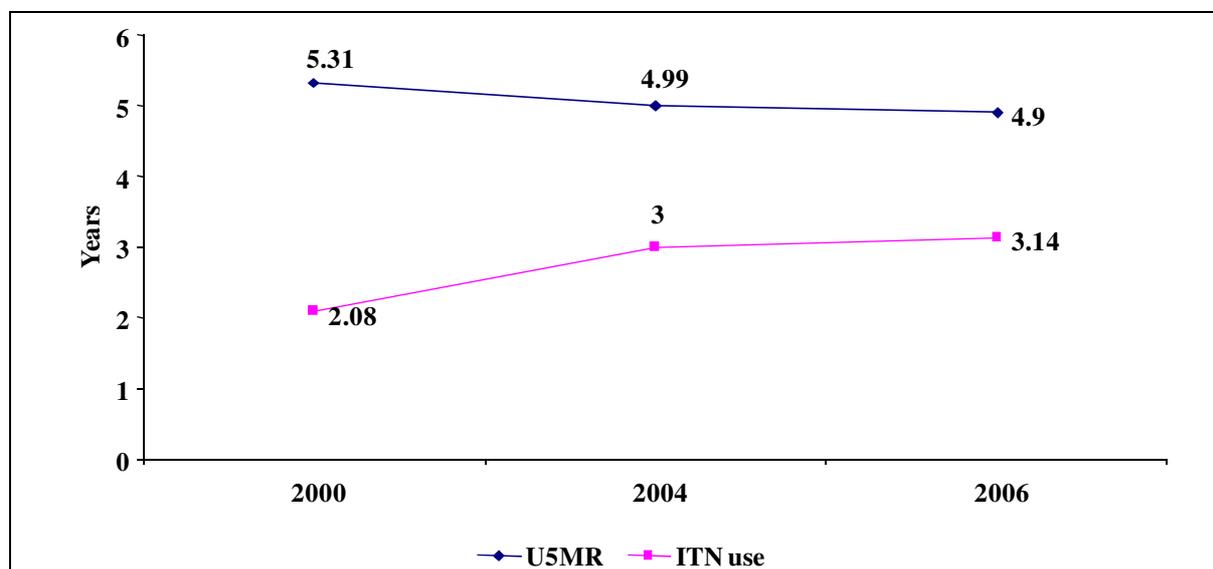


Figure 5.30 Correlation between log of all cause under-five mortality rate and ITN use

Source: DHS (2000, 2004), MICS (2006)

There are regional variations in under-five mortality rate (Figure 5.31). During the entire period, the North recorded the lowest under-five mortality rate. It registered 170.3, 120 and 101/1,000 children in 2000, 2004 and 2006, respectively. The Southern Region boasted of the highest under-five mortality rate in 2000 and 2004. It had an under-five mortality rate of 212.5 in 2000 and 164 in 2006. However, regional inequalities in under-five mortality rate declined in 2006.

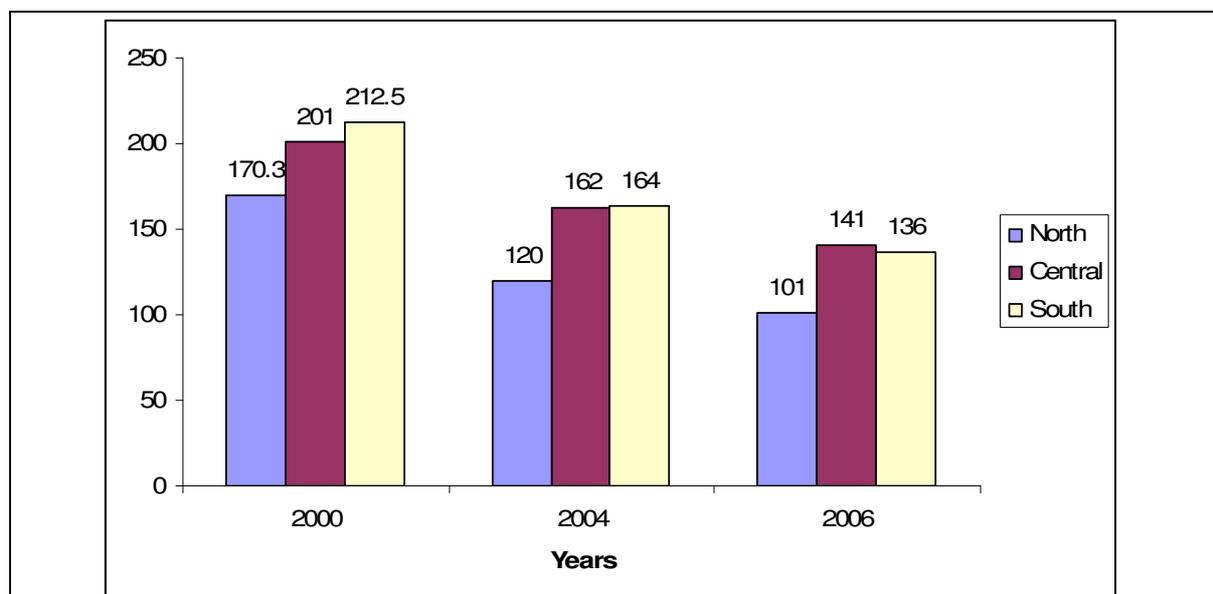


Figure 5.31 All cause under-five mortality per 1,000 children by region

Source: DHS (2000, 2004), MICS (2006)

Figure 5.32 shows that there is a direct relationship between education and under-five mortality rate. Households with no education bear the brunt of under-five mortality. In particular,

households with no education registered an under-five mortality rate of 214 in 2000 compared to 118 for households with secondary education. Education-induced inequalities decreased in 2006. In no education households under-five mortality was 2 times that of secondary education mortality in 2000 and it fell to 1.5 times in 2006.

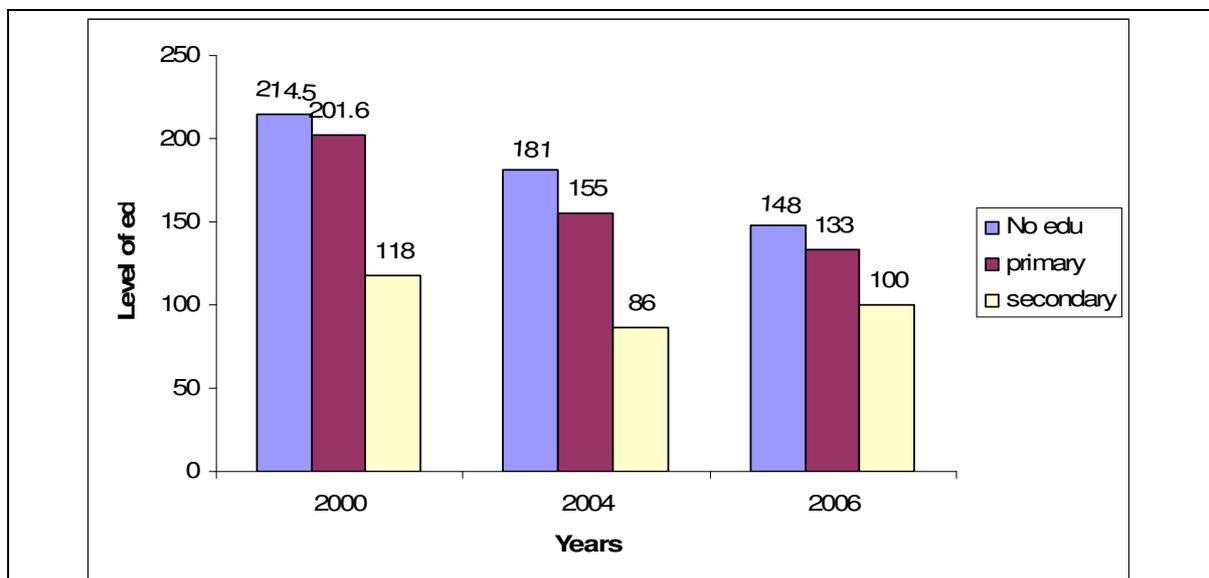


Figure 5.32 All cause under-five mortality per 1,000 children by level of education

Source: DHS (2000, 2004), MICS (2006)

## 5.4.2 Modelling the Impact of Scaling up Interventions for Malaria

### 5.4.2.1 Results from Impact Modelling of Malaria Interventions

The modelled estimates of deaths averted due to overall scale-up of malaria interventions by year are presented in Table 5.21 and Figure 5.33. As shown below, deaths averted grew from 3,614 in 2001 to 6,952 in 2007. The total number of deaths averted in this seven year period was 38,927.

Year	Total – All deaths averted	Total - Malaria deaths averted
2001	3,614	2,205
2002	4,346	2,849
2003	5,072	3,501
2004	5,801	4,162
2005	6,314	4,646
2006	6,828	5,134
2007	6,952	5,227
<b>Total</b>	<b>38,927</b>	<b>27,724</b>

Note: Vitamin A will prevent deaths from diarrhoea, measles. The deaths prevented from diarrhoea, measles and neonatal period will all be included total number of deaths but are excluded from the total malaria deaths

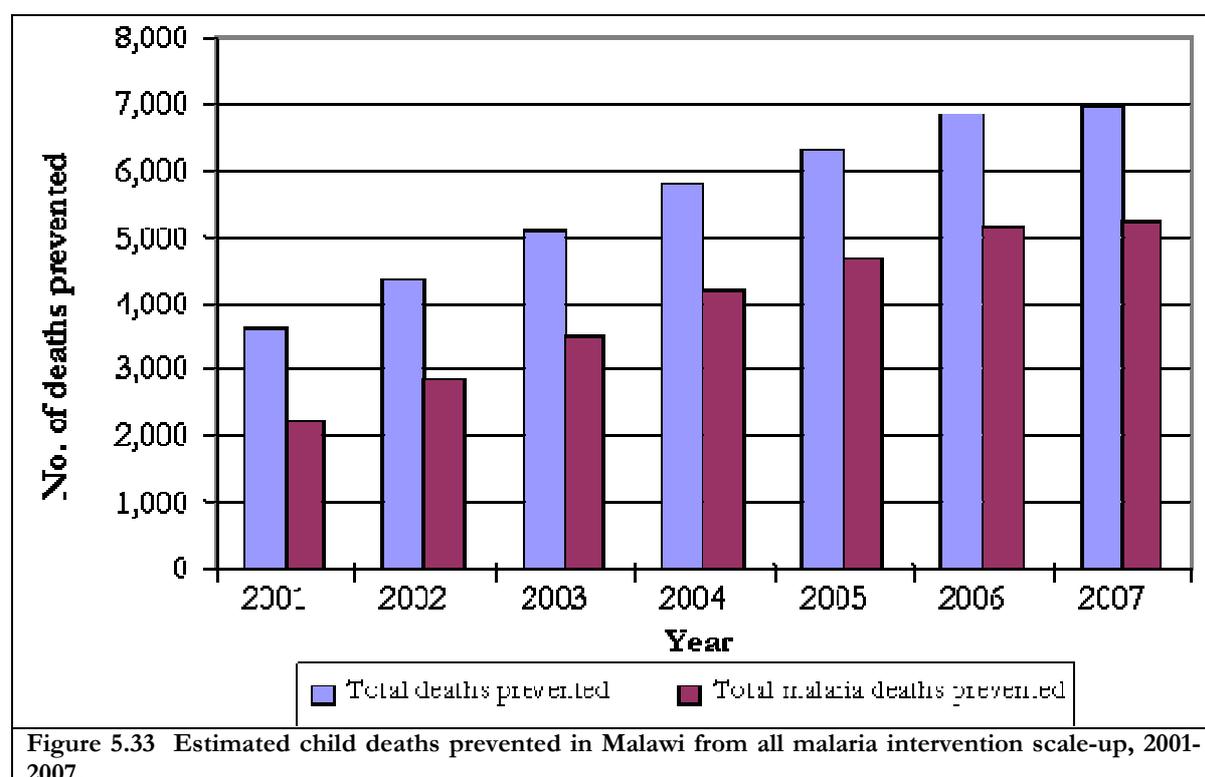
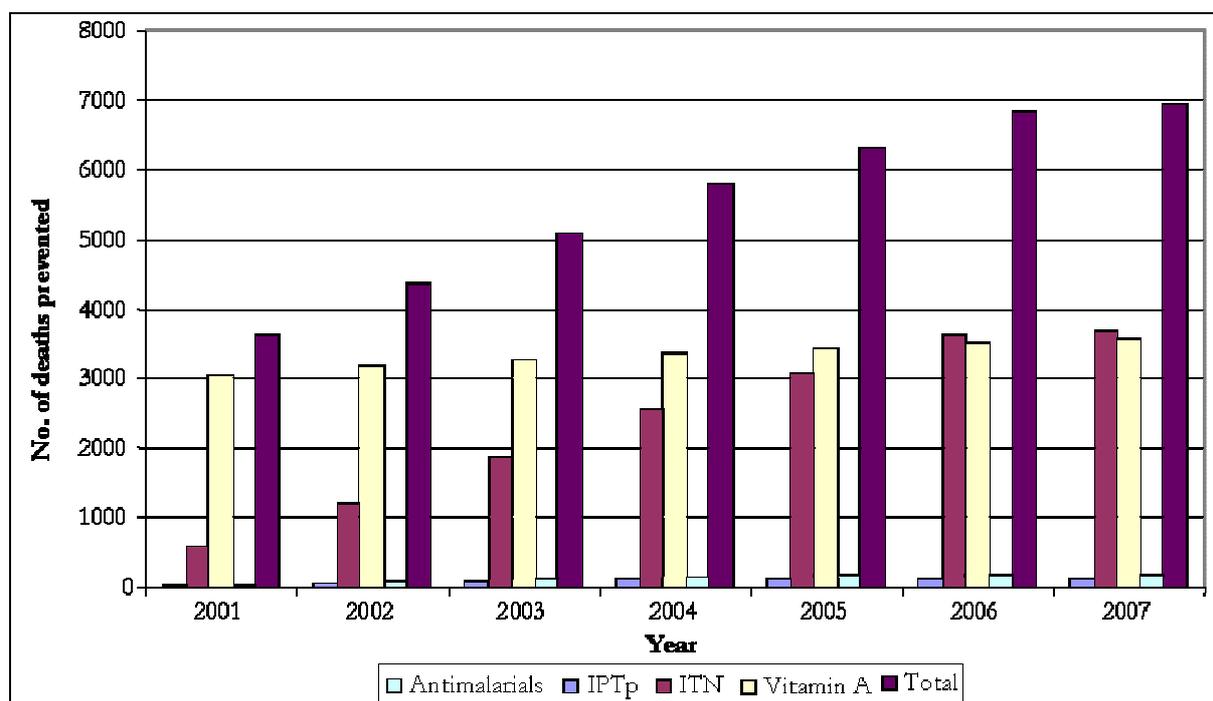


Figure 5.33 Estimated child deaths prevented in Malawi from all malaria intervention scale-up, 2001-2007.

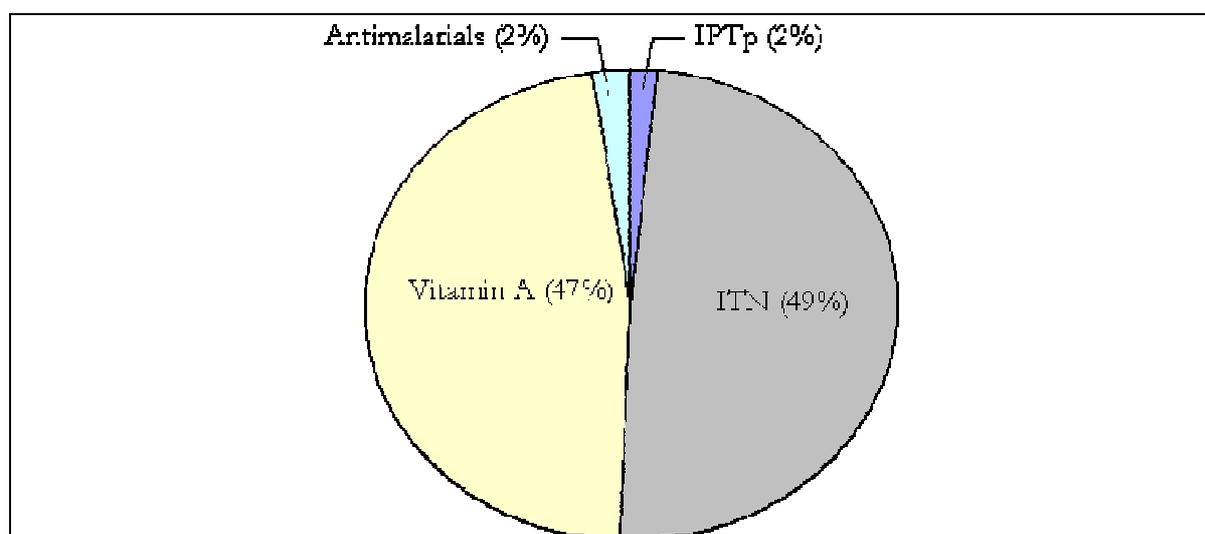
The model also produced estimates of deaths averted by intervention. In Table 5.22, Figures 5.34 and 5.35 below we show the proportion of deaths averted by intervention.

**Table 5.21 Estimated child deaths prevented in Malawi by malaria intervention 2001-2008**

Year	IPTp	ITN	Vit A	Antimalarials
2001	28	583	3052	36
2002	58	1,214	3179	74
2003	89	1,875	3274	115
2004	122	2560	3352	157
2005	119	3076	3424	160
2006	116	3602	3488	163
2007	118	3668	3551	166



**Figure 5.34 Estimated child deaths prevented in Malawi from all malaria intervention scale-up 2001-2007**



**Figure 5.35 Deaths prevented by malaria intervention**

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A key point to note about the attribution of deaths averted to intervention is the assumption of the model that first we estimate the impact of prevention interventions, then the effects of treatment. Therefore the impact of treatment is less when we have scaled up bed nets and other prevention interventions as these interventions reduce the need for treatment.

## **5.5 Overall Study Question: Has increased malaria funding led to a reduction in the burden of disease?**

### **5.5.1 Key Findings on malaria control input and Process**

Our assessment of malaria control inputs and processes has shown that the bulk of malaria control inputs are available and malaria control processes have been initiated. In particular, the Government of Malawi has developed ground-breaking policies and guidelines in order to enhance the success of malaria control interventions. Funding for malaria has increased over the years. The increase in funding has provided critical stimulus for scaling up malaria intervention hence moving closer to achieving the global malaria targets that were set at the dawn of the new millennium.

### **5.5.2 Key Findings on Malaria Control Outputs and Outcomes**

#### **5.5.2.1 Malaria treatment**

Our analysis has shown that the percentage of children receiving prompt and effective treatment within 24 hours of the onset of fever has increased substantially since 2000. Despite good progress in treating children under five years old, the proportion of children receiving prompt treatment falls short of the RBM target of 60 percent by 2005. This problem is further exacerbated by the glaring disparity in accessing treatment between urban and rural children, and the poorest and richest households. In particular, urban children are more likely to access treatment within 24 hours of onset of fever than rural children. Furthermore, children in the richest quintile are more likely to access prompt treatment than their counterparts in the poorest quintile. Similar results were obtained by Mathanga and Bowie (2004). They showed that very few caregivers did nothing about children fevers, but for caregivers who did nothing, the poorest were 2.5 times more likely to do nothing than the least poor. There is also education-based inequality in accessing prompt treatment. More educated mothers or caregivers are likely to promptly take their children to a health facility for treatment than mothers or care givers with no education. It fair however to say that spatial, income and education-based disparities have declined over the years. The decline in inequities means that more efforts have been expended to increase access to treatment of disadvantaged groups.

#### **5.5.2.2 Insecticide-treated nets**

Our analysis has shown that remarkable progress has been made in coverage of ITNs in Malawi over the past eight years. In particular, more households own at least one ITN and a larger proportion of children and pregnant women are sleeping under ITNs. There are however some challenges that dent good ITN performance in Malawi. First, the remarkable increase in ITN ownership and use fell short of the RBM target of 60 percent ITN ownership and use by 2005. Second, there are spatial, income and education-based disparities in ITN ownership and use. In particular, urban households are more likely to own and use ITNs than their rural counterparts. In addition, households in the richest quintile are more likely to own and use ITNs than their counterparts in the poorest quintile of the income distribution. Households with secondary education are more likely to own and use an ITN than households with no education. The consolation however is that the urban-rural disparities and income-based inequalities have decreased over time.

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### **5.5.2.3 Intermittent preventive treatment for pregnant women**

The results of our analysis show that uptake of IPT<sub>p</sub> services by pregnant women has increased substantially over time. In particular, the proportion of pregnant women accessing IPT<sub>p</sub> has substantially increased over the years. This is not surprising given the fact that the success of IPT<sub>p</sub> depends on the attendance rate of pregnant women at antenatal clinics (ANC). Munthali and Kadzandira (2004) found that 97.8 percent of pregnant attended antenatal care clinics in Malawi. The drawback however is that the increase in coverage of IPT<sub>p</sub> did not reach the RBM target of 60 percent by the end of 2005.

### **5.5.2.4 Malaria burden in Malawi**

The increase in funding for malaria has led to scale up of malaria control interventions. This in turn has led to a reduction in all cause under-five mortality rate and the incidence of anaemia in children under five years old. The scale-up of malaria control intervention has increased the number of deaths averted among children less than five years old. Given the fact that incidence and prevalence data does not exist in Malawi, the improvement in basic health statistics can be taken as a proxy for a decreasing burden of malaria in Malawi.

## 6.0 Study Question 4: Have there been any effects on non-HIV/AIDS, tuberculosis, and malaria health services?

### 6.1 Study Question 2: Has the availability of quality non-HIV/AIDS, tuberculosis and malaria services increased?

#### 6.1.2 Has the quality of reproductive health and maternal and child health services improved?

##### 6.1.2.1 Quality of Service Level 1. Availability of basic elements: commodities, guidelines, systems, trained staff

Table 6.1 shows that the sampled facilities have the staff, guidelines and supplies but not infrastructure to provide quality reproductive and maternal health services. Specifically, 14.2 percent had the infrastructure, 55.8 percent had the staff, 54.0 percent had the guidelines and 74.3 percent had the supplies. Only 9.7 percent had all basic elements.

<b>Table 6.1 Health facilities with capacity to provide quality reproductive health services</b>						
Percentage of facilities offering reproductive health services with the infrastructure, staff, guidelines, equipment and supplies to offer quality services, by type of district, [Malawi, 2008]						
Type of District	Elements					Number of facilities offering reproductive health services
	Infrastructure <sup>1</sup>	Staff <sup>2</sup>	Guidelines <sup>3</sup>	Supplies <sup>4</sup>	All elements	
<b>High intensity</b>						
Lilongwe	6.3	62.5	68.75	81.3	6.3	15
<b>Medium intensity</b>						
Chiradzulu	15.4	61.5	38.5	76.9	15.4	11
Karonga	25.0	75.0	75.0	87.5	25.0	7
Machinga	10.5	68.4	68.4	68.4	5.3	16
Mzimba	12.5	37.5	37.5	75.0	0.0	8
Nkhotakota	26.7	60.0	60.0	80.0	26.7	14
Zomba	30.0	70.0	70.0	40.0	10.0	7
<b>Low intensity</b>						
Mwanza	0.0	58.3	58.3	75.0	0.0	10
Ntchisi	8.3	0.0	0.0	83.3	0.0	11
<b>Total</b>	14.2	55.8	54.0	74.3	9.7	99
<sup>1</sup> Infrastructure: Electricity, water, adequate infection control						
<sup>2</sup> Staff: Trained in the past 2 years in adolescent sexual and reproductive health (ASRH), Family planning						
<sup>3</sup> Guidelines: Adolescent sexual and reproductive health (ASRH), Family planning						
<sup>4</sup> Supplies: Oral and injectable contraceptives and male condoms						
<b>Source: DCA-Facility survey, 2008</b>						

Table 6.2 shows that the majority of sampled facilities do not have the capacity to provide quality delivery services. Of the 113 facilities 14.2 percent had the infrastructure, 47.8 percent had staff trained in delivery care (safe motherhood and life saving skills), 22.1 percent had guidelines on best- practice delivery care and 18.6 percent had equipment and supplies. In addition, of all sampled facilities only 2.7 percent had all basic elements (infrastructure, staff, guidelines and, equipment and supplies).

<b>Table 6.2 Health facilities with capacity to provide quality delivery services</b>						
Percentage of facilities offering delivery services with the infrastructure, staff, guidelines, and equipment and supplies to offer quality services, Malawi, 2008						
Type of District	Elements					Number of facilities offering delivery and neonatal services
	Infrastructure <sup>1</sup>	Staff <sup>2</sup>	Guidelines <sup>3</sup>	Equipment and Supplies <sup>4</sup>	All elements	
<b>High intensity</b>						
Lilongwe	6.3	50.0	50.0	25.0	0.0	13
<b>Medium intensity</b>						
Chiradzulu	15.4	23.1	38.5	38.5	0.0	11
Karonga	25.0	75.0	25.0	12.5	12.5	6
Machinga	10.5	52.6	21.1	10.5	0.0	14
Mzimba	12.5	50.0	0.0	12.5	0.0	8
Nkhotakota	26.7	33.3	6.7	20.0	6.7	11
Zomba	30.0	80.0	30.0	10.0	10.0	9
<b>Low intensity</b>						
Mwanza	0.0	50.0	16.7	25.0	0.0	9
Ntchisi	8.3	33.3	0.0	8.3	0.0	11
<b>Total</b>	<b>14.2</b>	<b>47.8</b>	<b>22.1</b>	<b>18.6</b>	<b>2.7</b>	<b>92</b>
<sup>1</sup> Infrastructure: Electricity, water, adequate infection control						
<sup>2</sup> Staff: Trained in the past 2 years in Delivery care ('safe motherhood'/life saving skills)						
<sup>3</sup> Guidelines: Delivery care ('safe motherhood'/life saving skills)						
<sup>4</sup> Equipment and Supplies: Oxytocin, magnesium sulfate, <i>and other country-specific equipment and supplies</i>						
<b>Source: DCA-Facility survey, 2008</b>						

Table 6.3 shows that most of the sampled facilities have the trained staff and guidelines to deliver child health services but they do not have the infrastructure and, equipment and supplies. Of the 113 sampled facilities 14.2 percent had the infrastructure, 74.3 percent had trained staff, 72.6 percent had the guidelines and 22.1 percent had equipment and supplies. And of all the sampled facilities, 8.9 percent had all the basic elements.

<b>Table 6.3 Health facilities with capacity to provide quality child health services</b>						
Percentage of facilities offering child health services with the infrastructure, staff, guidelines, and equipment and supplies to offer quality services, by type of district [Malawi, 2008]						
Type of District	Infrastructure <sup>1</sup>	Staff <sup>2</sup>	Guidelines <sup>3</sup>	Equipment and Supplies <sup>4</sup>	All elements	Number of facilities offering child health services
<b>High intensity</b>						
Lilongwe	6.3	75.00	68.8	18.8	0.0	14
<b>Medium intensity</b>						
Chiradzulu	15.4	84.6	76.9	30.8	7.7	9.0
Karonga	25.0	87.5	87.5	37.5	25.0	7.0
Machinga	10.5	68.4	68.4	21.1	5.3	16.0
Mzimba	12.5	75.0	75.0	12.5	0.0	8.0
Nkhotakota	26.7	66.7	66.7	20.0	20.0	14.0
Zomba	30.0	80.0	80.0	20.0	20.0	9.0
<b>Low intensity</b>						
Mwanza	0.0	66.7	66.7	33.3	0.0	12
Ntchisi	8.3	75.0	75.0	8.3	8.3	11
<b>Total</b>	<b>14.2</b>	<b>74.3</b>	<b>72.6</b>	<b>22.1</b>	<b>8.9</b>	<b>100</b>
<sup>1</sup> Infrastructure: Electricity, water, adequate infection control						
<sup>2</sup> Staff: Trained in the past 2 years in Integrated management of childhood illness (IMCI)						
<sup>3</sup> Guidelines: Integrated management of childhood illness (IMCI)						
<sup>4</sup> Equipment and Supplies: Vitamin A, oral rehydration salts, formulary antibiotics, hemoglobin/hematocrit determination						
<b>Source: DCA-Facility survey, 2008</b>						

The bulk of health facilities do not have the capacity to provide quality STI services. Of the 113 sampled facilities, 14.1 percent had the infrastructure, 62.8 percent had trained staff and 15 percent had equipment and supplies. The disappointing result is that only 8.9 percent of the facilities had all the elements. The reason for having a high proportion of facilities with trained staff and guidelines is that the government might prioritise the provision of these inputs given the fact it may not be able to provide all the inputs due to inadequate health care resources (Table 6.4).

<b>Table 6.4 Health facilities with capacity to provide quality STI services</b>						
Percentage of facilities offering sexually transmitted infection services with the infrastructure, staff, guidelines, and equipment and supplies to offer quality services, by type of district [Malawi, 2008]						
Type of District	Infrastructure <sup>1</sup>	Staff <sup>2</sup>	Guidelines <sup>3</sup>	Equipment and Supplies <sup>4</sup>	All elements	Number of facilities offering STI services
<b>High intensity</b>						
Lilongwe	6.3	87.5	87.5	6.3	0.0	16
<b>Medium intensity</b>						
Chiradzulu	15.4	53.9	53.9	23.1	7.7	12.0
Karonga	25.0	87.5	87.5	37.5	25.0	8.0
Machinga	10.5	68.4	68.4	5.3	0.0	18.0
Mzimba	12.5	87.5	87.5	0.0	0.0	8.0
Nkhotakota	26.7	60.0	60.0	20.0	20.0	15.0
Zomba	30.0	70.0	70.0	20.0	10.0	10.0
<b>Low intensity</b>						
Mwanza	0.0	50.0	50.0	25.0	0.0	12
Ntchisi	8.3	8.3	8.3	8.3	0.0	12
<b>Total</b>	14.1	62.8	62.8	15.0	6.2	111
<sup>1</sup> Infrastructure: Electricity, water, adequate infection control						
<sup>2</sup> Staff: Trained in the past 2 years in Diagnosis and treatment (management) of STIs						
<sup>3</sup> Guidelines: Diagnosis and treatment (management) of STIs						
<sup>4</sup> Equipment and Supplies: Ciprofloxacin, male condoms, syphilis test						
<b>Source: DCA-Facility survey, 2008</b>						

### 6.1.3 Has the coverage of services improved (overall and equitably)?

Overall 7 percent of the children reported symptoms of acute respiratory infection in the two weeks preceding the survey (Table 6.5). There is little variation between background characteristics.

Table 6.5 Prevalence and treatment of symptoms of ARI								
Among children aged under five years, the percentage who had symptoms of acute respiratory infection (ARI), in the two weeks preceding the survey and among the children with symptoms of ARI, the percentage who received the specific treatments, according to background characteristics [Malawi, 2008]								
Background characteristic	Among children under age five			Among children under age five with ARI				
	% with ARI			Saw health provider		Took antibiotics		
	Number	%	Total	%	Number	%	Number	Total
<b>Sex of child</b>								
Male	200	7	2,777	43	86	4	7	200
Female	230	8	2,795	48	110	3	7	230
Missing	72	0	15,964	35	25	8	6	72
<b>Highest level of school attended</b>								
None	91	2	3,744	35	32	4	4	91
Nursery	0	0	12	0		0	0	0
Primary	350	3	13,256	46	162	3	12	350
Secondary	37	1	2,684	38	14	5	2	37
Higher	0	0	156	0	0	0	0	0
Missing	24	1	1,684	54	13	8	2	24
<b>Wealth quintile</b>								
Lowest	87	3	3176	44	38	5	4	87
2	96	3	3548	45	43	5	5	96
3	111	3	3632	41	45	3	3	111
4	82	2	3,788	54	44	4	3	82
Wealthiest	63	2	3,800	44	28	3	2	63
Missing	63	2	3,592	37	23	5	3	63
<b>District</b>								
<b>High Intensity</b>								
Lilongwe rural	87	3	2540	41	36	1	1	87
Lilongwe city	27	1	1948	37	10	0	0	27
<b>Medium Intensity</b>								
Karonga	50	2	2248	68	34	8	4	50
Mzimba	46	2	2204	39	18	4	2	46
Nkhotakota	85	5	1832	32	27	2	2	85
Machinga	5	0	1956	0	0	0	0	5
Zomba	38	2	2,032	42	16	3	1	38
Chiradzulu	8	0	2,448	63	5	0	0	8
<b>Low Intensity</b>								
Ntchisi	111	5	2324	47	52	7	8	111
Mwanza	45	2	2,004	51	23	4	2	45

**Table 6.6 Assistance during delivery. Percent distribution of live births in the five years preceding the survey by person providing assistance during delivery and percentage of births assisted by a skilled provider, by background characteristics**

Background characteristics		Doctor		Nurse		Aux. Midwife		TBA		CHC		Other		Skilled health provider		Total
		Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count <sup>1</sup>	%	
<b>Age group</b>	15-24	53	4	14	1	50	4	34	3	608	49	117	10	107	9	1,231
	25-39	116	6	34	2	82	4	72	4	845	44	178	9	201	10	1,932
	40+	13	4	3	1	10	3	9	3	164	48	27	8	26	8	344
	Missing	19	6	3	1	11	4	9	3	151	48	30	10	30	10	312
<b>Education</b>	None	36	5	10	2	26	4	17	3	271	41	51	8	65	10	663
	Nursery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	Primary	138	6	38	2	105	4	89	4	1,154	47	244	10	247	10	2,473
	Secondary	17	4	3	1	14	3	14	3	221	50	27	6	32	7	438
	Higher	1	8	0	0	0	0	0	0	6	50	0	0	1	8	12
Missing	9	4	3	1	8	3	4	2	116	50	30	13	19	8	231	
<b>Wealth quintile</b>	Lowest	46	8	10	2	22	4	19	3	246	43	58	10	72	13	575
	2	31	5	8	1	26	4	18	3	322	47	70	10	55	8	680
	3	35	5	12	2	31	5	24	4	292	44	62	9	66	10	664
	4	37	5	14	2	30	4	23	3	292	43	54	8	72	11	674
	Wealthiest	24	4	5	1	21	3	20	3	326	52	43	7	47	7	632
Missing	28	5	5	1	23	4	20	3	290	49	65	11	52	9	594	
<b>District</b>																
	<b>High Intensity</b>															
	Lilongwe rural	20	4	6	1	41	8	38	8	192	39	42	9	62	13	494
	Lilongwe city	10	3	1	0	17	5	19	6	169	51	15	5	27	8	332
	<b>Medium Intensity</b>															
	Mzimba	9	3	4	1	7	2	6	2	141	44	24	7	18	6	324
	Nkhotakota	16	4	8	2	6	2	1	0	155	42	24	6	24	6	371
	Karonga	10	3	3	1	14	4	9	3	181	52	45	13	25	7	346
	Machinga	11	3	2	1	11	3	9	3	139	40	18	5	23	7	347
	Zomba	14	4	3	1	4	1	1	0	218	61	69	19	18	5	356
	Chiradzulu	45	10	6	1	7	2	4	1	216	50	33	8	54	13	429
	<b>Low Intensity</b>															
	Ntchisi	27	6	11	3	36	8	32	7	194	45	45	10	62	14	430
	Mwanza	39	10	10	3	10	3	5	1	163	42	37	9	51	13	390

Note: If more than one source of ANC was mentioned, only the provider with the highest qualifications is considered in this tabulation.;<sup>1</sup> Skilled provider includes doctor, nurse, midwife and auxiliary nurse/midwife

Source: DCA Household Survey, 2008

Fewer than 10 percent of the births in the 5 years preceding the survey were assisted by either nurses or midwives during delivery. The proportion of children assisted by a skilled health provider does not vary significantly with increase in educational level of the mother and wealth quintile from which the mother comes from. Note that a considerable proportion of births were done by community health workers, especially in Zomba, and Karonga (Table 6.7).

Table 6.8 shows vaccination coverage for children aged 12 to 23 months at the time of the survey (or 18-29 months in countries where measles vaccination is not recommended in the first year of life). The table also shows the percentage of children who had been vaccinated by 12[18] months of age. This latter percentage is used to ascertain the proportion of children who had been vaccinated at approximately the proper times (the first year of life, for example).

The information on childhood immunizations is obtained for all the respondent's children under five years of age. Whenever a vaccination card was available, this served as the source of information. The respondent was asked to recall if the child had received some vaccines a) if there was no written vaccination record, or b) if the vaccination was not recorded on the card. For children whose information was based on the mother's report, the proportion of vaccinations given during the first year of life was assumed to be the same as for children with a written record of the date of vaccination.

The vaccination rates for children aged 12-23 months at any time before the survey are presented in Table 6.8 by background characteristics in order to assess the success of the vaccination programme in reaching all subgroups of the population.

<b>Table 6.7 Vaccinations by background characteristics</b>							
<b>Percentage of children aged 12-23 months who received specific vaccines at any time before the survey (according to a vaccination card or the mother's report), and percentage with a vaccination card, by background characteristic, [Malawi, 2008]</b>							
	<b>BCG</b>	<b>DPT 3</b>	<b>Polio 3</b>	<b>Measles</b>	<b>All basic vacc. (%)</b>	<b>No Vacc. (%)</b>	<b>Number of children</b>
<b>Sex</b>							
Male	224 (54)	226 (54)	226 (54)	210 (50)	178 (43)	281 (68)	416
Female	285 (57)	283 (56)	274 (55)	265 (53)	230 (46)	353 (70)	503
Missing	13 (17)	14 (18)	14 (18)	13 (17)	9 (12)	16 (21)	77
<b>Mother's age</b>							
15-24	222 (57)	220 (57)	215 (55)	204 (52)	175 (45)	236 (62)	389
25-39	232 (49)	234 (49)	231 (48)	216 (45)	177 (37)	324 (68)	477
40+	25 (50)	24 (48)	25 (50)	24 (48)	24 (48)	36 (72)	50
Missing	43 (54)	43 (54)	43 (54)	44 (55)	41 (51)	54 (68)	80
<b>Mother's highest level of school attended</b>							
None	75 (46)	78 (48)	75 (46)	69 (42)	64(39)	119 (73)	164
Primary	475 (72)	351 (53)	347 (53)	330 (50)	279 (42)	416 (63)	658
Secondary+	78 (68)	60 (53)	58 (51)	59 (52)	47 (41)	74 (65)	114
Missing	32 (53)	26 (43)	34 (57)	30 (50)	26 (43)	39 (65)	60
<b>Wealth quintile</b>							
Lowest	78 (49)	75 (47)	74 (47)	71 (45)	59 (37)	97 (61)	158
2	117 (57)	114 (55)	114 (55)	104 (50)	87 (42)	132 (64)	207
3	89 (51)	85 (48)	85 (48)	84 (48)	67 (38)	118 (67)	176
4	90 (50)	97 (54)	91 (51)	85 (47)	76 (42)	114 (63)	180
Wealthiest	74 (58)	76 (60)	74 (58)	73 (57)	65 (51)	92 (72)	127
Missing	74 (50)	76 (51)	76 (51)	48 (32)	63 (43)	97 (66)	148
<sup>1</sup> BCG, measles and three doses each of DPT and polio vaccine (excluding polio vaccine given at birth)							
<b>Source: DCA Household survey</b>							

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## 7.0 Health Systems Effects

### 7.1 Health Financing

Malawi first received GFATM funding in April 2003 as part of its Round 1 HIV/AIDS grant. Subsequently, Malawi has received grants for malaria (under Round 2) and HIV/AIDS (OVC) and Health Systems strengthening (both under Round 5). Malawi also qualified for three grants under Round 7 (US\$36 million for HIV/AIDS, US\$62 million for malaria and US\$17.9 for tuberculosis). In addition, Malawi's application for the rolling continuation channel for its Round 1 grant was also conditionally approved. For the purposes of this study, only the Round 1 HIV/AIDS grant and Round 2 malaria grant were relevant expenditures during the period under study.

#### 7.1.1 National Health Accounts

NHA is a framework that has been used internationally to diagnose the financial functioning of health systems and design sound health financing policies, which can lead to improvement in the performance of health systems.

NHA provides a framework for measuring Total Health Expenditure (THE), i.e. both public and private including donors. It tracks the flow of funds through the health system from sources (e.g. Ministry of Finance, donors, households), through financing agents (entities which pool and manage the funds received from financing sources to pay for or purchase health care goods and services (e.g. MoH, NGOs), to providers (e.g. hospitals, clinics, dispensaries, pharmacies, traditional healers), functions (e.g. curative, preventive, rehabilitative, administration), health stratification (type of diseases or interventions funded e.g. HIV and AIDS, RH, child health, malaria) and beneficiaries (e.g. by location of residence, age, gender, socio-economic status).

Malawi completed a general NHA and subaccounts study for HIV/AIDS, Reproductive Health and Child Health for 2005 in 2006 for the financial years 2002/03-2004/05. Hence the same methods and data sources were used to collect data for financial years 2002/03 and 2005/06.

To this end, similar to the previous study for financial years 2002/03-2004/05, this study used the same internationally endorsed framework for undertaking NHA as contained in *the Guide to producing national health accounts with special application for low-income and middle income countries* (WHO, World Bank and USAID 2003). The only additions and changes made were the TB and Malaria Subaccounts. This study collected both primary and secondary expenditure data for financial year 2005/06 from institutions for general NHA, HIV/AIDS, TB and Malaria. However, this study developed disease specific allocation factors for HIV/AIDS, TB and Malaria which were applied to the general NHA Tables for current health care expenditures for 2002/03 and 2005/06.

#### 7.1.2 General Health Expenditures

Between financial years 2002/03 and 2005/06, Malawi's THE increased from MK 14.6 billion to MK 37.6 billion, an increase of 39 percent. The per capita expenditure on health increased from US\$15 in 2002/03 to US\$25 in 2005/06, still below the US\$34 per capita recommended by the WHO Commission on Macroeconomics and Health. Government's contribution to THE declined during the period from 35.4 percent in 2002/03 to 21.5 percent in 2005/06, representing a 40 percent decline. In terms of GFATM specific indicators, while there were no GFATM resources in 2002/03, the percentage of GFATM resources of THE was 9.32 percent in 2005/06, a fairly significant amount.

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As a financing source, donors contributed the most to THE, 46 percent in 2002/03 and increasing to 51 percent in 2005/06. The GFATM, while not on the ground in 2002/03, contributed 9 percent in 2005/06. Public funds on the other hand declined from 35 percent in 2002/03 to 22 percent in 2005/06. Employer funds increased over the period from 5 percent to 9 percent while household funds decreased slightly from 12 percent to 9 percent.

As a financing agent, the Ministry of Health is the biggest contributor to THE, although its contribution has declined by almost half from 60 percent of THE in 2002/03 to 29 percent in 2005/05, the decline being partly explained by the fact that health funding started being transferred directly to districts (devolution) by the Ministry of Finance instead of through the Ministry of Health, hence the increase of local authorities contribution to THE from 1 percent in 2002/03 to 11 percent in 2005/06. Another explanation in the decline in Ministry of Health contribution is that donors, e.g. USAID, during that time increased funding to vertical programmes and direct funding to health programmes. This is explained by the doubling in other NGOs and the rest of the world figures during this time.

While households out-of-pocket payments are now only the fourth largest financing agent (with 9 percent share in THE), in terms of private financing agents, households have the largest share in the Malawi health system. This contribution has significantly reduced from 46 percent in 2002/03 to 30 percent in 2005/06. Local NGOs on the other hand, have increased their contribution from 17 percent in 2002/03 to 30 percent, tying with households as the largest contributor to private financing agents. The contribution from private health insurance and private firms and parastatals increased during this period.

In terms of distribution of THE by disease, other diseases made up 62 percent and 53 percent of THE in 2002/03 and 2005/06 respectively. The contribution of HIV/AIDS expenditure to THE increased from 16 percent in 2002/03 to 23.66 percent in 2005/06, due to inflows to HIV/AIDS from the GFATM and PEPFAR. Malaria also registered an increase from 20 percent in 2002/03 to 22 percent in 2005/06, in part from the first disbursement from the GFATM Malaria grant to Malawi. TB on the other hand registered a decline as a percentage of THE from 2.27 percent in 2002/03 to 1.26 percent in 2005/06.

### **7.1.3 HIV/AIDS Expenditures**

GFATM resources have risen from zero in 2002/03 when there was no GFATM funding in Malawi to 30 percent of the THE for HIV/AIDS. GFATM resources for HIV/AIDS in 2005/06 made up 44.32 percent of total external funds for HIV/AIDS. The introduction of GFATM and PEPFAR resources for HIV/AIDS contributed in raising total expenditure on HIV/AIDS as a percentage of THE from 16.03 percent in 2002/03 to 23.66 percent in 2005/06. Administration for HIV/AIDS as a percentage of THE increased during this period from 0.80 percent to 3.12 percent, due most likely to the increased human and financial requirements to administer and co-ordinate the national response brought about by the additional funding.

From a situation in 2002/03 where government was the single largest financing source for HIV/AIDS at 44 percent and donors were the next largest financing source at 42 percent, the share of government reduced drastically to 18.4 percent in 2005/06. The donor contribution also reduced, although slightly, to 38.6 percent. The coming in of GFATM resources in 2005/06 made the GFATM the second largest financing source at 30.7 percent after donors (which is an aggregation of all donors to HIV/AIDS). One of the seven general principles of the GFATM is *“making available and leverage additional financial resources”* thus ensuring that its assistance does not replace/reduce other sources of funding to HIV/AIDS, malaria or TB and other health programmes. The reduction in public and donor funds to HIV/AIDS, if indeed caused by the

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introduction of funding for HIV/AIDS from the GFATM, would be a possible violation of this principle. In absolute terms however, public funds were MK1,022,135,548 in 2002/03 and rose in 2005/06 to MK1,640,457,757 while donor funds were MK974,166,838 in 2002/03 and rose to MK3,432,812,075 in 2005/06. Thus in Malawi Kwacha terms both public and donor funds rose during the period but HIV/AIDS total health expenditure grew faster in percentage terms than the corresponding growth in public and donor financing sources, hence the percentage decrease for both financing sources.

From a situation where the Ministry of Health was controlling 43 percent of HIV/AIDS total expenditure in 2002/03, with rest of the world at 19 percent and NAC at 11 percent, the situation changed drastically in 2005/06 with the Ministry of Health only controlling 9 percent and the share of the rest of the world doubling to 40 percent and NAC rising to 19 percent. The doubling of the share of the rest of the world can be explained by the active involvement of vertical funding in HIV/AIDS, especially by the United States Government (USG) through PEPFAR, UNICEF (procurement of ARVs) and increased activities of international NGOs in HIV/AIDS.

In terms of private HIV/AIDS health expenditure, PLWHA out-of-pocket spending was the largest financing agent accounting for 28 percent and 33 percent of total private HIV/AIDS health expenditure in 2002/03 and 2005/06 respectively. This increase in PLWHA out-of-pocket spending is disturbing from a policy point of view, as mentioned in the 2002-2004 NHA Report, as ARVs started being offered for free from 2003/04 and it would have followed that PLWHA out-of-pocket spending would have been reduced. The increase in out-of-pocket spending for PLWHA is mainly explained by increase in laboratory costs and medical fees when seeking care for opportunistic infections. It should be noted that transport costs are not included as per NHA standard practice.

#### **7.1.4 Malaria Expenditures**

In terms of relevant indicators on malaria for Malawi, while there were no GFATM resources for malaria in Malawi in 2002/03, the GFATM contributed to 16.84 percent to total external funds for Malawi in 2005/06. Total expenditure on malaria as a percentage of THE rose from 19.90 percent in 2002/03 to 22.03 percent in 2005/06. Out-of-pocket expenditure on malaria as a percentage of THE was 1.96 percent in 2002/03 and 2.13 percent in 2005/06.

Between 2002/03 and 2005/06 the largest financing source was donors, accounting for 51.7 percent in 2002/03 and 45.97 percent in 2005/06. The second largest source was public funds at 35.1 percent in 2002/03 and 27.05 percent in 2005/06. As can be seen, both of these sources showed declines during this time. The GFATM made up 9.31 percent of total financing sources in 2005/06, perhaps explaining the decline in both donor and public sources as this new finance source took over some of the activities and programmes that were previously funded by the two sources. As was noted for HIV/AIDS, this development would be a clear violation of the GFATM general principle of *“making available and leverage additional financial resources”* thus ensuring that its assistance does not replace/reduce other sources of funding to HIV/AIDS, malaria or TB and other health programmes.

As was the case of HIV/AIDS, in Malawi Kwacha terms both public and donor funds actually rose during the period but malaria total health expenditure grew faster in percentage terms than the corresponding growth in public and donor financing sources, hence the percentage decrease for both financing sources.

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### **7.1.5 Tuberculosis Expenditures**

In terms of TB related indicators, total expenditure on TB as a percentage of THE is relatively small compared to HIV/AIDS and malaria, 2.27 percent in 2002/03 and declining to 1.26 percent in 2005/06. External expenditure on TB as a percentage of THE fell significantly from 2.08 percent in 2002/03 to only 0.50 percent in 2005/06.

### **7.1.6 Other diseases expenditures**

In terms of other diseases, i.e., all other diseases apart from HIV/AIDS, malaria and TB, total health expenditure on other diseases as a percentage of THE was 62 percent in 2002/03 and 53 percent in 2005/06. The external expenditure on other diseases as a percentage of the THE, rose from 26.85 percent in 2002/03 to 31.29 percent in 2005/06.

#### **7.1.6.1 Fully distributed disease expenditure by Function**

In 2002/03, the largest financing source for in-patient curative care was government at 51 percent, followed by private (29 percent) and other external resources at 20 percent. In 2005/06, this situation changed with government now being only the third largest financing source (30 percent) behind private (34 percent) and external resources (31 percent). The GFATM was a distant fifth at 5 percent. This same shift of financing sources occurred for outpatient curative care where government moved from being the largest financing source at 45 percent in 2002/03 to being the least source of financing at 19 percent in 2005/06 behind external resources (28 percent), GFATM (27 percent), and private sources (26 percent). All GFATM financing for in-patient and out-patient curative care went to HIV/AIDS (opportunistic infection treatment).

While government reduced its share as a financing source to in-patient and out-patient curative care, the share of government resources to prevention and public health services doubled from 9 percent in 2002/03 to 19 percent in 2005/06. External resources for preventive and public health services fell from a substantial 87 percent in 2002/03 to a still large 69 percent in 2005/06. The GFATM share to this function was 9 percent, all of it going to preventive and public health services for HIV/AIDS.

In terms of health administration and health insurance, the share of government resources going to this function fell from 35 percent in 2002/03 to 16 percent in 2005/06 while the share of external resources increased from 60 percent in 2002/03 to 80 percent in 2005/06. This pattern in increasing external resources is common to the two of the three focal diseases (HIV/AIDS and malaria) and other diseases. TB was the only disease where the government share to the function actually increased.

The substantial shift of government resources from in-patient and out-patient curative care to preventive and public health services is common to all the three focal diseases (HIV/AIDS, malaria and TB) as well as other diseases as is the increase in external resources to in-patient and out-patient curative care and reductions in external resources to prevention and public health services.

#### **7.1.6.2 Funding trends for HIV, Malaria and HIV programmes**

The NHA while showing an improvement in Malawi's THE per capita from increased from US\$15 in 2002/03 to US\$25 in 2005/06, this is still below the US\$34 per capita recommended by the WHO Commission on Macroeconomics and Health for 2001. The trend in the decline of government financing to THE observed in the previous NHA exercise is also evident in this NHA with Government's contribution to THE declining during the period from 35.4 percent in

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2002/03 to 21.5 percent in 2005/06, representing a 40 percent decline. It would be extremely unlikely for Malawi to reach the recommended US\$34 in the absence of increased government financing; however, increased donor financing in the absence of corresponding increase in government financing raises serious issues of sustainability.

As a financing source, donors contributed the most to THE, 46 percent in 2002/03 and increasing to 51 percent in 2005/06. The GFATM, while not on the ground in 2002/03, contributed 9 percent to THE in 2005/06. Similar reductions in government financing were noted in HIV/AIDS and malaria but unlike THE, where donor share increased between the years, in the two diseases, donor shares also fell. This development in THE, HIV/AIDS and Malawi financing would be a clear violation of the GFATM general principle of GFATM *“making available and leverage additional financial resources”* thus ensuring that its assistance does not replace/reduce other sources of funding to HIV/AIDS, malaria or TB and other health programmes. This is an important finding that requires further discussion between the government, donors and the GFATM. Of interest is the fact that for TB where there were no GFATM resources, the share of government and donor resources remained very steady at 61 percent in 2002/03 and 60.5 percent in 2005/06 for government while donor funds were 39 percent in 2002/03 and 39.5 percent in 2005/06.

The increasing PLWHA out-of-pocket spending is also of concern. As has already been mentioned, in terms of private HIV/AIDS health expenditure, PLWHA out-of-pocket spending was the largest private financing agent accounting for 28 percent and 33 percent of total private HIV/AIDS health expenditure in 2002/03 and 2005/06 respectively. This increase in PLWHA out-of-pocket spending is disturbing from a policy point of view as ARVs started being offered for free from 2003/04 and it would have followed that PLWHA out-of-pocket spending would have been reduced.

The substantial shift of government resources from in-patient and out-patient curative care to preventive and public health services is common to all the three focal diseases (HIV/AIDS, malaria and TB) as well as other diseases as is the increase in external resources to in-patient and out-patient curative care and reductions in external resources to prevention and public health services. The balance between total expenditure on curative care and total expenditure on prevention and public health services remain about the same in 2002/03 and 2005/06 at a ratio of 2:1. It is important that an integrated and balanced approach to prevention and treatment for all diseases is pursued, which is one of the seven guiding principles of the GFATM.

In conclusion, this assessment of the collective impact on health financing that GFATM and other national and international partners have had has resulted in interesting findings from which is hoped will lead to dialogue among government and its partners and lead to more evidence-based decision making, especially relating to financing of the three focal diseases as well as the general health system.

## **7.2 Health Indicators**

Fifty-two point four (52.4) percent of the Malawian population lives on less than \$1 a day (NSO 2004, IHS) and Malawi's health indicators remain among the poorest in the region (see Table 7.1 below). The HIV/AIDS prevalence rate among adults (15-49 years) is 12 percent (National AIDS Commission 2008,) and HIV/AIDS-related conditions are estimated to account for more than 40 percent of all inpatient admissions (Government of Malawi 2002). Life expectancy has recently fallen to 36.3 years, mainly as a result of the HIV/AIDS epidemic. Tuberculosis (TB),

once on the decline, has also been increasing, with 70 percent of TB patients also testing HIV positive.

<b>Figure 7.1 Selected Health Indicators for Malawi</b>	
<b>Indicator</b>	<b>1999-2005*</b>
Total population (NSO, 2005)	11.3 million
Infant mortality rate per 1,000 live births (MDHS, 2004)	76
Under five mortality rate per 1,000 live births (MDHS, 2004)	133
Total fertility rate (MDHS 2004)	6
Life expectancy at birth (NSO, 2003)	36. 3years
Maternal mortality rate/100,000 live births (MDHS 2004)	984
Total HIV-positive population (NAC, 2003)	700,000 – 1,000,000

**Source: Various. \*Latest between 1999 and 2005.**

### 7.3 Health Policy and structure

The Ministry of Health in 1999 made a decision to move from a project approach to a Sector-Wide Approach (SWAp).

In 2004, the Government of Malawi together with its developing partners finalized work on a six-year Programme of Work (POW) valued at US\$763 million. The SWAp POW is based on the Essential Health Package (EHP) which is a minimum package of health services to be freely provided and composed of the most common causes of mortality and morbidity in Malawi including malaria, TB, HIV/AIDS, malnutrition, diarrhoea, cholera, acute respiratory tract infections etc.

Malawi has a network of health facilities belonging to different ministries and agencies. About 85 percent of the population lives within a 10 km radius of a health facility. The facilities range from small dispensaries on estates to large hospitals in cities. Between these agencies, there were 843 health facilities in the country in 2002, more than 50 percent of them health centres (dispensary/maternity unit) (see Table 7.2).

<b>Figure 7.2 Distribution of Health Facilities in Malawi, by Ownership, 2002</b>								
<b>Type</b>	<b>Government</b>		<b>Nongovernment</b>			<b>Private for-profit</b>		<b>Total</b>
	<b>MoH</b>	<b>LG</b>	<b>CHAM</b>	<b>BLM</b>	<b>NGO</b>	<b>Firms</b>	<b>Private facilities</b>	
Central hospital	4	-	-	-	-	-	-	4
Mental hospital	1	-	1	-	-	-	-	2
District hospital	22	-	-	-	-	-	-	22
Hospital	19	-	27	-	-	7	3	56
Health centre	288	12	115	1	-	-	-	416
Maternity centre	2	12	1	-	-	-	-	15
Rehabilitation centre	-	-	1	-	-	-	-	1
Clinic	2	4	8	27	1	-	-	42
Voluntary counselling clinic	-	-	-	-	3	-	-	3
Dispensary	54	4	8	-	-	119	97	282
<b>Total</b>	<b>392</b>	<b>32</b>	<b>161</b>	<b>28</b>	<b>4</b>	<b>126</b>	<b>100</b>	<b>843</b>
<b>%</b>	<b>46.5</b>	<b>3.9</b>	<b>19.2</b>	<b>3.3</b>	<b>0.5</b>	<b>14.9</b>	<b>11.7</b>	<b>100</b>

**Source PER 2005, Health Information System Data Base and Manpower Development Unit Survey (1996, 1997)**

As can be seen from the table above, the MoH has the largest number of facilities (46.5 percent of the total health facilities in Malawi), followed by CHAM (19.2 percent of the total). Firms are the third largest providers with 14.9 percent of the total health facilities while the private-for-

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profit is the fourth largest provider of health services with 11.7 percent of the total health facilities. Last but not one is the Ministry of Local Government with 3.9 percent of the health facilities in Malawi and finally, other government agencies.

Although Malawi has this good network of health facilities, a JICA/MoH inventory in 2002 found that only about 9 percent of government and mission health facilities were capable of providing the EHP onsite. In each district, only one or two facilities had adequate EHP capacity<sup>21</sup>. These service deficits arise from lack of health workers, supply stock-outs, and lack of basic utilities (water, electricity, phone or radio communication).

## **7.4 HIV/AIDS, Tuberculosis and Malaria Equity Issues**

### **HIV/AIDS**

There is spatial disparity in the coverage of ART in Malawi. Urban areas have more sites than rural areas. This disparity is a clear reflection of a health care delivery system that is skewed towards urban areas. In particular, urban areas have higher per capita health facilities than rural areas. This disparity makes it very difficult for eligible HIV/AIDS patients to access ART services. It has also increased default rates because of long distances to health facilities which in turn precipitate high transport costs.

A related problem to the coverage of ART sites is that almost all CD4 cell count machines are based in urban or peri-urban areas. The direct consequence of this is that there are widespread delays in initiation of ART to eligible patients. The delays reduce the benefits of ART to patients. It also makes it difficult for health workers to monitor clinical progress of patients on treatment. Gender disparities exist in access to ART services. More women are accessing ART than men. More women may access ART services because they may be more knowledgeable about the benefit of ART than men. They attend antenatal and under-five clinics. These might be potential avenues for women to learn about the benefit of ART. Men might not have these opportunities. HIV testing is also mandatory for pregnant women and HIV testing is a gateway to accessing ART. Thus it is natural that more women should be on ART treatment than men. A related disparity is that more women are consuming VCT services than men. There is no disparity in access to PMTCT services between rural and urban areas.

There are also disparities in accessing funding from the Global Fund. Urban-based health NGOs are more likely to access funding from the Global Fund than rural-based organisations or community-based organisations (WHO Maximizing Positive Synergies Project 2009). One of the major challenges reported for civil society and CBOs is access to resources from the Global Fund, due to time-consuming and complicated procedures and the lack of capacity among civil society to develop technically sound proposals. To alleviate this challenge, the Global Fund should simplify its procedures and target its communications to civil society on opportunities to use its funding mechanisms.

### **Tuberculosis**

Despite the increase in the quantity of TB services over the years, there are gender and spatial disparities in access to TB services. More women access TB services than men. More men default on TB treatment than women. The coverage of TB services is denser in urban-based

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<sup>21</sup> The JICA study applied the following criteria in determining whether a facility had the capacity to deliver EHP services: (1) it must be able to deliver out-patient care, family planning services, maternity services, and immunization; and (2) it must have the following staff complement – medical assistant or clinical officer (one per facility), and nurse/midwife (two per facility).

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facilities than in rural facilities. This disparity reflects the health care delivery system in Malawi that is biased towards urban areas. Age disparity does not exist in access to TB services.

### **Malaria**

There are widespread disparities in access to malaria intervention and services. In particular, urban children are more likely to access treatment within 24 hours of onset of fever than rural children. Children in the richest quintile of income are more likely to access prompt treatment than their counterparts in the poorest quintile. More educated mothers or caregivers are likely to promptly take their children to health facility for treatment than mothers or caregivers with no education. Urban-based pregnant women are more likely to receive intermittent preventive treatment than rural-based women. It is however fair to say that these disparities have decreased over the years.

There are also spatial, income and education-based disparities in ITN ownership and use. In particular, urban households are more likely to own and use ITNs than their rural counterparts. In addition, households in the richest quintile are more likely to own and use ITNs than their counterparts in the poorest income quintile. In order to balance the need for an equitable and sustainable ITN programme, the government should continue providing free ITNs to vulnerable groups (children under five years old and pregnant women) and encourage the development of a commercial sector for ITNs. The private sector may benefit from tax and tariff reforms. Removal of taxes and tariffs on ITNs will level the playing ground for domestic ITN producers attempting to compete with international firms. It is worth mentioning that the Government of Malawi has changed the ITN policy. From this 2008, it will start distributing long lasting insecticidal nets which do not require re-treatment.

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## **8.0 Conclusion and Recommendations**

### **8.1 HIV/AIDS**

The increase in HIV/AIDS resources in the past five years has increased the quantity and quality of HIV/AIDS services in Malawi. There has been an increase in the number of patients accessing ART treatment, a scale-up in prevention of mother to child services, an increase in the uptake of HIV testing services through the introduction of HIV testing week and a strengthened health care delivery system. The growing ART treatment coverage has strengthened the health care delivery system along many dimensions. It has saved the lives of health care workers, thereby maintaining the size of the health care workforce. It has also reduced the bed occupancy rate due to reduced admissions. As a result, health care workers can now devote more person-hours to equally important conditions such as child and maternal health. Resources from the Global Fund have also contributed to other aspects of health systems strengthening such as provision of salary incentives to professional health workers and funding and recruitment of more than 5,000 health surveillance assistants (non-professional health workers).

The major challenge, however, is that the scale-up of HIV/AIDS services has not been matched with the health strengthening efforts given the fact that HIV/AIDS deals the hardest blow to the weakest health care delivery system. In particular, CD4 count machines are available at only a small number of facilities offering ART. The adverse consequence is that there are widespread delays in initiation of ART due to the limited number of CD4 cell count machines. It is also difficult for health workers to monitor the clinical and immunological progress of patients who initiate treatment.

Funding from the Global Fund has been used to acquire equipment and other supplies. However, the health care delivery system still lacks basic equipment and materials. The Global Fund needs to invest more resources in the acquisition of equipment and materials in order to strengthen the health sector. The Global Fund needs to shift its funding paradigm from short-term investment to long-term investment such as health infrastructure development. There exist disparities in accessing funding from the Global Fund. Urban-based health NGOs are more likely to access funding from the Global Fund than rural-based organisations or community-based organisations (WHO Maximizing Positive Synergies Project 2009). One of the major challenges reported for civil society and CBOs is access to resources from the Global Fund, due to time-consuming and complicated procedures and the lack of capacity among civil society to develop technically sound proposals. To alleviate this challenge, the Global Fund should simplify its procedures and target its communications to the civil society on opportunities to use its funding mechanisms.

### **8.2 Tuberculosis**

The increase in funding for tuberculosis in recent years has resulted in an increase in the quantity and quality of TB services. The number of smear positive patients has decreased over the years. On the other hand, the number of smear negative extra pulmonary tuberculosis patients has increased over the years. This has resulted in an increase of TB disease burden which in turn has led to overstretching of the health care delivery system. The main culprit for the increase in smear negative tuberculosis is HIV/AIDS. Patients who are infected with HIV are more likely to suffer from tuberculosis. The Government of Malawi is however in the process of integrating HIV/AIDS and tuberculosis services. That is, patients who are smear positive also undergo an HIV test.

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The number of microscopy centres has also increased. More health workers have been trained in TB services. A clear testimony of the improvement in quality of TB services is the high treatment and cure rate. Treatment success rate stands at 75 percent for new smear positive cases. Treatment completion rate among new smear negative cases is 75 percent and 73 percent for extra pulmonary cases.

The major challenge of TB services is that diagnosis of TB relies in passive detection using case notification. This has led to low detection rates. The World Health Organisation estimates that Malawi only detects 49 percent of all TB cases. Passive case detection explains the low case detection rate. The death rate among TB patients declined from 22 percent in 1998 to 13 percent in 2006. The government needs to adopt an active case detection rate in order to improve the case detection rate in Malawi. A possible constraint however is financial and human resources. There are also concerns that funding for TB has dwindled despite the huge amount of funding that TB received in the past decade.

### **8.3 Malaria**

In the past decade, malaria has received tremendous funding from international donors and national governments. The increase in funding has increased the quantity and quality of malaria control interventions. Children receiving prompt and effective treatment within 24 hours of the onset of fever have increased substantially since 2000. The coverage and use of ITNs among children less than five years and pregnant women has increased over the past eight years. The proportion of women accessing IPT has increased over the years. The problem however is that Roll Back Malaria 2005 targets for prompt and effective treatment, ITN use and coverage and coverage of intermittent preventive treatment for pregnant women have not been met in Malawi. There also exist widespread disparities in access to malaria intervention and services. In particular, urban children are more likely to access treatment within 24 hours of onset of fever than rural children. Children in the richest quintile of income are more likely to access prompt treatment than their counterparts in the poorest quintile. More educated mothers or caregivers are likely to promptly take their children to a health facility for treatment than mothers or caregivers with no education. Urban-based pregnant women are more likely to receive intermittent preventive treatment than rural-based women.

To improve case management and reduce geographical and income-based treatment disparities, the Ministry of Health should embrace and implement an easy-to-access home-based management of malaria (HMM). HMM entails providing mothers and caregivers of children less than five years old with increased access to appropriate information and appropriately packaged drugs to help ensure prompt and effective treatment. HMM may encourage prompt treatment given the fact that the family is the first hospital for any child with high fever in malaria endemic areas. Finally, the government should consider introducing intermittent preventive treatment for infants (IPT<sub>i</sub>) in order to protect children under five from frequent malaria attacks. It is fair to say that the Government of Malawi is in the process of conducting clinical trials to investigate the feasibility of initiating IPT<sub>i</sub>.

There are also spatial, income and education-based disparities in ITN ownership and use. In particular, urban households are more likely to own and use ITNs than their rural counterparts. In addition, households in the richest quintile are more likely to own and use ITNs than their counterparts in the poorest income quintile. In order to balance the need for equitable and sustainable ITN programme, the government should continue providing free ITNs to vulnerable groups (children under five and pregnant women) and encourage the development of a commercial sector for ITNs. The private sector may benefit from tax and tariff reforms. Removal of taxes and tariffs on ITNs will level the playing ground for domestic ITN producers

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attempting to compete with international firms. It is fair now to say that the disparities in the ownership and use of ITNs have been decreasing over the years.

Disparities also exist in access to IPT. More educated pregnant women are more likely to access IPT than less educated women. Pregnant women in the highest income quintile are more likely to access treatment than women in the lowest quintile. Educated pregnant women are likely to access IPT than pregnant women who are less educated. Differences in income and population levels between rural and urban residents might explain disparities in ITN utilisation.

#### **8.4 Non-HIV/AIDS, Tuberculosis and Malaria Health Services (Health System)**

The Global Fund's resources have strengthened the health care system. It has resulted in high retention of staff in the public sector due to the financial incentives that are provided to professional health staff. It has strengthened the capacity of the health care delivery system by recruitment of more than 5,000 health surveillance assistants. Resources from the Global Fund have also been used for purchasing and procurement of equipment and supplies.

The resources from the Global Fund and other donors have also strengthened the community-based health system by providing financial and technical support (WHO Positive Synergies Project 2009). Resources have also been used to establish a bursary for payment of school fees for orphans and other vulnerable children. However, the Global Fund has also skewed the health system towards HIV/AIDS, tuberculosis and malaria. In particular, more attention is paid to the three diseases than other equally important health problems such as primary health care (WHO Positive Synergies, 2009).

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## 9.0 Appendixes

### Appendix A: Study Question Details

Following is a more detailed description of the study questions that will be answered in this evaluation. Tabulation plans that are related to these questions can be found in the Attachment.

#### 1. **Has funding/spending increased for the three disease programmes?**

Financial resources are a fundamental input into any programme and are one of the primary focus areas of the Health Impact Evaluation. Other inputs (i.e., infrastructure, human capacity, technology, etc) are essential but, because they are not easily quantified, are not considered as separate determinants in this analysis.

An indication of annual donor funding contributions from the major donors can be obtained relatively easily by reviewing donor records. However, contributions made indirectly through other parties are not easily obtained but will be included in the analysis where possible. The National Health Account exercises already conducted and those that will be conducted as part of the evaluation will give an indication of the levels of spending on the three diseases in each participating country. As part of the sub-national assessment, information about the level of funding that reaches the district-level (or district-equivalent) will also be obtained.

#### 2. **Has the availability of services (both treatment and preventative) increased?**

There are many aspects to availability — quantity, quality, and coverage — which will be addressed as separate questions.

- Has the quantity of services increased?  
The quantity of health services provided will be obtained from a review of national routine service statistics. As part of the District Comprehensive Assessment (DCA), district-level information will be obtained by reviewing health facility records during the Facility Census.
- Are services equitably (geographic, gender, age) distributed?  
Disaggregating the abstracted service statistic information by geographic dispersion (urban/rural), gender, and age will give an indication as to how well the services are equitably distributed. Services should not necessarily be distributed equally but should match the need. For example, if a national sero-prevalence survey finds a higher HIV prevalence among women, then more women should be receiving services.
- Has the quality of services improved?  
Quality of services can be assessed at four different levels:
  - Level 1. Availability of basic elements: commodities, guidelines, systems, trained staff
  - Level 2. Quality of service delivery: adherence to treatment guidelines
  - Level 3. Adherence to services provided
  - Level 4. Effectiveness of services

With each increase in level, there is an increase in the complexity of the studies that need to be conducted. For example, to determine the quality of service delivery (Level 2) requires observation of services and interviews with providers and clients or review of patient medical records to determine if care is provided according to international or national guidelines whereas, a Level 4 determination about effectiveness would require a randomized controlled trial or long-term follow-up of a cohort of patients.

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Due to limited funding and time, the Health Impact Evaluation will assess quality of services primarily at Level 1 by ascertaining the availability of basic elements required to provide quality services. This information will come from the review of national health facility surveys and the DCA Health Facility Census. There will be less focus on the other levels. The DCA Follow-Up Study of TB patients and the record review of ARV patients will be conducted to give some information about adherence to treatment, an assessment of Level 3 of quality of services. An attempt will be made to also capture any information regarding Level 4 that may have been obtained in special studies. Survival analysis for ART patients and TB patients at facilities visited during the DCA Facility Census will also be attempted.

Given the limited availability of facility surveys, it is unlikely that multiple sets of information over time will be available so trends may not be established. The DCA is expected to give insight into the association between scale-up and quality of services.

Availability of basic elements (Level 1) for the provision of non-health services (those delivered in schools, in work places, and by community-based organizations) will be assessed in the DCA Community Survey.

- Has the coverage of services improved (overall and equitably)?  
Coverage of a limited list of services (health facility-based and community-based) will be captured during the review of information from national household surveys and in the DCA Household Surveys. Again it is unlikely that there will be trend data available to answer this question, and an association between level of scale-up and coverage will need to be determined.
- Is coverage more equitable?  
Service coverage information may be disaggregated to give a sense as to whether or not coverage is equitable. As stated for the equitable distribution of services, coverage of services may not be equal across groups, so coverage rates should be matched to need.
- Have knowledge and risk behaviours changed?  
Risk behaviours will be captured during the review of national surveys and in the DCA household survey. Information on this should be quite comparable across sources and will be easy to obtain. There should also be national trend data incorporating information from previous national household surveys.

### **3. Have the incidence, prevalence and mortality related to the three diseases changed?**

Capturing information on disease epidemiology will be difficult. In some cases, trend data will be available from existing surveys, disease surveillance, and HMIS data and in other cases modelling will need to be done to gain insight into this aspect.

Cause-specific mortality trends are difficult to detect. Trends in overall child and adult mortality will be obtained from secondary analysis. The primary purpose of initially including verbal autopsies was to obtain information on cause of death. In many countries baseline data on cause of death is lacking and it will be difficult to obtain empirical trends. Hospital data will be examined, and, if good, they may provide some indication on the importance of the three diseases as causes of death, albeit changing biases in admission and discharge practices over time may play an important confounding role. Estimates of reduction in mortality due to the three diseases will therefore rely on models that use coverage and effectiveness of interventions as major inputs.

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**4. Have there been any effects on non-HIV/AIDS, tuberculosis, and malaria health services?**

The emphasis that has been placed on the three diseases by increasing funding may have had an effect on the provision of other services. An indication of these wider health system effects will be gathered by looking at trends in the coverage of routine services such as childhood immunizations, family planning, and other maternal and child health services and compare them to trends in the coverage of the three diseases, where possible.

All analyses and studies will look at maternal and child health interventions, as a way to ascertain where there are negative or positive effects over time. In addition, health system data are gathered at the national and district level on financing and health workforce. In general, it will be difficult to attribute changes in these interventions, for example immunization coverage, to the scale-up against the three diseases as multiple factors play a role. With the DCA data this can be done in a single multi-level model of analysis. At the national level, the analysis will be more of a triangulation type.

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## Appendix B: HIV Mathematical Modelling – Methods

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21/04/2008

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### *Introduction*

HIV prevalence and sexual behaviour indicator data can be combined using mathematical modelling to test the hypothesis that changes in patterns of sexual behaviour have altered the natural course of the HIV epidemic. When epidemics mature, prevalence can decline even if individuals do not change their risk behaviour [1,2,3]. This is due to the epidemic moving to predominately lower risk groups and through AIDS mortality removing from the population some of the individuals that have contributed most to transmission. These ‘natural epidemiological dynamics’ confound simple statistical tests for trends in prevalence data since a significant decline in prevalence does not necessarily indicate behaviour changes reducing infectious spread. In addition, the non-linear threshold relationship between sexual risk behaviour and HIV spread means that the extent to which changes in reports of sexual behaviour materially affect the epidemic is unclear. Changes in sexual behaviour indicators, though apparently substantial, may not be epidemiologically relevant if, for instance, they are overwhelmed by high degrees of risk of other types, or they do not reduce the level of risk below a certain threshold, or they are confined to parts of the population at little risk of acquiring or transmitting infection [4,5 STI, 2007]. Therefore, it is useful to construct a mathematical model that provides a mechanistic description of the link between individual sexual behaviour, transmission in the population and that can simulate these natural epidemiological dynamics. Observed trends in prevalence data can then be compared against the model output to assess the evidence for observed changes in sexual behaviour actually having an impact on the course of the epidemic, beyond what natural changes in prevalence would be expected.

### *Methods*

The mathematical model represents the heterosexual transmission of HIV in a sex and sexual-activity stratified sexually-active population aged 15 to 49 years [2,6]. The model is defined by a set of ordinary differential equations and solved numerically. (Further details of the model, and the analysis procedure are provided in an appendix document.)

In the model, individuals starting sex are allocated to one of three sexual activity groups, representing those that have only spousal partnerships, those with long-term casual partnerships and those with high number of sexual partners. Model parameters specify, separately for each gender, the fraction of the population entering each group, the mean rate of partner change, and the relative rates of partner change for each group. Sexual partnerships formed between individuals in the two higher risk groups are classified as ‘casual’ partnerships; all other partnerships are classified as ‘regular’. The number of sex acts and condom use in each of these partnership types can be specified separately so that, for instance, casual partnerships comprise fewer sex acts and with higher condom use. The mean rate of forming sexual partnerships for men and women and the use of condoms in casual partnerships can change over time in piecewise linear fashion. (All other parameters are held constant during one epidemic simulation.) Parameters specify the year that the change in risk behaviour begins, the relative difference between the new and original values, and the time it takes for behaviour to reach the new value.

The extent of contact between individuals in the different risk groups is determined by the ‘mixing’ parameter’, which varies on a scale between random and assortative mixing (individuals

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tend to form partnerships with individuals in the corresponding sexual activity group of the opposite gender). If AIDS mortality selectively removes individuals from the higher risk groups, two assumptions are possible: there can be ‘no replacement’, and the distribution of risk behaviour in the population decreases; or ‘replacement’, so that individuals in other group move into the higher risk groups, so that the overall distribution remains constant over time. If the parameters used in a simulation are such that total number of partnerships formed by men and women are not equal (for instance, if AIDS mortality affects one sex more than the other) then a ‘balance’ parameter is used to determine the extent to which the actual pattern of contact is determined by the men.

Infected individuals move through two stages of asymptomatic infection; acute infection (lasts five months, with an elevated chance of transmission [7]) and latent infection (with a lower chance of transmission). Individuals develop symptoms of immune-suppression approximately eight years after infection, at which time the chance of transmission in each sex act increases but individuals may reduce the coital frequency. The overall mean time from infection to death is 10.5 years, which is in good agreement with recent observational data from African cohort studies [8,9].

The model simulates transmission in the general population, but most prevalence data is for women attending ante-natal clinics (ANCs). The two measures may not be directly comparable if the women attending clinics are not representative of the general population [6,10 AIDS, 2000]. Therefore, before comparison with the ANC data, the model-simulated prevalence time-series is recalibrated to correct the observed discrepancy between ANC measures of prevalence and measures of prevalence in the general population in the same year[11,12 2008].

The model is parameterised with behavioural indicator data from the country and compared to prevalence data in a Bayesian melding framework [13,14]. For each model parameter, a probability distribution is defined that represents prior knowledge about likely values. Where possible, these priors are based on data but if there is no information for a particular parameter a non-informative prior is used. Prior limits on simulated prevalence can also be set so that, despite there being little data available early in the epidemic, simulations in which prevalence rise too quickly or slowly can be excluded [12,14]. The simulated prevalence time-series is compared to prevalence data using an approach that compares trends in prevalence within each site (‘random effects model’), to avoid the possibility that declines in prevalence are spuriously indicated by the recruitment of progressively more remote clinics in the sentinel surveillance system [15 2006]. The analysis is performed separately for urban and rural regions, or with whatever stratification that is routinely used in deriving national estimates for HIV prevalence trends.

To test the hypothesis that changes in sexual behaviour have contributed to altering the natural course of the epidemic, two models are compared: one which does not allow behaviour change ( $M_0$ ), with one that does ( $M_1$ ). The *Bayes factor* measures the relative agreement to the data of the two models ( $M_1$  versus  $M_0$ ), and there is strong evidence for behaviour change influencing the epidemic if the Bayes factor is greater than 30, indicating that model  $M_1$  is in substantially better agreement with the data [16]. In that case, the number of infections averted is calculated by comparing two runs of model  $M_1$ , with the behaviour change parameters either set to their best-fitting values or to values indicating no behaviour change. These two simulations are run using the same population growth rate [17]. If the Bayes Factor is not greater than 30, then it is concluded that behavioural changes have not affected the epidemic trajectory and no infections have been averted. If the Bayes factor is between 10 and 30, there is some evidence for

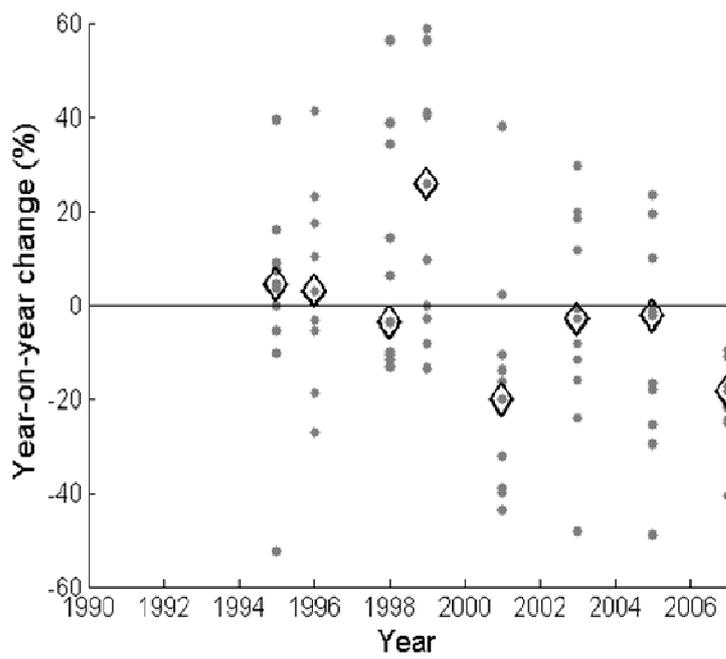
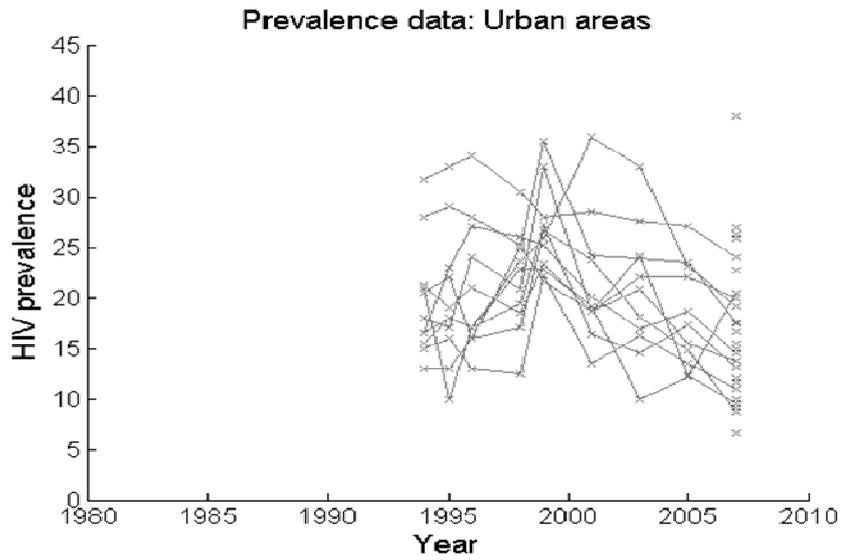
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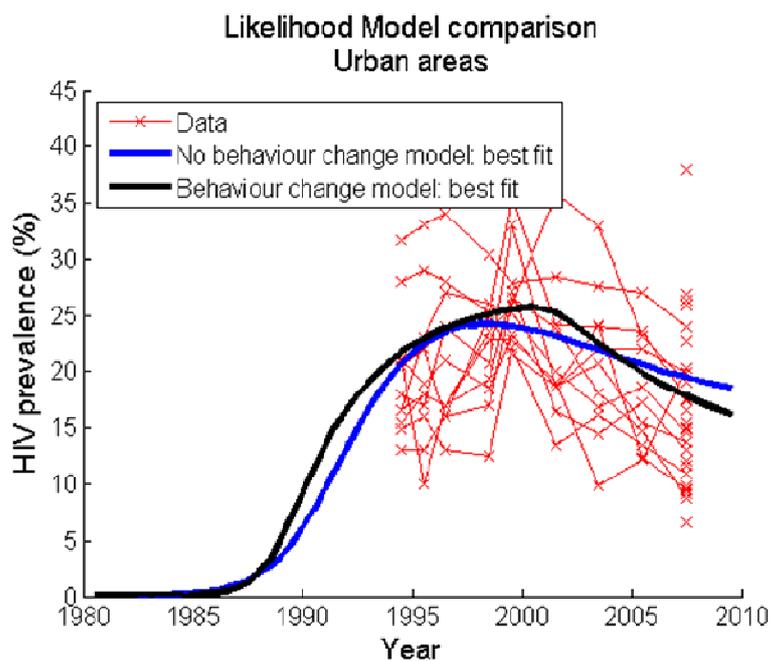
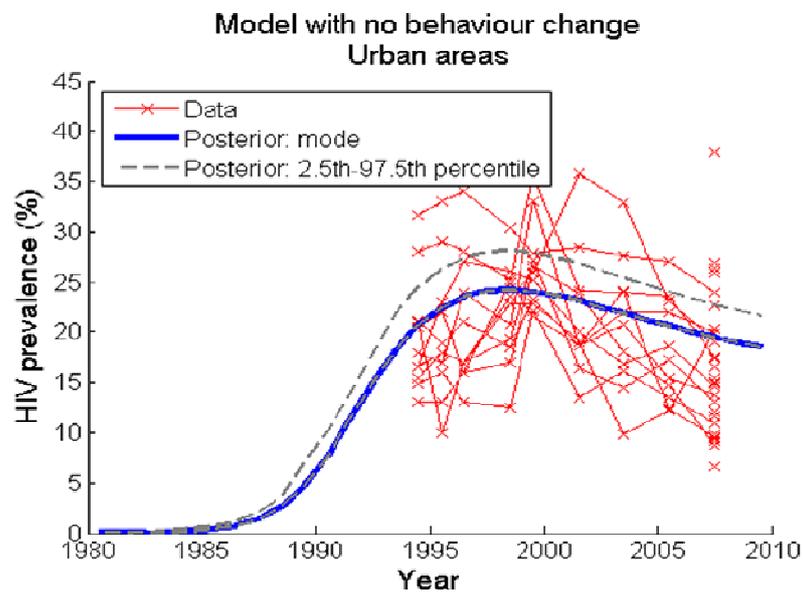
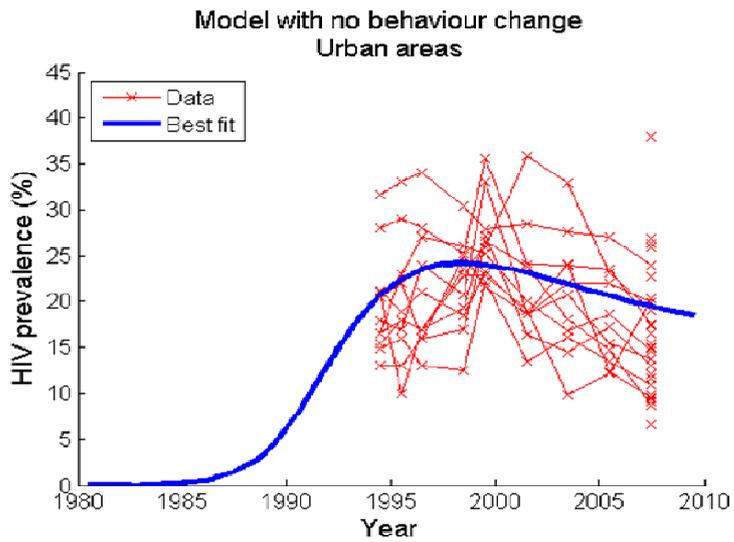
behaviour change altering the epidemic, and further interpretation is necessary. Numbers of infections averted in urban and rural areas of the country are summed to give national estimates.

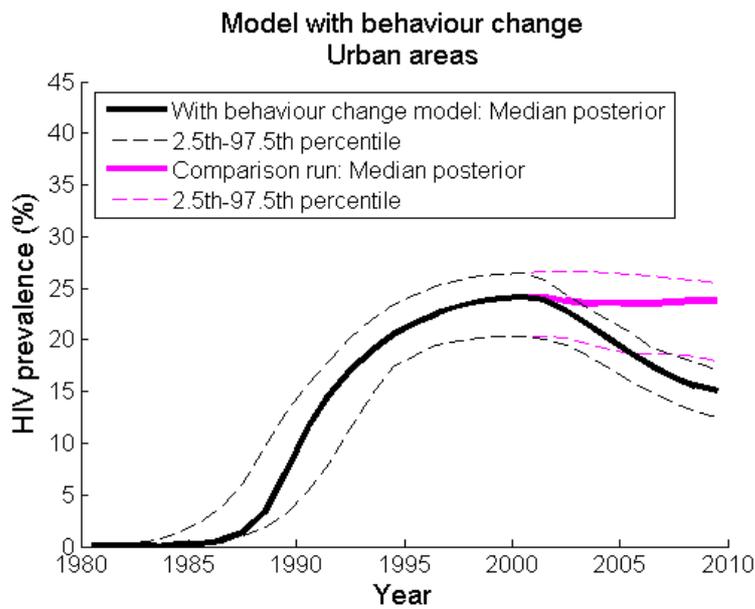
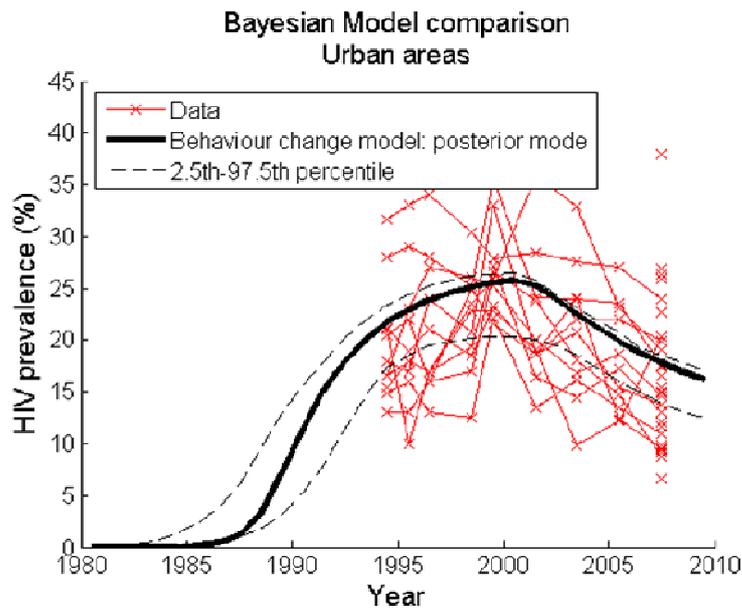
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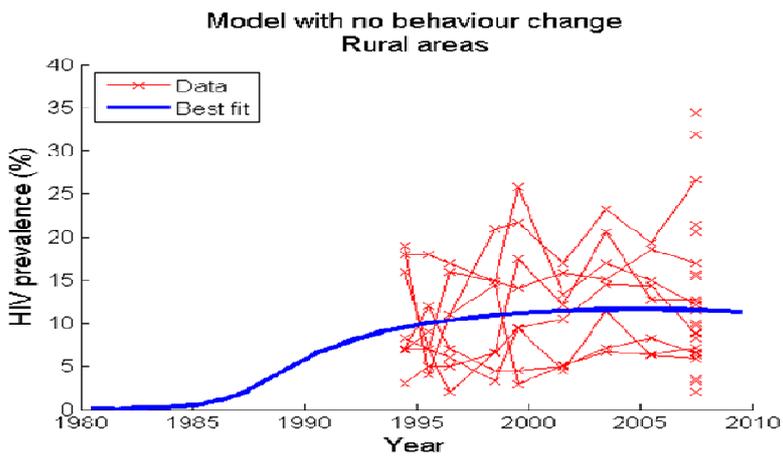
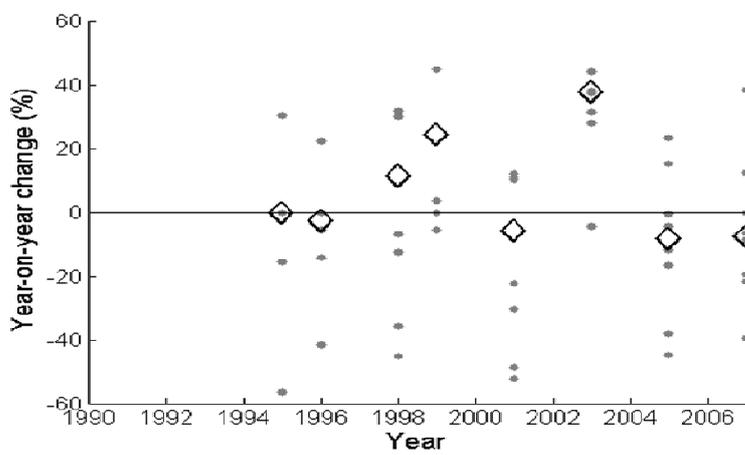
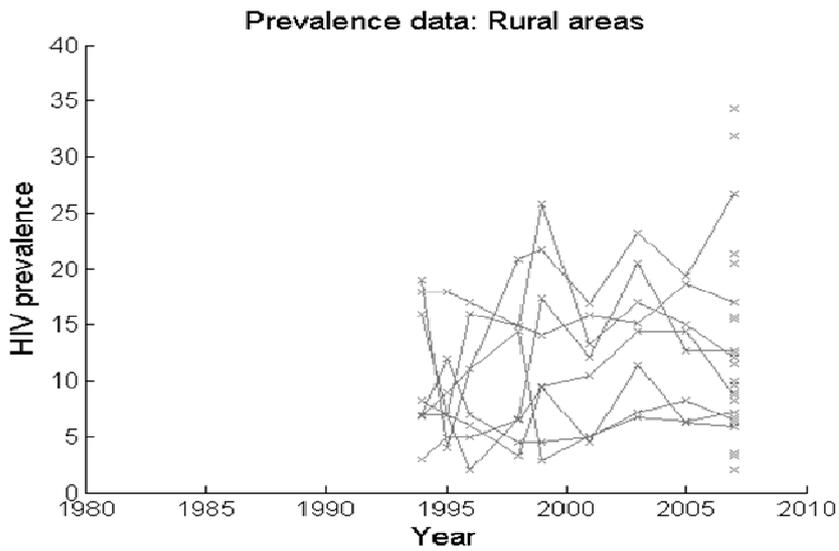
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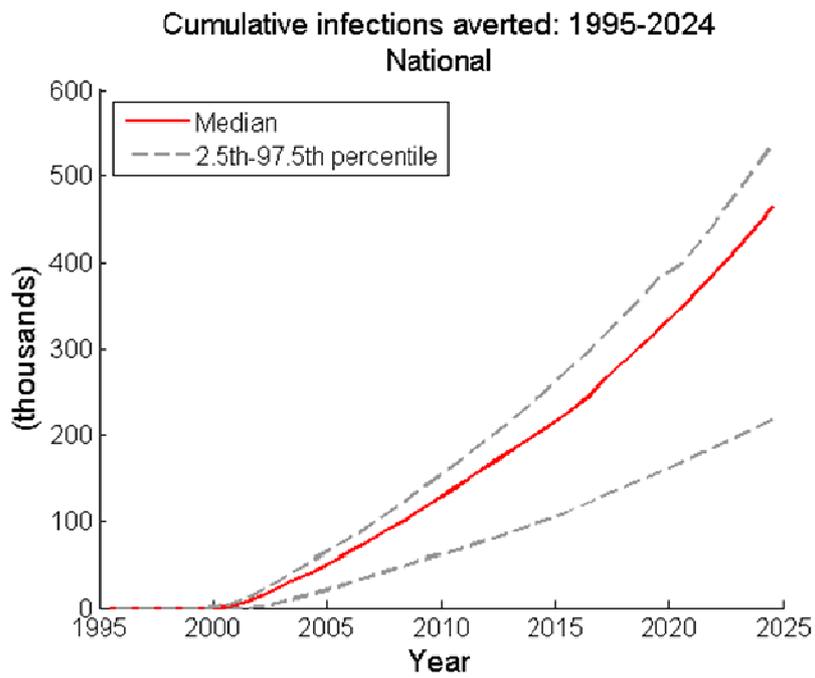
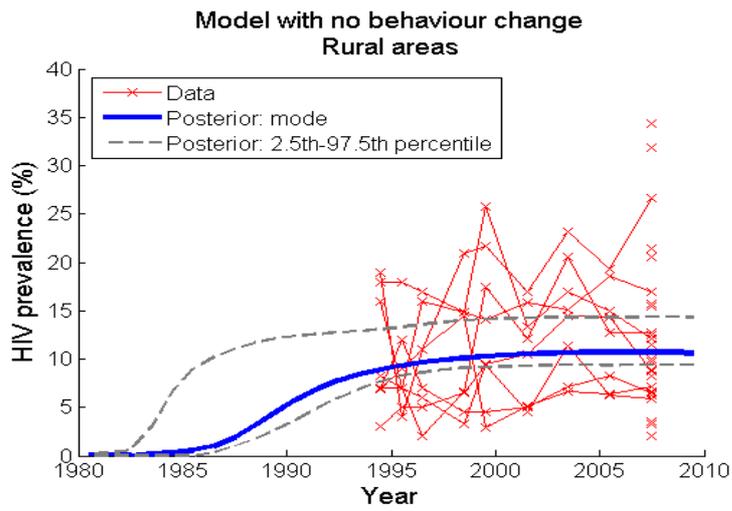
## Appendix C HIV Mathematical Modelling – Outputs











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## Appendix D: Malaria Modeling Section –Methods

### Background on modelling approach and tool

There is still a paucity of reliable indicators that can be used to measure short and long term, malaria-specific health impacts at country levels. Malaria related mortality, an important aspect of the burden of malaria,<sup>22</sup> is difficult to define and diagnose, especially in young children. Its measurement is confined to clinics which capture only a small and variable fraction of the malaria burden. All cause mortality, another useful indicator that has been used to evaluate the efficacy of various malaria interventions, can only be collected at a population level and is often limited to selected, small-scale sentinel ‘demographic surveillance’ sites.

Modeling has been used to estimate the impact of interventions on child survival focused on interventions that could be delivered at the community level for neonates and older children.<sup>23</sup> Models have also been used to examine the impact of clinic and community-based interventions and the impact they would have on mortality during the neonatal period.<sup>24</sup> Combination of these two models has produced an impact model that contained both community- and facility-based interventions that had been shown to be efficacious in reducing mortality.<sup>25</sup> This combined model is the basis from which modelling of impact of scaling up of malaria interventions begins, using 41 interventions and modelling the effects that scaling up these interventions would have on child mortality.

The purpose of the malaria modelling work is to estimate the impact that increased coverage of key effective malaria interventions have had on malaria-related mortality in the Malawi. A model will be used to estimate the lives saved/deaths averted due to increased coverage in three primary malaria-specific interventions as well as two other interventions that have an impact on malaria-related mortality. The malaria-specific interventions are insecticide treated bed nets, intermittent presumptive treatment for pregnant women, and effective treatment for children with malaria. The malaria-related interventions are supplementation of zinc and vitamin A. In addition, the model can be used to also look at the impact of indoor residual spraying if countries have a programme for this. The assumptions related to effectiveness of malaria interventions have been reviewed by the Monitoring and Evaluation Reference Group of Roll Back Malaria (Malaria MERG) and represent the consensus efficacy estimates for interventions. Recent efforts to validate the predicted impact from the model with measured changes in mortality have found good agreement suggesting that the model can be used to estimate deaths averted and lives saved due to increases in coverage.<sup>26</sup>

### Structure and process of modelling deaths averted or lives saved

The model is built around three major components. These are cause of death in children under the age of five years, coverage of key interventions, and effectiveness of these interventions. The basic structure of the model is that one loads in a baseline coverage of interventions and level and cause of deaths in children under the age of five. In addition, the model has efficacy of key

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<sup>22</sup> Nabarro D & Taylor E (1998) The ‘Roll Back Malaria’ campaign. *Science* 280, 2067–2068.

<sup>23</sup> Jones G, Steketee, R, Black RE, Bhutta Z, Morris, SS. How many child deaths can we prevent this year? *Lancet*, 2003; 362: 65-71.

<sup>24</sup> Darmstadt GL, Bhutta ZA, Cousens S, Adam T, Walker N, Debernisi L. (2005). Evidence-based, cost-effective interventions that matter: how many newborns can we save and at what cost? *Lancet* 2005; 365: 988-997.

<sup>25</sup> Morris SS, Black RE, Shibuya K, Cousens S, Bryce J. How Many Child Deaths Can We Prevent? New Estimates for 2003. Paper presented at Tracking Progress in Child Survival: Countdown to 2015. London, December 2005

<sup>26</sup> Masanja H, de Savigny D, Samuelson P, et al. Child survival gains in Tanzania: analysis of data from demographic and health surveys. *Lancet*, 2008; 371: 1276-1283.

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interventions in reducing cause-specific mortality. One can then look at the effects of increasing coverage on these interventions in reducing overall and cause-specific mortality. The model also uses national demographic projections that include population structure and fertility to produce estimates of number and rate of under-five deaths for the country under different assumptions of future scale up of interventions.

### **Model inputs**

As noted, the model inputs require yearly data (including estimated or interpolated data) for coverage of the major interventions: household ownership of insecticide-treated mosquito nets (ITNs); household application of indoor residual spraying within the past 6 (or 12) months; reproductive-aged women receiving 2 or more doses of intermittent preventive treatment during their last pregnancy (IPTp) which occurred in the past 2 years; and proportion of children under the age of 5 years with fever in the past two weeks who received an anti-malarial treatment according to national policy.

In addition to these malaria-specific intervention coverage estimates for the model, the malaria-associated mortality rates are understood to be affected by deficiencies in Vitamin A and Zinc. Thus changing coverage levels of supplementation efforts in Vitamin A and Zinc deficient populations will also improve child survival estimates and should be included in the model if possible. If there are no changes in the coverage of these supplements, these can be held constant in the model.

Finally, it is expected that intervention coverage data points are not available for every year and the model allows for linear interpolation of the estimates for the interim years based on the initial and final year coverage estimates. Or, if additional local information allows, the country estimates may be increasing in certain jumps in coverage in known years and this too can be input into the model.

## Appendix E. Tables from district health facility survey

Table 9.1 Total number of health facilities visited, percentage with specific drugs available on the day of the visit, and percentage with drugs available at some time during the past three months by District, Malawi 2008											
District	Total N° of Facilities visited	Percent w/ACT available today	Percent w/ACT available in past three months	Percent w/Artesiminin available today	Percent w/Artesiminin available in past three months	Percent w/Fansidar available today	Percent w/Fansidar available in past three months	Percent w/Quinine available today	Percent w/Quinine available in past three months	Percent w/Other available today	Percent w/Other available in past three months
Total	108	92.59	94.44	9.26	11.11	95.37	96.3	89.81	93.52	14.81	14.81
<b>Type of District</b>											
<b>High</b>	<b>15</b>	<b>86.67</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>93.33</b>	<b>100</b>	<b>93.33</b>	<b>93.33</b>	<b>6.67</b>	<b>6.67</b>
..Lilongwe	15	86.67	100	0	0	93.33	100	93.33	93.33	6.67	6.67
<b>Medium</b>	<b>69</b>	<b>92.75</b>	<b>92.75</b>	<b>14.49</b>	<b>15.94</b>	<b>95.65</b>	<b>95.65</b>	<b>89.86</b>	<b>95.65</b>	<b>15.94</b>	<b>15.94</b>
..Chiradzulu	13	84.62	84.62	38.46	46.15	100	100	84.62	100	46.15	46.15
..Karonga	6	100	100	0	0	100	100	83.33	100	0	0
..Machinga	18	88.89	88.89	5.56	5.56	88.89	88.89	88.89	88.89	5.56	5.56
..Mzimba	8	100	100	0	0	100	100	100	100	0	0
..Nkhotakota	15	100	100	13.33	13.33	93.33	93.33	93.33	93.33	13.33	13.33
..Zomba	9	88.89	88.89	22.22	22.22	100	100	88.89	100	22.22	22.22
<b>Low</b>	<b>24</b>	<b>95.83</b>	<b>95.83</b>	<b>0</b>	<b>4.17</b>	<b>95.83</b>	<b>95.83</b>	<b>87.5</b>	<b>87.5</b>	<b>16.67</b>	<b>16.67</b>
..Mwanza	12	91.67	91.67	0	8.33	91.67	91.67	91.67	91.67	25	25
..Ntchisi	12	100	100	0	0	100	100	83.33	83.33	8.33	8.33

Source: DCA Health Facility Survey, 2008

<b>Table 9.2 Number of health workers working full-time and number present on the day of the visit by district, Malawi 2008</b>										
	Working Full Time					Present at Facility today				
	Total	Medical doctors/physicians	Clinical officers /assistant medical officers	Certified registered nurses	Nursing assistants/nursing aides	Total	Medical doctors/physicians	Clinical officers /assistant medical officers	Certified registered nurses	Nursing assistants/nursing aides
<b>Total</b>	1,375	32	270	568	505	784	22	183	285	294
<b>Type of District</b>										
<b>High</b>	<b>202</b>	<b>7</b>	<b>52</b>	<b>118</b>	<b>25</b>	<b>112</b>	<b>2</b>	<b>36</b>	<b>56</b>	<b>18</b>
..Lilongwe	202	7	52	118	25	112	2	36	56	18
<b>Medium</b>	<b>901</b>	<b>19</b>	<b>168</b>	<b>337</b>	<b>377</b>	<b>547</b>	<b>16</b>	<b>113</b>	<b>187</b>	<b>231</b>
..Chiradzulu	101	3	35	32	31	45	3	16	16	10
..Karonga	107	1	16	43	47	68	1	12	26	29
..Machinga	116	1	17	28	70	79	1	15	21	42
..Mzimba	126	1	15	49	61	48	1	5	18	24
..Nkhotakota	294	3	35	124	132	157	2	27	51	77
..Zomba	157	10	50	61	36	150	8	38	55	49
<b>Low</b>	<b>272</b>	<b>6</b>	<b>50</b>	<b>113</b>	<b>103</b>	<b>125</b>	<b>4</b>	<b>34</b>	<b>42</b>	<b>45</b>
..Mwanza	168	5	24	57	82	64	4	11	19	30
..Ntchisi	104	1	26	56	21	61	0	23	23	15

Source: DCA Health Facility Survey, 2008

<b>Table 9.3: District by number and percentage of facilities with each guideline observed or reported available combined, Malawi 2008</b>										
Guideline Topic	Total	District								
		Lilongwe	Chiradzulu	Karonga	Machinga	Mzimba	Nkhotakota	Zomba	Mwanza	Ntchisi
Total N° of Facilities visited	108	15	13	6	18	8	15	9	12	12
Integrated management of childhood illness (IMCI)	73.15	73.33	76.92	83.33	66.67	75	66.67	88.89	66.67	75
Adolescent sexual and reproductive health	22.22	53.33	38.46	16.67	22.22	0	6.67	33.33	16.67	0
Delivery care	50	66.67	23.08	66.67	55.56	50	33.33	88.89	50	33.33
Family Planning	47.22	66.67	15.38	66.67	50	37.5	60	77.78	58.33	0
Diagnosis and treatment (management) of STIs	62.96	93.33	53.85	83.33	66.67	87.5	60	77.78	50	8.33
Diagnosis and treatment (management) of malaria	87.04	100	92.31	66.67	66.67	87.5	93.33	88.89	83.33	100
Diagnosis and treatment (management) of tuberculosis	49.07	86.67	61.54	50	16.67	75	33.33	44.44	33.33	58.33
Management of MDR-TB	12.04	40	7.69	0	11.11	12.5	0	22.22	8.33	0
HIV/AIDS opportunistic infection treatment and care	32.41	46.67	84.62	0	16.67	0	20	44.44	58.33	0
HIV/AIDS counselling and testing	46.3	80	69.23	33.33	33.33	0	20	44.44	58.33	58.33
HIV/AIDS counselling only	12.04	40	23.08	0	5.56	0	0	11.11	16.67	0
HIV testing including HIV rapid testing	43.52	33.33	23.08	50	38.89	50	60	77.78	66.67	8.33
Prevention of mother to child transmission (PMTCT) of HIV	80.56	93.33	76.92	83.33	72.22	100	60	88.89	75	91.67
Infection control/standard precautions for handling blood and other bodily fluids	50	60	7.69	33.33	50	50	46.67	77.78	50	75
Management of TB/HIV co-infection	13.89	53.33	23.08	0	11.11	0	6.67	0	0	8.33
Drug and supplies management	34.26	66.67	38.46	0	22.22	12.5	26.67	22.22	33.33	58.33
Health management information system (HMIS) training	30.56	53.33	23.08	0	33.33	12.5	13.33	33.33	50	33.33
Post-Exposure Prophylaxis (PEP)	20.37	46.67	30.77	0	5.56	0	13.33	44.44	25	8.33

**Source: DCA Health Facility Survey, 2008**

**Table 9.4 District by percentage of facilities with drugs and commodities available today or in the past three months, Malawi 2008**

Drugs and Commodities	Total	Type of District											
		High			Medium						Low		
		All	Lilongwe	All	..Chiradzulu	..Karonga	Machinga	Mzimba	..Nkhotakota	..Zomba	All	..Mwanza	..Ntchisi
<b>AVAILABLE TODAY</b>													
Total N° of Facilities visited	108	15	15	69	13	6	18	8	15	9	24	12	12
Salbutamol inhaler for asthma 0.1mcg/dose	23.15	6.67	6.67	26.09	61.54	0	22.22	12.5	26.67	11.11	25	41.67	8.33
Glibenclamide capsules or tabs for diabetes 5mg	20.37	26.67	26.67	20.29	15.38	33.33	5.56	12.5	33.33	33.33	16.67	16.67	16.67
Atenolol capsules or tabs for cardiovascular disease 50 mg	22.22	20	20	14.49	15.38	16.67	5.56	0	20	33.33	45.83	33.33	58.33
Captopril capsules or tabs for cardiovascular disease 25mg	12.96	6.67	6.67	15.94	38.46	0	0	12.5	20	22.22	8.33	16.67	0
Enalapril for cardiovascular disease 2.5mg	10.19	6.67	6.67	14.49	61.54	0	0	12.5	6.67	0	0	0	0
Simvastatin capsules or tabs for cardiovascular disease 20 mg	1.85	0	0	2.9	0	0	5.56	12.5	0	0	0	0	0
Amitriptyline capsules or tabs for depression 25 mg	36.11	33.33	33.33	40.58	92.31	33.33	16.67	12.5	46.67	33.33	25	25	25
Ciprofloxacin capsules or tabs for infectious disease 500mg	30.56	20	20	33.33	76.92	33.33	16.67	12.5	26.67	33.33	29.17	33.33	25
Co-trimoxazole suspension for pediatric infectious disease 8+40mg /ml	61.11	46.67	46.67	59.42	84.62	100	33.33	62.5	60	44.44	75	83.33	66.67
Co-trimoxazole tablets for adult infectious diseases 80-400mg	83.33	66.67	66.67	85.51	100	83.33	83.33	87.5	73.33	88.89	87.5	75	100
Co-trimoxazole tablets for adult infectious diseases 160-800mg	16.67	0	0	20.29	0	16.67	50	12.5	20	0	16.67	33.33	0
Amoxicilin capsules or tabs for infectious disease 500mg	69.44	33.33	33.33	78.26	100	83.33	77.78	62.5	86.67	44.44	66.67	91.67	41.67
Ceftriaxone injection for infectious disease 1g/vial	16.67	6.67	6.67	23.19	76.92	0	11.11	12.5	13.33	11.11	4.17	8.33	0
Fluconazole capsules or tabs for infectious disease 150mg	22.22	13.33	13.33	27.54	69.23	16.67	11.11	12.5	26.67	22.22	12.5	16.67	8.33
Diclofenac or ibuprofen capsules or tabs for pain relief 150mg	37.96	33.33	33.33	37.68	61.54	33.33	27.78	25	40	33.33	41.67	58.33	25
Paracetamol suspension for paediatric pain relief 125mg/ml	66.67	80	80	63.77	76.92	66.67	55.56	50	80	44.44	66.67	83.33	50
Omeprazole capsules or tabs for peptic ulcers and reflux 20 mg	22.22	13.33	13.33	27.54	76.92	0	11.11	0	26.67	33.33	12.5	25	0
Albendazole chewable tablets for the treatment of parasitic infestations 400 mg	85.19	100	100	91.3	100	100	88.89	87.5	93.33	77.78	58.33	83.33	33.33
Mebendazole tablets for the treatment of parasitic infestations 100 mg	17.59	60	60	11.59	23.08	0	11.11	12.5	6.67	11.11	8.33	16.67	0

<b>Table 9.4, cont....</b>													
Drugs and Commodities	Total	Type of District											
		High			Medium						Low		
		All	Lilongwe	All	..Chiradzulu	..Karonga	Machinga	Mzimba	..Nkhotakota	..Zomba	All	..Mwanza	..Ntchisi
Mebendazole tablets 500 mg	23.15	20	20	21.74	23.08	33.33	5.56	12.5	33.33	33.33	29.17	0	58.33
Metrodinazole for the treatment of vaginal infections	90.74	93.33	93.33	89.86	92.31	100	88.89	100	80	88.89	91.67	83.33	100
Vitamin A capsules 200,000IU	65.74	73.33	73.33	68.12	46.15	66.67	66.67	87.5	80	66.67	54.17	58.33	50
Oxytocin injection for use during second and third stage of labour and for treatment of postpartum haemorrhage 10IU in 1 ml ampoule	75	53.33	53.33	79.71	76.92	100	66.67	100	73.33	88.89	75	58.33	91.67
Magnesium sulphate for prevention and treatment of eclampsia-related seizures 500mg /ml in 2 ml ampoule	20.37	33.33	33.33	18.84	38.46	16.67	11.11	12.5	20	11.11	16.67	25	8.33
Oral rehydration salts ORS sachets	87.96	93.33	93.33	88.41	100	100	72.22	100	86.67	88.89	83.33	91.67	75
Combined oral contraceptive pills	87.96	93.33	93.33	88.41	92.31	100	83.33	87.5	93.33	77.78	83.33	75	91.67
Injectable contraceptives	81.48	93.33	93.33	79.71	84.62	100	72.22	87.5	86.67	55.56	79.17	75	83.33
Male condoms	82.41	86.67	86.67	81.16	84.62	100	77.78	75	86.67	66.67	83.33	83.33	83.33
<b>AVAILABLE IN PAST THREE MONTHS</b>													
Salbutamol inhaler for asthma 0.1mcg/dose	12.5	28.57	28.57	8.16	25	16.67	0	0	0	25	11.76	0	18.18
Glibenclamide capsules or tabs for diabetes 5mg	4.76	9.09	9.09	3.7	0	0	12.5	0	0	0	5.26	0	10
Atenolol capsules or tabs for cardiovascular disease 50 mg	2.5	0	0	1.79	0	0	0	12.5	0	0	8.33	0	20
Captopril capsules or tabs for cardiovascular disease 25mg	2.2	7.14	7.14	1.79	12.5	0	0	0	0	0	0	0	0
Enalapril for cardiovascular disease 2.5mg	2.11	0	0	3.45	20	0	0	0	0	11.11	0	0	0
Simvastatin capsules or tabs for cardiovascular disease 20 mg	1	0	0	1.61	0	16.67	0	0	0	0	0	0	0
Amitriptyline capsules or tabs for depression 25 mg	1.52	0	0	0	-	0	0	0	0	0	5.88	12.5	0
Ciprofloxacin capsules or tabs for infectious disease 500mg	8.22	25	25	4.44	0	0	0	14.29	9.09	0	6.25	14.29	0
Co-trimoxazole suspension for pediatric infectious disease 8+40mg /ml	25	37.5	37.5	11.11	0	-	0	0	33.33	20	80	0	100
Co-trimoxazole tables for adult infectious diseases 80-400mg	33.33	20	20	33.33	-	0	0	0	50	100	100	100	-
Co-trimoxazole tables for adult infectious diseases 160-800mg	2.33	6.67	6.67	0	0	0	0	0	0	0	5.26	14.29	0
Amoxicilin capsules or tabs for infectious disease 500mg	16.13	20	20	21.43	-	0	0	33.33	50	20	0	-	0
Ceftriaxone injection for infectious disease 1g/vial	1.15	0	0	1.96	50	0	0	0	0	0	0	0	0

Table 9.4, cont....													
Drugs and Commodities	Total	Type of District											
		High			Medium						Low		
		All	Lilongwe	All	..Chiradzulu	..Karonga	Machinga	Mzimba	..Nkhotakota	..Zomba	All	..Mwanza	..Ntchisi
Fluconazole capsules or tabs for infectious disease 150mg	0	0	0	0	0	0	0	0	0	0	0	0	0
Diclofenac or ibuprofen capsules or tabs for pain relief 150mg	6.15	0	0	9.52	20	0	8.33	0	11.11	16.67	0	0	0
Paracetamol suspension for paediatric pain relief 125mg/ml	32.35	66.67	66.67	25	66.67	0	14.29	0	66.67	20	42.86	0	50
Omeprazole capsules or tabs for peptic ulcers and reflux 20 mg	3.7	7.69	7.69	4.17	33.33	0	0	12.5	0	0	0	0	0
Albendazole chewable tablets for the treatment of parasitic infestations 400 mg	14.29	-	-	20	-	-	0	100	0	0	11.11	100	0
Mebendazole tablets for the treatment of parasitic infestations 100 mg	0	0	0	0	0	0	0	0	0	0	0	0	0
Mebendazole tablets 500 mg	0	0	0	0	0	0	0	0	0	0	0	0	0
Metrodinazole for the treatment of vaginal infections	37.5	0	0	50	100	-	0	-	33.33	100	0	0	-
Vitamin A capsules 200,000IU	41.18	75	75	25	16.67	0	20	100	33.33	33.33	60	50	66.67
Oxytocin injection for use during second and third stage of labour and for treatment of postpartum haemorrhage 10IU in 1 ml ampoule	8	14.29	14.29	7.69	0	-	0	-	25	0	0	0	0
Magnesium sulphate for prevention and treatment of eclampsia-related seizures 500mg /ml in 2 ml ampoule	0	0	0	0	0	0	0	0	0	0	0	0	0
Oral rehydration salts ORS sachets	63.64	100	100	42.86	-	-	50	-	50	0	100	-	100
Combined oral contraceptive pills	9.09	0	0	14.29	0	-	0	0	0	50	0	0	0
Injectable contraceptives	38.89	0	0	46.15	50	-	50	0	50	50	25	0	50
Male condoms	41.18	50	50	41.67	0	-	33.33	50	0	100	33.33	0	50

Table 9.5 Percentage availability of specific test by district, Malawi 2008													
Test and Availability	Total	Type of District											
		High			Medium						Low		
		All	Lilongwe	All	Chiradzulu	Karonga	Machinga	Mzimba	Nkhotakota	Zomba	All	Mwanza	Ntchisi
Total N° of Facilities visited	108	15	15	69	13	6	18	8	15	9	24	12	12
<b>HIV test</b>													
Available on-site results today	85.19	93.3	93.33	79.71	100	66.67	77.78	87.5	73.33	66.67	95.83	91.67	100
Not available	13.89	6.67	6.67	18.84	0	33.33	22.22	12.5	26.67	22.22	4.17	8.33	0
Missing	0.93	0	0	1.45	0	0	0	0	0	11.11	0	0	0
<b>Hb</b>													
Available on-site results today	27.78	33.3	33.33	26.09	15.38	16.67	33.33	12.5	20	55.56	29.17	41.67	16.67
Available off-site results 2 days	1.85	0	0	0	0	0	0	0	0	0	8.33	16.67	0
Not available	69.44	66.7	66.67	72.46	76.92	83.33	66.67	87.5	80	44.44	62.5	41.67	83.33
Missing	0.93	0	0	1.45	7.69	0	0	0	0	0	0	0	0
<b>Malaria blood slide</b>													
Available on-site results today	44.44	53.3	53.33	49.28	92.31	16.67	44.44	12.5	33.33	77.78	25	41.67	8.33
Available off-site results 2 days	1.85	0	0	0	0	0	0	0	0	0	8.33	16.67	0
Not available	53.7	46.7	46.67	50.72	7.69	83.33	55.56	87.5	66.67	22.22	66.67	41.67	91.67
<b>TB sputum</b>													
Available on-site results today	8.33	6.67	6.67	10.14	0	16.67	5.56	12.5	20	11.11	4.17	8.33	0
Available on-site results not today	12.04	13.3	13.33	11.59	0	0	22.22	0	6.67	33.33	12.5	25	0
Available off-site results 2 days	12.96	33.3	33.33	5.8	23.08	0	0	0	0	11.11	20.83	25	16.67
Not available	65.74	46.7	46.67	71.01	69.23	83.33	72.22	87.5	73.33	44.44	62.5	41.67	83.33
Missing	0.93	0	0	1.45	7.69	0	0	0	0	0	0	0	0
<b>Blood glucose</b>													
Available on-site results today	21.3	33.3	33.33	20.29	23.08	16.67	16.67	12.5	20	33.33	16.67	25	8.33
Available off-site results 2 days	1.85	0	0	0	0	0	0	0	0	0	8.33	16.67	0
Not available	75.93	66.7	66.67	78.26	69.23	83.33	83.33	87.5	80	66.67	75	58.33	91.67
Missing	0.93	0	0	1.45	7.69	0	0	0	0	0	0	0	0
<b>Syphilis test</b>													
Available on-site results today	26.85	33.3	33.33	27.54	53.85	33.33	16.67	12.5	20	33.33	20.83	25	16.67
Available off-site results 2 days	1.85	0	0	0	0	0	0	0	0	0	8.33	16.67	0
Not available	71.3	66.7	66.67	72.46	46.15	66.67	83.33	87.5	80	66.67	70.83	58.33	83.33

Source: DCA Health Facility Survey, 2008

<b>Table 9.6 Availability of specific tests in facilities by district, Malawi 2008</b>												
Test and Availability	Total	Type of District										
		High			Medium						Low	
		All	..Lilongwe	All	..Chiradzulu	..Karonga	..Machinga	..Mzimba	..Nkhotakota	..Zomba	All	..Mwanza
Total N° of Facilities visited	108	<b>15</b>	15	<b>69</b>	13	6	18	8	15	9	<b>24</b>	12
<b>HIV test</b>												
Available on-site results today	92	<b>14</b>	14	<b>55</b>	13	4	14	7	11	6	<b>23</b>	11
Not available	15	<b>1</b>	1	<b>13</b>	0	2	4	1	4	2	<b>1</b>	1
Missing	1	<b>0</b>	0	<b>1</b>	0	0	0	0	0	1	<b>0</b>	0
<b>Hb</b>												
Available on-site results today	30	<b>5</b>	5	<b>18</b>	2	1	6	1	3	5	<b>7</b>	5
Available off-site results 2 days	2	<b>0</b>	0	<b>0</b>	0	0	0	0	0	0	<b>2</b>	2
Not available	75	<b>10</b>	10	<b>50</b>	10	5	12	7	12	4	<b>15</b>	5
Missing	1	<b>0</b>	0	<b>1</b>	1	0	0	0	0	0	<b>0</b>	0
<b>Malaria blood slide</b>												
Available on-site results today	48	<b>8</b>	8	<b>34</b>	12	1	8	1	5	7	<b>6</b>	5
Available off-site results 2 days	2	<b>0</b>	0	<b>0</b>	0	0	0	0	0	0	<b>2</b>	2
Not available	58	<b>7</b>	7	<b>35</b>	1	5	10	7	10	2	<b>16</b>	5
<b>TB sputum</b>												
Available on-site results today	9	<b>1</b>	1	<b>7</b>	0	1	1	1	3	1	<b>1</b>	1
Available on-site results not today	13	<b>2</b>	2	<b>8</b>	0	0	4	0	1	3	<b>3</b>	3
Available off-site results 2 days	14	<b>5</b>	5	<b>4</b>	3	0	0	0	0	1	<b>5</b>	3
Not available	71	<b>7</b>	7	<b>49</b>	9	5	13	7	11	4	<b>15</b>	5
Missing	1	<b>0</b>	0	<b>1</b>	1	0	0	0	0	0	<b>0</b>	0
<b>Blood glucose</b>												
Available on-site results today	23	<b>5</b>	5	<b>14</b>	3	1	3	1	3	3	<b>4</b>	3
Available off-site results 2 days	2	<b>0</b>	0	<b>0</b>	0	0	0	0	0	0	<b>2</b>	2
Not available	82	<b>10</b>	10	<b>54</b>	9	5	15	7	12	6	<b>18</b>	7
Missing	1	<b>0</b>	0	<b>1</b>	1	0	0	0	0	0	<b>0</b>	0
<b>Syphilis test</b>												
Available on-site results today	29	<b>5</b>	5	<b>19</b>	7	2	3	1	3	3	<b>5</b>	3
Available off-site results 2 days	2	<b>0</b>	0	<b>0</b>	0	0	0	0	0	0	<b>2</b>	2
Not available	77	<b>10</b>	10	<b>50</b>	6	4	15	7	12	6	<b>17</b>	7

Source: DCA Health Facility Survey, 2008

**Table 9.7: Percentage of facilities with specific features regarding the total number of facilities visited, Malawi 2008**

	Telephone or short wave	Computer functioning	Internet access	Electricity	Safe Water
Total N° of Facilities visited	108.00	108.00	108.00	108.00	108.00
Total of Facilities with:	98.15	18.52	12.96	50.00	92.59
<b>Type of District</b>					
<b>High</b>	<b>12.96</b>	<b>3.70</b>	<b>1.85</b>	<b>9.26</b>	<b>12.96</b>
..Lilongwe	12.96	3.70	1.85	9.26	12.96
<b>Medium</b>	<b>62.96</b>	<b>11.11</b>	<b>9.26</b>	<b>30.56</b>	<b>61.11</b>
..Chiradzulu	12.04	3.70	3.70	4.63	12.04
..Karonga	5.56	0.93	0.93	2.78	5.56
..Machinga	15.74	1.85	0.93	7.41	15.74
..Mzimba	7.41	0.93	0.93	2.78	6.48
..Nkhotakota	13.89	1.85	0.93	6.48	12.96
..Zomba	8.33	1.85	1.85	6.48	8.33
<b>Low</b>	<b>22.22</b>	<b>3.70</b>	<b>1.85</b>	<b>10.19</b>	<b>18.52</b>
..Mwanza	11.11	2.78	1.85	6.48	11.11
..Ntchisi	11.11	0.93	0.00	3.70	7.41
<b>Source: DCA Health Facility Survey, 2008</b>					

**Table 9.8: Number of facilities having specific features regarding the total number of facilities visited, Malawi 2008**

	Telephone or short wave	Computer functioning	Internet access	Electricity	Safe Water
Total N° of Facilities visited	108	108	108	108	108
Total of Facilities with:	106	20	14	54	100
<b>Type of District</b>					
<b>High</b>	<b>14</b>	<b>4</b>	<b>2</b>	<b>10</b>	<b>14</b>
..Lilongwe	14	4	2	10	14
<b>Medium</b>	<b>68</b>	<b>12</b>	<b>10</b>	<b>33</b>	<b>66</b>
..Chiradzulu	13	4	4	5	13
..Karonga	6	1	1	3	6
..Machinga	17	2	1	8	17
..Mzimba	8	1	1	3	7
..Nkhotakota	15	2	1	7	14
..Zomba	9	2	2	7	9
<b>Low</b>	<b>24</b>	<b>4</b>	<b>2</b>	<b>11</b>	<b>20</b>
..Mwanza	12	3	2	7	12
..Ntchisi	12	1	0	4	8
<b>Source: DCA Health Facility Survey, 2008</b>					

<b>Table 9.9 Infrastructure and availability of services at health facility, by percentage</b>						
	Counselling and testing only	Counselling and testing and PMTCT only	Counselling and testing, PMTCT and ARV's only	TB services	Malaria services	TOTAL
<b>Land line telephone</b>						
Yes	20.0	18.0	18.0	22.0	24.0	24.0
No	72.0	58.0	48.0	83.0	86.0	88.0
<b>Cellular phones</b>						
Yes	87.0	73.0	64.0	101.0	105.0	107.0
No	5.0	3.0	2.0	4.0	5.0	5.0
<b>Short-wave radio</b>						
Yes	73.0	63.0	53.0	80.0	80.0	82.0
No	18.0	12.0	12.0	24.0	29.0	29.0
Missing	1.0	1.0	1.0	1.0	1.0	1.0
<b>Phone within 15 minutes</b>						
Yes, available at all times	62.0	50.0	45.0	74.0	78.0	79.0
Yes, not available at all times	13.0	12.0	9.0	13.0	13.0	13.0
No, none within 15 minutes	16.0	13.0	11.0	17.0	18.0	19.0
Missing	1.0	1.0	1.0	1.0	1.0	1.0
<b>Computer</b>						
Yes, functioning	20.0	19.0	19.0	20.0	21.0	21.0
Yes, not functioning	4.0	4.0	4.0	4.0	4.0	4.0
No	68.0	53.0	43.0	81.0	85.0	87.0
<b>Internet access</b>						
Yes	14.0	14.0	14.0	14.0	14.0	14.0
No	9.0	8.0	8.0	9.0	10.0	10.0
Missing	1.0	1.0	1.0	1.0	1.0	1.0
<b>Central supply of electricity</b>						
Yes	47.0	43.0	39.0	51.0	56.0	56.0
No	43.0	32.0	26.0	52.0	52.0	54.0
Missing	2.0	1.0	1.0	2.0	2.0	2.0
<b>Other source of electricity</b>						
Generator	17.0	17.0	17.0	17.0	19.0	19.0
Solar supply	39.0	31.0	24.0	43.0	44.0	45.0
Other source	1.0	1.0	0.0	1.0	1.0	1.0
Missing	35.0	27.0	25.0	44.0	46.0	47.0
<b>Functional generator</b>						
Yes, functional with fuel	13.0	13.0	13.0	13.0	15.0	15.0
Not functional	3.0	3.0	3.0	3.0	3.0	3.0
Don't know	1.0	1.0	1.0	1.0	1.0	1.0
Missing	35.0	27.0	25.0	44.0	46.0	47.0
<b>Continuous power</b>						
Yes	40.0	37.0	33.0	43.0	47.0	48.0
No	46.0	34.0	28.0	56.0	57.0	58.0
Missing	6.0	5.0	5.0	6.0	6.0	6.0
<b>Most common source of water</b>						
Piped into facility	60.0	55.0	48.0	65.0	69.0	70.0
Piped onto facility grounds	2.0	2.0	2.0	2.0	2.0	2.0
Public taps, standpipe	1.0	0.0	0.0	1.0	1.0	1.0
Tubewell/borehole	23.0	16.0	13.0	30.0	31.0	32.0
Protected dug well	2.0	1.0	1.0	2.0	2.0	2.0
Unprotected dug well	2.0	1.0	1.0	2.0	2.0	2.0
No water source	0.0	0.0	0.0	1.0	1.0	1.0
Missing	2.0	1.0	1.0	2.0	2.0	2.0
<b>Water outlet within 500 mts</b>						
Yes	26.0	18.0	15.0	32.0	33.0	34.0
No	2.0	1.0	1.0	3.0	3.0	3.0
Missing	2.0	0.0	0.0	2.0	2.0	2.0
<b>Provide inpatient care</b>						
Yes	26.0	25.0	25.0	26.0	26.0	26.0
No	61.0	46.0	37.0	74.0	79.0	80.0
Missing	5.0	5.0	4.0	5.0	5.0	6.0

Source: DCA Health Facility Survey

<b>Table 9.10 Percentage of infrastructure and availability of services at health facility</b>						
	Counselling and testing only	Counselling and testing and PMTCT only	Counselling and testing, PMTCT and ARV's only	TB services	Malaria services	TOTAL
<b>Antenatal services</b>						
Yes	90.0	76.0	66.0	97.0	99.0	101.0
No	2.0	0.0	0.0	8.0	11.0	11.0
<b>Delivery services at the facility</b>						
Yes	83.0	73.0	64.0	90.0	91.0	92.0
No	9.0	3.0	2.0	15.0	19.0	20.0
<b>Parental administration of antibiotics</b>						
Yes	89.0	75.0	65.0	100.0	106.0	107.0
No	3.0	1.0	1.0	5.0	4.0	5.0
<b>Parental administration of oxytocic drugs</b>						
Yes	77.0	68.0	61.0	87.0	87.0	87.0
No	15.0	8.0	5.0	18.0	23.0	25.0
<b>Parental administration of anti-convulsants</b>						
Yes	88.0	74.0	64.0	101.0	106.0	107.0
No	4.0	2.0	2.0	4.0	4.0	5.0
<b>Manual removal of placenta</b>						
Yes	48.0	45.0	41.0	52.0	52.0	52.0
No	44.0	31.0	25.0	53.0	58.0	60.0
<b>Removal of retained product</b>						
Yes	26.0	26.0	25.0	27.0	28.0	28.0
No	66.0	50.0	41.0	78.0	82.0	84.0
<b>Delivery services at home</b>						
Yes	2.0	1.0	1.0	3.0	3.0	3.0
No	86.0	72.0	62.0	98.0	103.0	105.0
Missing	4.0	3.0	3.0	4.0	4.0	4.0
<b>Postpartum services</b>						
Yes	83.0	73.0	64.0	91.0	92.0	93.0
No	9.0	3.0	2.0	14.0	18.0	19.0
<b>Diagnosis of sexually transmitted infection</b>						
Yes	66.0	54.0	46.0	78.0	84.0	84.0
No	26.0	22.0	20.0	27.0	26.0	28.0
<b>Treatment of sexually transmitted infection</b>						
Yes	87.0	73.0	64.0	100.0	106.0	107.0
No	5.0	3.0	2.0	5.0	4.0	5.0
<b>Cervical cancer prevention</b>						
Yes	11.0	9.0	8.0	11.0	11.0	11.0
No	80.0	66.0	57.0	93.0	98.0	100.0
Missing	1.0	1.0	1.0	1.0	1.0	1.0
<b>Home-based care</b>						
Yes	63.0	58.0	52.0	67.0	67.0	68.0
No	29.0	18.0	14.0	38.0	43.0	44.0
<b>Palliative care</b>						
Yes	44.0	39.0	32.0	45.0	45.0	46.0
No	46.0	35.0	32.0	58.0	63.0	64.0
Missing	2.0	2.0	2.0	2.0	2.0	2.0
<b>Diagnosis of malaria</b>						
Yes	44.0	41.0	38.0	46.0	48.0	48.0
No	48.0	35.0	28.0	59.0	62.0	64.0
<b>Treatment of malaria</b>						
Yes	90.0	75.0	66.0	104.0	110.0	110.0
No	2.0	1.0	0.0	1.0	0.0	2.0

Source: DCA Health Facility Survey, 2008

<b>Table 9.11 Percentage of TB services offered at health facilities</b>						
	Counselling and testing only	Counselling and testing and PMTCT only	Counselling and testing, PMTCT and ARV's only	TB services	Malaria services	TOTAL
<b>Offer TB services</b>						
Yes	90.0	75.0	66.0	105.0	104.0	105.0
No	2.0	1.0	0.0	0.0	6.0	7.0
<b>Offers: Diagnosis of TB through sputum smear microscopy</b>						
Yes	31.0	29.0	28.0	32.0	32.0	32.0
No	59.0	46.0	38.0	73.0	72.0	73.0
<b>Offers: Diagnosis of tuberculosis through culture</b>						
Yes	2.0	2.0	2.0	2.0	2.0	2.0
No	88.0	73.0	64.0	103.0	102.0	103.0
<b>Offers: Diagnosis of tuberculosis including X-ray</b>						
Yes	12.0	12.0	12.0	12.0	12.0	12.0
No	78.0	63.0	54.0	93.0	92.0	93.0
<b>Offers: Diagnosis of MDR TB using culture or rapid test</b>						
Yes	3.0	3.0	3.0	3.0	3.0	3.0
No	86.0	71.0	62.0	101.0	100.0	101.0
Missing	1.0	1.0	1.0	1.0	1.0	1.0
<b>Offers: Treatment of tuberculosis</b>						
Yes	81.0	69.0	61.0	94.0	93.0	94.0
No	9.0	6.0	5.0	11.0	11.0	11.0
<b>Offers: Directly Observed Treatment, Short- course (DOTS)</b>						
Yes	48.0	41.0	36.0	55.0	54.0	55.0
No	42.0	34.0	30.0	50.0	50.0	50.0
<b>Offers: Directly Observed Treatment (DOT) outreach services</b>						
Yes	55.0	45.0	38.0	67.0	66.0	67.0
No	35.0	30.0	28.0	38.0	38.0	38.0
<b>Offers: Follow-up of tuberculosis patients</b>						
Yes	83.0	70.0	61.0	97.0	96.0	97.0
No	6.0	4.0	4.0	7.0	7.0	7.0
Missing	1.0	1.0	1.0	1.0	1.0	1.0

Source: DCA Health Facility Survey, 2008

**Table 9.12 Percentage of HIV/AIDS services offered at health facilities**

	Counselling and testing only	Counselling and testing and PMTCT only	Counselling and testing, PMTCT and ARV's only	TB services	Malaria services	TOTAL
<b>Offers: HIV counselling</b>						
Yes	92.0	76.0	66.0	94.0	95.0	97.0
No	0.0	0.0	0.0	5.0	6.0	6.0
Missing	0.0	0.0	0.0	1.0	1.0	1.0
<b>Offers: HIV counselling for pregnant women</b>						
Yes	90.0	76.0	66.0	91.0	91.0	93.0
No	2.0	0.0	0.0	8.0	10.0	10.0
Missing	0.0	0.0	0.0	1.0	1.0	1.0
<b>Offers: HIV testing</b>						
Yes	92.0	76.0	66.0	90.0	90.0	92.0
No	0.0	0.0	0.0	9.0	11.0	11.0
Missing	0.0	0.0	0.0	1.0	1.0	1.0
<b>Offers: HIV Testing of pregnant women</b>						
Yes	89.0	75.0	65.0	87.0	87.0	89.0
No	3.0	1.0	1.0	12.0	14.0	14.0
Missing	0.0	0.0	0.0	1.0	1.0	1.0
<b>Offers: Antiretroviral therapy (ART)</b>						
Yes	69.0	66.0	66.0	72.0	72.0	72.0
No	22.0	10.0	0.0	27.0	29.0	31.0
Missing	1.0	0.0	0.0	1.0	1.0	1.0
<b>Offers: Prevention of mother-to-child transmission (PMTCT) through ARVs</b>						
Yes	76.0	76.0	66.0	78.0	78.0	79.0
No	16.0	0.0	0.0	22.0	24.0	25.0
<b>Offers: Post-exposure prophylaxis</b>						
Yes	50.0	48.0	43.0	51.0	51.0	52.0
No	42.0	28.0	23.0	48.0	50.0	51.0
Missing	0.0	0.0	0.0	1.0	1.0	1.0
<b>Offers: Youth friendly services</b>						
Yes	53.0	47.0	41.0	56.0	57.0	58.0
No	38.0	28.0	24.0	42.0	43.0	44.0
Missing	1.0	1.0	1.0	2.0	2.0	2.0
<b>Offers: HIV/AIDS preventive outreach services</b>						
Yes	69.0	62.0	53.0	74.0	74.0	75.0
No	21.0	12.0	11.0	23.0	25.0	26.0
Missing	2.0	2.0	2.0	3.0	3.0	3.0
<b>Provide Blood transfusion</b>						
Yes	15.0	15.0	15.0	15.0	15.0	15.0
No	77.0	61.0	51.0	87.0	92.0	94.0
Missing	0.0	0.0	0.0	3.0	3.0	3.0

Source: DCA Health Facility Survey, 2008

<b>Table 9.13 Percentage availability and functionality of equipment in health facility</b>						
	Counselling and testing only	Counselling and testing and PMTCT only	Counselling and testing, PMTCT and ARV's only	TB services	Malaria services	TOTAL
<b>Equipment: X-ray machine</b>						
Available and functional now	12.0	12.0	12.0	12.0	12.0	12.0
Available not functional now	2.0	2.0	1.0	2.0	2.0	2.0
Never available	78.0	62.0	53.0	91.0	96.0	98.0
<b>Blood pressure machine</b>						
Available and functional now	82.0	68.0	59.0	93.0	98.0	100.0
Available not functional now	2.0	1.0	1.0	4.0	4.0	4.0
Not available	3.0	3.0	3.0	3.0	3.0	3.0
Never available	5.0	4.0	3.0	5.0	5.0	5.0
<b>Stethoscope(s)</b>						
Available and functional now	87.0	72.0	62.0	100.0	105.0	107.0
Available not functional now	1.0	1.0	1.0	1.0	1.0	1.0
Not available	3.0	3.0	3.0	3.0	3.0	3.0
Never available	1.0	0.0	0.0	1.0	1.0	1.0
<b>Micronebulizer</b>						
Available and functional now	13.0	13.0	12.0	13.0	13.0	13.0
Available not functional now	5.0	4.0	3.0	4.0	4.0	5.0
Not available	1.0	1.0	1.0	1.0	1.0	1.0
Never available	72.0	57.0	49.0	86.0	91.0	92.0
Missing	1.0	1.0	1.0	1.0	1.0	1.0
<b>Ophthalmoscope</b>						
Available and functional now	26.0	21.0	19.0	27.0	32.0	33.0
Available not functional now	4.0	4.0	3.0	4.0	4.0	4.0
Not available	1.0	1.0	1.0	1.0	1.0	1.0
Never available	60.0	49.0	42.0	72.0	72.0	73.0
Missing	1.0	1.0	1.0	1.0	1.0	1.0
<b>Otoscope</b>						
Available and functional now	39.0	33.0	29.0	41.0	46.0	47.0
Available not functional now	4.0	4.0	3.0	4.0	4.0	4.0
Not available	4.0	4.0	4.0	4.0	4.0	4.0
Never available	45.0	35.0	30.0	56.0	56.0	57.0
<b>CTSCAN or MRI</b>						
Available and functional now	1.0	1.0	1.0	1.0	1.0	1.0
Available not functional now	1.0	1.0	1.0	1.0	1.0	1.0
Not available	1.0	1.0	1.0	1.0	1.0	1.0
Never available	89.0	73.0	63.0	102.0	107.0	109.0
<b>Adult weighing scale</b>						
Available and functional now	77.0	67.0	58.0	91.0	95.0	97.0
Available not functional now	6.0	6.0	6.0	6.0	6.0	6.0
Not available	2.0	1.0	1.0	2.0	2.0	2.0
Never available	7.0	2.0	1.0	6.0	7.0	7.0
<b>Weighing equipment for under 5</b>						
Available and functional now	87.0	72.0	62.0	100.0	103.0	105.0
Available not functional now	3.0	3.0	3.0	3.0	3.0	3.0
Never available	2.0	1.0	1.0	2.0	4.0	4.0
<b>Thermometer for oral or rectal temperature</b>						
Available and functional now	89.0	73.0	63.0	102.0	107.0	109.0
Available not functional now	3.0	3.0	3.0	3.0	3.0	3.0

Source: DCA Health Facility Survey, 2008

**Table 9.14 Percentage of medical professionals available in health facility, Malawi 2008**

	Counselling and testing only	Counselling and testing and PMTCT only	Counselling and testing, PMTCT and ARV's only	TB services	Malaria services	TOTAL
<b>Medical doctors/physicians</b>						
None	78.0	62.0	52.0	91.0	96.0	98.0
1	7.0	7.0	7.0	7.0	7.0	7.0
2	3.0	3.0	3.0	3.0	3.0	3.0
3	2.0	2.0	2.0	2.0	2.0	2.0
4	1.0	1.0	1.0	1.0	1.0	1.0
9	1.0	1.0	1.0	1.0	1.0	1.0
<b>Certified registered nurses</b>						
None	19.0	11.0	10.0	22.0	22.0	23.0
1	27.0	23.0	17.0	32.0	35.0	36.0
2	11.0	8.0	6.0	14.0	16.0	16.0
3	9.0	8.0	7.0	11.0	11.0	11.0
4	1.0	1.0	1.0	1.0	1.0	1.0
5	3.0	3.0	3.0	3.0	3.0	3.0
6	3.0	3.0	3.0	3.0	3.0	3.0
7	2.0	2.0	2.0	2.0	2.0	2.0
9	1.0	1.0	1.0	1.0	1.0	1.0
10	3.0	3.0	3.0	3.0	3.0	3.0
13	1.0	1.0	1.0	1.0	1.0	1.0
15	1.0	1.0	1.0	1.0	1.0	1.0
16	1.0	1.0	1.0	1.0	1.0	1.0
30	1.0	1.0	1.0	1.0	1.0	1.0
32	2.0	2.0	2.0	2.0	2.0	2.0
34	1.0	1.0	1.0	1.0	1.0	1.0
36	1.0	1.0	1.0	1.0	1.0	1.0
38	1.0	1.0	1.0	1.0	1.0	1.0
40	1.0	1.0	1.0	1.0	1.0	1.0
44	1.0	1.0	1.0	1.0	1.0	1.0
50	1.0	1.0	1.0	1.0	1.0	1.0
Missing	1.0	1.0	1.0	1.0	1.0	1.0
<b>Laboratory technicians/technologist</b>						
None	75.0	60.0	50.0	88.0	93.0	95.0
1	6.0	5.0	5.0	6.0	6.0	6.0
2	4.0	4.0	4.0	4.0	4.0	4.0
3	4.0	4.0	4.0	4.0	4.0	4.0
4	1.0	1.0	1.0	1.0	1.0	1.0
5	1.0	1.0	1.0	1.0	1.0	1.0
7	1.0	1.0	1.0	1.0	1.0	1.0
<b>Lab assistants</b>						
None	76.0	62.0	54.0	87.0	91.0	93.0
1	10.0	9.0	7.0	12.0	13.0	13.0
2	2.0	2.0	2.0	2.0	2.0	2.0
3	1.0	1.0	1.0	1.0	1.0	1.0
4	1.0	0.0	0.0	1.0	1.0	1.0
9	1.0	1.0	1.0	1.0	1.0	1.0
Missing	1.0	1.0	1.0	1.0	1.0	1.0
<b>Social workers</b>						
None	84.0	68.0	60.0	97.0	102.0	104.0
1	1.0	1.0	1.0	1.0	1.0	1.0
2	2.0	2.0	1.0	2.0	2.0	2.0
3	1.0	1.0	1.0	1.0	1.0	1.0
5	1.0	1.0	1.0	1.0	1.0	1.0
10	2.0	2.0	1.0	2.0	2.0	2.0
Missing	1.0	1.0	1.0	1.0	1.0	1.0

Source: DCA Health Facility Survey, 2008

**Table 9.15 Percentage availability of drugs for infectious diseases**

	Counselling and testing only	Counselling and testing and PMTCT only	Counselling and testing, PMTCT and ARV's only	TB services	Malaria services	TOTAL
<b>Co-trimoxazole suspension for paediatric infectious disease</b>						
Available today	54.0	47.0	41.0	64.0	68.0	68.0
Not available	36.0	28.0	24.0	38.0	40.0	41.0
Missing	2.0	1.0	1.0	3.0	2.0	3.0
<b>Co-trimoxazole tables for adult infectious diseases (80/400mg)</b>						
Available today	74.0	63.0	55.0	88.0	93.0	93.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	15.0	11.0	9.0	13.0	14.0	15.0
Missing	2.0	1.0	1.0	3.0	2.0	3.0
<b>Co-trimoxazole tables for adult infectious diseases (160/800mg)</b>						
Available today	11.0	9.0	7.0	17.0	19.0	19.0
Not available	77.0	64.0	56.0	83.0	87.0	88.0
Missing	4.0	3.0	3.0	5.0	4.0	5.0
<b>Fluconazole capsules or tabs for infectious disease</b>						
Available today	23.0	23.0	23.0	23.0	25.0	25.0
Not available	65.0	50.0	40.0	77.0	81.0	82.0
Missing	4.0	3.0	3.0	5.0	4.0	5.0

Source: DCA Health Facility Survey, 2008

<b>Table 9.16 Percentage availability of malaria drugs</b>						
	Counselling and testing only	Counselling and testing and PMTCT only	Counselling and testing, PMTCT and ARV's only	TB services	Malaria services	TOTAL
<b>Coartem and artemisinin combination therapy</b>						
Available today	85.0	72.0	63.0	98.0	102.0	103.0
Not available	5.0	3.0	2.0	4.0	6.0	6.0
Missing	2.0	1.0	1.0	3.0	2.0	3.0
<b>Artemisinin (oral) - not as combination therapy</b>						
Available today	7.0	7.0	7.0	9.0	11.0	11.0
Not available	81.0	66.0	57.0	91.0	95.0	96.0
Missing	4.0	3.0	2.0	5.0	4.0	5.0
<b>Fansidar (SP, sulfadoxine + Pyrimethamine) 500mg+25mg</b>						
Available today	89.0	75.0	65.0	99.0	105.0	106.0
Not available	1.0	0.0	0.0	3.0	3.0	3.0
Missing	2.0	1.0	1.0	3.0	2.0	3.0
<b>Quinine (oral or injectable)</b>						
Available today	82.0	70.0	61.0	95.0	100.0	100.0
Not available	8.0	5.0	4.0	7.0	8.0	9.0
Missing	2.0	1.0	1.0	3.0	2.0	3.0
<b>Other anti-malarial drugs (oral or injectable)</b>						
Available today	13.0	10.0	8.0	14.0	17.0	17.0
Not available	72.0	61.0	53.0	83.0	86.0	87.0
Missing	7.0	5.0	5.0	8.0	7.0	8.0

Source: DCA Health Facility Survey, 2008

**Table 9.17 Percentage availability of TB drugs**

	Counselling and testing only	Counselling and testing and PMTCT only	Counselling and testing, PMTCT and ARV's only	TB services	Malaria services	TOTAL
<b>Ethambutol oral (100mg)</b>						
Available today	11.0	10.0	10.0	12.0	12.0	12.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	75.0	61.0	52.0	87.0	92.0	94.0
Missing	5.0	4.0	3.0	5.0	5.0	5.0
<b>Ethambutol oral (400mg)</b>						
Available today	5.0	4.0	4.0	5.0	5.0	5.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	77.0	63.0	54.0	90.0	95.0	97.0
Missing	9.0	8.0	7.0	9.0	9.0	9.0
<b>Isoniazid oral (100mg)</b>						
Available today	15.0	14.0	12.0	15.0	15.0	15.0
Not available	73.0	59.0	52.0	86.0	91.0	93.0
Missing	4.0	3.0	2.0	4.0	4.0	4.0
<b>Isoniazid oral (300mg)</b>						
Available today	4.0	3.0	3.0	4.0	4.0	4.0
Not available	80.0	66.0	57.0	93.0	98.0	100.0
Missing	8.0	7.0	6.0	8.0	8.0	8.0
<b>Pyrazinamide oral (400mg)</b>						
Available today	10.0	9.0	8.0	10.0	10.0	10.0
Not available	75.0	61.0	53.0	88.0	93.0	95.0
Missing	7.0	6.0	5.0	7.0	7.0	7.0
<b>Rifampin oral (150mg)</b>						
Available today	8.0	7.0	5.0	8.0	8.0	8.0
Not available	76.0	62.0	55.0	89.0	94.0	96.0
Missing	8.0	7.0	6.0	8.0	8.0	8.0
<b>Rifampin oral (300mg)</b>						
Available today	3.0	2.0	2.0	3.0	3.0	3.0
Not available	80.0	66.0	57.0	93.0	98.0	100.0
Missing	9.0	8.0	7.0	9.0	9.0	9.0
<b>Streptomycin injectable (1g)</b>						
Available today	12.0	12.0	12.0	12.0	12.0	12.0
Not available	72.0	57.0	48.0	85.0	90.0	92.0
Missing	8.0	7.0	6.0	8.0	8.0	8.0
<b>Isoniazid + Rifampicin (Rifina oral) (75mg+150mg)</b>						
Available today	43.0	42.0	40.0	44.0	44.0	45.0
Not available	46.0	32.0	25.0	58.0	63.0	64.0
Missing	3.0	2.0	1.0	3.0	3.0	3.0
<b>Isoniazid + Rifampicin (Rifina oral) (150mg+300mg)</b>						
Available today	4.0	3.0	3.0	4.0	4.0	4.0
Not Available	76.0	62.0	53.0	89.0	94.0	96.0
Missing	12.0	11.0	10.0	12.0	12.0	12.0
<b>Isoniazid + Rifampicin (Rifina oral) (30mg+60mg)</b>						
Available today	15.0	14.0	14.0	15.0	15.0	15.0
Not Available	71.0	57.0	48.0	84.0	89.0	91.0
Missing	6.0	5.0	4.0	6.0	6.0	6.0
<b>Isoniazid +Ethambutol (EH) (150mg+400mg)</b>						
Available today	13.0	11.0	11.0	15.0	15.0	15.0
Not available	73.0	60.0	51.0	84.0	89.0	91.0
Missing	6.0	5.0	4.0	6.0	6.0	6.0
<b>Isoniazid+Rifampicin+Pyrazinamide (RHZ, Rifater) (75mg+150mg+400mg)</b>						
Available today	4.0	3.0	3.0	4.0	4.0	4.0
Not available	79.0	65.0	56.0	92.0	97.0	99.0
Missing	9.0	8.0	7.0	9.0	9.0	9.0
<b>Isoniazid +Rifampicin +Pyrazinamide (RHZ,Rifater)( 30mg+60+150mg)</b>						
Available today	7.0	6.0	5.0	7.0	7.0	7.0
Not available	77.0	63.0	55.0	90.0	95.0	97.0
Missing	8.0	7.0	6.0	8.0	8.0	8.0
<b>Isoniazid +Rifampicin +Pyrazinamide+Ethambutol(75mg+150mg+400mg+275mg)</b>						
Available today	73.0	64.0	56.0	80.0	79.0	81.0
Not available	17.0	11.0	9.0	23.0	29.0	29.0
Missing	2.0	1.0	1.0	2.0	2.0	2.0

Source: DCA Health Facility Survey, 2008

**Table 9.18 Percentage availability of HIV drugs**

	Counselling and testing only	Counselling and testing and PMTCT only	Counselling and testing, PMTCT and ARV's only	TB services	Malaria services	TOTAL
<b>Zidovudine (AZT, ZDV)</b>						
Available today	18.0	17.0	17.0	18.0	18.0	18.0
Not available	49.0	47.0	47.0	57.0	60.0	60.0
Missing	3.0	2.0	2.0	3.0	3.0	3.0
<b>Abacavir (ABC)</b>						
Available today	9.0	8.0	8.0	9.0	9.0	9.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	56.0	54.0	54.0	64.0	67.0	67.0
Missing	4.0	3.0	3.0	4.0	4.0	4.0
<b>Didanosine (DDI) buffered formulation</b>						
Available today	5.0	4.0	4.0	5.0	5.0	5.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	59.0	57.0	57.0	67.0	70.0	70.0
Missing	5.0	4.0	4.0	5.0	5.0	5.0
<b>Didanosine (DDI) enteric coated formulation</b>						
Missing	70.0	66.0	66.0	78.0	81.0	81.0
<b>Efavirenz (EFZ)200</b>						
Available today	13.0	12.0	12.0	13.0	13.0	13.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	53.0	51.0	51.0	61.0	64.0	64.0
Missing	3.0	2.0	2.0	3.0	3.0	3.0
<b>Efavirenz (EFZ)600</b>						
Available today	27.0	26.0	26.0	27.0	27.0	27.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	39.0	37.0	37.0	47.0	50.0	50.0
Missing	3.0	2.0	2.0	3.0	3.0	3.0
<b>Lamivudine 3TC</b>						
Available today	16.0	15.0	15.0	16.0	16.0	16.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	50.0	48.0	48.0	58.0	61.0	61.0
Missing	3.0	2.0	2.0	3.0	3.0	3.0
<b>Nevirapine (NVP)</b>						
Available today	62.0	60.0	60.0	66.0	67.0	67.0
Not available	5.0	4.0	4.0	9.0	11.0	11.0
Missing	3.0	2.0	2.0	3.0	3.0	3.0
<b>Stavudine40 (d4T)</b>						
Available today	9.0	8.0	8.0	9.0	9.0	9.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	56.0	54.0	54.0	64.0	67.0	67.0
Missing	4.0	3.0	3.0	4.0	4.0	4.0
<b>Stavudine30 (d4T)</b>						
Available today	8.0	7.0	7.0	8.0	8.0	8.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	56.0	54.0	54.0	64.0	67.0	67.0
Missing	5.0	4.0	4.0	5.0	5.0	5.0
<b>Atavudine30+Lamivudine (d4T+3TC)</b>						
Available today	39.0	38.0	38.0	39.0	39.0	39.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	28.0	26.0	26.0	36.0	39.0	39.0
Missing	2.0	1.0	1.0	2.0	2.0	2.0
<b>Stavudine 30+Lamivudine+Nevirapine (d4T30+3TC+NVP)</b>						
Available today	44.0	43.0	43.0	44.0	44.0	44.0
Not available	24.0	22.0	22.0	32.0	35.0	35.0
Missing	2.0	1.0	1.0	2.0	2.0	2.0
<b>Zidovudine+ Lamivudine (AZT+3TC)</b>						
Available today	29.0	28.0	28.0	29.0	29.0	29.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	36.0	34.0	34.0	44.0	47.0	47.0
Missing	4.0	3.0	3.0	4.0	4.0	4.0

Source: DCA Health Facility Survey, 2008

<b>Table 9.19 Percentage availability of HIV therapy combination drugs</b>						
	Counselling and testing only	Counselling and testing and PMTCT only	Counselling and testing, PMTCT and ARV's only	TB services	Malaria services	TOTAL
<b>Zidovudine+ Lamivudine+Abacavir (AZT+3TC+ABC)</b>						
Available today	3.0	2.0	2.0	3.0	3.0	3.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	60.0	58.0	58.0	68.0	71.0	71.0
Missing	6.0	5.0	5.0	6.0	6.0	6.0
<b>Zidovudine+ Lamivudine+Nevirapine (AZT+3TC+NVP)</b>						
Available today	4.0	3.0	3.0	4.0	4.0	4.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	59.0	57.0	57.0	67.0	70.0	70.0
Missing	6.0	5.0	5.0	6.0	6.0	6.0
<b>Tenofovir+ Disoproxil Fumarate (TDF/Viread)]</b>						
Available today	9.0	9.0	9.0	9.0	9.0	9.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	56.0	53.0	53.0	64.0	67.0	67.0
Missing	4.0	3.0	3.0	4.0	4.0	4.0
<b>Tenofovir+ Emtricitabine (TDF/FTC)</b>						
Available today	1.0	1.0	1.0	1.0	1.0	1.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	62.0	59.0	59.0	70.0	73.0	73.0
Missing	6.0	5.0	5.0	6.0	6.0	6.0
<b>Tenofovir+ Lamivudine (TDF/3TC)</b>						
Available today	2.0	1.0	1.0	2.0	2.0	2.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	61.0	59.0	59.0	69.0	72.0	72.0
Missing	6.0	5.0	5.0	6.0	6.0	6.0
<b>Tenofovir+ Lamivudine+ Efavirenz (TDF/3TC/EFV)</b>						
Available today	2.0	1.0	1.0	2.0	2.0	2.0
Available but expired	1.0	1.0	1.0	1.0	1.0	1.0
Not available	61.0	59.0	59.0	69.0	72.0	72.0
Missing	6.0	5.0	5.0	6.0	6.0	6.0
<b>Tenofovir + Emtricitabine+ Efavirenz (TDF/FTC/EFV)</b>						
Available today	2.0	1.0	1.0	2.0	2.0	2.0
Not available	61.0	59.0	59.0	69.0	72.0	72.0
Missing	7.0	6.0	6.0	7.0	7.0	7.0
<b>Atazanavir (ATV)</b>						
Available today	1.0	1.0	1.0	1.0	1.0	1.0
Not available	62.0	60.0	60.0	70.0	73.0	73.0
Missing	7.0	5.0	5.0	7.0	7.0	7.0
<b>Indinavir (IDV)</b>						
Available today	1.0	1.0	1.0	1.0	1.0	1.0
Not available	62.0	60.0	60.0	70.0	73.0	73.0
Missing	7.0	5.0	5.0	7.0	7.0	7.0
<b>Lopinavir/ritonavir (LPV/RTV)</b>						
Available today	11.0	10.0	10.0	11.0	11.0	11.0
Not available	55.0	53.0	53.0	63.0	66.0	66.0
Missing	4.0	3.0	3.0	4.0	4.0	4.0
<b>Nelfinavir (NFV)</b>						
Available today	2.0	1.0	1.0	2.0	2.0	2.0
Not available	62.0	60.0	60.0	70.0	73.0	73.0
Missing	6.0	5.0	5.0	6.0	6.0	6.0
<b>Ritonavir (RTV)</b>						
Available today	2.0	1.0	1.0	2.0	2.0	2.0
Not available	62.0	60.0	60.0	70.0	73.0	73.0
Missing	6.0	5.0	5.0	6.0	6.0	6.0
<b>Saquinavir (SQV)</b>						
Available today	2.0	1.0	1.0	2.0	2.0	2.0
Not available	62.0	60.0	60.0	70.0	73.0	73.0
Missing	6.0	5.0	5.0	6.0	6.0	6.0

Source: DCA Health Facility Survey, 2008

**Table 9.20 Percentage availability of testing equipment for HIV, TB and malaria**

	Counselling and testing only	Counselling and testing and PMTCT only	Counselling and testing, PMTCT and ARV's only	TB services	Malaria services	TOTAL
<b>Rapid test for HIV</b>						
Available observed	61.0	51.0	46.0	62.0	63.0	64.0
Available not observed	27.0	21.0	17.0	27.0	26.0	27.0
Not available	4.0	4.0	3.0	16.0	21.0	21.0
<b>Cytoflowmeter or CD4 count machine</b>						
Available observed	5.0	5.0	5.0	5.0	5.0	5.0
Available not observed	2.0	2.0	2.0	2.0	2.0	2.0
Not available	85.0	69.0	59.0	98.0	103.0	105.0
<b>PCR for viral load</b>						
Available not observed	1.0	1.0	1.0	1.0	1.0	1.0
Not available	90.0	74.0	64.0	103.0	108.0	110.0
Missing	1.0	1.0	1.0	1.0	1.0	1.0
<b>Microscope</b>						
Available observed	27.0	25.0	22.0	28.0	29.0	29.0
Available not observed	8.0	8.0	8.0	9.0	9.0	9.0
Not available	57.0	43.0	36.0	68.0	72.0	74.0
<b>Slides with covers</b>						
Available observed	16.0	15.0	12.0	17.0	18.0	18.0
Available not observed	3.0	3.0	3.0	4.0	4.0	4.0
Not available	73.0	58.0	51.0	84.0	88.0	90.0
<b>GIEMSA stain</b>						
Available observed	3.0	2.0	2.0	3.0	3.0	3.0
Available not observed	1.0	1.0	1.0	2.0	2.0	2.0
Not available	88.0	73.0	63.0	100.0	105.0	107.0
<b>FIELD stain</b>						
Available observed	22.0	20.0	19.0	24.0	25.0	25.0
Available not observed	4.0	4.0	4.0	4.0	4.0	4.0
Not available	66.0	52.0	43.0	77.0	81.0	83.0
<b>Rapid malaria Test</b>						
Available observed	10.0	10.0	10.0	10.0	12.0	12.0
Available not observed	6.0	5.0	5.0	6.0	6.0	6.0
Not available	76.0	61.0	51.0	89.0	92.0	94.0
<b>TB sputum test</b>						
Available observed	26.0	24.0	23.0	26.0	26.0	26.0
Available not observed	5.0	5.0	5.0	6.0	6.0	6.0
Not available	61.0	47.0	38.0	73.0	78.0	80.0
<b>Culture test for TB</b>						
Not available	92.0	76.0	66.0	105.0	110.0	112.0
<b>DST for TB</b>						
Not available	92.0	76.0	66.0	105.0	110.0	112.0
<b>Testing for MDR</b>						
Available not observed	1.0	1.0	0.0	0.0	0.0	1.0
Not available	91.0	75.0	66.0	105.0	110.0	111.0

Source: DCA Health Facility Survey, 2008

	Counselling and testing only	Counselling and testing and PMTCT only	Counselling and testing, PMTCT and ARV's only	TB services	Malaria services	TOTAL
<b>Coulter/ haemolytic analyzer (Total lymphocyte count, full blood count, platelets)</b>						
Available observed	5.0	5.0	5.0	5.0	5.0	5.0
Available not observed	8.0	7.0	7.0	8.0	8.0	8.0
Not available	79.0	64.0	54.0	92.0	97.0	99.0
<b>Centrifuge for hematrocrit</b>						
Available observed	5.0	4.0	3.0	5.0	5.0	5.0
Available not observed	2.0	1.0	1.0	2.0	2.0	2.0
Not available	84.0	70.0	61.0	97.0	102.0	104.0
Missing	1.0	1.0	1.0	1.0	1.0	1.0
<b>Pregnancy test</b>						
Available observed	18.0	16.0	16.0	20.0	21.0	21.0
Available not observed	8.0	7.0	7.0	8.0	8.0	8.0
Not available	66.0	53.0	43.0	77.0	81.0	83.0

Source: DCA Health Facility Survey, 2008

	Counselling and testing only	Counselling and testing and PMTCT only	Counselling and testing, PMTCT and ARV's only	TB services	Malaria services	TOTAL
<b>HIV test</b>						
Available on-site results today	89.0	73.0	64.0	90.0	90.0	92.0
Not available	2.0	2.0	2.0	14.0	19.0	19.0
Missing	1.0	1.0	0.0	1.0	1.0	1.0
<b>Hb</b>						
Available on-site results today	29.0	27.0	24.0	30.0	31.0	31.0
Available off-site results 2 days	2.0	2.0	0.0	2.0	2.0	2.0
Not available	60.0	46.0	41.0	72.0	76.0	78.0
Missing	1.0	1.0	1.0	1.0	1.0	1.0
<b>Malaria blood slide</b>						
Available on-site results today	45.0	42.0	39.0	47.0	49.0	49.0
Available off-site results 2 days	2.0	2.0	0.0	2.0	2.0	2.0
Not available	45.0	32.0	27.0	56.0	59.0	61.0
<b>TB sputum</b>						
Available on-site results today	9.0	8.0	8.0	9.0	9.0	9.0
Available on-site results not today	12.0	11.0	10.0	13.0	13.0	13.0
Available off-site results 2 days	14.0	14.0	12.0	14.0	14.0	14.0
Not available	56.0	42.0	35.0	68.0	73.0	75.0
Missing	1.0	1.0	1.0	1.0	1.0	1.0

Source: DCA Health Facility Survey, 2008

**Table 9.23: Availability of Malaria drugs, Malawi 2008**

Drugs and Commodities	Available today	Not available	Missing
<b>COARTEM AND ARTEMISININ COMBINATION THERAPY (ACT) (ARTEMETER + LUMEFANTRINE)</b>			
Total N° of Facilities visited	100.00	6.00	2.00
<b>Type of District</b>			
<b>High</b>	<b>13.00</b>	<b>33.33</b>	<b>0.00</b>
..Lilongwe	13.00	33.33	0.00
<b>Medium</b>	<b>64.00</b>	<b>66.67</b>	<b>50.00</b>
..Chiradzulu	11.00	33.33	0.00
..Karonga	6.00	0.00	0.00
..Machinga	16.00	16.67	50.00
..Mzimba	8.00	0.00	0.00
..Nkhotakota	15.00	0.00	0.00
..Zomba	8.00	16.67	0.00
<b>Low</b>	<b>23.00</b>	<b>0.00</b>	<b>50.00</b>
..Mwanza	11.00	0.00	50.00
..Ntchisi	12.00	0.00	0.00
<b>ARTEMISININ (ORAL) - NOT AS COMBINATION THERAPY</b>			
Total N° of Facilities visited	10.00	94.00	4.00
<b>Type of District</b>			
<b>High</b>	<b>0.00</b>	<b>15.96</b>	<b>0.00</b>
..Lilongwe	0.00	15.96	0.00
<b>Medium</b>	<b>100.00</b>	<b>59.57</b>	<b>75.00</b>
..Chiradzulu	50.00	7.45	25.00
..Karonga	0.00	6.38	0.00
..Machinga	10.00	17.02	25.00
..Mzimba	0.00	8.51	0.00
..Nkhotakota	20.00	13.83	0.00
..Zomba	20.00	6.38	25.00
<b>Low</b>	<b>0.00</b>	<b>24.47</b>	<b>25.00</b>
..Mwanza	0.00	11.70	25.00
..Ntchisi	0.00	12.77	0.00
<b>FANSIDAR (SP, SULFADOXINE + PYRIMETHAMINE) 500MG+25MG</b>			
Total N° of Facilities visited	103.00	3.00	2.00
<b>Type of District</b>			
<b>High</b>	<b>13.59</b>	<b>33.33</b>	<b>0.00</b>
..Lilongwe	13.59	33.33	0.00
<b>Medium</b>	<b>64.08</b>	<b>66.67</b>	<b>50.00</b>
..Chiradzulu	12.62	0.00	0.00
..Karonga	5.83	0.00	0.00
..Machinga	15.53	33.33	50.00
..Mzimba	7.77	0.00	0.00
..Nkhotakota	13.59	33.33	0.00
..Zomba	8.74	0.00	0.00
<b>Low</b>	<b>22.33</b>	<b>0.00</b>	<b>50.00</b>
..Mwanza	10.68	0.00	50.00
..Ntchisi	11.65	0.00	0.00

*Table 9.23, cont.*

Drugs and Commodities	Available today	Not available	Missing
QUININE (ORAL OR INJECTABLE)			
Total N° of Facilities visited	97.00	9.00	2.00
<b>Type of District</b>			
<b>High</b>	<b>14.43</b>	<b>11.11</b>	<b>0.00</b>
..Lilongwe	14.43	11.11	0.00
<b>Medium</b>	<b>63.92</b>	<b>66.67</b>	<b>50.00</b>
..Chiradzulu	11.34	22.22	0.00
..Karonga	5.15	11.11	0.00
..Machinga	16.49	11.11	50.00
..Mzimba	8.25	0.00	0.00
..Nkhotakota	14.43	11.11	0.00
..Zomba	8.25	11.11	0.00
<b>Low</b>	<b>21.65</b>	<b>22.22</b>	<b>50.00</b>
..Mwanza	11.34	0.00	50.00
..Ntchisi	10.31	22.22	0.00
OTHER ANTIMALARIAL DRUGS (ORAL OR INJECTABLE)			
Total N° of Facilities visited	16.00	85.00	7.00
<b>Type of District</b>			
<b>High</b>	<b>6.25</b>	<b>16.47</b>	<b>0.00</b>
..Lilongwe	6.25	16.47	0.00
<b>Medium</b>	<b>68.75</b>	<b>62.35</b>	<b>71.43</b>
..Chiradzulu	37.50	5.88	28.57
..Karonga	0.00	7.06	0.00
..Machinga	6.25	17.65	28.57
..Mzimba	0.00	9.41	0.00
..Nkhotakota	12.50	14.12	14.29
..Zomba	12.50	8.24	0.00
<b>Low</b>	<b>25.00</b>	<b>21.18</b>	<b>28.57</b>
..Mwanza	18.75	9.41	14.29
..Ntchisi	6.25	11.76	14.29

Source: DCA Health Facility Survey, 2008

## Appendix F Country logbook

Name	Year	Report	Data	Health services	AIDS	TB	Malaria
Housing and Population Census	2008 1998 1987 1977	Available	Available	General	Some		Some
<b>Population-based Surveys</b>							
Demographic and Health Survey (DHS) with HIV/AIDS Modules	2004 2000	Available	Available	MCH coverage	Module with HIV testing		Questions
Demographic and Health Survey (DHS) without HIV/AIDS Modules	1996 1992	Available	Available	MCH coverage	Questions		Questions parasites & anaemia
Multiple Indicator Cluster Survey	2006	Under preparation	Available	Some			
Sexual Behaviour Survey	2004	Available	Available		Module		
Welfare and Monitoring Survey	2005	Available	Available	General			
World Health Survey	2003	Available	No	Some	Some		
Malawi Integrated Household Survey	2004 1997	Available	Available	General			
Knowledge, Attitude & Practice Survey	1996	Available	Available	General	Some		
National Health Account (NHA)	2008 2006	Available	Available	health expenditure	Some	Some	Some
ITN Coverage Survey	2004	Available	Available				Questions
HIV/AIDS Situation Analysis Survey	2002 2003 2004 2005 2006	Available	Available		HTC, PMTCT & ART		Incidence & prevalence
Malawi Micronutrient Survey	2001	Available	Available				
Malawi Family Formation Survey	1984	Available	Available	General	None	None	None
Malawi Social Indicators Survey	1995	Available	Available	General	Some	None	Some
Household Survey Report	1990	Available	Available	General	Some	None	Some
Population and Health in Malawi	1984	Available	Available	General	Some	None	Some
Survey of Household Expenditure and Small-scale Economic Activity	1990-1991	Available	Available				
Profile of Poverty in Malawi	1998	Available	Available				
The Determinants of Poverty in Malawi	1998	Available	Available				
Malaria Indicator Survey	1995	Available	Available	MCH Coverage	Questions	Questions	Questions
National Tuberculin Survey	1994	Available	No	Some			

Name	Year	Report	Data	Health services	AIDS	TB	Malaria
<b>Facility-based Assessments</b>							
HIV/AIDS Sentinel Surveillance Reports	1994-2007	Available	Available		prevalence		
TB Surveillance Reports	1984 - 2007		Available			Notification	
Health Statistical Abstracts	2005	Available	N/A	Service provision & coverage	Service provision	Service provision	Service provision
<b>Local Studies</b>							
Anaemia & parasitaemia Study	2007	Available	Available				Malaria
Antimalaria drug efficacy study	2005	Available	Available				Malaria
Malaria Vector Survey	2007	Available	Available	Some			Malaria
Malaria Rapid Assessment Survey	2006	Available	Available				Malaria
High Early Death Rates of TB patients	2001	paper Bowie & Mathanga	No	Some		TB	
Equity Analysis of Malaria Control	2006						Malaria
TB & Poverty	2004	Avaiialble	Available	General		TB	
<b>Analysis &amp; Synthesis Studies &amp; Reports</b>							
Malawi HIV and AIDS Monitoring and Evaluation Report	2007	Available	Available	General	AIDS	TB	Malaria
Impact of Global Fund Study	2006 2001	Available	N/A	HSS	AIDS	TB	Malaria
HIV/AIDS Trends in 1990s	2004	Available	N/A		AIDS		
HIV/AIDS Coordination Study	2004	Available	N/A		AIDS		
HIV/AIDS Triangulation Report	2007 2006	Available	N/A		AIDS		
Joint Mid-Year Review of Health Sector	2006	Available	N/A	General			
HIV Human Resources Impact Study	2002	Available	N/A	Health services			AIDS
Gender & Epidemiology of TB	1998	Paper Simwaka et al.	N/A			TB	
Equity Analysis of TB Control	2006	2006				TB	
Synthesis Study in the Health Sector	2006	Mann et al.2006		General			
The HIV Epidemic in Malawi: Where is it Going?	2008	Available	Available		Trends in HIV/AIDS		
An Assessment of the National Response to Malaria in Malawi	2008	Ndhlovu (2008)	Available		Malaria		Malaria
Malaria and Children: Progress in Intervention Coverage (UNICEF)	2007	Available	Available		Malaria		Malaria

Name	Year	Report	Data	Health services	AIDS	TB	Malaria
Programme Scaling up Malaria Control Interventions: Malaria Strategic Plan 2005-2010	2005	Available	Available		Malaria		Malaria
Malaria Annual Reports	2006-2007	Available	Available		Malaria		Malaria
Epidemiology of Malaria in Malawi	2006	Available	Available		Malaria		Malaria
Guidelines for Management of ITNs Programme (Malawi Government)	2007	Available	Available		Malaria		Malaria
Training Manual for Health Workers	2007	Available	Available		Malaria		Malaria
World Malaria Report	2005b	Available	Available		Malaria		Malaria
Estimating National HIV Prevalence in Malawi from Sentinel Surveillance Data	2003	Available	Available		HIV/AIDS		HIV/AIDS
An Assessment of the response of Education Sector towards Life Skills Education	2001	Chimombo et al. 2001	Available		HIV/AIDS		HIV/AIDS
the Malawi Experience							
Report of a Country-wide survey of HIV/AIDS Services in Malawi	2006	Available	Available		HIV/AIDS		HIV/AIDS
Behavioural Surveillance Survey	2004	Available	Available		HIV/AIDS		HIV/AIDS
A five Year Scale up Plan for Provision of PMTCT Services in Malawi	2006-2010	Available	Available		HIV/AIDS		HIV/AIDS
Adolescent Sexual and Reproductive Health in Malawi: A Synthesis of Research Evidence	2004	Munthali et al. 2004	Available		HIV/AIDS		HIV/AIDS
Positive Synergies between Health Systems and Global Health Initiatives:	2009	Available	Available	General	HIV/AIDS		HIV/AIDS
Civil Society Findings from Malawi							
Quarterly ART Reports	2007 06 05 04	Available	Available		HIV/AIDS		HIV/AIDS
Epidemiological Profile of HIV/AIDS in Malawi	2005	Available	Available		HIV/AIDS		HIV/AIDS
Reconciling Antenatal Clinic Based Surveillance and Population Based Surveys in SSA	2003	Available	Available		HIV/AIDS		HIV/AIDS
Report of the Malawi ART Programme External Review Team	2006	Available	Available		HIV/AIDS		HIV/AIDS
NTCP of Malawi	2002	Available	Available		Tuberculosis		Tuberculosis
NTCP Annual Report	2006	Available	Available		Tuberculosis		Tuberculosis
NTCP's Five-year Development Plan	2007	Available	Available		Tuberculosis		Tuberculosis
WHO World Tuberculosis Report	2007	Available	Available		Tuberculosis		Tuberculosis