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HEALTH NEEDS ASSESSMENT FOR BLANTYRE CITY, MALAWI

Prepared by:

Moumié Maoulidi, Ph.D.

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Figure 1. Map of Malawi, Showing Blantyre City



Source: NSO (2011)

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ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
BCC	Blantyre City Council
CHAM	Christian Health Association of Malawi
DHO	District Health Office
DHS	Demographic Health Survey
EMOC	Emergency Obstetric Care
IMR	Infant Mortality Rate
IPT	Intermittent Preventive Treatment
LLIN	Long Lasting Insecticide Treated Nets
MCI	Millennium Cities Initiative
MDGs	Millennium Development Goals
MDHS	Malawi Demographic Health Survey
MMR	Maternal Mortality Ratio
MoH	Ministry of Health
MoLG	Ministry of Local Government
NGO	Non-Governmental Organization
NSO	National Statistics Office
U5MR	Under-5 Mortality Rate
HIV	Human Immunodeficiency Virus Syndrome
PMTCT	Prevention of Mother-to-Child Transmission
QECH	Queen Elizabeth Central Hospital
TB	Tuberculosis
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
UNV	United Nations Volunteer
USD	United States
WHO	World Health Organization
WMS	Welfare Monitoring Survey

EXECUTIVE SUMMARY

Blantyre City, located in Southern Region, Malawi, is characterized by high rates of malaria, HIV/AIDS, maternal mortality and an increasing burden of non-communicable diseases, such as cancer. Despite progress in reducing child mortality, children in Blantyre and Malawi are still dying of preventable causes such as neonatal complications, pneumonia and diarrhea. Malnutrition levels are also high.

Government reports indicate that the country is likely to achieve the fourth Millennium Development Goal (MDG 4), reducing child mortality. The two most recent Malawi Demographic and Health Surveys (MDHS) reveal that, between 2004 and 2010, infant mortality in Blantyre District declined from 90 to 69 deaths per 1,000, while under-five mortality declined from 153 to 110 deaths per 1,000 (MDHS, 2004; MDHS 2010).

Progress towards improving maternal health (MDG 5) has been lackluster. Although recent maternal mortality data for Blantyre City are not available, the 2010 DHS indicates that almost one out of every 150 pregnant women in Malawi dies during childbirth. This is partly because many women give birth at home without the assistance of a skilled health professionals or recourse to emergency obstetric care. The central hospital and private hospitals in the city can deliver children by cesarean section and specialized obstetric care for conditions such as postpartum hemorrhage and sepsis, but there is an urgent need for anesthesia, ultrasound machines, surgical equipment and other supplies to help with difficult deliveries.

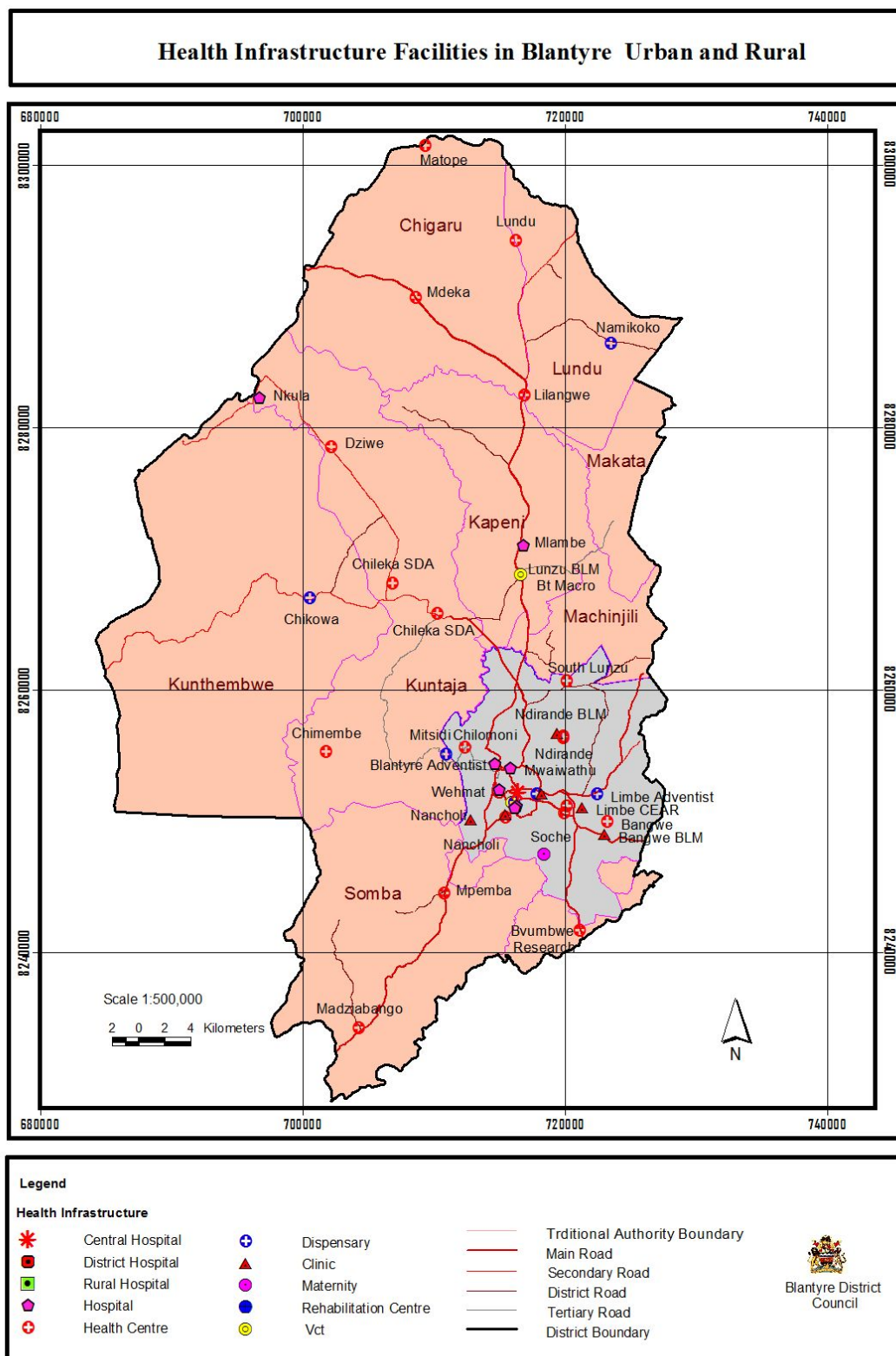
HIV/AIDS, malaria and tuberculosis (TB) are also major challenges. Although Malawi and large cities such as Blantyre have unquestionably made progress in reducing the number of people who are HIV-positive, the prevalence rate remains above 10 percent. Malaria also remains a major cause of morbidity and mortality in Blantyre, and, even though donor support has contributed to reductions in tuberculosis rates, an increase in multidrug resistant (MDR) TB cases has also been reported. It is debatable, therefore, whether the city and the country will be able to attain MDG 6 by 2015. Another key problem facing health facilities in Blantyre is the crucial shortage of qualified health staff. This is partly because the Ministry of Health has found it difficult to train, recruit and retain the necessary quantity and quality of human resources. At Queen Elizabeth Central Hospital (QECH), one of the nation's main facilities, many doctors hail from western countries. Additional challenges facing the health care delivery system in Blantyre include persistent stock-outs of drugs and medical supplies, insufficient essential medical equipment and an inadequate number of ambulances.

MCI estimates that Blantyre can achieve the health-related MDGs with an average annual per capita investment of USD 29 per annum for the years 2014 and 2015.

This report is organized as follows: an introduction reviews the methodology used and limitations in conducting the research; this is followed by a description of the structure of Blantyre's health care system, an analysis of major health challenges and an outline of costs necessary to attain the three health-related MDGs. The conclusion synthesizes the findings and

offers some recommendations.

Figure 2. Map Showing Health Facilities in Blantyre District and Blantyre City



I. INTRODUCTION

1. Background

Blantyre City is situated in the Southern Region of Malawi and is the country's oldest city.¹ Although Lilongwe is the administrative capital, Blantyre City is the nation's commercial and industrial capital city. Covering a total area of 228 square kilometers of hilly and rugged terrain, Blantyre is linked to all parts of Malawi, as well as to the neighboring countries of Mozambique, Zimbabwe, South Africa, Zambia, Kenya and Tanzania, by road, rail and air.

The city is divided into 26 wards, with Ndirande South and Likhubula as the most highly populated wards. The least populated ward is Limbe Central. The majority (over 65 percent) of the city's residents live in unplanned settlements or slums, where poverty is pervasive (UN HABITAT, 2011).

1.1. Objectives

This needs assessment focuses on the three United Nations Millennium Development Goals (MDGs) relating to health: reducing child mortality (MDG 4); improving maternal health (MDG 5); and reducing rates of HIV/AIDS, malaria, tuberculosis (TB) and other diseases (MDG 6). The report seeks to delineate key health challenges in Blantyre City and to identify financial and human and infrastructural resources that might begin to address them. Some of these health challenges include high rates of HIV, malaria and maternal mortality.

1.2. Methodology

Field research for this report was conducted in 2009, 2012 and 2013. Data were collected from the District Health Office (DHO), Queen Elizabeth Central Hospital (QECH), as well as from such secondary sources as the Malawi Demographic and Health Surveys (MDHS) and reports compiled by the Malawi Ministry of Health and Population, the National Statistics Office (NSO), the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO).

The costs of scaling up health services to help Blantyre attain the MDGs by 2015 are estimated using a costing model developed by the United Nations Millennium Project. This costing model, now administered by the UN Development Programme (UNDP) and member states for use at the national level, is being applied here at the municipal level by the Millennium Cities Initiative (MCI).

1.3. Limitations

¹ The name "Blantyre" is also commonly used to refer to a district that consists of two areas, namely Blantyre City and Blantyre rural. Unless otherwise specified, in this needs assessment the term Blantyre refers to the city.

A key limitation facing researchers is that health data in Blantyre City are collected separately by the District Health Office (DHO) and QECH. Reporting centers (zones) in the Blantyre District provide data to the DHO, and this information is aggregated to compile indicators at the district level. Data from private health facilities were generally not available. More importantly, compiling indicators at the city level from public health facility records is a difficult undertaking. To overcome these challenges, MCI New York focused on seven of the reporting centers in Blantyre City that provide data to DHO —Bangwe, Chilomoni, Limbe, Makheta, Ndirande, South Lunzu and Zingwangwa—and then merged the available DHO data with QECH data for the period 2008-2010.

1.4. Demographics

According to the latest census, in 2008 Blantyre City had a population of 661,256 (NSO, 2009). Assuming that the city has been growing at a rate of 4.09 percent, the projected 2013 population is 816,001 (NSO, 2010).² The DHO estimates that, in 2013, the population density in the city was 3,417 people per square kilometer (sq. km), which is considerably higher than the 203 people per sq. km in rural areas of Blantyre District. The city has a very young population, with a median age of 19.7 years and over 60 percent of the population under the age of 25.

II. DATA ANALYSIS

2. Health Facilities and Services in Blantyre

Health care services in Blantyre are provided by the Ministry of Health (MOH), the Ministry of Local Government (MoLG) and the private sector. The public sector is the largest provider of health services in Blantyre. Health care services are mainly provided by Queen Elizabeth Central Hospital (QECH), a central hospital run by the government and the main health care service provider, as well as the public health centers and clinics that fall under the aegis of the DHO.

The private health sector is also involved in the provision of health services and consists of two subsectors: the private nonprofit; and the private for-profit. The private non-profit subsector includes the Christian Health Association of Malawi (CHAM)³, other faith-based organizations and non-governmental organizations. The MOH and CHAM have a mutually dependent relationship, in that the Ministry contracts out to CHAM both to provide maternal and child health services and to train most of the nurses in Blantyre and across Malawi (SHOPS Project, 2012). The private for-profit subsector mainly consists of facilities owned by private companies.

2.1. Structure of the Health System

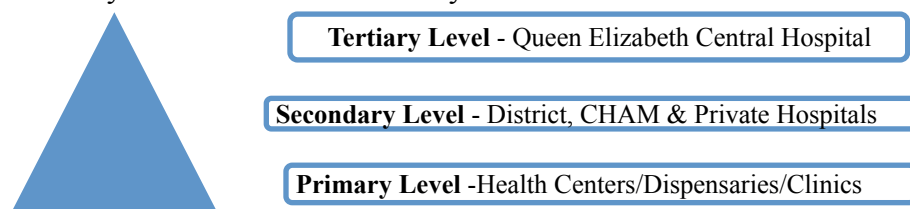
The health system in Malawi has three levels: a primary level, comprising clinics, dispensaries and health centers; a secondary level, consisting of district and CHAM hospitals; and a tertiary level, featuring four central hospitals. As mentioned above, one of these central hospitals,

² Table A 2.32, “Summary of Projected Population Growth and Selected Demographic Indicators, Blantyre City,” NSO (2010).

³ CHAM was established by missionaries in 1966, originally as the Private Hospital Association of Malawi.

QECH, is located in Blantyre City. QECH is the largest referral hospital in the country, providing health care services to both urban and rural residents as well as specialized clinical services to district hospitals in Southern Region. It is also a teaching hospital for students from the College of Medicine, Malawi College of Health Sciences and Kamuzu College of Nursing. Services offered at the primary level include HIV testing and counseling, immunization and ambulatory care using point of care diagnostic tests for conditions such as acute respiratory infections, diarrhea, pneumonia and other diseases affecting children under-five. Secondary care offers inpatient/admission care for more serious conditions, and ambulatory care using laboratory diagnostic facilities. Uncomplicated child birth is offered at health centers while more complex care childbirth is provided at the secondary level. The tertiary level offers specialized care. Patients are advised to first visit clinics, dispensaries and health centers, where those with complicated illness can then be referred to hospitals or QECH. However, public clinics and health centers are often short-staffed and short on equipment and supplies. As a result, many patients bypass the primary and secondary levels and go directly to QECH, hoping that they will get the care they need.⁴ In addition, since many hospitals are private and most Blantyre residents cannot afford treatment at such facilities, most referrals are to QECH. Figure 3 shows the levels of health care delivery in Blantyre.

Figure 3. Blantyre Health Service Delivery Levels



2.2. Health Facilities

Blantyre City has one central public hospital (QECH), six private hospitals and a NGO hospital specializing in orthopedics (Beit Cure International). There are also six public health centers and several public health clinics managed by the Blantyre City Council (BCC) and the District Health Office (DHO), as well as mobile clinics providing antenatal services. In addition to public clinics, there are several clinics and dispensaries run by religious organizations as well as by such companies as Malawi Railways, Portland Cement, Lever Brothers and Tobacco Processors, Press Corporation Limited, Medical Aid Society of Malawi (MASM) clinic, AMINA Adventist health center and MEDICARE (formally known as WEHMAT maternity clinic). Table 1 provides a list of key public and private hospitals and health centers in the city.

Table 1. Blantyre Health Facilities by Ownership

⁴ The Nation, <http://mwnation.com/central-hospitals-heading-for-disaster-with-drug-shortage/>

Health Centers/Clinics	Hospitals
Bangwe (MOH)	QECH (MOH)
Chilomoni (MOH)	Mlambe (CHAM)
Chirimba (MOH)	Blantyre Adventist (Private)
Limbe (MOH)	Mwaiwathu (Private)
Ndirande (MOH)	Mtengo Umodzi (Private)
South Lunzu (MOH)	Chitawira (Private)
Zingwangwa (MOH)	Beit Cure International (NGO)
Makheta (MoLG)	Shifa Hospital (Private)
Lumbira (CHAM)	
Malabada (CHAM)	
Soche Maternity	

Source: DHO

Health facilities administered by CHAM and for-profit health facilities provide limited but crucial health services. Hospitals such as Mwaiwathu and Blantyre Adventist, for instance, are renowned for their medical services and even attract patients from the capital city, Lilongwe. However, health facilities in Blantyre City are unevenly distributed, with residents in informal settlements having poor access to affordable health services (UN-HABITAT, 2011).

Figure 4. Some Health Facilities in Blantyre City



2.3. Health Services

Blantyre City Council is mandated by the Local Government Act (1998) to provide health services (UN-HABITAT, 2011). The DHO obtains drugs from the MOH and then distributes them to health facilities. The city has two medical storage facilities, one for pharmaceuticals and one for general storage. Key challenges facing the health care delivery system in Blantyre include: persistent stock-outs of drugs and medical supplies; inadequate essential medical

equipment and ambulances; and shortages of trained health workers. Shortages of medications and medical supplies are quite common in Blantyre.

2.4. Human Resources

Blantyre has a significant shortage of doctors and other skilled health staff. In 2011, QECH had 77 doctors (40 provided by the Ministry of Health, 29 provide by COM and 8 provided by United Nations Volunteers (UNV)). DHO records show that public health centers typically do not have doctors on their staff, but each center should ideally have between two and five doctors. In 2010/2011, this translated to one doctor per 6,993 inhabitants. QECH records show that the hospital had 271 nurses in 2010/2011, while DHO documents show that there were 308 nurses. The nurse-to-population ratio was, therefore, one nurse per 1,352 inhabitants. These ratios are well above WHO's recommendation of one medical doctor per 1,000 inhabitants and one nurse per 400 inhabitants (Mwenda, 2012; Rakoum, 2010). Table 2 shows the number of positions that needed to be filled at QECH and health centers in 2010/11.

Table 2. 2010/2011 Staffing Levels at QECH and Critical Posts to be Filled

Post	Posts Approved by MOH for QECH	Filled posts by organizations			
		MOH	COM	UNV	TOTAL
Specialist Doctors	42	7	29	8	44
Doctors	31	33			33
Nursing	420	271			271
Clinical Officers	187	161			161
Clinical support	173	165			165
Administrative	75	99			99
Non-clinical support	147	69			69
Ancillary	241	439		-	439
TOTAL	1,129	1,154	29	8	1,159
Bangwe HC, Chilomoni HC, Limbe HC, Ndirande HC, South Lunzu HC, Zingwangwa HC	Existing (2010)	Ideal	Additional Staff Needs		
Clinicians apart from Doctors	19	39	20		
Dental Technicians	6	0	0		
Doctors	0	19	19		
Environmental Health Officers	7	0	0		
Health Surveillance Assistants	228	814	586		
Nurses	49	240	191		
TOTAL	309	1112	816		

Source: QECH and DHO

According to a September 2012 article in *The Guardian* newspaper, Malawi's health system depends on 'clinicians' – paramedics with diplomas – and an army of more than 10,000 ordinary people given three months' training to become health surveillance assistants.”⁵ The national government is committed to strengthening human resources in health facilities and has partnered with CHAM to accelerate the training and recruitment of health professionals to fill all available positions. However, the task is a daunting one. In 2009, 312 posts were vacant at the city's

⁵ <http://www.theguardian.com/global-development/2012/sep/13/queen-malawi-improve-survival-rates-newborn>

public health centers, including hospital attendants, nurses, midwives, laboratory assistants and security guards. In its 2010/11 Annual Report, QECH also reported staff shortages

3. Child Health

Infant and child mortality indicators at the city level were not available. However, according to the two most recent Malawi Demographic and Health Surveys (MDHS), between 2004 and 2010, infant mortality in Blantyre District declined from 90 to 69 deaths per 1,000 live births, while under-five mortality declined from 153 to 110 deaths per 1,000 (MDHS, 2004; MDHS 2010). Projections by the National Statistical Office show that in 2012, the infant mortality rate (IMR) in Blantyre City was 37 deaths per 1000 live births (NSO, 2010). If this trend continues, the city and the country are likely to achieve the MDG 4 goal of reducing infant and child mortality by two-thirds.

Malawi is one of the countries in sub-Saharan Africa that has proven successful in reducing child mortality. DHS data show that between 2004 and 2010, infant mortality in Malawi declined from 76 to 66 deaths per 1,000 live births, while the under-five child mortality rate dropped from 133 deaths to 112 deaths per 1,000 live births (MDHS, 2004; MDHS 2010). Factors contributing to declining child mortality rates include malaria control activities, increased rates of exclusive breastfeeding, better access to improved water sources, immunization campaigns and Vitamin A supplementation.

While progress is being made in reducing both infant and under-five mortality, further efforts are required to sustain progress made in reducing neonatal mortality. In 2004, neonatal mortality in Blantyre region was 46 deaths per 1,000 live births, but this number dropped to 25 per 1,000 live births by 2010, almost a 50 percent reduction. However, at the national level, neonatal mortality increased from 27 to 31 deaths per 1,000 live births. Some of the causes of neonatal deaths include HIV, asphyxia, infection and prematurity.

3.1. Child Morbidity and Mortality

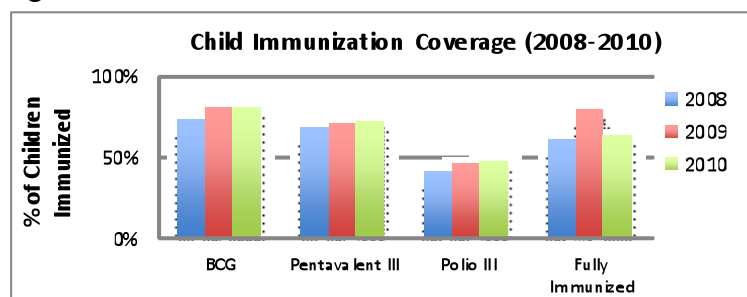
Major causes of child morbidity include malaria, acute respiratory infection (ARI) and diarrhea. According to the 2011 Malawi Statistical Yearbook, half of the new malaria cases at QECH were children under-five. Data from health facilities shows that 31,921 children under-five (25 percent) suffered from ARI. The 2011 Welfare Monitoring Survey (WMS) further reveals that 30 percent of children in Blantyre City had diarrhea, and 5.3 percent had diarrhea and blood in the stool.

3.2. Inoculations

Immunizations have been an important tool in efforts to avert childhood diseases. In recent years, Malawi has accorded priority to child immunization, and as a result, fewer children are dying because of diseases such as measles. Figure 5, based on data from health centers in the city, shows child immunization coverage during the 2008-2010 period. It is evident that while the proportions of children immunized against diseases such as tuberculosis, diphtheria, whooping

cough and tetanus have been increasing, there is a need to ensure that the children are fully immunized.

Figure 5. Number of Children Under-1 Year Immunized at Health Centers and Dispensaries

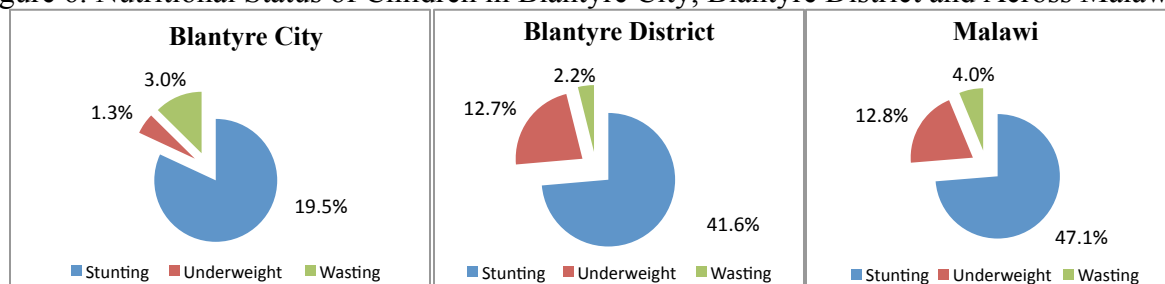


DHO HMIS Records (2008-2010)

3.3. Nutrition

As Figure 6 shows, in terms of nutrition, Blantyre City is doing better than the district and the country as a whole. According to the 2010 Demographic and Health Survey (DHS), malnutrition in Blantyre District is quite high. Around 42 percent of children under-five are stunted, 21 percent are severely stunted, 12.7 percent are underweight and 2.2 percent exhibit wasting.⁶

Figure 6. Nutritional Status of Children in Blantyre City, Blantyre District and Across Malawi



Source: DHS (2010); NSO (2011) for Blantyre City data

However, DHO records based on data from health centers in the city show that between 2008 and 2010, the proportion of children under-five receiving Vitamin A supplementation increased from 10.4 to 12.3 percent. Vitamin A deficiency is particularly problematic, because it lowers children's immune systems and reduces their chances of surviving a serious illness.

Part of the problem is that breastfeeding rates in Blantyre District and in Malawi are quite low. WHO advises that infants be exclusively breastfed for the first six months of life. In Blantyre District, though, women are practicing exclusive breastfeeding for only three months, while nationally, the duration is approximately four months (MDHS, 2010). Promoting exclusive breastfeeding will not only improve child nutrition but also reduce illness related to diarrhea.

⁶ DHS (2010)

4. Maternal Health

One in two women in Blantyre is of child-bearing age (WCBA), i.e., between 15 - 49 years old. In 2010 the total fertility rate (the average number of children that would be born to a woman over her lifetime) was four in Blantyre District compared to almost six for the country as a whole (NSO, 2010). Given that women face the risk of maternal death multiple times when fertility rates are high, it is critical to focus on maternal health.

4.1. Maternal Mortality Ratio

Malawi has one of the highest maternal mortality rates in the world.⁷ In 2006, UNICEF estimated that the maternal mortality ratio (MMR) in Malawi was 807 maternal deaths for every 100,000 births, but the 2010 Malawi DHS indicates that maternal mortality ratio has declined to 675 per 100,000 (UNICEF, 2008; MDHS, 2010). This is still much higher than the continental ratio of 500 deaths per 100,000 live births.⁸

Maternal mortality data at the sub-national level are not readily available. However, a 2005 study by Lema et al. at Queen Elizabeth Central Hospital in Blantyre showed that five years ago, the MMR at QECH was 1,027 per 100,000 births. According to the study, the leading causes of high maternal death include puerperal sepsis, post-abortion complications, obstetric hemorrhage and eclampsia. The high rates can also be attributed to delays in getting to the hospital, illegal abortion and poorly equipped health infrastructure and facilities (GoM, 2007). In addition, one out of three women in the Southern Region of Malawi begin bearing children between the ages of 15 - 19, when they are much more likely to die in childbirth.

4.2. Antenatal and Postpartum Care

In recent years, the Government of Malawi has sought to improve the accessibility of antenatal services and to increase both the use of skilled health personnel during delivery and the availability of emergency obstetric care (EMOC). MICS records indicate that in 2006, access to and utilization of antenatal care in Blantyre Urban was 98 percent (NSO and UNICEF, 2007). This is confirmed in the two most recent MDHS, which found that 97.3 and 98.4 of women in the district received antenatal care (MDHS, 2004; MDHS 2010).

However, the proportion of births attended by skilled health professionals is inconclusive.⁹ Data from the 2011 Welfare Monitoring Survey (WMS) show that 96.1 percent of deliveries were assisted by skilled personnel but data from the six health facilities in Blantyre City reveal that between 2008 and 2010, less than 60 percent of all births were delivered by skilled personnel.

One possible explanation for this discrepancy is that the WMS figure includes data from QECH where, according to WMS 2009, 58 percent of all deliveries take place. Postnatal care indicators are also not satisfactory. In 2006, only 26 percent of mothers received postnatal care within 48

⁷ Maternal mortality refers to the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy.

⁸ <http://esaro.unfpa.org/public/pid/7130> (Campaign on Accelerated Reduction of Maternal Mortality in Africa).

⁹ The term “skilled health professional” is defined as either a doctor, clinical officer, nurse or midwife; however the vast majority of Malawian women see nurses or midwives (MDHS, 2004).

hours after delivery, and another 26 percent of mothers did not receive postnatal care until 7- 41 days after delivery (NSO and UNICEF, 2008). The lack of adequate postnatal care is a key factor behind high maternal (and infant?) mortality rates.

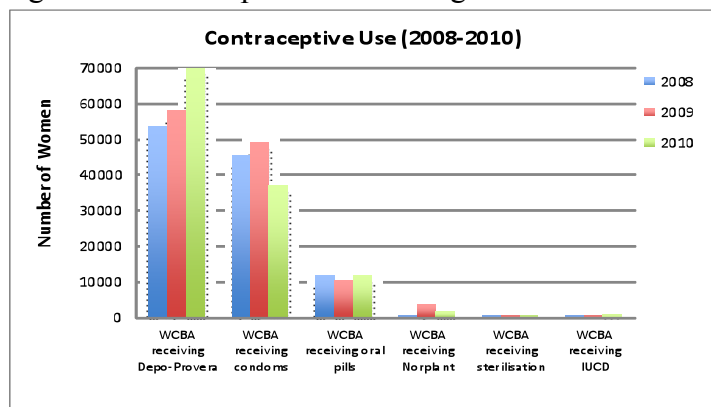
4.3. Emergency Obstetric Care

Emergency Obstetrics Care (EMOC) is widely recognized as an important means of reducing maternal mortality. Ideally, there should be five facilities capable of offering EMOC services to 500,000 people, and the facilities should have essential equipment, medication, and supplies to perform services such as cesarean sections and blood transfusions. Health centers in Blantyre can deliver children by C-section and treat women for conditions such as postpartum hemorrhage and sepsis, but there is a consistent need for anesthesia, ultrasound machines, surgical equipment and other supplies to help cope with difficult deliveries.

4.4. Family Planning

Rapid population growth in Malawi has led the government to designate family planning as an integral part of the national development policy. As shown in Figure 7, which is based on DHO data, Depo-Provera is the most popular family planning method, followed by condoms and pills. This is not surprising since most public-sector clinics only offer hormonal injections (Depo-Provera), condoms and contraceptive pills. High HIV rates explain why many women are also using condoms.

Figure 7. Contraceptive Use Among Women of Child-bearing Age (2008-2010)



Source: DHO

Critical interventions are needed to reduce maternal mortality and improve women's health in Blantyre and across Malawi as a whole. This will require additional resources as well as political will. In 2009, recognizing the daunting challenge of reducing maternal mortality, Malawi launched the Campaign on Accelerated Reduction of Maternal Mortality in Africa (CARMMA). This undertaking aims to bring about societal change in support of maternal health and has been adopted by more than 39 African countries. In 2012, in order to accelerate progress in meeting MDG 5, President Joyce Banda also launched an initiative known as Maternal Health and Safe Motherhood. One of the project's aims is to achieve universal access to reproductive health services.

5. HIV/AIDS, Malaria and Other Diseases

5.1. HIV/AIDS

The HIV/AIDS epidemic is a major public health challenge in Blantyre and Malawi. In 2010 it was estimated that 10.6 percent of Malawians between the ages of 15 - 49 were HIV-positive. Surveys such as the 2004 and 2010 MDHS show that women tend to have higher HIV prevalence rates than men. For instance, in 2004 and 2010 the HIV prevalence rates for women were 13.3 percent and 12.9 percent, respectively, but for men they were 10.1 and 8.1 percent.

HIV prevalence rates in Southern Region, where Blantyre District is located, are about twice as high as in other regions. Moreover, urban women tend to have much higher prevalence rates than rural women. One reason is that poverty prompts women and girls to engage in transactional sex as a source of income, increasing their likelihood of HIV infection.

Health workers have also been adversely affected by the epidemic, with the disease contributing significantly to staff absence and attrition. As the 2010/11 QECH Annual Report observes, “There is an increased loss of staff time due to HIV/AIDS. Much of staff time is lost due to staff sickness, or caring for their relations in addition to actual staff losses through deaths.”

HIV/AIDS Prevention and Treatment

Malawi's antiretroviral therapy (ART) program is improving. ART is provided through public and private health facilities in the country, and health workers in all ART sites have been trained. Yet, a recent *Nyasa Times* article reports that doctors at QECH have disclosed that although the number of pregnant women testing positive for HIV is high, seropositive mothers are not accessing antiretroviral (prophylaxis or treatment) for Prevention of Mother-to-Child Transmission (PMTCT).¹⁰ DHO data for 2008-2010 from health centers in Blantyre City confirm this, showing that about 10 percent of pregnant women are testing positive for HIV but anti-retrovirals such as nevirapine are not given to all seropositive mothers and/or babies for PMTCT. According priority to PMTCT is important because it contributes directly to saving women's and babies' lives and is hence essential to the achievement of maternal and child health priorities.

A key challenge in preventive efforts is that data on several high-risk groups, such as migrant workers, sex workers, truck drivers, men having sex with men and injecting drug users, are not collected.

5.2. Malaria

Malaria is also another serious public health problem in Blantyre, partly because the city is located in a malaria endemic zone. The Ministry of Health estimates that between July 2010 and June 2011, malaria cases accounted for 37 percent of all outpatient visits in the district and was a leading cause of hospital admissions among children under-five (NSO, 2011).

¹⁰ <http://www.nyasatimes.com/2012/12/07/19-percent-of-malawi-pregnant-women-are-hiv-positive-experts/>

Malaria Prevention and Treatment

Increasing the distribution of insecticide-treated bed nets and enhancing access to malaria control are two of the interventions that have been shown to help decrease the number of malaria deaths. Additional, albeit more expensive means of malaria control, include providing Intermittent Preventive Treatment (IPT) to expecting mothers and making artemisinin-containing combination therapies.¹¹

5.3. Tuberculosis (TB)

Tuberculosis (TB) and HIV/AIDS are closely linked in Blantyre and Malawi with most TB patients co-testing as HIV positive. DHO data from the six public health centers in the city for the 2008-2010 period reveal that TB cure rates and TB completion rates have been increasing. This is partly because health centers and private hospitals provide free TB diagnosis and treatment. In newspaper articles, several Blantyre District Health Office (DHO) officials have also proclaimed that the TB cure and treatment success rates exceed the WHO target of 85 percent.¹²

Tuberculosis (TB) Prevention and Treatment

In recent years, TB control services have been strengthened in Blantyre district to improve the detection and cure rates. Interventions that have assisted prevention efforts include the establishment of sputum collection points and microscopy sites in communities and the provision of health facilities with the necessary equipment. New technologies for TB diagnosis, such as *genexpert*, are instrumental, since they provide results in less than one hour. This is relevant because early detection and diagnosis play critical roles in prevention and treatment efforts. Despite these successes in the battle against TB, an increase in multidrug-resistant (MDR) TB cases has also been reported in Malawi.¹³ This is worrisome because such cases are expensive to treat and spread rapidly in densely populated areas, such as the informal settlements in Blantyre.

5.4. Other Diseases

The Cancer Registry at QECH is the main data collection center on cancers in Malawi, and available data indicate that incidence rate of Kaposi's sarcoma (KS) both in adults and children has been increasing. The data also reveal an increase in cervical cancer diagnoses among young women.

¹¹ For example, the formulation known as Coartem, developed by Novartis.

¹² See 14 July 2011 article by Grace Khombe entitled "Blantyre TB Cure Rate at 90%," on *Zodiak Online*, retrieved from http://www.zodiakmalawi.com/index.php?option=com_content&view=article&id=1080:blantyre-tb-cure-rate-at-90, and March 25, 2013 article in *The Nation* entitled, "TB cure rate soars- Blantyre DHO," retrieved from <http://mw-nation.com/tb-cure-rate-soars-blantyre-dho/> and ????? (Also, sometimes the reference is with the date first, other times with the month first – do we do it as the citation does it, according to the American or European practice? Or do we be consistent?)

¹³ Online article entitled, "Malawi registers 10 multidrug resistant TB cases," retrieved from <http://www.faceofmalawi.com/2013/04/malawi-registers-10-multidrug-resistant-tb-cases/>

6. Financing of Public Health Care

According to UNICEF, in 2012/13, 12 percent of Malawi's national budget was allocated to health. This allocation falls short of the Abuja Declaration recommendation that African governments should allocate about 15 percent of their budgets to the health sector.

As stipulated in the 1998 Decentralization Policy, since the 2005/2006 fiscal year the Central Government has been transferring funds to local authorities. According to the Malawi Sustainable Development Network Programme, local authorities have prioritized the provision of drugs and medical supplies, as well as the provision of supplementary feeding to pregnant mothers and children under-five.¹⁴ However, it is debatable whether the amounts transferred to Blantyre City Council for health activities are sufficient. What is unquestionable is that the country relies heavily on donor funding to finance the health sector and when donors reduce their contributions, it severely impacts service delivery.¹⁵ Moreover, revenues generated by QECH and other public health facilities are grossly insufficient to meet the needs.

III. RESULTS FROM THE UNDP COSTING MODEL

This study uses the UN Millennium Project Integrated Health Model (IHM) to project costs required to meet the MDGs between 2010 and 2015. The IHM costing model differs from other costing models such as the World Bank/UNICEF Marginal Budgeting for Bottlenecks (MBB), in that MBB estimates marginal (additional) costs required, whereas the IHM estimates total costs (i.e., funds already being spent in the health system plus additional required health costs).

Since IHM is a simulation model used to forecast health expenditures, it relies on baseline data, unit costs and, often times, assumptions. For instance, the baseline year for the Blantyre Health Model is 2010, and the model assumes that the population will grow at an annual growth rate of four percent between 2010 and 2015. Additional model assumptions are detailed below.

Assumptions about Facilities

Given that data from district and CHAM hospitals were not available, the costing model only takes into account dispensaries, health centers and the QECH. Private health facilities are not taken into account because they are not financed by the central government or BCC.

Commodity Supply Assumptions

The model assumes that the costs of constructing new storage facilities ranges between USD75,000 and USD500,000. The cost for purchasing vehicles for the transportation of goods ranges between USD10,000 - USD100,000. Equipment costs for items such as computers and telephones are also included. Moreover, in terms of human resources, the model assumes that three supervisors, four technicians, 20 supply loaders and 50 drivers are needed.

¹⁴ http://www.sdn.org.mw/budget-2011/votes-2011/Local_Councils_-_OBB.pdf

¹⁵ See the June 6, 2011 IRIN article entitled Malawi: UK aid cuts hit health care, <http://www.irinnews.org/report/92877/malawi-uk-aid-cuts-hit-health-care>

Catchment Sizes

The health model needs population data and catchment data. Typically, catchment data is a subset of population data. The problem for the Blantyre model is that it is difficult to estimate the number of people served by different types of health facilities. This is because many people come to the city for health services from rural areas in Blantyre District, as well as from surrounding districts and regions. As a result, the catchment areas exceed the number of Blantyre city residents. For instance, in 2010, the Blantyre City population was 721,063 but the health centers catchment area alone was 754,430 and QECH does not really have catchment area population since it serves people from all over Malawi.

Hence, estimating how many city residents are served by specific health institutions is a task fraught with challenges. An alternative approach to estimating populations served by health institutions is to focus on Health Management Information Systems (HMIS) zones and to identify the catchment area populations in these zones. Table 3 presents the 2010-2012 catchment area populations by HMIS zone located in the city. There are 21 data reporting centers in Blantyre District, each with its own catchment area population. Six of the reporting centers—Bangwe, Chilomoni, Limbe, South Lunzu, Ndirande and Zingwangwa—are in the city. Population data in the model therefore do not refer to the actual number of people living in the city, rather to the number of people receiving service from health facilities in the catchment areas.

Table 3. District Health Office 2011 Catchment Area Populations by HMIS Zone

Facility	Catchment Population (2010)	Catchment Population (2011)	Catchment Population (2012)
Bangwe	127,132	131,667	136,360
Chilomoni	78,152	80,940	83,825
Limbe	107,086	110,906	114,858
Ndirande	206,256	213,613	221,227
South Lunzu	83,475	86,453	89,534
Zingwangwa	137,682	142,594	147,676
Total	754,430	781,342	809,190
Blantyre City Population	721,063	751,642	783,296

Source: DHO and QECH 2010-2011 Annual Report

Human Resources Assumptions

According to available data, in 2010 the six health centers needed 1,111 staff members—doctors, clinicians apart from doctors, nurses, dental technicians, environmental health officers and health surveillance assistants—but only 309 positions were filled. The number of additional staff required, therefore, was 814. QECH, the referral hospital, had a total staff of 680 but needed about 1,159 staff members, making quality medical service a significant challenge.

In terms of in-service training, it is assumed that medical school requires five years of general training and four years of specialized training, whereas nursing school requires four years of general training and one year of specialized training.

Information on staffing levels as well as salaries was obtained from a Blantyre District Health Office spreadsheet entitled, “Personal Emoluments Projections for 2010/11 (MK'000).”

Unit Costs

Unit costs for child health services were obtained from other health costing models while costs for maternal health services such as cesarean section and Assisted Vaginal Delivery (AVD) were derived from the UNFPA Reproductive Health Costing Model. These unit costs only include costs for drugs and supplies and not personnel costs per case. This is because personnel costs are already reflected in the Human Resources section of the model.

Based on data from six health facilities, the model assumes that six percent of births are delivered by C-section, and more than half of births are attended by skilled personnel. Data on rates of postpartum hemorrhage, puerperal sepsis and post-abortion complications and sepsis cases were not provided by DHO but were retrieved from the 2011 Malawi Statistical Yearbook.

Based on these assumptions, MCI projects that the city can achieve the health-related MDGs by investing USD 29 per capita per annum, for the years 2014 and 2015. Table 4 outlines the annual per capita costs associated with reaching these MDG targets.

Table 4. Costing Model Summary for Blantyre (in USD)

	2010	2011	2012	2013	2014	2015	Average (2014-15)
Child Health	2.4	2.4	2.5	2.4	2.3	2.1	2
Maternal Health	1.5	1.6	1.6	1.7	1.7	1.7	2
HIV/AIDS, Malaria and other diseases (Total)	6	7	7	7	8	8	8
HIV/AIDS	5.5	5.7	6.0	6.3	6.5	6.7	7
Malaria Prevention and Treatment	0.3	0.9	0.9	0.9	0.9	0.9	1
Facilities, Human Resources, Health Systems	9.9	17.2	14.9	14.7	17.4	17.1	17
Commodity Supply Systems	0.2	0.2	0.2	0.4	0.5	0.3	0
Total Per Capita Costs (\$)	20	28	26	26	29	29	29

The expected average per capita cost for operating the health system to achieve the MDGs is estimated at USD29 per annum per capita. Health infrastructure and human resources are the most costly investment, with the 59 percent of per capita costs going to these expenses. Costs for HIV and malaria constitute 26 percent of the average annual per capita costs, maternal health costs constitute less than six percent, and child health costs are about seven percent of annual per capita costs. These investments cannot be financed through public resources alone and will require support from international partners.

IV. CONCLUSION AND RECOMMENDATIONS

The findings of this needs assessment indicate that progress is being made toward meeting the health-related MDGs in Blantyre; yet much work remains to be done. For instance, strategies to improve maternal and child health include ensuring, above all, that 1) essential drugs and supplies are available at all times, and 2) health facilities are well staffed. Blantyre City can also increase health care coverage by rehabilitating health centers and clinics and improving services at these facilities, so that patients do not feel compelled to refer themselves to QECH. According to the Director of Planning at BCC, plans are underway to construct a new district hospital that will improve residents' access to health care.

To improve child survival, progress must also be made in Blantyre to reduce neonatal mortality, through such interventions as the AAP's "Helping Babies Breathe" protocol. The incidences of diarrhea, ARI and water-borne diseases also need to be reduced.

Blantyre and Malawi as a whole stand little chance of reaching the MDG 5 target of 155 maternal deaths per 100,000 live births by 2015 unless drastic measures are taken to improve maternal health. Interventions such as increasing the number of pregnant women receiving antenatal care, ensuring that more women deliver in institutions and taking full advantage of postnatal care all need to be scaled up.

In order for the city and the district to achieve MDGs 5 and 6 by 2015, swift interventions must be put in place immediately and need to be fully materialized during the 2014-2015 period. As examples, the proportion of women who deliver in health facilities with skilled attendants must increase, and pregnant women should be provided with emergency obstetric services, free long-lasting insecticide-treated bed nets (LLITNs) and IPT.

Strategies to reduce the incidence of HIV/AIDS, malaria and infectious diseases include expanding availability of ARVs in all public health facilities; conducting yearly anti-malaria campaigns; and promoting use of long-lasting insecticide-treated nets. Although there has been progress in the prevention and control of malaria, interventions such as vector control and indoor spraying still need to be encouraged and scaled. There is also a need for additional sensitization campaigns on how residents can control mosquito breeding grounds. Moreover, MDG 6 will not be attained unless health authorities in Blantyre significantly reduce the numbers of new cases of HIV/AIDS and TB.

Finally, to promote progress towards the attainment of the health-related MDGs and all MDGs, MCI further recommends that the authorities in Blantyre engage local communities and enhance the role of community health workers. The objective should be to train these workers to bring preventive health care services to mothers and children, rather than waiting for them to come to health centers, at which point they are likely to be sicker and significantly harder to treat, at much higher cost. There is also a need for DHO and BCC to compile city-level health indicators, instead of just deriving district-level indicator as the DHO is currently doing. This will improve monitoring of progress towards health objectives and facilitate targeting of interventions.

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