Ministry of Health and Child Welfare

National Malaria Control Programme

Zimbabwe Malaria Programme Review Report

June 2011

Table of Contents

List of tables and figures

Figures

Tables

List of abbreviations & Acronyms

ACT	Artemesinin-Based combination Therapy
AFRO	African Region of the World Health Organisation
AIDS	Acquired Immunodeficiency Syndrome
AMR	Adverse Medicine Reaction
ANC	Antenatal Care
BCC	Behaviour Change communication
CBHW	Community Based health Worker
CCM	Country Coordinating Mechanism(Global Fund)
CMC	Community Malaria Committee
CPU	Civil Protection Unit
CQ	Chloroquine
DDT	Dichlorodiphenyl Trichloroethane
DHE	District Health Executive
DPS	Director Pharmacy Services
EPR	Epidemic Preparedness and Response
GF	Global Fund
GOZ	Government of Zimbabwe
HIV	Human Immunodeficiency virus
HMIS	Health Management Information System
HQ	Ministry of Health and Child Welfare Head Quarters
IDSR	Integrated Disease Surveillance and Response
IEC	Information Education Communication
IPTp	Intermittent Preventive Treatment in Pregnancy
IRS	Indoor Residual Household spraying
ITN	Insecticide treated Nets
LLIN	Long Lasting Insecticide impregnated Nets
MCAZ	Medicines Control Authority of Zimbabwe
MOHCW	Ministry of Health and child Welfare
MPR	Malaria Programme Review
NHS	National Health Strategy
NIHR	National Institute of Health Research
NMCP	National Malaria Control Programme
NMRL	National Microbiology Reference Laboratory
NMTPAC	National Medicines and Therapeutics Policy Advisory Committee
OPD	Outpatient Department
PEDCO	Provincial Epidemiology and Disease Control Officer
PHE	Provincial Health Executive
PMD	Provincial Medical Director
PPEC	Personal Protective Equipment and Clothing
PR	Principal Recipient(Global fund)
PSI	Population Services International
RDT	Rapid diagnostic tests(for malaria)
SDA	Service Delivery area
SOP	Standard Operating Procedures
SP	Sulfadoxine/Pyrimethamine
TLV	Threshold Limit Values
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
WHO	World Health Organisation
ZINQAP	Zimbabwe National Quality Assurance Programme
ZIP	Zimbabwe Informed Push
Nat Pharm	National Pharmaceutical Company of Zimbabwe
NHIS	National Health Information System

Executive Summary

The Malaria Programme Review (MPR) is a periodic joint programme management process for reviewing progress and performance of country programmes with the aim of improving performance and refining or redefining the strategic direction and focus. The findings of this review will be used to inform policy and strategic directions for future drive towards achieving universal coverage, its maintenance thereof and further action towards pre-elimination and elimination.

Key findings

Historically an estimated 50% of the population in Zimbabwe resided in malaria endemic areas, although there is evidence of recent geographical changes in malaria distribution. The malaria risk mapping and stratification are out-dated, and areas for pre-elimination need to be refined. Malaria is mainly seasonal in Zimbabwe with potential for epidemics during the rainy season. Malaria accounts for 30% of all out patient attendances, 12% of hospital admissions. Malaria overally remains the second commonest cause of morbidity and mortality after HIV and AIDS related illnesses in the country Ninety-eight per cent (98%) of all cases of malaria are caused by *P. falciparum*. The primary vector is *An. arabiensis*.

The NMCP has a malaria control policy and strategic plan aligned with the overall National Health Strategy 2009-2013. Technical guidelines and training manuals are available to support priority interventions. The Government of Zimbabwe considers malaria as a key target disease as reflected in the old National Health Strategy (NHS) 1997-2007 as well as in the current NHS 2009-2013. GOZ has consistently allocated close to 15% of its national budget to health from 2007. From 2003 a specific budget line item for malaria was created, and between 2009 and 2011 the Government allocated up to USD1.2 million per year to malaria control, the highest allocation for any disease programme in the MOHCW. In addition there exists the Parliamentary Portfolio Committee on Health, which provides a platform for malaria issues to be discussed at a high political level. Most malaria services are provided free of charge in the country. Furthermore, Zimbabwe has attracted substantial funding from the Global Fund, with other partners promising further support for the medium term. The NMCP conducts regular meetings and programme updates are given to the Minister's and Permanent Secretary's meetings.

However, there is a funding shortfall to complete implementation for the current strategic plan. In addition, partners are not fully coordinated leading to fragmented programme implementation. Placement of the NMCP in the MOHCW organogram is at a low level compared to similar priority disease programmes, for effective decision-making. Challenges exist with respect to decision-making, coordination and management between the PR, NMCP, and CCM of Global Fund supported activities. Achievements have been made on cross border malaria control activities with South Africa, and this needs to be consolidated and expanded to other border areas.

IRS is increasingly being supplemented with long lasting insecticidal nets (LLINs) in thirty districts. Furthermore larviciding is implemented in a few low transmission areas. The Government has consistently funded the IRS programme for the past decade. With additional external financial support, the programme has successfully managed to maintain and even expand the population protected by IRS within the targeted 3.2 million people from 85% in 2008 to 90% in 2010. Since changing to universal coverage of LLINs in 2009, a total of 1.8 million nets have been distributed (giving a coverage of 83%), leaving an existing gap of 650,000 nets. Funding is available for around 1.5 million replacement LLINs starting in 2013, through the GF R10 grant. The available vector distribution map is out-dated.

Sixteen vector sentinel sites manned by staff trained in basic entomology have been established. Information generated from these sites will be used to update the vector distribution map.

The major challenges in vector control include late spraying due to delayed release of funds and delivery of vector control commodities in the recent past. There is need to identify appropriate mechanisms for replacing old ineffective nets with new LLINs, particularly through routine channels such as ANCs and CBHWs that can sustain continuous availability of effective replacement nets.

The malaria diagnosis and case management policy changed to the use of ACTs in 2004 and implementation of the policy started in 2007. Between 2004 and 2007 an interim policy of CQ+SP was used. The new policy recommends parasitological confirmation of all malaria cases. All public health facilities now use rapid diagnostic tests whilst all admitting institutions use microscopy for malaria diagnosis. While malaria case management services are free in the government sector, local authority health facilities charge user fees, but RDTs and ACTs are free. Malaria case management training has been provided to public health staff, other government ministries (Defence, Home Affairs, Local Government) and private health sector institutions that offer health services. Community Case Management of Malaria using the new policy (use of ACTs) was approved in 2010 and training of the Community Based Health Workers has started in one province. Malaria treatment guidelines and standard operating procedures for diagnostics, including manuals for Community Case Management of Malaria, have been developed and distributed to all levels of health care. For quality control and assurance the NMCP works closely with ZINQAP, MCAZ and the NMRL. IPTp is recommended in 30 moderate to high burden malaria districts.

Out dated case definitions and the absence of algorithms on malaria treatment potentially compromises the quality of diagnosis and treatment and reduces the accuracy of NHIS and surveillance data. In addition there is lack of a comprehensive QA/QC strategy for malaria laboratory diagnosis. IPTp coverage remains substantially below the national target, with IPTp1 at 45.5% and IPTp2 at 27.8% in 2009. Management of severe malaria in health facilities as per the case management audit is 72.5%, but could be strengthened further. One of the main bottlenecks for sustained case management includes inadequate financing for continuous long term procurements and supplies of RDTs and all anti-malaria medicines (ACTs, SP, quinine and Clindamycin). Moreover, the non-inclusion of anti-malaria commodities in the Essential Drugs Kits constrains the availability of case management services. Adequate stocks of ACTs and RDTs are available for 2011, but there is currently limited funding for new supplies in the pipeline for 2012 onwards. This is a serious shortfall that will undermine the malaria control programme if urgent actions are not taken.

Zimbabwe is characterized by a highly seasonal malaria transmission pattern which predisposes it to the risk of malaria outbreaks. The NMCP has national EPR guidelines and uses the weekly surveillance system and a community based early warning system that reports public health events. A weekly surveillance epidemiological bulletin is compiled at the HQ and at some provinces, although its dissemination is currently limited. Epidemic thresholds are in use in most health facilities. IDSR trainings have been conducted in the recent past but have not been rolled out to all districts and health facilities due to inadequate funding. There is also lack of documentation on epidemics, no epidemic risk mapping and no post mortems were conducted following malaria epidemics. Most provinces have had inadequate emergency stocks for outbreak response, inadequate training in epidemic preparedness and response and most EPR plans are out dated. In general there is inadequate use of meteorological data for malaria epidemic prediction at all levels.

Zimbabwe has a robust health procurement and supply logistics system. NatPharm is the principle national procurement and supply logistics agency for medical supplies. Nevertheless, recently malaria control procurements have been outsourced to other partners. The Zimbabwe Informed Push (ZIP) is the system that distributes health commodities through the public health system, but due to financial constraints and logistical bottlenecks, the system has been unable to maintain the minimum 3-month's stocks in health facilities. Health facilities also place orders for supplies, to ensure adequate stock availability (PULL system). The actual distribution is done on a quarterly basis based on consumption

data. The overriding challenge is that current funding sources, including from the GF, are inadequate to cover the total requirements of malaria control commodities in Zimbabwe from 2012 to 2015.

There is political commitment from the highest levels. Zimbabwe has a national malaria communication strategy that spells out main advocacy, social mobilization and BCC. Implementation of these strategies through the public health system, including CBHWs and community malaria committees (CMCs) is creating demand for malaria control interventions and utilization of services. Generally 80% of the population know the signs and symptoms of malaria. However, early treatment seeking behaviour has only increased from 3.6% in 2005 to 40.5% in 2009 and net-use still falls below the national target of 80%. Major challenges include inadequate funding for BCC/IEC activities and limited availability of BCC/IEC materials at all levels, especially for people with minority languages.

The NMCP has a Monitoring and Evaluation Plan that is aligned to the 2008-2013 Malaria Strategic Plan. Zimbabwe uses the National Health Information System (NHIS) to capture routine morbidity and mortality data on weekly, monthly and quarterly basis. The system collects data on suspected malaria cases, tested and positive malaria cases, deaths, IPTp and ACT consumption by facility. Although RDT data are being recorded, its data collection tool is not standardized. The NHIS has introduced a more comprehensive software package for data capturing and management, for the DHIS countrywide. A total of 1200 out of 1500 health facilities in the country have been supported with cell phones to strengthen weekly data transmission. This system is currently being piloted in two districts. Data on vector control interventions is systematically collected using specific routine systems such as activity reports. Programme data storage, monitoring is weak. There was a Malaria Indicator Survey in 2008, and additional population based surveys such as the DHS are used to collect data on various malaria indicators. Malaria case management Audits are conducted every two years, and the last one was in 2009. Through the NIHR, Zimbabwe conducts operational research on therapeutic efficacy testing studies on first line anti malarials, bioassays, and vector bionomics and insecticide susceptibility tests.

There is inadequate monitoring of completeness and utilization of data from the NHIS at national level. The review also noted that there is inadequate feedback to lower levels and that there is inadequate information sharing with partners. There are several indicators in the national malaria M&E plan however emphasis on monitoring is largely confined on Global Fund performance framework.

Key best practices, success stories and facilitating factors

Outpatient Department (OPD) malaria cases decreased from 14% in 2005 to 9% in 2009; inpatient malaria cases declined from 9.5% to 8.4% between 2005 and 2008. Malaria deaths as a proportion to inpatient deaths decreased from 7.1% in 2003 to 3% 2008. The noticeable decline in absolute figures for malaria over the past 10 years is matched by declining incidence rates as well as positivity rates.

IRS is increasingly being supplemented with long lasting insecticidal nets (LLINs) in thirty districts. Furthermore larviciding is implemented in a few low transmission areas. The Government has consistently funded the IRS programme for the past decade. With additional external financial support, the programme has successfully managed to maintain and even expand the population protected by IRS within the targeted 3.2 million people from 85% in 2008 to 90% in 2010.

The new Malaria policy recommends parasitological confirmation of all malaria cases. All public health facilities now use rapid diagnostic tests whilst all admitting institutions use microscopy for malaria diagnosis. Malaria case management services are free in the government sector.

Main problems and challenges

There is a funding shortfall to complete implementation for the current strategic plan. The current funding sources, including from the GF, are inadequate to cover the total requirements of malaria control commodities in Zimbabwe from 2012 to 2015. For case management there is inadequate financing for continuous long term procurements and supplies of RDTs and all anti-malaria medicines (ACTs, SP, quinine and Clindamycin). Whereas adequate stocks of ACTs and RDTs are available for 2011, there is currently limited funding for new supplies in the pipeline for 2012 onwards. Old ineffective nets need replacement with new LLINs but as yet the funding is not adequate to cover this replacement and also to achieve universal coverage. Funding for BCC/IEC activities is inadequate and hence there is limited availability of BCC/IEC materials at all levels, especially for people with minority languages. The major challenges in vector control include late spraying due to delayed release of funds and delivery of vector control commodities in the recent past. It has not been possible to roll out IDSR trainings to all districts and health facilities in the recent past due to inadequate funding.

Placement of the NMCP in the MOHCW organogram is at a low level compared to similar priority disease programmes, for effective decision-making. Challenges exist with respect to decision-making, coordination and management between the PR, NMCP, and CCM of Global Fund supported activities. Partners are not fully coordinated leading to fragmented programme implementation.

Out dated case definitions and the absence of algorithms on malaria treatment potentially compromises the quality of diagnosis and treatment and reduces the accuracy of HIS and surveillance data. In addition there is lack of a comprehensive QA/QC strategy for malaria laboratory diagnosis. IPTp coverage remains substantially below the national target, with IPTp1 at 45.5% and IPTp2 at 27.8% in 2009. Management of severe malaria in health facilities as per the case management audit is 72.5%, but could be strengthened further.

There is also lack of documentation on epidemics, no epidemic risk mapping and no post mortems were conducted following malaria epidemics. Most provinces have had inadequate emergency stocks for outbreak response, inadequate training in epidemic preparedness and response and most EPR plans are out dated. There is also inadequate use of meteorological data for malaria epidemic prediction at all levels.

Programme data storage, monitoring is weak. There is inadequate monitoring of completeness and utilization of data from the NHIS at national level. The review also noted that there is inadequate feedback to lower levels and that there is inadequate information sharing with partners. There are several indicators in the national malaria M&E plan however emphasis on monitoring is largely confined on Global Fund performance framework.

Key recommendations

The following strategic directions are recommended for the Zimbabwe malaria control programme in the next three years:

1. Urgently leverage additional funds and engage partners to fill the 2012-13 malaria control resource gaps.
2. Strengthen partnership and programme management to address human and financial resource needs, commodity requirements, monitoring and evaluation and operational research.
3. Urgently expand community based malaria control services through strengthening community health systems.
4. Scale up and direct interventions based on epidemiological evidence, including district level targeted elimination activities.
5. Strengthen malaria monitoring and evaluation, surveillance and utilization of evidence for effective programming.

1 Introduction

1.1 Background

Zimbabwe has a surface area of 390,757 km^2. It lies between latitudes 15^0 and 22^0 S and longitudes 25^0 and 33^0 E. It has a distinct hot summer (rainy) season and a cool to cold winter. The rainy season is between November and May, and the country receives about 1,000 mm of rainfall per year (1996 figures). The annual rainfall pattern by Province varies from as little as 700 mm in Matabeleland North to as much as 1,500 mm in Manicaland. During the rainy season, temperatures range from an average maximum 30^0 C to minimum averages around 18^0 C. Winter temperatures on the other hand average between 25^0 C maximum and 10^0 C minimum. Most of the country therefore has conditions conducive to malaria transmission especially during the hot summer season.

Zimbabwe is divided into ten administrative provinces (each with a provincial capital) and 62 rural districts which are further subdivided into wards. Harare is the country's capital city and Bulawayo is the second largest city. All provincial capitals are linked by a good road and rail network.

Zimbabwe has a projected population of 12, 347,238 people in 2008 based on the 2002 population Census (Central Statistical Office, 2002). Below (table 1) is a table showing the population breakdown.

Table 1: Population distribution by age group: 2008

Age group	Population	(%)
< 5 years	1779181	14.4
5-14 years	3233331	26.2
>or =15 years	7334726	59.4
Women of child bearing age	3185587	25.8

Source: *Projected from 2002 Census* on economic activities

1.2 Environmental and climatic factors influencing malaria

Zimbabwe has a distinct hot summer with mean minimum temperature of 18ºC and mean maximum temperature of 30ºC. The annual rainfall pattern varies from 700 mm to 1 500 mm in the months of December to March. The altitude of the country varies from 600-900 meters above sea level in the low-veld in the south east and the Zambezi valley in the north and from 900-1200 meters along the high-veld that cuts across the central region of the country.

Most of the country has conditions conducive to malaria transmission especially during the rainy season (December to March). Malaria transmission is however more prevalent in the low-lying areas (altitude 600-900 meters above sea level). Twenty-four (24) of the fifty-six (56) districts in the country are within this high transmission area

1.3 Malaria Parasites and Vectors

The predominant malaria parasite in Zimbabwe is *Plasmodium falciparum,* which accounts for 98% of all reported malaria cases. *Plasmodium ovale* and *P. malariae* account for the remainder. *Anopheles arabiensis* is the major vector for malaria transmission. It rests both outdoors and indoors and feeds both on humans and animals making it difficult to eliminate by IRS. *A. merus* has been reported in Zimbabwe in isolated localities but its role in malaria transmission is yet

unclear. The most abundant species of the *An. gambiae* complex in Zimbabwe is *An. quadriannulatus,* which is not a malaria vector but coexists with *An. arabiensis.*

1.4 Socioeconomic impact of malaria

Malaria is a major public health problem in Zimbabwe. About 50% of Zimbabwe's population live in malaria transmission areas. Malaria is ranked second amongst the top ten causes of OPD attendance contributing 20-30% of out-patients attendance, 12% inpatients and is the second highest cause of death for inpatients per annum. The malaria incidence rate in the twenty most affected districts ranged between 158-700 cases per 1000 per annum in 1999. In year 2000, 15% of outpatient attendance and approximately 20% of in-patient admissions to public health facilities were due to malaria.

2 Justification for the Malaria Programme Performance Review

Zimbabwe has been conducting Indoor Residual Spraying (IRS) since the late 1940s. The percentage coverage has been fluctuating between 30% and 85%. Other interventions such as LLINs, use of RDTs and ACTs, improved BCC strategies, massive investments in training and significant funding inflows from the Global Fund all needed a critical review. The MPR was to enable Zimbabwe to assess the implementation level of current strategies with a view of strengthening the malaria control programme and systems.

The MPR was expected to help in the identification of what is working and what is not and why and propose solutions to major problems or barriers to scaling up programme implementation. This in turn would support planning and resource mobilization for scaling up delivery of malaria control services leading to a gradual increase of the malaria free areas in the country ultimately leading to elimination of malaria.

In addition, it was hoped that key partners will use the results of the programme review to reach a consensus on problems, identify gaps and suggest improvements in programme performance, as well as proposing solutions and identifying activities required for the rapid outcomes of both the malaria control programme and the long term sustainable outcome of the overall national public health system.

The major outcome of MPR in Zimbabwe was that it allowed the country an opportunity to precisely situate the programme and make critical decisions relating to its strategic direction *vis-a vis* scaling up control, moving towards pre-elimination and eventual elimination of local transmission in the country. It was therefore also useful as a tool to be used for resource mobilisation with various partners.

2.1 Objectives of the MPR

2.1.1. Overall Objective

The purpose of the review was to identify achievements; progress and performance of current National Malaria Control Programme as well as identifying major emerging critical issues, key challenges, and investigate the causes of identified major problems and propose solutions with the view for programme redesign to achieve better performance as regards quality and impact.

2.2 The specific objectives were:

1. To review the malaria epidemiology (endemicity, seasonality, parasite, vector situation, morbidity and mortality) in Zimbabwe
2. To assess progress towards the global targets of reducing morbidity and mortality due to malaria, with the view to ascertain gaps that will lead Zimbabwe to malaria pre-elimination
3. To review the policy and programming framework of the country within the context of the health system and the national development agenda
4. To review the current programme service delivery systems, their performance and challenges
5. Define the next steps to improve Programme performance

2.3 Methodology of the MPR

The MPR was conducted in 4 phases namely; planning and preparation (Phase 1), thematic desk reviews (Phase 2); field visits to validate thematic reports (Phase 3) and report writing and other follow up actions (Phase 4). The latter is continuing.

2.3.1 Phase One: Planning and Preparation

The first phase of planning started in 2010 and the MPR proposal was submitted for funding to RBM and WHO/AFRO. In Feb 2011, NMCP convened a meeting with stakeholders in preparation to the desk review. Subsequently, the thematic review groups were formed in order to review programme strategies. These groups were comprised of partners and Ministry staff. All thematic groups were chaired by partners involved in specific malaria control strategies and the National Malaria Control Programme served as a secretariat. Terms of Reference were developed and validated in a stakeholders meeting. The plan and budget were submitted to the RBM, the Malaria Unit and other partners for funding.

2.3.2 Phase Two: Thematic Desk Reviews

The second phase started in March 2011 and ended in May 2011. This phase involved selecting tools for the field review and conducting thematic desk reviews. Thematic review groups met according to the group's needs and at least weekly. Two retreats were organized to finalize thematic review reports. This desk review consisted of a summary of recent progress in achieving set targets for access, coverage, quality, use and impact. It allowed the programme to identify best practices, recognize problems, determine the priority of those problems, decide on how to investigate those of highest priority and propose appropriate solutions. This phase revealed information weaknesses and gaps and therefore where the external review process would focus.

2.3.3 Phase Three: Field Review

The third phase was done according to the guidelines and it involved briefing of external review team. This ensured team-building between internal and external review teams, consensus-building on findings of thematic internal desk review, familiarization with data collection tools for field visits, briefing and formation of field teams for field review. The field visits started with central level visits to national institutions and organizations. This was followed by district and community field visits to malaria service delivery points. Later, teams re-converged and shared field reports through

plenary presentations on key findings. Thereafter, thematic review reports were updated with this information to ensure completeness, and then preparation of drafts of the final report, executive summary, aide-memoire and slide presentation of key findings and recommendations. The aide memoire was circulated to stakeholders for study and internalization two days before the signature day. Then the same presentations were presented to the RBM stakeholders meeting that culminated into a ceremony for signing the aide-memoire.

Presentation of the findings was made to the Permanent Secretary and Senior Officials in the Ministry of Health and Child Welfare by the team followed by a presentation to all stakeholders in malaria control and the signing of the aide memoire on 17th of June 2011. The aide memoire (Annex 3) was signed by the Permanent Secretary of the Ministry of Health and child Welfare, the WHO Country representative, Heads of UNDP, UNCEF, DFID and USAID.

2.3.4 Phase 4: Follow-Up

Phase 4 will start with finalizing, publishing and dissemination of the report. There will be followed with implementation of recommendations as part of updating policies, guidelines and plans as well as systematic monitor of the implementation of the recommendations. As part of the recommendations the NMCP and its partners will also update malaria policies and strategic and annual operational plans, and redesign programme as planned during the MPR.

The sections that follow consist of the following: epidemiology of malaria; management support; programme performance by thematic areas – malaria vector control, malaria diagnosis and treatment, epidemic preparedness and response, supply chain management, advocacy, communication and social mobilization, surveillance, monitoring and evaluation; conclusions; and recommendations.

3 Epidemiology of Malaria

3.1 Population at Risk of Malaria

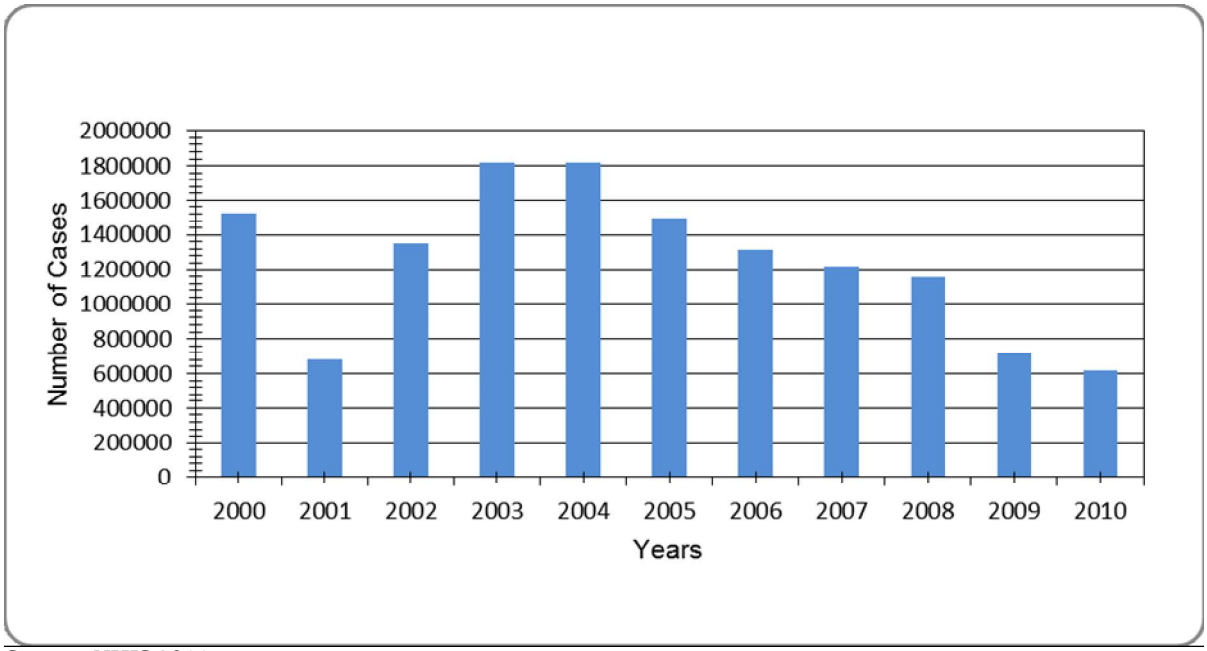
Malaria remains a public health problem in Zimbabwe, with more than of 5 million people at risk of contracting malaria annually. Historically, it is estimated that 50% of the population resides in malaria endemic areas (National Health Strategy 2008-2013)

3.2 The Burden of Malaria

Since 2004, malaria incidence has been declining with a decrease in the number of reported cases from 1.8 million cases in 2006 to about 600,000 in 2010, a 66% reduction in number of cases. This has been mainly attributed to changing weather patterns (drought), indoor residual spraying (IRS), increased use of insecticide treated nets (ITN) and improved diagnosis of the disease and prompt treatment of cases.

Malaria remains the second commonest cause of all new OPD attendances accounting for an average of 1.4 million cases annually. The number of cases reduced from 1.8 million in 2003 to about 600,000 cases in 2010, with over 2000 malaria related deaths annually (NHIS). In the early 1990's, malaria accounted for 30% of all out patient attendances, 12% of hospital admissions and was the second commonest cause of morbidity in Zimbabwe. Ninety-eight per cent (98%) of all cases of malaria are caused by *P. falciparum*. The primary vector is *An. arabiensis*. Outpatient Department (OPD) malaria cases decreased from 14% in 2005 to 9% in 2009; inpatient malaria cases declined from 9.5% to 8.4% between 2005 and 2008. Malaria deaths as a proportion to inpatient deaths decreased from 7.1% in 2003 to 3% 2008.

Figure 1: Malaria Morbidity Trends (suspected and confirmed) cases: 2000 - 2010



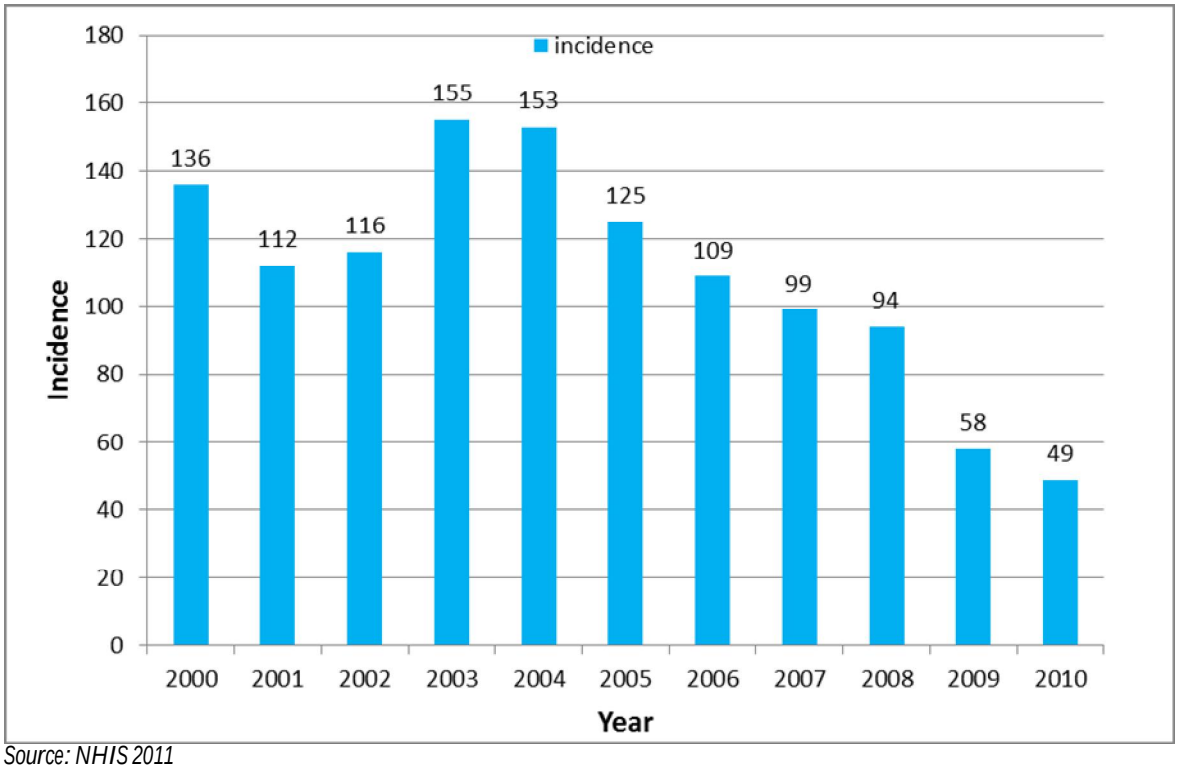
Source: NHIS 2011

The graph shows a decline of malaria cases over the years (53%) decrease from 2000 baseline of 1,527,286 cases). In 2001 the drop was attributed to a massive health industrial action that paralysed the reporting system. The highest cases were reported in 2003 and 2004.

Reduction in Malaria morbidity: Trends on malaria incidence

There has been a reduction in incidence malaria cases reported over the past 10 year period from 2000 to 2010 as shown in Figure 2. The year 2010 marked as the reporting benchmark for the Abuja Declaration of 2000, which committed member states to have halved malaria morbidity by 2010 based on 2000 baseline. By December 2009 the malaria incidence rate for Zimbabwe stood at 58 cases per 1000 population showing a 57% decline from the 2000 level which was 136/1000 population at risk. By December 2010 the malaria incidence rate for Zimbabwe stood at 49/1000 showing a decline of almost 64% from the 2000 rate of 136/1000 population at risk, and lower than what was targeted for 2010.

Figure 2: Malaria Incidence rate per 1000 population for the years 2000 to 2010



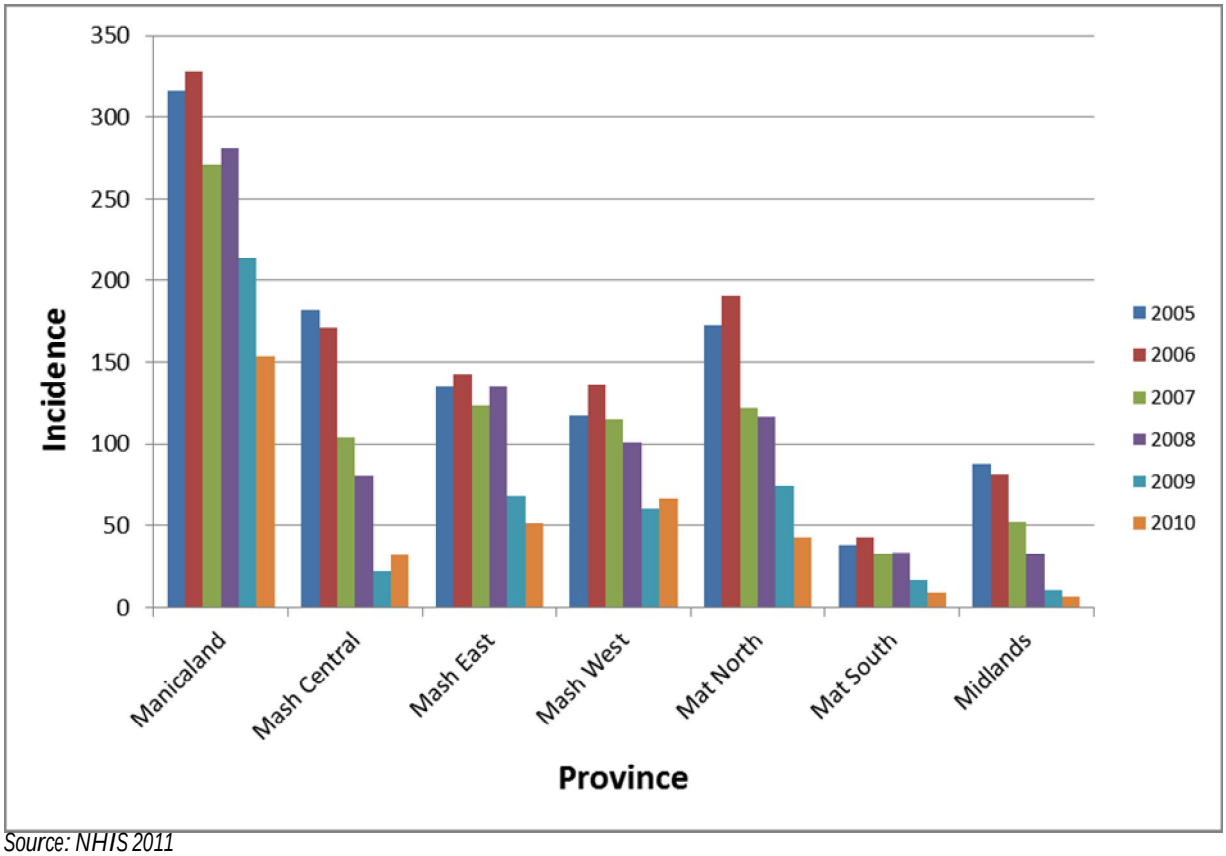
Source: NHIS 2011

This achievement is attributed to increased investments in malaria control through support from the Roll Back Malaria Initiatives, the Global Fund and other partners that enabled the Ministry of Health and Child Welfare to scale up malaria interventions.

Malaria Incidence by province

Zimbabwe has 62 districts of which 45 are highly burdened by malaria and targeted interventions were implemented in these districts with the aim of reaching universal access for malaria interventions. The *graph* below compares provincial malaria incidence trends from 2005 to 2010 and it shows a general decrease of the incidence of malaria by province over the past 6 years. Although there is a general decrease in incidence rates in all provinces, this has remained relatively high in Manicaland province and low in Matabeleland South province. The high incidence of malaria in Manicaland could a result the 730km uncontrolled border with Mozambique and most communities in this border area have limited access to malaria services, especially on the Mozambiquan side and therefore seek for treatment on the Zimbabwean side.

Figure 3: Provincial Malaria Incidence by year 2005 to 2010



Source: NHIS 2011

Inpatient morbidity and mortality due to malaria

The main challenge identified from 2009 to 2010 has been the non-submission of inpatient (T9) data from admitting institutions. Therefore there has been no malaria inpatient morbidity and mortality data to report on from 2008 to date due to the change from DOS based software to windows. However a trend analysis of morbidity data from 2001 to 2008 show a general decline from 45,643caases in 2001 to 11,350cases in 2008, a 75% reduction in the number of cases. On the other hand mortality data over the years from year 2001 to 2008 shows a marked decline in inpatient mortality due to malaria in 2002 and 2003 followed by a slight increase in 2004 to 2002 level then further decline up to 2008. Case Fatality rate of malaria has more or less followed the same trend although there was a noted spike in 2007. This could have been a result of the prevailing economic challenges in the country that caused a lot of attrition of health workers and shortages of supplies. On average malaria accounted for at least 3% of all hospital deaths.

Figure 4: Malaria Inpatient Morbidity trends, 2001 to 2008, Zimbabwe

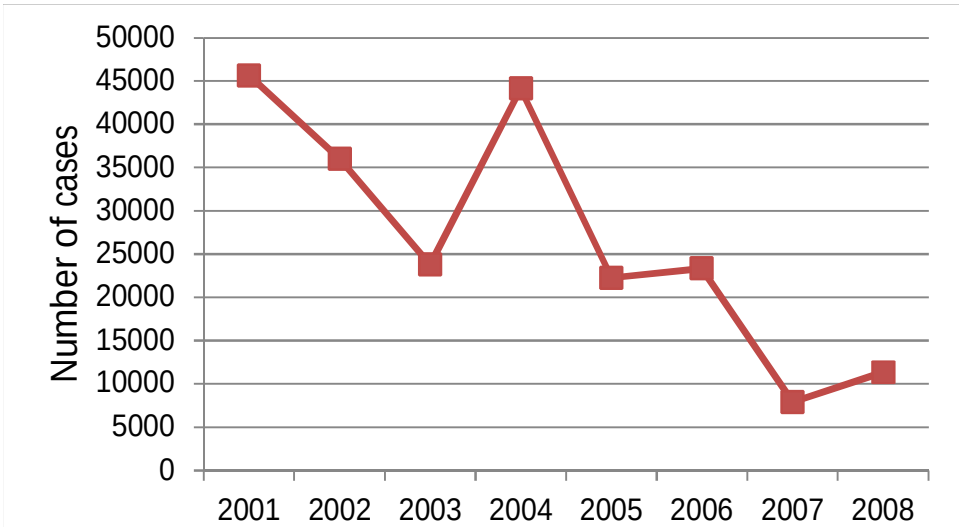
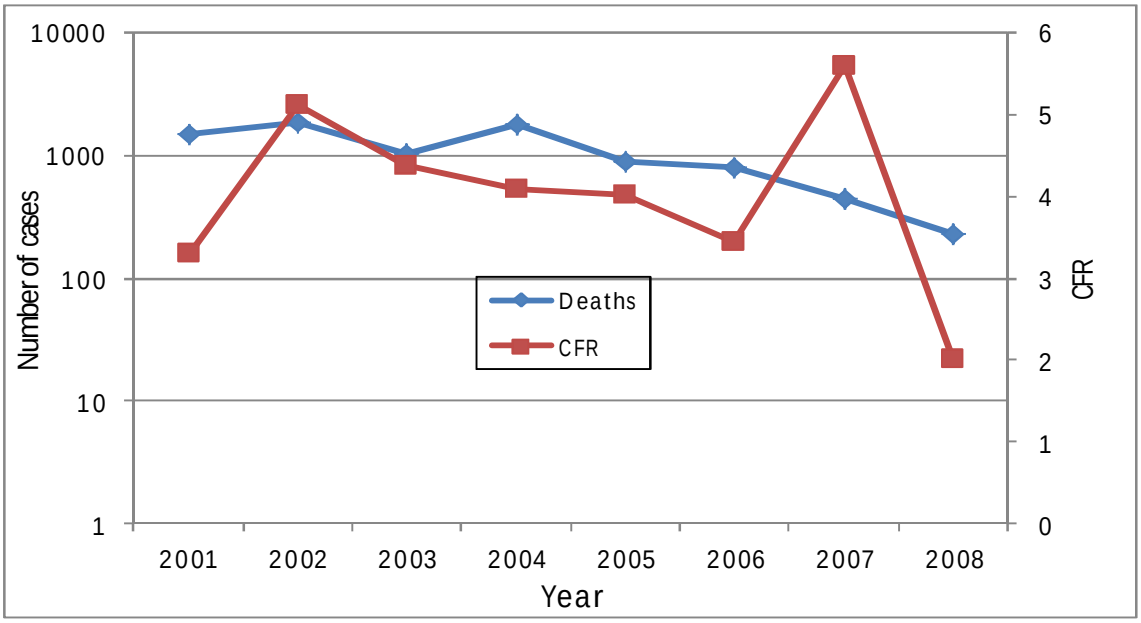


Figure 5: Malaria inpatient mortality trends 2001 t0 2008, Zimbabwe



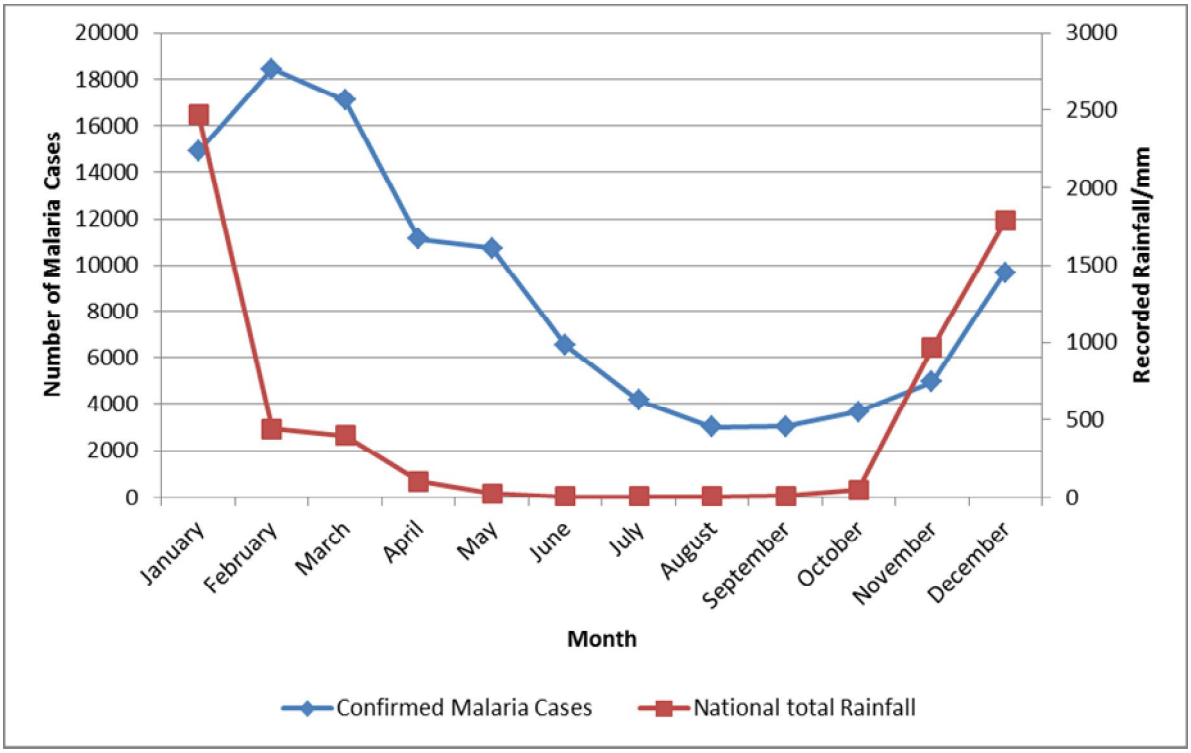
Community data is not routinely reported through the main stream NHIS hence it is not included in this data

3.3 Temporal Distribution of Malaria

Temperature and rainfall pattern govern the life cycles of both *P. falciparum* and *A. arabiensis*. Zimbabwe is warm and wet from November to April, cold and dry from May to August, and hot and dry from September to October. Most of the malaria transmission occurs during the warm and wet season with peak from February to April. Cold months in June and July limit malaria transmission even in endemic malaria areas. Although temperatures from September to October are suitable for malaria transmission, dry conditions limit mosquito breeding. Below (figure 6) is a graph showing malaria monthly figures and national total rainfall for 2008, to illustrate the seasonality trends of malaria

transmission in Zimbabwe. Although this is general trend, there are variations in the provinces depending on the rainfall pattern.

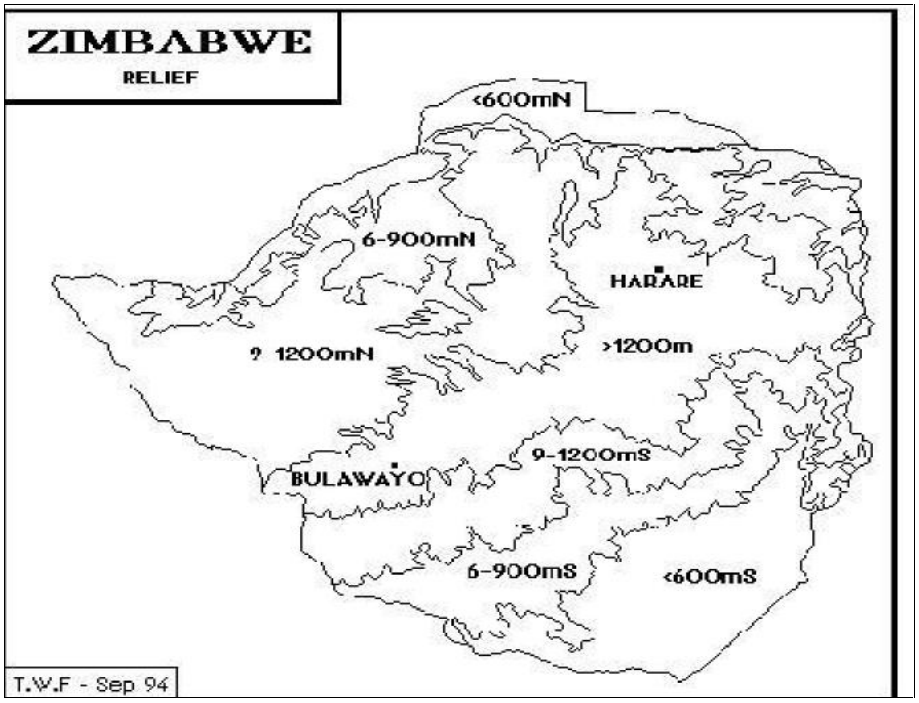
Figure 6: Malaria cases and National total rainfall by month, Zimbabwe, 2008



3.4 Geographical Distribution of Malaria

Zimbabwe is divided by a central watershed lying above 1200 metres above seas level and flanked north and south by low lying areas. In 1986 the country was divided into three epidemiological malaria areas (Fig 7). The three epidemiological zones in terms of malaria transmission were: (1)Areas below 900 metres below sea level, to the north and below 600 metres in the southern parts, where malaria was considered to be perennial and(2) areas between 900-1200 metres north and 600-900 south, where malaria was said to be seasonal and were prone to epidemics. In areas above 1200 metres north and 900 metres south malaria transmission did not normally occur. Traditionally higher areas have been described as unstable, and lower areas as stable in terms of Malaria transmission.

Figure 7: Zimbabwe altitudes zones



3.4.1 Malaria Prevalence
3.4.2 Stratification

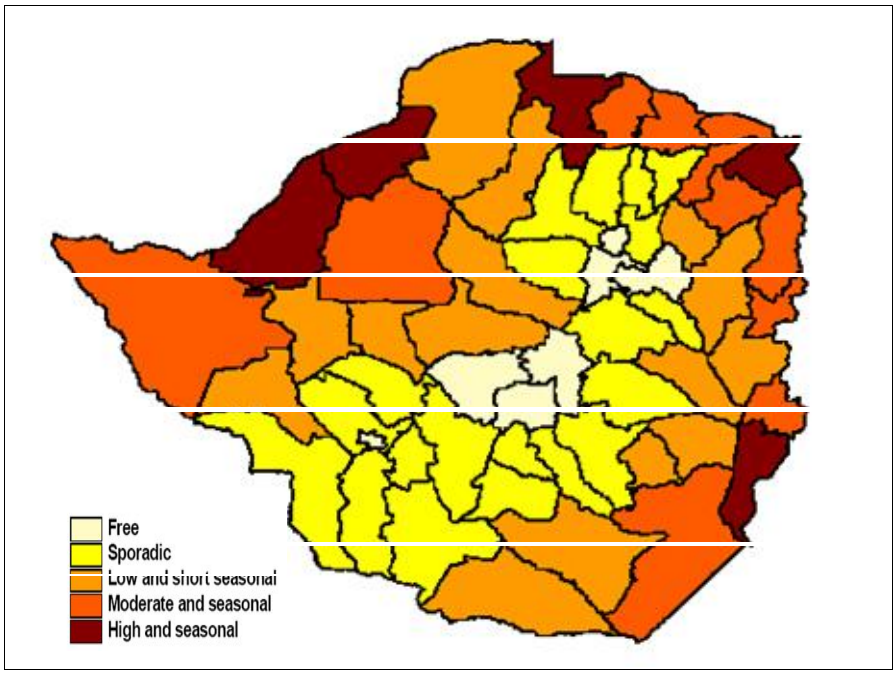
In 2002, new malaria stratification was developed using both expert opinion, epidemiological and entomological data. Out of the 59 rural districts, malaria occurs in 54 districts whose levels of transmission vary from very high and seasonal to sporadic. The districts were therefore classified as follows:

1. Six with high and seasonal transmission
2. Twelve with moderate and seasonal transmission
3. Fifteen with low and short seasonal transmission
4. Twenty-one with sporadic transmission
5. Five are free of malaria

This stratification is shown in the figure 8 below. A total of 33 districts are considered to be high burden malaria transmission districts warranting some interventions.

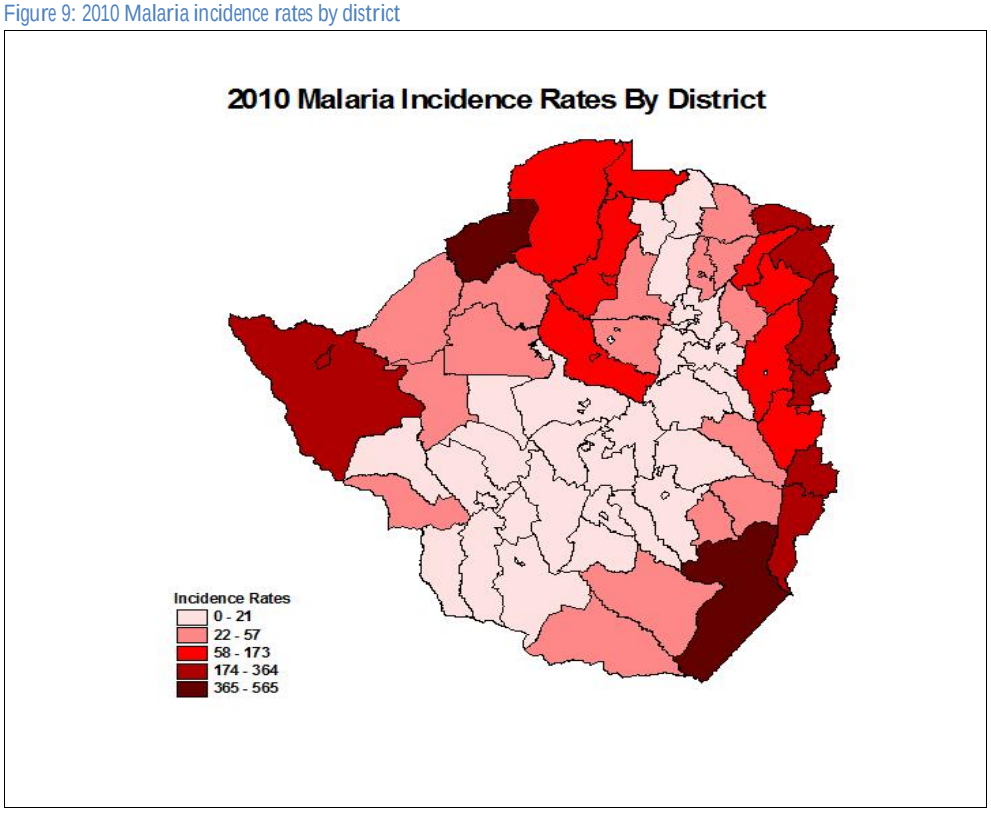
The 2002 stratification map is still the reference point for malaria forecasting and programming. The process of stratification involved four parameters, which were expert opinion, entomological vector control, epidemiological stratification and composite stratification. A combination of these factors produced a composite risk and stratification map, which still stands as a reference point. The maps below show the position of districts in the different levels of malaria transmission zones.

Figure 8: Composite Malaria Stratification map 2002



In view of the changes that have occurred in malaria including levels of endemicity and transmission patterns the stratification map need to be updated. Efforts for updating this map have been taken using the current malaria incidence mainly of suspected malaria cases. From this, the resultant stratification is as follows:

Figure 9: 2010 Malaria incidence rates by district



This shows low malaria incidences in the middle of the country which gradually increases towards the border districts. There is need to further assess the epidemiology of malaria in order for better targeting of strategies that will have the highest impact for each area.

3.5 Key Issues

- The malaria risk mapping and stratification are out-dated
- There is limited analysis and use of epidemiological data
- Areas targeted for elimination need to be clearly identified

3.6 Action Points

- Use existing routine and surveillance data to update malaria risk maps, stratification and identification of new areas for pre-elimination.
- Strengthen analysis of existing epidemiological data for programme planning and management.
- Implement pre-elimination/elimination activities in selected low transmission districts.
- Conduct malaria prevalence survey as a baseline to monitor impact.

4 Programme Management and Guidance

The functions of Programme and Finance management in malaria prevention and control in Zimbabwe are performed at the national, provincial, district and to some extent the health facility and community levels. These include important functions such as: planning and administration; logistics management; budget, finance management and resource mobilization; human resource management; monitoring programme performance; and coordinating capacity building as well as co-ordination of partnerships. In order to achieve its goals the National Malaria Control Programme (NMCP) works with sister departments and units within the Ministry of Health and Child Welfare at national, provincial and district levels through the management teams at these levels, to the primary health care facility and community levels. The functions of NMCP aim to achieve the following objectives:

1. To provide a supportive environment with clear policy and strategic guidelines
2. To provide technically sound business plans in conformity with national malaria control strategic plans at all levels.
3. To support all levels of programme implementation to have annual operational plans which are in line with the National Malaria Strategic plan.
4. To support provinces and districts to scale up utilization of cost effective interventions.
5. To support all implementing levels and partners improve quality of care through provision of basic health services.
6. To provide evidence base for adaptation of effective strategies through supporting operational research for the various interventions for malaria prevention and control.
7. To provide feedback to management and partners through supporting effective monitoring and evaluation of interventions in the country.

4.1 Place of Malaria Control in the National Health and Development Agenda

Malaria is regarded as one of the priority diseases in Zimbabwe. Zimbabwe subscribes to the millennium Development goals where Malaria is one of the disease targeted for reversal by 2015. In the National Health Strategy 1997- 2007 and 2009-2013 Malaria appears as one of the top priority diseases in the country. Malaria is the only disease programme in the ministry of Health and Child Welfare which has a separate budget line.

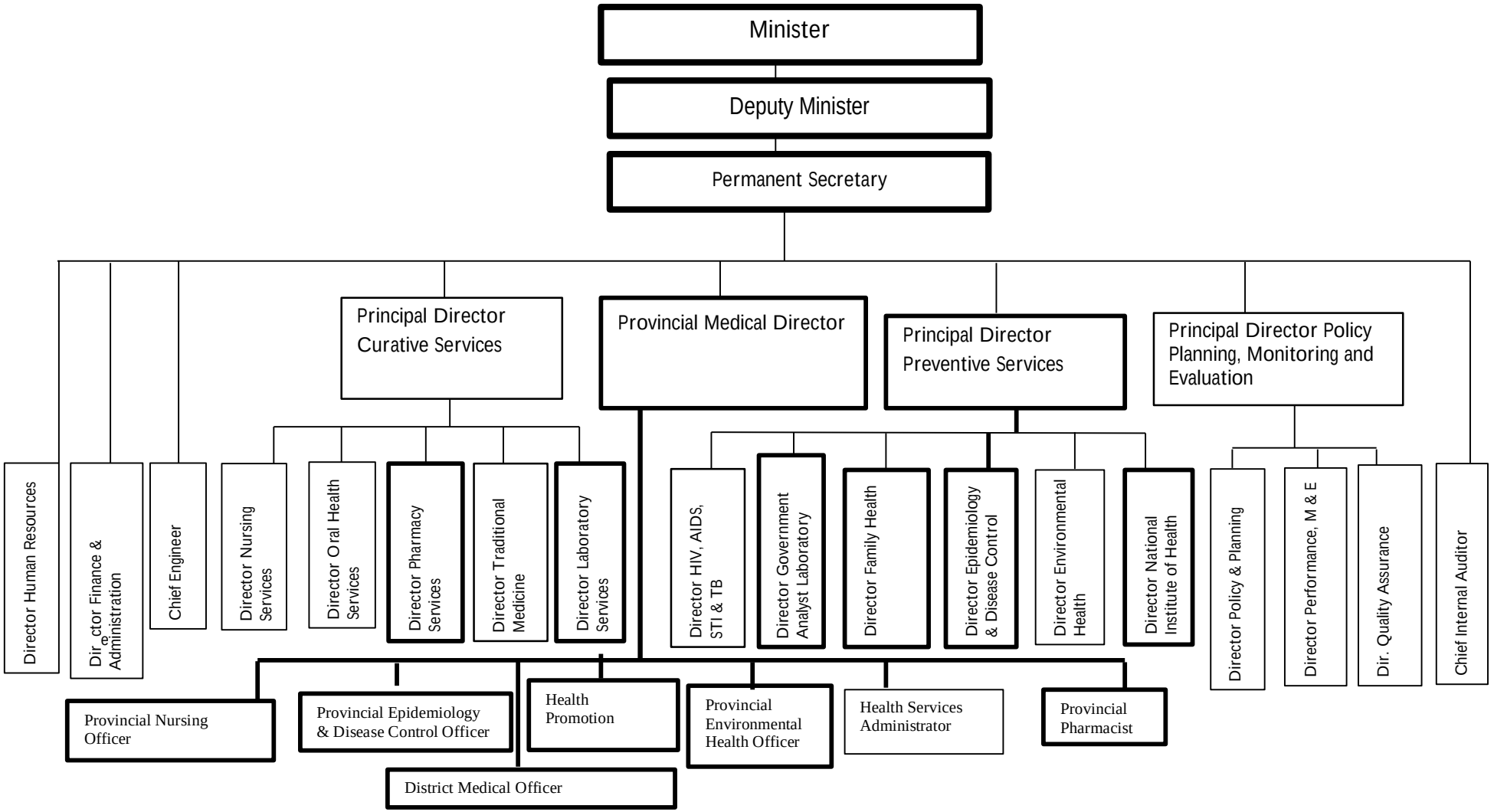
4.2 The National Health System

The Ministry of Health and Child Welfare is headed by the Minister for policy issues and the Permanent Secretary for operations. The permanent Secretary is supported by several professional experts as shown in the organogram below.

The main health Services are provided by Hospitals and Clinics under the leadership of the Provincial Medical Directors for the Rural Provinces and the Director for City Health Services for the two urban provinces. The Central Hospitals which provide referral points for all the provinces are run by management boards and headed by Chief Executives Officers

Technical direction for all arrears is given by the National office headed by the 3 Principal Directors. Malaria issues fall under the Principal Director Preventive with Support from the curative for laboratory services and Pharmaceutical Services.

Figure 10: Structure of Ministry of Health and Child Welfare, Zimbabwe, as at 2011



4.3 Organization and Management of the National Malaria Control Programme

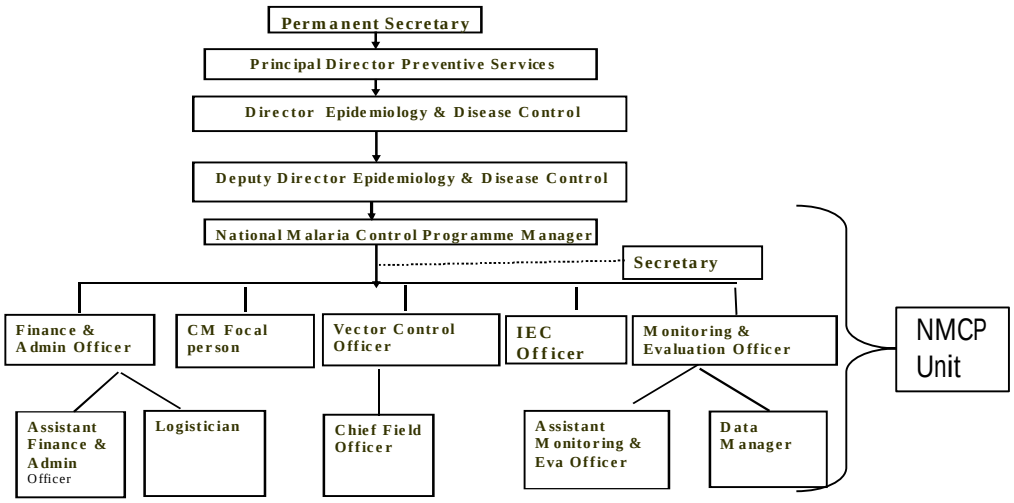
4.3.1 History of malaria control

Malaria prevention and control activities in the country have evolved from being implemented from a thinly staffed central office at the former Blair Research Institute now called the National Institute of Health Research (NIHR) in 2000 to 2001, to a fully-fledged unit by the end of 2010. Between 2000 and 2001 malaria activities were mainly focused on Vector Control especially Indoor Residual Household Spraying (IRS), and these were coordinated by a Chief Field Officer who was stationed at NIHR. During 2001 support from the RBM partnership resulted in the development of the RBM Strategic Plan 2001-7 which led to the creation of additional posts for malaria control activities. A post for the focal person for malaria at Head Office was created and the Chief Field Officer was moved to Head Office to work under this focal person. The RBM Strategic Plan saw the scope of malaria control interventions being widened to include the use of insecticidal nets, Intermittent Preventive Therapy in pregnancy and others. It also recommended the creation of a fully-fledged Malaria Unit, and activities were decentralized to provinces and districts. Additional resources were availed to 10 Front Runner districts in the country to scale up malaria control interventions in these high burdened districts.

4.3.2 Organization of the National Malaria Control Programme

Between 2005 and 2008 the country successfully applied for the Global Fund support through Rounds 1, 5 and 8 grants and these enabled the Ministry to complete the staff establishment of the malaria unit by the end of 2009. The diagram below is the current organogramme of NMCP.

Figure 11: Position of NMCP in the Ministry of Health and Child Welfare Organogram



Malaria Control Technical Subcommittees

Technical Support to NMCP is provided by various subcommittees headed by specialists in the specific thematic areas. Currently in existence are four subcommittees namely, Case management (including Malaria in Pregnancy and Drug

Policy), Vector Control, IEC and Surveillance, Monitoring and Evaluation and Operational research. The membership of the subcommittees is drawn from the public and private sector including academia. The technical Subcommittees meet on a quarterly basis. Their main purpose is to advise NMCP on policy direction with regards to the thematic areas and also development of technical guidelines

Linkages within MOHCW

The NMCP taps into the rich professional and technical expertise that is reflected within the structure of the MOHCW (figure10). The existence of Directorates such as, Human Resources, Finance and Administration, Laboratory Services, Pharmacy Services, Environmental Health, Nursing Services, HIV/AIDS & Tuberculosis, Policy and Planning, National Institute of Health Research, Reproductive Health, Nutrition, Health Information, Health Promotion, Traditional Medicines and many other critical units such as the, Integrated Management Childhood Illnesses (IMCI), Expanded Programme of Immunization (EPI), Nutrition, and the Health Studies Office enables the NMCP to be adequately guided on the various intervention and technical areas readily. However the high number of the different departments and their different and at times complex reporting structures pause challenges and may result in serious bureaucratic delays in decision making. This is especially experienced within the NMCP due to its placement within the structure, which is several levels below the Permanent Secretary, causing many decision making centres that result in delayed action.

Linkages with Other Key Stakeholders

The NMCP works closely with key stakeholders such as the National Pharmaceutical Company of Zimbabwe (Nat pharm) which serves as the central medical stores for the country responsible for the procurement (for medicines under government funding only), storage and distribution of malaria commodities including anti-malaria medicines. Another key institution, which works with the programme, is the Medicine Control Authority of Zimbabwe (MCAZ) which is responsible for the assessment and registration of all medicines in the country. Only medicines, which would have been assessed and met the standard set by the MCAZ, are used by the NMCP as anti-malarials in the country. For the diagnostics of malaria disease the programme works with the Zimbabwe National Quality Assurance Programme (ZINQAP) responsible for the external quality assurance aspects of all the laboratories in the country. Internal quality assurance is done by the National Microbiology Reference Laboratory (NMRL). This linkage is a very important one as it assures quality service delivery in the area of malaria case management.

Cross Border activities

There is a Cross Border initiative between Zimbabwe (Matabeleland South) and South Africa, Trans-Zambezi Malaria Initiative – among Zimbabwe, Zambia, Namibia and Botswana, and Zimbabwe (Manicaland) – Mozambique. These are platforms for coordination of malaria control interventions across borders. The Cross- Border collaboration between South Africa and Zimbabwe has been very active with several meetings taking place on either side of the border. Through this initiative there has been support offered to Matabeleland south, Zimbabwe, in one of the years, in indoor residual insecticide spaying. There is a memorandum of understanding between Manicaland Province in Zimbabwe and Manica Province in Mozambique on cross border collaboration. Meetings have also been held on either side of the border but more still needs to be done to functionalise this collaboration in Malaria Control. Meetings have also been held between Mozambique, Malawi, Zambia and Zimbabwe to initiate some cross- border activities where these four countries meet. Funding problems seem to be the main underlying problem in making effective cross-border initiatives

Implementation Structure/Arrangement

Implementation of malaria control activities and interventions are performed at the following levels:

- National office: Spearheads policy, national guidelines Standard operating Procedures and manuals development, as well as guiding and overseeing implementation of activities. It is also responsible for monitoring disease trends, resource mobilization and partnership coordination. The NMCP staff at Head Office is donor supported and is basically contract workers which is a threat to the stability of the programme.

- Provincial level: This is the hub of programme implementation and is led by the Provincial Health Executive (PHE) headed by the Provincial Medical Director (PMD). The PHE is made up of professionals such as Medical Professionals (Epidemiologists), Senior Nurses, Pharmacists and Laboratory specialists, Health Promotion, Health Services Administration, Environmental Health and Finance. The province supervises all the districts under it. One member of the PHE, the Provincial Epidemiology and disease control Officers (PEDCO) who is also the Provincial Malaria Focal Person is supported by partners but the rest get allowances from the retention scheme package that has been financed by different partners including the GF. Because of this, there are different allowances being given to the staff by the funding partner. The difference in the conditions of service for the PHE members is a cause of disharmony and disgruntlement at this level.

- District: This level is a mirror reflection of the provincial level in terms of the professional mix in its composition and it oversees all malaria control activities in the district and reports to the PMD. The District Health Executive (DHE) is headed by the District Medical Officer.

- Health Facility: This is the primary health care level and is manned by Nurses, Environmental Health Technicians and Nurse Aides. The few staff at this level is in charge of all health care services and is answerable to the DHE.

- Community Level: Ward Health Teams comprising of community members such as Community Based Health Workers, School Health Masters, headmen, chiefs, religious leaders and councillors are responsible for overseeing programme implementation in conjunction with the health facility staff. The WHT members are voluntary workers and are not salaried staff, although the Community Based Health Workers currently get some monetary incentives from the Global Fund R8. The issue of incentives at this level continues to affect commitment from the WHT.

4.3.3 Malaria Control Policies and Guidance

Programme management and implementation is made possible by the availability of guiding documents such as the Human Resource Policy, Finance Management guidelines, Asset Management and Transport policy documents, National Health Strategy 2009-2013. Malaria Policy, and Malaria Strategic Plan 2008-13. These documents are available at all implementation levels and this enables implementers to deliver interventions in a standardized and uniform approach.

The other documents available by thematic area are as follows

i. Vector Control
   - ITN Policy
   - Long Lasting Nets Distribution Strategy

- Spray operator's Manual
- Guidelines to the implementation of malaria vector control interventions.
- The Hazardous Substances and Articles Act and the Environmental Management Act provides guidance for waste management measures in vector control the programme

ii. Case Management

- The malaria treatment guidelines
- Essential Drug List in Zimbabwe (EDLIZ), which is reviewed every four years

iii. Procurement Supply Chain Management

- Essential Drugs List of Zimbabwe (EDLIZ)

iv. Malaria Advocacy, Communication and Social Mobilization

- Malaria Communication Strategy 2008-13

v. Malaria surveillance, monitoring, evaluation and operational research

- Malaria M&E Plan 2008-13

4.4 Annual Implementation Planning

Planning

NMCP is involved in planning meetings at local and regional levels. At local level NMCP has weekly meetings to review the previous week's activities and plan and agree on the current week activities. NMCP is also involved in the monthly Task force meetings where all the epidemic prone diseases are discussed. Every year there is a Malaria Planning and Review meeting hosted by NMCP to look at the current year and plan for the following. This meeting draws stakeholders involved in Malaria control with a balanced professional mix. The programme is also involved in the National Annual Planning and Review Meetings hosted by the Ministry of Health and Child welfare.

The provinces and districts are supposed to hold quarterly Provincial Health Team Meetings (PHTs) and District Health Team Meetings (DHTs) where review and planning of all health matters is done including Malaria. These meetings have not been taking place as frequently as expected because of funding constraints.

At regional level, NMCP participants in ESM meetings

Periodic Evaluations

Malaria indicator survey (MIS) is conducted every 3 years. Therapeutic efficacy Testing (TET) is conducted every 2 years to monitor sensitivity of antimalarial drugs. Every year after indoor residual household spraying, bioassays are done to check on the quality of spraying. In addition periodic program audits are carried out by internal and external auditors. Every five years the country conducts a demographic and Health Survey which also tracks some malaria control indicators. Track surveys are also carried out and shared. Information from all these activities is used to inform programme direction and policy.

Programme Monitoring Mechanisms

The NMCP holds weekly departmental meetings at which all service delivery area focal persons give updates on their areas of responsibility highlighting progress made, coverage achieved, challenges being faced and support needed. Their plans for the week are shared and inputs provided by the team members. This arrangement allows for timely identification of bottlenecks and facilitates a coordinated and rational use of resources. The forum also ensures that there is adherence to the operational plans and budget. These meetings are chaired by the programme manager or any other officer delegated to do so by the manager. The minuted meetings have been held consistently since 2008 to date. Key issues that arise from the weekly NMCP meetings are taken up to the Permanent Secretary's and at times to the Minister's meetings for management's information as well as guidance. This arrangement ensures timely decision making by the relevant authorities. Issues that relate to the Global Fund grants are also taken up to the Country Coordinating Mechanisms meetings or the CCM Malaria Subcommittees which meet monthly.

The Ministry of Health and Child Welfare also has National Taskforce meetings, chaired by the Director Epidemiology and Disease Control and held monthly to discuss epidemic prone diseases especially malaria. The meetings are attended by all provinces in the country and serves as a platform for them to share experiences on the epidemic prone diseases, discuss the situation and data on these diseases in the various provinces. Through these meetings the NMCP is well informed on malaria trends in the country, thus enabling timely intervention in the event of outbreaks.

4.5 Partnership in Malaria Control

NMCP works with some partners to implement the Malaria control programme. The main Partners are Plan International which is involved mainly in vector control and PSI which is involved in LLINs distribution, community mobilisation and behaviour change communication. These partners have worked with NMCP for more than a decade. Earlier on they used to get separate funding sources and of late they have been sub-sub recipients of Global Funding. The partners have been meeting on an *ad-hoc* basis with NMCP overseeing their programming.

4.6 Financing of Malaria Control and Elimination

Planning, reporting and control systems

There is a well-coordinated planning and reporting financial system from periphery to national level. The finance operating system is guided by the Ex-Chequers Act. A simplified manual also exists. For donor funded programmes, the above also applies as well as adherence to donor specific agreements. The MOH also has an internal audit department which carries out audit reviews from time to time. This helps in strengthening the internal control systems. In addition support supervision is also carried out.

Budgeting process

The national malaria control programme budget is derived from the programme's strategic plan. The planning process is as follows:

- The districts prepare and submit their annual plans and budgets to the provinces
- the provinces consolidate the district plans and budgets and send them to the head office

- At national level provincial plans are consolidated in order to come up with the national plan and budget

The Government and partners fund the programme. The budgeting from the Government of Zimbabwe is done on an annual basis but for most partners budgeting is done according to specific agreements and budget cycle of the partner. The national malaria control programme has been getting the biggest budget allocation from the health budget compared to the other programmes within MOHCW over the past six years.

Table 2: Income received over the past four years and 2011 budget from major donors/funding grants

Partners	2007	2008	2009	2010	2011
GOZ	600,000.00	850,000.00	1,400,000.00	1,200,000.00	1, 000,000.00
Global Fund	6,800,000.00	2,100,000.00	11,320,000.00	24,500,000.00	2,600,000.00
WHO(CERF)			1,200,000.00		
UNICEF	150,000.00	320,000.00	450,000.00	25,000.00	
USAID			200,000.00		1,000,000.00
DFID			300,000.00		
EU	3,500,000.00				
Private Sector	60,000.00	47,250.00	60,000.00	20,000	12,500.00
Total	11,110,000.00	3,317,250.00	14,930,000.00	25,745,000.00	4,612,500

NB: The budget considered for GOZ for 2007 & 2009 is for activities funded in foreign currency only. This does not include human resource and infrastructure maintenance related costs or contribution.

In addition, several NGOs, both local and international, have immensely supported malaria control activities through their own funding (sometimes provided in kind) and as sub-recipients for specific SDAs under the various GF grants. The European Union (EU) too supported major malaria activities for the years 2007 to 2010. An amount of US$3.5million was given through Plan International for support to 6 project districts. Through this fund Plan was able to procure and distribute 60,000 ITNs, supported trainings, IRS and procurement of medicines.

Resource Mobilization

Zimbabwe has successfully applied for funding under Global fund for GF R1, 5, 8 and lately R10. Application for Cross-Border initiatives to Global Fund which included R7 for Mozambique, Zimbabwe and Zambia Cross Border Initiative (MOZIZA) and Trans-Limpopo Malaria Initiative (TLMI) and, R8 for Trans Zambezi Malaria Initiative were unsuccessful.

Best Practices

- The monthly meetings that review EPR situation in the country. This is a key opportunity for providing the PMD's information on different aspects of malaria in addition to discussing the malaria situation in their own catchment provinces.
- Presence of the various sub-committees for the different thematic areas that discusses most of the implementation challenges.

4.7 Key Issues

- Malaria control policy, strategic & technical guidelines and training manuals are available
- There is high political commitment to malaria control shown by a separate budget for malaria control which is not so with other diseases
- The funding available is inadequate to cover all program requirements, particularly after 2011
- The release of programme funds from National Government and also from Global fund PR, are often delayed thereby delaying the implementation of programme activities
- Although there is good support from the Government there is still heavy dependency on external funding including the funding of critical Human Resources posts in Malaria Control
- Access to services is poor at community level
- The NMCP Program Manager's position in the MOHCW organogramme is too low taking into consideration the responsibilities that go with it; Directing large sums of money and mobilising stakeholders for program support including reorientation of programme towards pre-elimination efforts
- There is inadequate coordination of partners leading to fragmented programme implementation

4.8 Actions Points

- MOHCW to engage Treasury and UNDP (PR) at the highest level to ensure timely release of annually and quarterly allocated malaria funds.
- Develop a strategy for resource mobilization and in the short-term convene a stakeholders meeting to fill in identified funding gaps.
- Urgently expand community based malaria control services to the underserved through supporting Ward Health Teams.
- NMCP's place in the MoHCW organogram to be elevated to a level commensurate with other similar disease programmes, and the task of malaria pre-elimination.
- Improve partner coordination and involvement at all stages of the programme planning cycle.
- Strengthen cross-border collaboration at provincial and district level with Mozambique, Botswana, South Africa and Zambia.

5 Malaria Vector Control

5.1 Organisational Structure

At national level there is a focal person for malaria vector control while at Provincial and District levels vector control falls under the Environmental Health Officer.

5.2 Vector Control Sub- Committee

The MoHCW assumes the leadership role in developing, maintaining and guiding partnerships. In the case of malaria vector control, this is primarily carried out through the multisectoral vector control sub-committee as well as the ITN Working Group in line with the 3 ones principle (one Coordinating Body, one National Strategic Plan and one Monitoring and Evaluation System). The MOHCW shares the National Malaria Control Programme Strategy as well as

specific vector control strategic plans e.g. National ITN Strategic Plan to partners with the aim of reaching consensus on vector control implementation.

5.3 Human Resource Training and Capacity Development

The Zimbabwe training programme for IRS is specifically designed to guide trainers who are engaged in training personnel in indoor residual household spraying for malaria control. The training is guided by spray operators manual which is used at all three levels of IRS training (IRS level one training targets IRS provincial managers, IRS level two training is meant for IRS district managers and supervisor and IRS level three is for spray operators). Of the three IRS training levels, level three is regarded in the country as the most important training because it equips the spray operators with relevant techniques and skills to conduct the actual spraying. Table 3 is showing trends of spray operator trained (IRS level three training) from 2001 to 2010.

The spray operators' manual is read together with WHO manual for IRS (2000). However, the topics for all the three IRS training levels are designed in such a way that the participants would understand not only the spraying techniques, but also the basic entomology and the epidemiology of malaria. As vector control is dynamic, facilitators may adjust this IRS training programme to accommodate necessary changes. During levels I and II trainings participants are also equipped with skills and knowledge for conducting mosquito bio assays, larviciding and mosquito rearing.

Health and safety issues in IRS have been of high priority as evidenced by provision of personal protective equipment and clothing (PPEC) to all spray operators and their supervisors. In addition, spray operators are trained and supervised in safe pesticides handling. Safety issues are also imparted to the community through health education. No evidence for IRS chemical poisoning has been documented ever since the history of IRS in Zimbabwe.

Rural health centre staff and communities are trained in LLIN management (beneficiary identification, distribution, record keeping, hanging, maintenance and use)

Table 3: Indoor residual spraying (IRS) level 3 training (spray operators) from 2001 to 2010

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Target	1,120	1,120	1,120	1,120	1,120	1,120	1,120	1,120	1,120	1,120
Trained	829	1,019	538	482	381	918	*	918	1,030	1,154
% trained	74	91	48	43	34	82	*	82	92	103

* Missing data

5.4 Vector Control Service Delivery

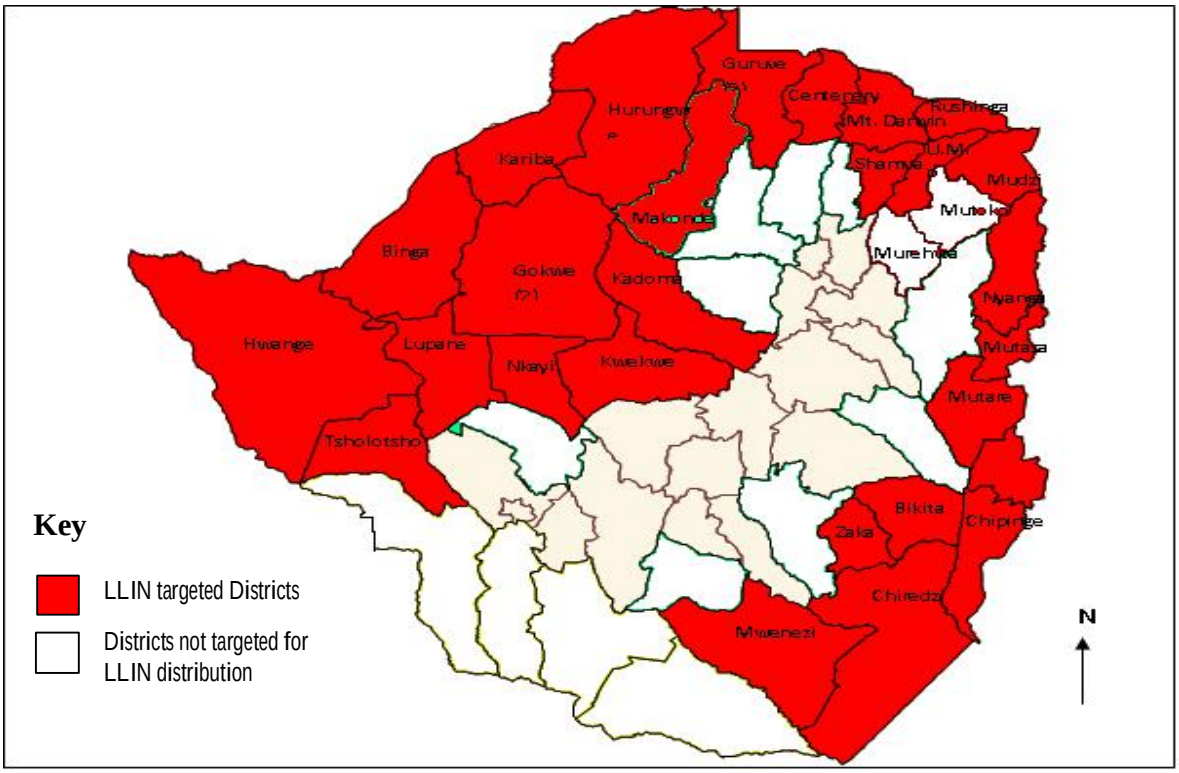
5.4.1 Long Lasting Insecticidal Nets Specifications and Distribution Methods

Zimbabwe developed a National ITN Policy in 2003 (revised in 2006), which ensures systematic LLIN procurement, distribution, advocacy, promotion, affordable pricing, use among the benefiting communities, and monitoring and evaluation activities. Through the support from government of Zimbabwe and partners Insecticide Treated Nets Implementation Strategy/Guidelines (2009) was developed which provides the operational framework for consistent advocacy, promotion, distribution, and use of LLINs in malaria prevention.

All key partners in LLIN promotion formed an ITN working group (ITWG) as a committee of the vector control subcommittee and worked in a participatory process to develop the above documents as well as coordinating and standardizing implementation of LLIN projects in Zimbabwe.

Under the ITN Policy (2006), priority was given to the pregnant women, children under 5 years old, people living with HIV/AIDS and underprivileged as identified by the local community whereas Zimbabwe Insecticide Treated Nets Implementation Strategy/Guidelines (2009) advocates for Universal Access to LLINs targeting 30 medium to high malaria burdened districts (Figure 5) basing on malaria stratification (2002).

Figure 12: Targeted LLINs distribution districts since 2009



ITN/LLIN distribution methods

LLINs are distributed through health facilities, community based distribution, door-to-door and during emergency situation. All the LLINs which were distributed by Zimbabwe government and partners in 2009 and 2010 were provided free of charge. Before each distribution cycle, a house to house census is done where numbers of individuals in the home and/or sleeping areas are counted. The net requirements for each household are then calculated using the 1net/2person formula or 1 net/sleeping area.

From 2008 to 2010 a total of 1,916,866 LLINs were distributed free to the targeted communities using two or more of the above mentioned distribution strategy (Table 4). The LLIN distributed in 2010 are estimated to cover 83% of the population basing on the assumption that one LLIN is shared between two people or one LLIN per sleeping space in the 30 targeted districts.

Table 4: Distribution trends of ITN/LLIN (2004 to 2010)

Year	2004	2005	2006	2007	2008	2009	2010	GRAND TOTAL
ITN distributed	90 000	0	835 344	0	0	0	0	925 344
LLIN distributed	0	0	0	0	57 000	640 557	1 219 309	1 916 866
TOTAL	90 000	0	835 344	0	57 000	640 557	1 219 309	2 842 210

According to the draft Malaria Indicator Survey Report of 2008, the distribution coverage of ITNs was 22%. From the same study six per cent of pregnant women slept under a treated mosquito net in the previous night. The majority of households with mosquito nets had the conventional type and the re-treatment rate was very low. These proportions were similar to those reported in the ZDHS+ for 2005-2006, (6.7% slept under any net and 2.9% slept under treated net the previous night).

In 2009 Zimbabwe expanded from a targeted group approach to universal coverage for LLINs. Although LLINs have been introduced, there are still a substantial number of conventional nets in the communities.

5.4.2 Indoor Residual Spraying

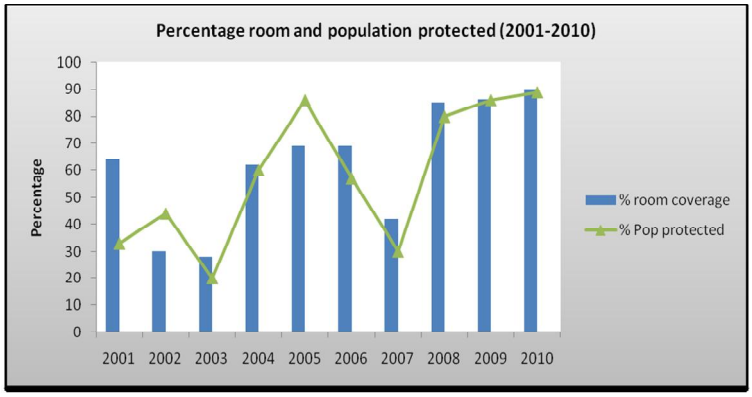
From 2001 to 2007 the rooms sprayed and population protected were below the targets (Table 5). This was a result of limited resources which were availed to the IRS programme. From 2008 to 2010 resources improved significantly. As a result IRS coverage also improved and surpassed the 80% global target.

Table 5: IRS room and population coverage, 2001 to 2010

Season	Target Rooms	Rooms sprayed	% Coverage	Target Pop	Pop protected	% Pop. Protected
2001	1 191 950	762 848	64	1 602 334	1 229 798	33
2002	2 235 151	680 577	30	4 732 872	1 022 603	44
2003	2 235 151	284 128	28	4 732 872	435 748	20
2004	2 175 026	1 350 403	62	3 373 034	2 031 509	60
2005	1 839 727	1 271 474	69	1 875 472	1 608 848	86
2006	1 764 368	1 212 572	69	2 920 561	1 659 393	57
2007	1 413 074	588 994	42	2 436 172	742 289	30
2008	1 111 663	958 045	85	1 630 915	1 242 346	80
2009	1 992 181	1 638 303	86	3 096 049	2 575 116	86
2010	2 255 318	2 023 159	90	3 478 413	3 090 289	89

The graph below shows trends in IRS coverage between 2001 and 2010. From 2001 to 2007, percentage structures sprayed and population protected was below 80%. From 2008 to 2010, the coverage for both structures sprayed and population protected increased above 80%. This could be attributed to increased support both from government of Zimbabwe and partners.

Figure 13: IRS room coverage and population protected 2001 to 2010



5.4.3 Vector Surveillance and Operational Research

Entomological research in Zimbabwe is conducted by several partners who are led and coordinated by National Institute of Health Research. During early 1990s, vector mapping and vector bionomics were identified as research priorities in the 3 year plan (1991-2001) (NMCP 1998) and RBM Strategic Plan (1997-2007) because of information gap that existed during that time. This resulted in vector mapping training being conducted from 1998 and the years that followed. Following this training, an increase in the number of sites where vector studies were conducted was recorded.

Bio-assay test on sprayed surfaces

The table below shows results of bioassays, which were conducted on sprayed surfaces from 2003 to 2011. Anopheles mortality rates after 24 hours ranged from 53 to 100%. However, Anopheles mortality rates in most of the bioassay test were above 80%, implying that the insecticides, which were used, were effective and was properly applied by the spray operators.

Table 6: Bioassays conducted on sprayed surfaces, 2003 to 2011

Year	Insecticide	District	Months post spray	Range (%)	Mean mortality (%)
2011	DDT	Gokwe South	4	77-100	92
2010	Deltamethrin 5WP	Kwekwe	1	80-100	90
			2	80-100	94
2009	Deltamethrin 5WP	Beit Bridge	1	78-100	93
			2	100	100
			3	83-100	95
			4	88-100	97
			5	80-100	93
			6	84-100	97.7
2008	Lambda-cyhalothrin 10WP	Gokwe North	3	61.5-100	68.9
2007	Lambda-cyhalothrin 10CS	Gokwe South	2	51-80	74.5
			3	11.1-100	61.4
2006	Lambda-cyhalothrin 10WP	Kadoma	1	65-100	97.4
		Bindura	8	55-88	73
		Kwekwe	8	50-100	76
2005	DDT	Chipinge	5	70-100	96.7
		Mudzi	5	100	100
		Centenary	5	100	100
		Mudzi	6	25-100	66
		Centenary	1	22-100	67

Year	Insecticide	District	Months post spray	Range (%)	Mean mortality (%)
			2	20-100	70
			4	4-100	71
		Bulilimangwe	0	100	100
		Gwanda	1	83-100	89
			2	100	100
		Nkayi	0	80-100	97
			1	100	100
			2	100	100
			3	100	100
2003	Deltamethrin 25SC	Hwange	2	60-90	70
			4	40-60	53

Bioassay results on ITNs/LLINs from 2006 to 2011

Table 6 is showing bioassay conducted on ITNs and LLINs from 2006 to 2011 in various districts. The implication of these bioassay results suggest that the insecticides bound on ITNs/LLINs was effective in killing mosquitoes with an average Anopheles mortality rate of up to 100% in 7 tests.

Table 7: Bioassays conducted on ITNs/ LLINs (2006 to 2011)

Year	Insecticide	District	Months post treatment	Range (%)	Mean mortality (%)
2011	Permethrin (LLINs)	Gokwe South	8	60-100	90
2008	Permethrin (LLINs)	Gokwe South	15	50-100	100
		Gokwe North	17	50-100	63.3
			24	33.3-81.8	97.8
			15	50-100	98
			17	63.6-100	100
			17	10-42.5	76.3
			85	41-100	77.6
2008	Deltamethrin (ITN)	Gokwe South	1	100	100
	Deltamethrin (LLINs)		12	100	100
2007	Deltamethrin (LLINs)	Gokwe North	17	50-100	63.3
			15	50 - 100	98
			15	50 -100	98
		Gokwe South	24	33.3 - 81.8	97.8
2006	Deltamethrin (LLINs)	Gokwe South	12	50-100	83
			2	100	100
	Deltamethrin (ITN)	Gokwe North	2	100	100
2006	Deltamethrin (LLINs)	Gokwe South	12	50-100	75

5.5 Key Issues

- Delayed spraying due to delayed release of funds and delivery of vector control commodities for the past three years
- No routine LLINs distribution through ANCs and CBHWs to maintain continuous universal coverage
- Inadequate funding to procure LLINs to achieve Universal coverage

- Vector bionomics data available only up to 2008.
- Larviciding limited to few districts and not systematic

5.6 Action Points

- Establish an insecticide buffer stock of 215,000 Kg of DDT and 13,000 Kg of Pyrethroids to start the annual IRS spray campaign on time.
- Procure and distribute 400,000 LLINs to fill the current gap to reach universal coverage.
- Procure and distribute at least 600,000 LLINs per annum through campaigns and initiate routine distributions of LLINs (for example through ANC and CBHWs) to ensure a continuous delivery of nets to replace LLINs that are worn out and to cover new sleeping places.
- Establish a five year LLIN and IRS needs based plan to accurately quantify total net, IRS resource and commodity requirements to maintain universal coverage in targeted districts and support fund raising efforts.
- Strengthen capacities for vector bionomics, including provision of entomological and laboratory equipment and human resources to ensure effective surveillance and monitoring of the impact of vector control interventions.
- Expand larviciding to areas of low malaria transmission to support malaria elimination.

6 Malaria Diagnosis and Treatment

Case management is the strategy aiming at ensuring that those people where prevention strategies have failed and are infected with malaria are correctly diagnosed and appropriately treated, using standard and effective approved methods and tools. The main actions undertaken in case management include diagnosis, treatment with appropriate medicines and provision of supportive care to patients infected with malaria. All malaria case management activities are informed by various guidelines that have been developed. In 2004, the country adopted ACT as the first line antimalarial, and it was put into effect in 2007, and since then has been rolled out to cover all health facilities. Furthermore, the inclusion of ACTs in village worker Kits has resulted in increasing coverage of treatment. In addition, the country has embarked on a process of improving parasitological diagnosis that culminated in the introduction of RDTs in 2004.

6.1 Policy and Guidance

The current policy states that all suspected malaria cases or patients should have parasitological confirmation with either a malaria Rapid Diagnostic Test (RDT) or microscopy, before receiving treatment. The only exception to this requirement is in the event of a confirmed malaria outbreak, where health workers cannot cope with or in the unlikely event of the health facility having run out of testing kits. (National Malaria Control Programme Strategy - 2008 — 2013, National Malaria Prevention and Control Policy, August 2010)

Therapeutic efficacy testing (TET):

National Institute of Health Research (NIHR) has been conducting TET for some time. Chloroquine which was the first line treatment for uncomplicated malaria in Zimbabwe for some time was found in 1984 to have varying levels of Chloroquine resistance in different parts of the country (published and unpublished reports prior to 1996). The first Chloroquine resistant cases were reported from the Zambezi valley.

In response to this alarming trend, an organized and systematic monitoring of *Plasmodium Falciparum* parasite response to Chloroquine was established in 1999 with a view to generate scientific data for decision making by the Ministry.

Eight sentinel sites in malaria endemic areas were established, one in each rural province, to carry out the monitoring exercise using the 1996 WHO protocol initially, which was adapted to include children above the age of 5 years. Results for the years 2000 to 2010 are shown in table 8 below. The results for 2010 are still undergoing PCR correction of which results may not be ready by completion of this report

Table 8: Outcome of Antimalarial Drug Efficacy Studies conducted 2000 to 2010

Year	*Antimalarial used (sites)*	*Treatment failure (%)*	*Comments*
2000	CQ (8)	43.2	Recorded at Lukunguni
2001	CQ (5) / CQ+SP (3)	36.3 / 4.5	Recorded at Chibuwe / Chirundu
2002	CQ (3)/CQ+SP	11.5 / 3.3	Recorded at Hauna / Chirundu
2003	CQ+SP (12)	5.0	Total all sites
2004	CQ+SP (11)	7.0	Total all sites
2005	CQ+SP (8) – inadequate numbers recruited to give valid results		
2006	CQ+SP (6)	26.0	Recorded at Kariba
2007	CQ+SP (3) / AL (5)	43.0 / 1	Recorded at Hauna / Total all sites
2009	AL (6)	5.0	Total all sites (Hauna – 8% TF)
2010	AL (8)	3.4	Total all sites (Chitulipasi -9% TF)

In September 2000, the malaria case management committee, guided by the results from this operational research recommended a free combination of Chloroquine and Sulphadoxine/Pyrimethamine as the interim first line treatment for uncomplicated malaria in Zimbabwe. The interim new policy was initially piloted in 3 high Chloroquine resistance districts in 2001. Drug efficacy studies from the 3 sites showed a combined treatment failure rate of only 3% for the new combination. In August 2001, the malaria case management committee re-affirmed its recommendation for free Chloroquine and Sulphadoxine/Pyrimethamine combination as first line antimalarial drug policy for Zimbabwe. Subsequent studies indicated rising failure of SP and a countrywide failure of Chloroquine.

A definitive decision to change to Artemether Lumefantrine (Co-artemether) was taken in August 2004, but implementation of the policy was delayed due to logistical problems and only started on a pilot basis, after the initial TOT had been conducted in February 2007 and was rolled out country-wide in 2008. However, again due to logistical problems, very few health workers were trained before 2009, resulting in some commodities (ACTs & RDTs) expiring in the health facilities, but the ACTs were tested by the Medicine Control Authority (MCAZ) and shelf life extended by a year and were thus utilized. The expired RDTs were destroyed. Chloroquine has been re-categorised to prescription only drug and this facilitated its removal from the communities.

Malaria case management policy and guidelines

The current policy states that all suspected malaria cases or patients should have parasitological confirmation done with either a malaria Rapid Diagnostic Test (RDT) or microscopy, before receiving treatment. The only exception to this requirement are in the event of a confirmed malaria outbreak, where health workers cannot cope with resultant number of patients or in the unlikely event of the health facility running out of testing kits.

The Malaria Rapid Diagnostic Kits to be used in the country should under-go successful laboratory and field evaluation done by the National Microbiology Reference Laboratory in conjunction with Zimbabwe Institute of National Quality Assurance Programme (ZINQAP) and other relevant authorities. The anti-malarials used in the country should also satisfy the registration requirements of the Medicine Control Authority of Zimbabwe (MCAZ).

In a case management audit done in 2009, carried out in three provinces selected randomly from the eight rural provinces – that included 9 rural health centres, 9 district hospitals, one mission hospital, 3 provincial hospitals and one central hospital selected from these provinces; about 92% of 405 suspected malaria cases were found to have been parasitologically confirmed by RDTs or microscopy, with the proportion for RDTs being about 70% and microscopy about 33% (Zimbabwe Malaria Case Management Audit Report, 2009). This clearly demonstrates good uptake of the new recommendation.

6.2 Organization of Case Management Services

There is a malaria case management focal point who also is the deputy programme manager. There is a case management subcommittee for the technical oversight. All aspects of malaria case management are delivered through the health systems structures. The organization of these is from the community level to the clinics, district hospitals, provincial referral hospitals and then the national hospitals. The total number of health facilities is a little over 1500. The clinics mainly offer outpatient services including ANC. The district and regional hospitals mainly provide a wide range of clinical services including management of referred cases of severe malaria. At the same time, there are also private clinics and hospitals mainly run by the churches that provide similar services.

6.3 Human Resources, Training and Capacity Development

Training of health workers

To get to understand case management, training is carried out. The training targets all health workers involved in the management of uncomplicated and severe malaria in children and adults, medical and nursing students, and any allied medical personnel managing patients in public, cities, missions and private facilities in the country. The categories of health workers trained were mainly doctors, nurses, environmental health officers (EHOs), Pharmacists and laboratory personnel.

TOTs were held under Global Fund Round 5 and partly under Round 8 which resulted in core training teams for each province, comprising of key representatives of PHE and DHE with focus in case management. Further support was obtained from national level were laboratory and specialists in malaria treatment were deployed to support the trainings. So far 5 746 health workers have been trained in case management, up to end of 2010, training in 2011 is only going to start in the 7th quarter. The breakdown of training by year is summarized in the table below:

INSERT TABLE with cadres trained by year by province if available

This has resulted in a total of 50% of health workers trained. This result is mainly dependant on availability of funds and currently there is no structured refresher trainings carried out on an annual basis.

The methods used in training were based on theory and practical training to impart skills and knowledge as guided by the case management training manuals and SOPs for laboratory diagnosis of malaria. The methods employed are as follows:

a) Lectures – standards presentations are used by the facilitators in the provinces.
b) Discussions – a discussion guide is used during trainings
c) Group presentations – in all instances participants break into group work to tackle specific assigned tasks relating to the trainings
d) Demonstrations- these are mainly for laboratory sessions which concentrate on practical application and use of the rapid diagnostic test kits (RDTs). The demonstrations also include microscopy examination of blood slides
e) Field visits- participants go to the field to visit clinics and do practical sessions using RDTs and interpreting the results, trouble shooting and recording.
f) Participants visit a hospital in a high malaria transmission area and attend to patients at OPD and wards and review patients' records and critically check on how the cases were managed. They also visit pharmacy to check on the malaria commodity stocks and management.

Participants manuals and facilitators manuals were updated and revised in early 2010 and were used in the training. Once training has been done, the trained cadres are expected to implement case management as per policy at their health facilities and these are mainly the nurses.

Post training support supervision is carried out at different levels. From the national level, visits are carried out spearheaded by the NMCP, including ministry officials, sometimes up to the level of the Permanent Secretary and principal directors are involved. The Provincial Health Executive (PHE), headed by the PMD does the supervision at the provincial level and the District Health Executive (DHE) headed by the DMO does the supervision at that level. The national level visits with knowledge of the province and the district, can go down to the rural health facilities. These visits also serve as monitoring of malaria case management activities.

As of now, there are at least two trained health workers per given facility, with bigger facilities having more.

6.4 Malaria Diagnosis

Malaria diagnosis in the country is either by clinical or parasitological confirmation, though the policy states that all suspected cases should be parasitologically confirmed. Initially the focus was on malaria microscopy mainly at hospital level. From 1990 the main practice was testing one in every 10 malaria cases during the high transmission season and one in five in the low transmission season. But since 2004, after the revision of the policy 9 parasitological diagnosis for all suspected malaria cases was recommended. This led to the introduction of RDTs initially in Mashonaland Central in 2006 and eventually rolled out to the rest of the country in 2007. This allowed extension of parasitological confirmation from the initial hospitals (about10%) primarily to cover all clinics and other health facilities (near 100%).

Malaria diagnosis service delivery infrastructure is in place with microscopes available mainly at hospital level although there has been establishment of microscopy centres at some rural health centres. The RDTs are also available in all health facilities, though stock outs remain a challenge in some areas. Human resources at district level in the laboratories are inadequate. Presently the recommended two Laboratory Scientists often times become overwhelmed with specimens sent from rural health centres since there are no posts for laboratory microscopists at the rural health level. Reporting system for malaria diagnosis is captured at the rural health centre in RDT registers. The information is then reported monthly to the district and captured in the HIS which is used to summarize the information and is sent to provincial and national level. The RDT registers have been introduced as a reliable source of information although there are still challenges of missing data that will need to be addressed. These registers are not standardized, as most of them have been initiated/improvised by health facilities. There are also some challenges in the procurement of laboratory equipment which is not standardized and not equitably distributed. Concerted efforts are needed in the purchase of equipment by research laboratory, reference laboratory, diagnostic laboratory and other partners, to ensure that all equipment and reagents procured are standardised and the distribution is equuitable and proper.

Quality Control and Quality Assurance of malaria diagnosis

Quality assurance at district laboratories is needed to ensure uniformity and quality in malaria diagnosis. This is currently done by ZINQAP the local proficiency testing centre, for laboratories that have paid membership fees. . However, some facilities cannot afford the fee. The table below gives some information on the proficiency testing that has been carried out by ZINQAP.

Table 9: Summarised results of proficiency testing of laboratory personnel by ZINQAP, 2007 to 2010

year		2007				2008				2009				2010			
Month		02	05	08	11	02	05	08	10	02	05	08	10	02	05	08	10
# labs enrolled		66	66	66	66	72	72	72	72	78	78	78	78	97	97	97	97
# labs responded		35	35	33	36	30	32	27	25	36	37	43	45	52	75	64	53
# Correct responses	MP1	31	31	4	29	21	26	20	19	20	28	28	36	45	57	43	44
	MP2	29	24	27	29	20	26	19	15	27	26	26	28	45	55	47	30
# Incorrect responses	MP1	4	4	29	7	9	6	7	6	16	9	15	9	7	18	21	9
	MP2	6	11	6	7	10	6	8	10	9	11	17	17	7	20	17	23
% correctness	MP1	89	89	12	81	70	81	74	76	56	76	65	80	87	76	67	83
	MP2	83	69	82	81	67	81	70	60	75	70	60	62	87	73	73	57

Note: MP1 and MP2 are blinded labels which ZINQAP uses in the proficiency testing.

National Microbiology Reference Laboratory (NMRL), whose mandate is to check on the proper functioning of the laboratories as well as disease surveillance through reports, which are supposed to come from all laboratories on weekly basis, is faced with challenges which have led to erratic reporting. There is no comprehensive QA/QC strategy for malaria laboratory diagnosis

Samples of slides are supposed to be sent from districts to NMRL for quality assurance in slide preparation and staining. The NMRL sentinel sites used to be 48, but the QC/QA is now done only from provincial or district hospitals. NMRL also coordinates the assurance of maintenance of quality in malaria diagnosis at rural health centres, although this is not being done due to human resource challenges.

Although RDTs have been successfully rolled out, there is still a substantial number of clinical cases being reported due to stock-outs of RDTs, as can be demonstrated in figure 14 and 15 below, both nationally(figure 14) and in Masvingo province(figure 15) as a specific example for the year 2010.

Figure 14: Trends in Malaria cases 2005- 2010

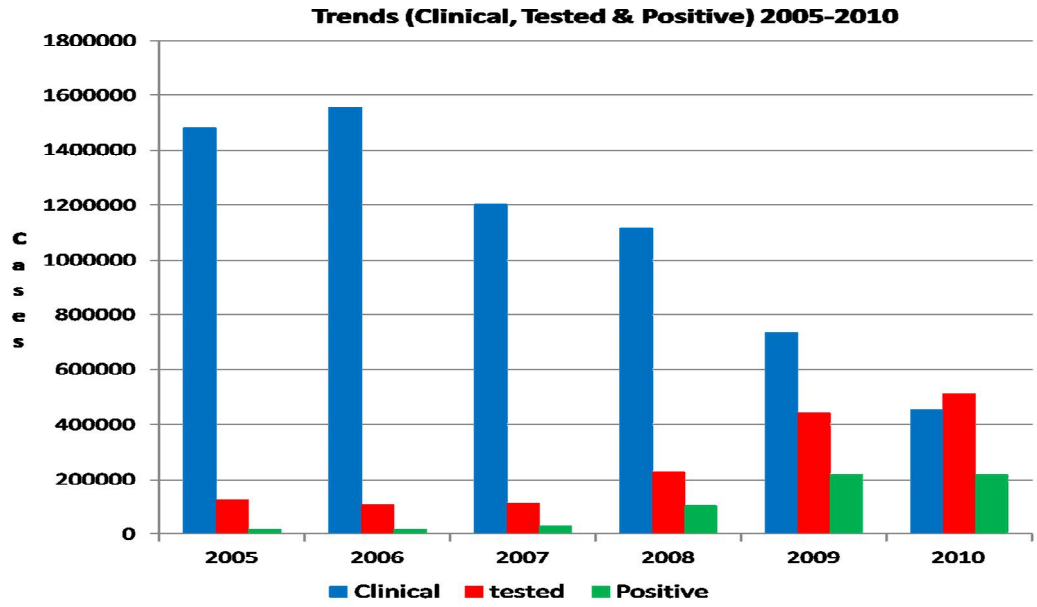
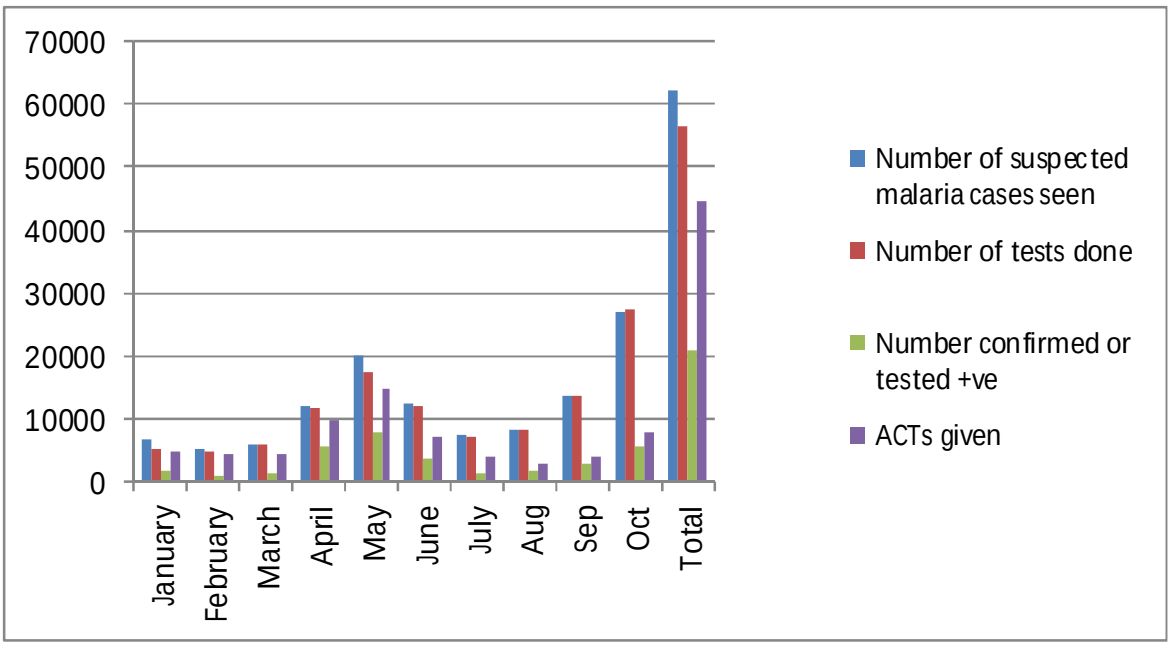


Figure 15: Masvingo province Disease burden/trends- T5Jan – Oct 2010



6.5 Malaria Treatment

The national malaria policy stipulates that uncomplicated malaria is treated as outpatients with Artemether-Lumefantrine (*Coartemether)* as the 1st line and with Oral Quinine plus Doxycycline or Clindamycin as the 2nd line. Severe malaria cases are managed as in-patients and given parenteral Quinine again plus Doxycycline or Clindamycin, including the treatment of any other complication that may arise during the course of treatment.

It is recommended that all severe cases of Malaria are referred to hospital for further treatment. In case of severe malaria, an RDT is done at the peripheral health centre, and if positive it is followed with a blood slide and labelled with the patient's name and date and both RDT and slide sent with the patient to hospital. Pre-referral treatment is with IM/IV loading dose of Quinine as a start dose is recommended if the patient is going to be transferred quickly. If a delay in transfer is envisaged, it is recommended that Rectal Artesunate is given instead. The latter has been discussed in the case management subcommittee, but it is not yet registered in the country, hence it is not available for use.

Appropriate supportive therapy to relieve symptoms is recommended in addition to the above anti-malaria drugs, like anti pyretic treatments with paracetamol or paediatric formulations of Ibuprofen for children. Physical measures such as tepid sponging and fanning may be useful in pyrexic children as they are more likely to develop febrile convulsions.

Since the introduction of ACTs in 2007 starting in Mashonaland Central, these have been rolled out to cover the whole country. Since then there have been challenges with stock-outs in some places primarily due to inaccurate quantification methods initially and latter due to inadequate resources for the procurement of these products.

Drug prophylaxis

No drug gives 100% protection against malaria, instead the drugs can reduce the risk, but can also give a false sense of protection. Health education on prevention e.g. IRS, LLINs, use of mosquito repellents and appropriate protective clothing should also be undertaken.

Drug prophylaxis is recommended for the following categories of people:

- All persons travelling from a non-malaria area to a malaria area. (e.g. people from cities on the high veld visiting low-lying areas).
- Persons with sickle cell anaemia or splenectomy living in or visiting a malaria area.
- Pregnant women in regions of potentially year round malaria and essentially seasonal malaria.

Pyrimethamine and Dapsone can be used, and/or Proguanil and Doxycycline in those intolerant to the first option.

6.6 Community management of malaria

Approval of the Community Based Health Workers policy (CBHW) by the malaria case management subcommittee with support by the Directorate of the laboratory, to reach high access levels was given in 2010. This coupled with the re-categorization of ACTs to a prescription initiated medicine especially in the high burden areas will improve treatment accessibility of communities especially those that reside far from health facilities. The CBHW are chosen by the community from where they reside to represent their communities. However there have been challenges in training these cadres in performing RDTs, due to lack of funding. Formally a total of 90 CBHW were trained in the province of

Mashonaland West and have been found very useful in using the RDTs and dispensing ACTs to communities. A further 1 000 CBHW is to be trained countrywide by the end of July 2011. There is need to cover training of an estimated 20,000 CHBWs mainly found in the high malaria burden districts. Ideally the CBHW should get their commodities, i.e. RDTS & ACTs from the community sister and are supervised by the EHT who is motorized.

6.7 Malaria in Pregnancy

The broad objective for malaria prevention & treatment in pregnancy in Zimbabwe is to reduce maternal and neonatal mortality and morbidity due to malaria, thus contributing to the attainment of MDG 4 - reduction of childhood mortality and MDG 5 – reduction in maternal death. The components of malaria control in pregnancy include quality focused antenatal care, appropriate health education and promotion, intermittent preventive treatment in pregnancy (IPT_p), use of long lasting insecticidal nets (LLINs) and malaria case management and prevention of anaemia in pregnancy, which is coordinated by Reproductive Health department.

Policy and Guidance

The current malaria strategy aims to achieve coverage of IPTp2 of at least 85% of pregnant women by 2012. Prior to this, the NMCP had been implementing activities aimed at achieving the Abuja Declaration targets of 60% set in 2000 for achievement in 2005. The targets were since revised to over 85% of the target population in Zimbabwe would sleep under insecticide-treated nets by end of December 2010 from the original 2005 target of 60%. The IPTp, with Sulphadoxine /Pyrimethamine (SP) was included as a strategy since May 2004 when it was recommended by the malaria subcommittee meetings for the high malaria burden districts and was rolled out in June 2004.

Three doses of SP are given to pregnant women, the first dose given at 16 weeks or after quickening, the second at 26-28 weeks, and the third between 34-36 weeks of gestation taken as Directly Observed Treatment (DOT)s. Caution must be exercised in HIV positive women on Cotrimoxazole prophylaxis who should not be given SP as they are already protected by the Cotrimoxazole, and also to avoid toxicity due to Sulphadoxine.

In terms of case management, the Guidelines for Management of Malaria in Zimbabwe December 2009 recommended the first line treatment before sixteen weeks to be oral quinine 600mg every 8 hours for 7 days with Clindamycin 300mg every 8hrs for 7 days and after sixteen weeks to be Artemether/ Lumefantrine (Coartemether) for uncomplicated malaria. For severe malaria, a loading dose of parenteral Quinine as prescribed is recommended. Where intravenous quinine cannot be given such as a primary care centre, intra-muscular quinine as a loading dose is recommended followed with a maintenance dosage of Quinine eight hourly until patient is able to take orally to complete 7 days. Oral treatment is then given as per treatment of uncomplicated malaria depending on the stages of pregnancy. The availability of clindamycin has been a challenge.

6.8 Access to and coverage with interventions

Malaria in Pregnancy is still a major cause of maternal mortality in Zimbabwe. In 2000, malaria was responsible for 21.6% of all major causes of maternal mortality reported. The CM Audit Report 2005 showed that the figure had declined to 18.2% in 2002 second to postpartum haemorrhage.

Attendance for antenatal care has generally been reported as high in Zimbabwe. The RBM Needs Assessment of Nov 2008 quoted it to be over 90% of women having at least one visit and it recorded the average time of the first visit being

16 weeks in town and 24 weeks in rural areas, that of 2006 had quoted it at 85%. The MIMS 2009 showed that nationally 93 per cent of women received antenatal care during pregnancy at least once. Generally, there were no major differences of ANC coverage by rural and urban areas, age of mother, education of mother and wealth.

Despite such high ANC coverage, IPTp1 was given to 45.5% of the women attending antenatal care. The median gestation period for receiving IPTp1 was 24 weeks (IQR 20, 28 weeks). There were more missing records for subsequent IPTp but there was a decreasing trend. Coverage for IPTp2 was 27.8% (76/273) and 18.9% (34/180) for IPTp3. The median gestation period for IPTp2 was 29 weeks (IQR 26, 32 weeks). The median gestation stage for receiving IPTp3 was 34 weeks (IQR 30, 36 weeks). Most women 87.6 per cent were observed swallowing the SP tablets by a health worker. About twenty eight per cent (28%) of the pregnant women received at least 2 doses of intermittent presumptive treatment (IPTp). On availability of malaria commodities 13/19 (68%) facilities reported stock-outs of SP which affected administration of IPTp. Eight out of the 19 facilities reported quinine injection stock-outs while two reported quinine tablets stock-outs. (Zimbabwe Malaria Case Management, Audit Report 2009)

In the MIS of 2008, a total of 5 654 households with women aged 15-49 years old were sampled. About 388 (7%) of the households reported at least one pregnant woman. The younger age-group 15-24 years old had the highest number of pregnant women (43.7%). The majority had at least been to primary school, 66.7% (table 7). There was a high non-response for the question on level of education and religion, 34.3% and 30.6 respectively. (MIS 2008)

Challenges to seek health care included not having money for treatment which was the most important concern impeding women from accessing health care for themselves with 58% of women sharing this concern. The majority of women reporting this concern were either of high parity (73%); divorced, separated, or widowed (72%); resided in rural areas (67%); had no education (84%); or were in the lowest wealth quintile (75%). Approximately half (48%) of women also reported that they were concerned that no drugs would be available at the health facility. About four in ten women reported that transportation (42%) and distance to the health facility (41%) were a big problem.

Usage of bed nets is relatively low among young children and pregnant women, the groups which are particularly vulnerable to malaria. Three per cent of pregnant women slept under an ever-treated net and another 3% slept under an ITN. The RBM Rapid Assessment of 2006 showed 53(36%) pregnant women reported having slept under a net the night before the assessment. Significant progress has been made in the area of ITN promotion and use with coverage rising from 2% in 2001 to the 36% in pregnant women. The MIS of 2008 set the figure lower at 27.5% for those who had slept under a mosquito net amongst pregnant women whilst those who had slept under a treated mosquito net were 5.6%. Nationally net ownership was reported to be 27% of the households with at least one ITN and no substantial difference between rural and urban areas were noted, (rural – 28%, urban – 26%).

Among the adult population age 15-49, 26% of women and 19% of men have been tested for HIV at some point in time. Twenty-two per cent of women and 16% of men received their results. Results from the HIV testing component in the 2005-06 ZDHS indicated that 18% of Zimbabwean adults age 15-49 were infected with HIV. Among women, the HIV rate was 21% compared to 15% among men. Because of the high prevalence of HIV among women, there is need for three doses of IPTp as compared to two doses recommended for HIV negative patients in places with HIV prevalence of below 10%. The majority of the pregnant women receive IPTp1 only, due to late booking.

National delivery capacity, structures and systems

At central level, the NMCP through the Case Management Focal person works in collaboration with the Reproductive Health Department in management of Malaria in Pregnancy. Whilst Reproductive Health Department deals with other maternal concerns, the NMCP has the active role of sourcing IPTp commodities, provision of training, prevention and treatment. At provincial level, the Provincial Medical Director is the accounting officer with implementation through the different cadres who deal with separate key issues. The Provincial Environment Health Officer is responsible for prevention which include Indoor Residual Spraying and LLIN distribution, The PEDCO , the MOH Maternal and Child Health and Provincial Nursing Officer are responsible for all other maternity issues. At the District, the DMO together with the DHE are overall in charge of all health services.

Implementation is at the hospital and primary health facility level. Hospitals and poly-clinics which are usually council or mission owned have Maternal and Child health clinics which are usually stand-alone Ante and Post-natal services. Cases requiring in-patient hospital care are admitted into the obstetric ward. Drugs and other services including laboratory services are combined together with the general public. At primary health facility level, services are usually integrated with those of other general conditions. At these facilities, usually manned by two or three nurses, the ante/post-natal services are not stand-alone

Training in MIP

There are no standalone guidelines in place for MIP/IPTp training; it has been incorporated in the general Malaria Case Management trainings, in 2004. The CM Audit Report 2005 showed some information gaps with regards to management of uncomplicated malaria in pregnancy in the first trimester where no one got the correct treatment. Although IPTp is only recommended in regions of high and moderate transmission of malaria, health facilities in areas of low transmission (Lupane) and sporadic transmission (Bindura) were also giving IPTp to pregnant women. Treatment of severe malaria and uncomplicated malaria in pregnancy was being done properly. As a result of this audit, a recommendation to strengthen IPTp strategy through training, ensuring universal availability of SP and regular supervision was made. NMCP has embarked on the development of MIP/IPTp training manual through a consultant, currently on-going. In addition a MIP Conference was held in July 2010 for all PMDs. At the Conference was the following were recommended:

- Train more health workers on malaria case management and follow up and hold refresher course on MIP case management
- Community sensitization on early booking
- Proper tool for MIP data capturing or strengthen data collection so that MIP is captured
- Early resource mobilization
- Adequate drug allocation for both prophylaxis and treatment of pregnant women
- Availability of blood and funds to treat those with anaemia
- Increase IPTp coverage through advocacy in the ANC.
- Lobby for reduction or scrapping of user fees so that all pregnant women book for ANC services.

Best Practices

- Availing of RDT and ACT to trained CBHWs for use in Mashonaland West
- Trainers in case management available in all provinces and districts
- Training of microscopists especially in view of the move to pre-elimination
- Regular (quarterly) meetings of the Malaria Case Management Sub-committee which assists NMCP with technical expertise

6.9 Key Issues

- Inadequate and delayed training of CBHW and lack of commodities for their use in some areas
- Inadequate training in the private health facilities and the referral hospitals
- No strategy for QA/QC for parasitological diagnosis
- Still a good number of malaria cases are managed clinically
- No treatment algorithms at all level health facilities
- Poor access to clinics in some province, hence need to prioritise training of CBHW in these areas.
- Inconsistent supply of Quinine and SP, leading to Stock-outs in instances.
- Non availability of standardised RDTs registers
- Lack of stand-alone MIP/IPTp guidelines
- Inadequate research in MIP
- Poor collaboration between Reproductive Health and NMCP
- Poor support supervision to implementing levels
- Lack of awareness of importance of IPTp in the community

6.10 Action Points

- Expand malaria community case management through training and maintaining of 6,600 CBHWs in malaria affected communities on the use of RDTs and ACTs.
- Introduce pre-referral rectal Artesunate for severe malaria (including training and establishing management and supervision systems) through CBHWs.
- Urgently leverage additional funds and engage partners to fill the 2012-15 supply gaps for at least 3 million RDTs and 1 million ACTs annually.
- Ensure a continuous supply of RDTs and anti-malaria drugs, through the development of accurate short and long term needs based forecasting and supply plans.
- NMCP to update case definitions and malaria case management algorithms and disseminate to all health facilities and CBHWs.
- Laboratory Directorate to establish a comprehensive QA/QC strategy and guidelines for malaria laboratory diagnosis.
- Strengthen collaboration between Reproductive Health and NMCP to improve the access and quality of prevention and treatment of malaria in pregnancy, with a special emphasis on IPTp.

- Continue to invest in annual pre-season malaria case management trainings for all health workers (taking into account high staff attrition) in both the private and public health care services, including on severe malaria case management at all the referral hospitals.

7 Epidemic Preparedness and response

7.1 History of Epidemics

In Zimbabwe, Malaria Transmission is seasonal, following the rainfall season. The country is classified into areas of high, moderate, and low transmission. Malaria epidemics follow the seasonal transmission pattern of malaria. The most affected age groups are children under 5 years and pregnant women. (Mpofu et al, 2006). History of malaria epidemics in Zimbabwe??????

7.2 Organization and Capacity

Zimbabwe has adopted the Integrated Disease Surveillance and Response (IDRS) approach and guidelines that have been adapted from WHO, which was used to train health workers.

Training in IDSR started in December 2002 with the training of trainers then the rest of the cadres up to 2010. In March 2010 there was further adaptation of the manuals to embrace the identified changes and again Training of Trainers was started. The trainings covered Health Workers from Provincial, District and Rural Health Centre levels. The trainings were coordinated by department of Epidemiology and Disease Control. To date, National, provincial, district, key Health staff at referral hospitals, Local Authority health staff, Uniformed Forces were trained and currently training of health staff at Rural Health Centre level is in progress. A total of 5746 health workers were trained in EPR and malaria case management in 2009 and 2010.

Trainings were coordinated at Provincial level by the identified EPR Focal persons. Most provinces and districts have an EPR plan, which includes malaria. All levels have Rapid Response Teams who are currently undergoing training on Rapid Response. To date, 201 cadres nationally have been trained in rapid response.

7.3 Major Programme Activities and Achievements

7.3.1.1 Forecasting

The Meteorological departments release weather outlook data before each season and on a day to day basis. The information is published through the radio, television and print media. There are sub-stations of the Met Department within the districts, which also provide the similar information at the local level as and when requested. However, there has been lack of coordination between the Met Department and the Ministry of Health and Child Welfare. The Ministry does not routinely collect weather information from the Meteorological department.

7.3.1.2 Preparedness

The forecasted rainfall pattern is not used for EPR planning (Chinhengo et al, 2004). Weekly weather updates are published by the Meteorological department, but their use in early warning and surveillance of malaria epidemics varies across districts in the country. There are national malaria EPR guidelines and IDSR guidelines documents. There is no emergency stock of malaria supplies set aside as part of preparedness for possible malaria epidemic response.

7.3.1.3 Early Detection

Epidemic thresholds are in use although not used consistently by all districts. There is a weekly epidemiological bulletin produced at Head Office by NHIS unit and some provinces. The surveillance system in use in the Zimbabwe Health Information System is based on weekly and monthly reporting formats where malaria data is captured along with 15 other disease conditions. The weekly surveillance system is also known as Rapid Notification of Epidemic Prone Diseases and is collected from 700 specified sentinel sites which reports on a weekly basis. This system has been able to capture a number of malaria outbreaks in the country.

The monthly reporting system uses what is called the T-series data collection and reporting tools, which is now integrated into the newly introduced District Health Information System (DHIS). In DHIS, all health facilities in the public health system report on a monthly basis. However, the poor completeness and timeliness of this system pose a serious challenge.

Epidemic thresholds have been calculated for each rural health centre/clinic, district and province catchment area using the *mean+1.5*SDEV* criteria. These graphs are used to detect epidemics. Up to 2008 when the country was not testing all malaria cases, the clinical cases were used to calculate the thresholds. From 2009 onwards with the introduction of RDTs, health centres are now expected to be treating and reporting confirmed malaria cases using an RDT or microscopy before treatment. Before 2009, 20% of suspected cases were laboratory tested to monitor positivity during peak malaria transmission season.

The current Threshold limit values (TLVs) are calculated using 30% of the pre-2009 TLVs; there are only two years of laboratory confirmed cases and the country needs at least three malaria data to calculate malaria threshold values. The country has a good surveillance system and in 2004 won a regional trophy for a good Rapid Disease Notification System.

Every district has a computer for disease surveillance. There is transport available at district level in the form of vehicles and motor-cycles. In districts that fall in non-malaria transmission zones, all the reported malaria cases are investigated.

In addition to the Rapid Disease Notification system, there is a strong community based early warning system that reports public health events including malaria to the nearby health facilities. At community level, the community members have acted as surveillance committees especially in malarious areas and have reported the outbreaks to health personnel.

7.3.1.4 Epidemic Response

Most of the epidemics reported have generally been responded to within one week of notification by local rapid response teams. Detection and response rates were reported to be 100% and 80% respectively in 2001/2002 and 100% for both detection and response in 2002/2003 and 2003/2004 seasons according to the Reaping Mission.

The districts and Rural Health Centres have been able to identify and respond to some of the outbreaks while others were identified at higher levels – especially when surveillance data was not analysed and utilized. However, information on detection and response to malaria outbreaks that occurred between 2005 and 2010 is not readily available.

There is no National Focal Person for malaria epidemics and there is no response coordination team. The National Malaria prevention and Control Policy (MOHCW, 2010) includes a section on epidemics and emergencies and is yet to be distributed to the intended users. The guidelines in use for EPR are the IDSR technical guidelines and RRT technical procedures, which are applicable to all diseases with epidemic potential. There is a technical working group at national level for all epidemics and emergencies. Rapid response teams and civil protection committees exist at provincial and district level for response and coordination of outbreak responses. Training of teams in IDSR, RRT and civil protection units has been going on at a slow pace because of funding problems.

The Zimbabwe National Malaria Prevention and control Policy (MOHCW, 2010) advises that for the control of epidemics, focal IRS, LLINs and case management may be used. However in Practice the method of control has always been case management for the period under review (Chinhengo *et al*, 2004; Maenzanise *at al* 2004 and Mpofu *at al* 2006).

For the purposes of increasing access to care temporary treatment centres have been set in areas for the duration of the outbreak if areas affected are far from Rural Health Centres. Community based Health Workers have also been used to treat patient especially in the days when Chloroquine was the country's first line antimalarial medicine (Chinhengo *et al*, 2004; Maenzanise *at al* 2004 and Mpofu *at al* 2006).

Accompanying the treatment of cases has also been the active case finding facilitated by the community based health workers and the environmental health technicians. A line list of all cases attended to is kept at the health facility or treatment centre and daily summaries relayed to the district Hospital. The line lists are checked for correctness by teams during support supervision and collect them for onward submission to the next levels, usually after some analysis. Ideally at the end of the outbreak the local team is supposed to write a report and this is not uniformly carried out in all places.

The Provinces and Districts have not been using the Integrated Disease Surveillance and Response self-evaluation tool to monitor their timeliness and quality of outbreak detection, investigation and response. Where the self-evaluation tools have been used, the epidemics were detected within a week of occurrence.

No epidemic assessment checklists and tools are in use. Detection of epidemics is based on a case based surveillance system. All suspected cases are tested with RDTs or microscopy for confirmation. After confirmation of the outbreak all suspected cases are treated with usual first line antimalarial medicine regardless of whether the test is done or not.

Almost every district has a vehicle and some motor-cycles. Health workers have been trained in malaria case management and in selected areas, in Kadoma, Binga, Hurungwe and Kariba, community health workers have been trained in malaria case management including use of Rapid Diagnostic Kits. Drugs and kits are available and pre-positioned to districts.

Community mobilization has been done in all high-risk areas and Information, Education and Communication (IEC) materials have been distributed. During the MPR field visits, IEC materials were largely absent in the visited health facilities.

After a report of an outbreak, there is an assessment by a Rapid Response, which is transmitted to all levels, in some instances detailing the additional support required to contain the outbreak. Depending on the size of the outbreak, the Civil Protection Unit (CPU) (constituting MoHCW, Local Government, Education, Social Welfare, Uniformed Forces

and partners) may be summoned to coordinate the control activities. Provinces and districts sharing boarders always share this information and collaborate in control activities.

There are no funds set aside for EPR from national to health centre level. The National level is usually supported by partners in the wake of an outbreak or sometimes has to reallocate funds from other line items to avert the consequences of epidemics. Provincial and district levels also use the same system of reallocation of resources in the wake of an outbreak. The district levels take advantage of the funds they raise from user fees (Health Services Fund) and use it for the outbreaks when they occur. This may seriously affect the amount or funds left to cater for other important services provided by the health facility.

7.3.1.5 Epidemic Post Mortem

The occurrence of malaria outbreak is not well documented and there has not been systematic post mortem carried out following malaria epidemics in recent years.

7.4 Key Issues

- No malaria epidemic risk mapping at all levels
- No updated EPR plans at provincial and district levels
- There is inadequate emergency stocks in most provinces
- No emergency funds set aside for outbreak response
- Inadequate use of meteorological data for prediction
- The new epidemic thresholds are not in use at some hospitals and health facilities
- No post mortems are done following malaria epidemics
- There is lack of documentation on epidemics in previous years in most provinces
- Not all Rapid Response Teams have been trained

7.5 Action Points

- Update EPR plans and thresholds at all levels, taking into account reductions in malaria cases.
- Mobilise financial resources to roll out IDSR trainings to all levels of care, including the community level.
- Pre-position emergency stocks and establish contingency funds at appropriate levels for emergency epidemic response.
- Conduct post-mortems at provincial and district levels and submit the relevant reports to higher levels.

8 Procurement and Supply Management

Procurement and Supply Management cuts across all interventions in the National Malaria Programme and is key to the success of the programme implementation and delivery. It is known that 70% of the NMCP budget goes towards procurement of goods[1]. In the history of the NMCP, PSM has not had that prominence and procurement activities have been dealt with in other thematic areas. For the first time PSM has been allocated its own slot as a thematic group.

[11] National Malaria Strategy 2008 - 2013

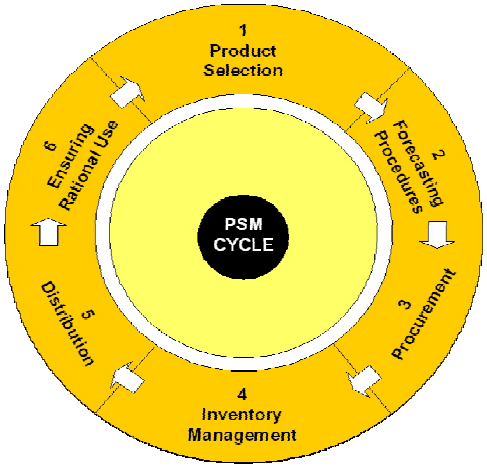
Previously individual thematic groups have tended to address procurement issues only whilst overlooking other critical stages of the whole PSM cycle. This is evidenced by the scarcity of reference materials pertaining to PSM for this review. The entire Procurement Supply Chain Management starts from product selection of the commodity up to the actual use.

The objective of PSM is to ensure a consistent supply of safe, effective, good quality, affordable and accessible commodities for malaria prevention and control. This is done through well-coordinated activities of the procurement cycle – i.e. product selection, forecasting and quantification, procurement, inventory management, distribution and rational medicines use. Malaria commodities PSM cover includes the supply of products and services mainly for Diagnosis, treatment of cases and for Vector Control. In the current review these areas are critically analysed from central level right down to end user at the periphery.

8.1 Organization and Management

The products and services which were considered in the PSM cycle include all malaria commodities used at different levels. Figure 16 below shows the full PSM cycle and figure 17 shows the players involved and their interactions. It is clear, form figure 17, that there is a complex partnership within the whole PSM cycle, which if not well coordinated may lead to major disjointed actions.

Figure 16: the full PSM cycle as represented below



8.1.1 Specification of commodities

Expert committees constituted by the Ministry of Health and Child Welfare draft specifications and standards for the different types of commodities and equipment. These committees represent all levels. Over the years the Ministry has managed to standardize specifications for various equipment. Though the government has standardized the requirements for equipment and vehicles, it is not surprising to find other brands or types in use. This is due to various funding and procurement mechanisms, with substantial amounts of commodities being donated in kind.

Diagnosis and Case Management and Malaria in Pregnancy

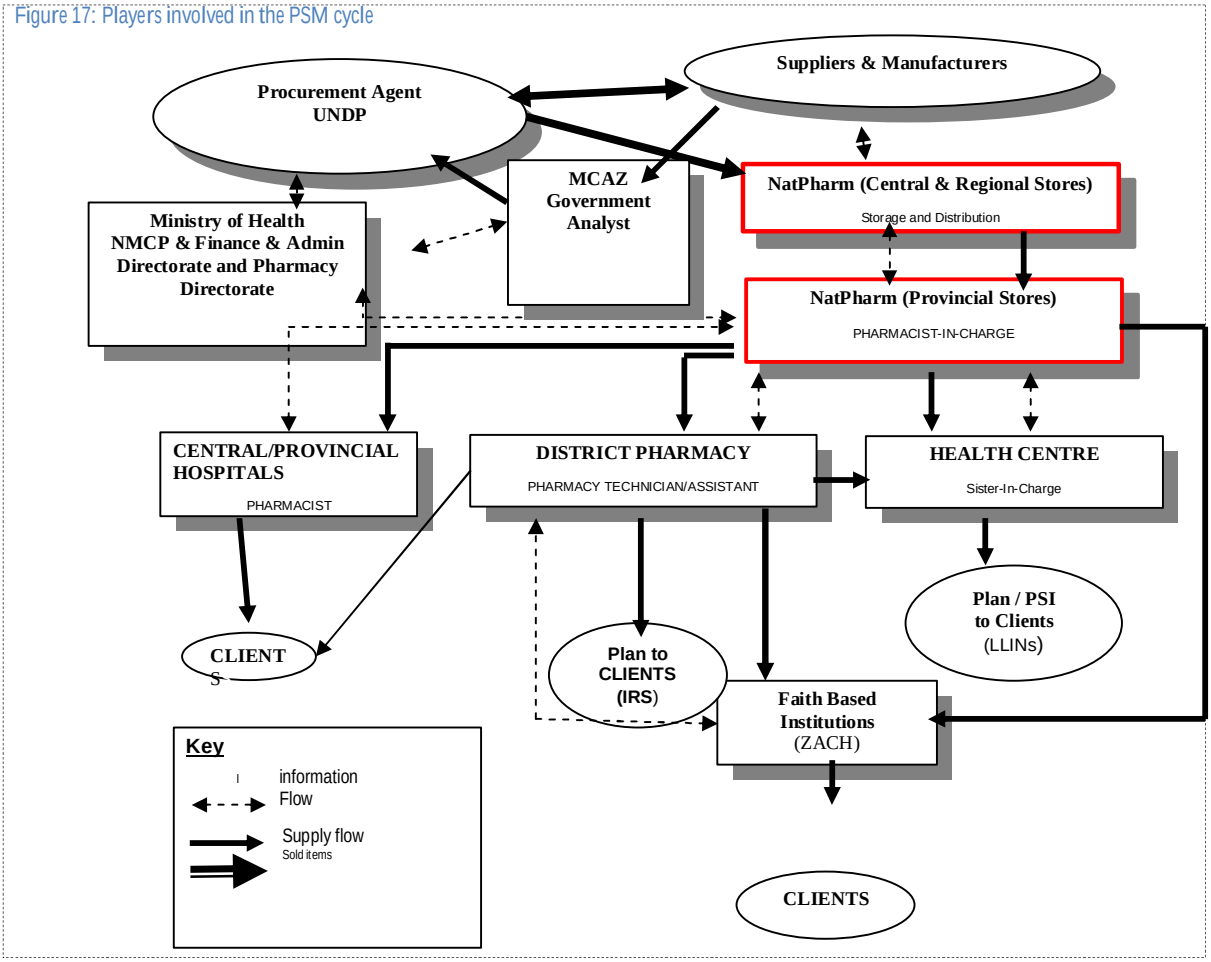
Product selection is done through the NMCP, through a technical subcommittee for Case Management, which regularly monitors effectiveness and resistance patterns. Based on its findings the committee makes recommendations to the National Medicines and Therapeutics Policy Advisory Committee (NMTPAC) changes to treatment protocols. The NMTPAC evaluates these recommendations with a view to changing the Standard Treatment Guidelines in the Essential Drugs List of Zimbabwe (EDLIZ). Product selection of Microscopes and Diagnostics is done by National Laboratory Scientist Council and Directorate of Laboratory Services. Once decisions on products have been made, the selection of the product to import is taken from the WHO pre-qualified sources/products for procurement through the various systems.

Selected Integrated Vector Control

The vector control subcommittee in the NMCP is responsible for the selection of commodities. In making the selection the committee takes into consideration the WHOPES recommendation on specifications, and successful field trials and testing by the National Institute for Health Research (NIHR). In the selection of products to use for IRS there is limitation on the range of products. The re-introduction of DDT was a temporary measure pending a more sustainable solution[2]. It therefore means that the choice of insecticide remains under threat because of environmental concerns on use of DDT.

[2] Annual Vector Control Report 2006

Figure 17: Players involved in the PSM cycle



Diagnosis, Case Management and MIP

Historically quantification was based on data from the Central Warehouse tallied from morbidity data obtained from end users through HMIS. Data tended to be unreliable as institutions submitted incomplete T5 forms[3]. There are now annual quantifications and quarterly reviews done by the Ministry of Health and Child Welfare Logistics Sub Unit under Directorate of Pharmacy Services (DPS) with technical assistance from JSI/Deliver. Partners like UNDP, UNICEF, Clinton Foundation and NatPharm are also co-opted into the quantification exercise and reports and results also shared. These reviews are based on a distribution system called Zimbabwe Informed Push System (ZIP) from which consumption data is obtained.

The quantification based on the ZIP system works well when there is a full supply of commodities[4]. Due to insufficient stocks at central level this system has never been able to be utilised maximally. Stocks available at the central warehouse are usually not sufficient to cover the maximum level of six months period. Non adherence to delivery schedules is

[3] Ministry of Health and Child Welfare ,Health Information System Department.
[4] ZIP SOP Manual 2011

common due to insufficient funds and other resources. Due to unreliable data as a result of stock outs and in adequate funding, the programme has not been able to make an informed adjustment as to the actual quantities needed.

Insert table of estimates of ACTs and RDTs for the next three or four years

Selected Integrated Vector Control

Quantification of the insecticides is based on the malaria endemicity and the number of households targeted. This is mainly from data derived during geographical recognisance. For Insecticide Treated Nets (LLINs) the quantification is based on the number of people and the sleeping areas at the household level obtained through a household census just before distribution and this is adjusted with the number of nets on hand[5].

Below is a table showing the 2009-2013 LLIN requirements based on quantification:

Table 10: ITN (LLINs) requirements 2009 to 2013

Year	2009	2010	2011	2012	2013
National Needs	1,300,000	1,735,978	1,755,073	1,774,379	1,793,897

8.2 Financing

8.2.1 Diagnosis, Case Management and Malaria in Pregnancy (MIP)

For all procurements, there is currently heavy reliance on donor funding due to the fact that GOZ has not been able to fund this programme adequately. Even when funds are available treasury has been slow to release such funds. The bureaucratic process involved in both the national and partner procurement systems tend to slow down the acquisition of the required commodities. Special waivers need to be granted by SPB in the future to make the procurement system more efficient as was the case with the NatPharm/Crown Agents consortium. In emergency situations there are challenges in acquiring stocks expeditiously, which can be alleviated by GOZ and partners setting aside funds for emergencies.

8.2.2 Selected Integrated Vector Control

While GOZ plays a significant contribution in procurement of IRS commodities especially the insecticide, there has generally been late disbursement of funds from Treasury for timely procurement. Global Fund procured insecticide arrived late in the 2010/11 spraying season, compounding the problem hence affecting desired and timely coverage targets[6].

Local manufacturers also site late enquiries from programmes for insecticides as contributing to delays in deliveries. They normally require adequate time for production planning and delivery. Funding for IRS commodities has been provided by GOZ and partners (Global Fund and Plan International)[7].Funding for the procurement of ITNs is primarily from partners. Currently the Global Fund has supported the procurement of LLINs. Previously other partners like UNICEF, PSI and Plan have supported the programme. Larviciding is funded for by GOZ. In all cases Global Fund

[5] Zimbabwe Insecticide Treated Nets Implementation Strategy (2009)
[6] Malaria Annual Report 2010
[7] Malaria Annual Report 2010

purchases are handled through the UNDP procurement system. Where GOZ funds are used the State Procurement regulations apply.

There has been generally low funding on commodities for support services; this leaves the programme vulnerable to partners' wishes and taste. Table is summary of the various players in procurement and their procurement procedures.

Table 11: Players involved in procurement and their procurement systems

Source of Funding	Type of Support provided	Procurement System used
GOZ	• IRS Chemicals • Larvicides	National Procurement Regulations
Global Fund(UNDP)	• ACTs and RDTs • LLINs(Mosquito nets) • IRS Chemicals • Vehicles, office equipment. • Support equipment e.g. GPS and PDAs	UN Agencies System
Plan	• IRS Chemicals and Equipment • ACTs and RDTs	Plan procurement procedures
WHO	• LLINs • ACTs-first consignment	UN Agencies System
UNICEF	• LLINs	UN Agencies System
PSI	• LLINs	PSI procurement System
Others e.g. USAID	• ACTs(once off support)	USAID Procurement System

8.3 Procurement

8.3.1 Diagnosis, Case Management and MIP

Procurement for the Global Fund supported project was handled by the NatPharm/Crown Agents consortium up to 2009 at central level[8]. The Procurement procedures were a hybrid of the national system of the State Procurement Board (SPB) and the Crown Agents regulations. Upon the change of the Principal Recipient for Global Fund, UNDP came into play. UNDP's procurement system utilizes Long Term Agreements (LTA) with various manufacturers and procurement agencies[9]. The major procurement agent for UNDP is UNICEF (medicines). Where GOZ is funding procurements NatPharm uses the national procurement procedures (State Procurement Regulations administered by the State Procurement Board). The State Procurement Regulations apply for all Public Institutions. State Procurement regulations were put in place to ensure transparency in the procurement process. There are three types of tenders:

Informal Tender: low value purchase (value reviewed from time to time and currently limit is USD 10 000); minimum of three quotations; tender floatation period less than two weeks.

[8] Global Fund Round 5 PSM Plan
[9] Global Fund Round 8 PSM Plan

Special Formal Tender: high value purchase; selected known bidders; tender floatation period less than 30 days and minimum two weeks.

Formal Tender: high value purchase; open to any bidder; tender floatation period minimum of 30 days. Due to lengthy process of the State Procurement Regulations, the NatPharm/ Crown Agents Consortium had applied for a waiver that would allow expeditious finalization of tenders. Tenders would be floated for shorter periods without referring documents to SPB at various stages. SPB would audit the process later.

At Provincial and District levels procurement is handled by the Central Buying Unit and Procurement Tender Committees for decentralized items for stipulated threshold values. The Central Buying Units sources quotations and compiles comparative schedules and hands over to the Procurement Tender Committee for adjudication.

8.4 Inventory Management and Storage

8.4.1 Diagnosis, Case Management and MIP

There is adequate storage space at central level, NatPharm being the provider. However at provincial, districts and periphery levels capacity varies, and is inadequate at the periphery level. At central level stock management is done using the Navision software complimented by a manual bin card system. At the periphery the system is mainly manual. The NMCP, at central level receives monthly updates of stock status from NatPharm. Such updates include stock levels at all NatPharm warehouses. Storage capacity at lower levels is inadequate especially given the National Policy of 6 months maximum stock levels. This is compounded by the huge amounts of expired stocks the clinics are holding. This could be alleviated by training personnel in good stock management and simplifying procedures for the disposal of expired stocks.

8.4.2 Selected Integrated Vector Control

The tender for insecticide requires the supplier to deliver directly to the specified district, which reduces pressure for storage space at central level. At district level there are adequate storage facilities. Shortage of storage space at the periphery also affects LLINs. Stock control cards (bin cards) are used for inventory management at facility level. The Inventory control system is ineffective due to lack of trained staff at the periphery levels and also general abuse of the system and the commodities. There is need to institute adequate security at the clinics and the periphery to reduce this risk. Though there appears to be adequate space for IRS chemicals at the periphery levels there is urgent need for the disposal of DDT waste to create space and minimize environmental hazard.

8.4.3 Programme Management, Advocacy, Social Mobilisation and BCC, SMEO and EPR.

An asset register is maintained for all equipment and routine verification is conducted. At distribution stage all assets are tagged with asset numbers. This is particularly so for Global Fund purchase items. There is little storage capacity required as items are purchased and distributed to their respective duty stations.

8.5 Distribution

8.5.1 Diagnosis, Case Management and MIP

NatPharm is responsible for the distribution from central and regional warehouses and to the periphery. This is possible because NatPharm's warehouses in the provinces are strategically positioned – Harare, Chinhoyi, Bulawayo, Mutare,

Gweru and Masvingo. Partners supporting the Ministry of Health and Child Welfare work in collaboration with NatPharm to conduct deliveries (ZIP). Such partners include UNICEF, DFID (Crown Agents) and JSI. Partners also provide delivery vehicles and additional personnel for monitoring deliveries and.

The ZIP distribution system is an informed 'push' system that goes right down to the periphery facility level. A Delivery truck goes out to health facilities from the warehouse and supplies are issued out to each of these based on consumption, stock on hand and adjustments. Ideally stocks are topped up to six months stock levels (maximum). Excess stocks are re-distributed within the system. Delivery teams return with records of what has been issued out and information entered into a software that calculates national consumption. Stock issues are entered into the Inventory Management System at the central warehouse after the delivery run. This is in contrast to the demand/ 'pull' system where information are entered into the system at time of dispatch. Before the introduction of the ZIP system in 2009, all medicines and other malaria commodities were issued on a demand basis/pull. The ZIP system was introduced to aid quantification as data coming through the HIMS was unreliable and incomplete to calculate consumption.

The ZIP system helps capture essential logistics data and it was initiated in response to stock outs of malaria commodities that were experienced in 2008 during the economic downturn. The country with the support of partners piloted a distribution system of the TB commodities in the Midlands province and stock out rates dropped from 30% to less than 5%, which was latter extended to malaria commodities and rolled out to all parts of the country in September 2009.[10]

Stock management and distribution at central level tries to ensure equitable distribution of supplies at all levels. In cases of shortages due to inequitable distribution of stocks the Area Distribution Coordinators supported by Crown Agents and based at provincial NatPharm stores or provinces and the Provincial Pharmacy Managers are mandated and capacitated by the Ministry to re-distribute stocks. However it is not sustainable in terms of costs involved. It entails more days out on delivery and therefore huge Travel and Subsistence payments to the delivery crew. Stock counting at health facilities means the delivery crew spends more time at one facility. Trips are made to some remote Institutions which may be well stocked. Under a demand or 'pull' system such institutions would not be visited. It is hoped that the "pull" system will systematically be re-introduced as the situation stabilizes.

8.5.2 Selected Integrated Vector Control

The IRS programme has over the years received tremendous support for transport, monitoring personnel through its strong partnership with PSI and Plan International. The programme enjoys good working relationship with the community because of the job creation for the functions of – loading, off-loading and spraying[11]. Distribution to the end user of the LLINs is done through collection by the users from the nearest facility.

8.5.3 Programme Management, Advocacy, Social Mobilisation and BCC, SMEO and EPR.

Distribution of items of a hardware nature (vehicles, ICT equipment and others) is as per original purchase requisition. Promotional materials are often distributed as per the distribution list from the IEC subcommittee. Monitoring of usage of equipment and vehicles are in place within the programme and normally follow the standard government policies.

[10] JSI/Deliver Project Document: Zimbabwe Innovative Distribution System brings steady supply of TB and Malaria drugs to health institutions.
[11] Malaria Annual Reports; 2008. 2009, 2010

Cases of equipment and vehicles not being utilized for the intended purpose have been reported. Asset verification has often revealed misplaced equipment and vehicles.

8.6 Rational Medicines Use

Rational medicines use entails the utilisation of medicines as recommended in the standard treatment guidelines. Due to high staff turnover training on rational use of medicines has to be conducted regularly. Surveys done through the Directorate of Pharmacy Services on rational medicine use had stalled due unavailability of funds and efforts are underway to resume the surveys.

The National Malaria Case Management Control Audit in 2009 showed that there was significant irrational use of antimalarials ranging from prescribing/dispensing ACTs without diagnostic testing to dispensing ACTs even after a negative RDT test. The Logistics Subunit (a unit under the directorate of pharmacy services) whose mandate was expanded to include Essential Medicines conducts supportive supervision once every two months to sites right round the country where their tools for support also include a component of rational medicines use. On the job training is also conducted at sites during the visits.

8.7 Quality control

There is a quality management system in place under the MCAZ. Samples are tested at the time of registration and post-marketing surveillance is routinely carried out by Nat Pharm in collaboration with MCAZ. In 2009 and 2010 a total of 16 and 5 ACTs samples were tested respectively but non-failed quality standards.

8.8 Pharmaco-vigilance

Individual health professionals play a role in product selection through the Adverse Drug Reactions reporting (ADR) system. Pharmaco-vigilance falls under the Directorate of Pharmaco-vigilance and Clinical Trials in MCAZ. Reporting is voluntary and there are is no system in place for reporting on Adverse Medicines Reaction (AMR) on regular basis. Depending on the gravity of the reactions the Authority communicates these to NMTPAC for further evaluation with a view to changing the treatment protocol. There is pharmaco-vigilance committee and its members include clinicians, MCAZ, Disease Prevention Programme, EPI staff and other health professionals. The Directorate of Pharmaco-vigilance is responsible for investigation of AMRs at national level while at district level Principal Medical Officers and District Nursing Officer in charge of this responsibility.
Spontaneous (voluntary/passive) pharmaco-vigilance of ACTs has been in place since their introduction in Mashonaland Central in 2007, with many challenges, such as:

- Lack of awareness amongst HW and patients
- Unavailability of adequate PV forms
- Lack of funding

Cohort Event Monitoring (CEM) of ACTs was established in 2008, as an Operational Research together with two other African countries, namely Tanzania and Nigeria. Ten thousand forms were distributed then and collection of these is on-going, 6 000 had been collected by September 2010 and of these 4 000 have already been entered into the WHO database at MCAZ, after the engagement of 2 full time data encoders. No analysis of data has yet taken please to include this in this report.

8.9 Logistics information system

A logistics information system is in place to collect, organize and disseminate information for decision making. Minimum and emergency order levels are established in the system with site level minimum at 3 months, maximum 6 months and emergency order point of 1 month. Centrally the Natpharm stores use a warehouse management system called NAVISION for processing orders. Consumption, stock on hand and adjustments data is collected at Service Delivery Points through and during the ZIP delivery runs. The district pharmacy personnel who are also the team leader for the distribution run in the district records all the information in the delivery/receipt vouchers(DRV) and sends the information to the central level with the Natpharm truck. The information is then encoded into a software at Natpharm that will calculate and aggregate the data to produce reports of consumption ,stock on hand, adjustments, quantities delivered ,number of days stock out and excess stock redistributed by site ,district, province and national level. Summary Delivery reports are also generated and shared with the Ministry and partners.

Key Issues

- SOPs are currently not being emphasized and yet there has been high attrition of trained staff
- PSM SOPs not used widely available
- Distortion of quantification due to stock outs of RDTs and ACTs
- Inadequate communication at all levels leading to delays in procurement
- Not enough interaction of Principal Recipient of Global Fund with NATPHARM
- Delay in the procurement of malaria commodities affected timely programme implementation – GF Grants
- Funding gap for procurement of ACTs and RDTs for 2012-2014
- Unfunded shipments 2012 being 1,000,000 treatments for ACTs and 3,000,000 tests for RDTs
- Capacity for procurement of medical supplies at NatPharm level but not used optimally
- Over dependence on external funding for malaria medicines and supplies
- Inexperienced personnel managing stocks due to staff attrition at Service Delivery Points
- Delayed disposal of waste and expired medicines
- Storage constraints: Inadequate security of commodities at facility level
- ZIP system is not maintaining minimum stock levels of 3 months at Service Delivery Points
- Inadequate training of facility staff on Rational Medicine Use

8.10 Action Points

- Establish a PSM subcommittee within NMCP to oversee timely procurement and supply chain management of malaria supplies as identified in the other thematic areas.
- Procurement of RDTs and anti-malaria medicines should be included within other national procurement fund and supply of essential medicines.
- Increase the role of NatPharm in malaria procurement and supply logistics.

9 Advocacy, Information, Education, Communication and Community Mobilization

9.1 Policies on Advocacy, social mobilization and BCC

The ten-year period since early 2000 has seen a large number of initiatives and strategies. Table 1 set out the main features of strategy changes. The Zimbabwe National Health Strategy for the periods 1999-2007 and 2009-2013, Zimbabwe Roll back Malaria Strategy (2000-2007), National Malaria Strategy (2008-2013), National Malaria Monitoring and Evaluation Plan (2010) National Malaria Policy (2010) incorporates the advocacy, social mobilization and behaviour change communication (BCC) indicators. Malaria communication is also included in the Health Promotion Unit yearly plans. The National Malaria Strategy (2008-2013) and the National Malaria Policy (2010) states the role of the programme which include mobilizing all sectors of society to promote malaria prevention and control strategies through use of community leaders as gatekeepers. The current National Malaria Strategy (2008-2013) and the Malaria Communication Strategy states clearly the objectives of the advocacy, social mobilization and BCC. The four core interventions addressed by the Malaria Communication Strategy include: 1) vector control (indoor residual spraying, larviciding and long lasting insecticidal nets, 2) case management, 3) epidemic preparedness and response, and 4) intermittent preventive treatment in pregnancy (IPT_P). Cross cutting interventions such as behaviour change communication, capacity building, operational research and monitoring and evaluation are also addressed within each of the four core interventions. The Communication Strategy spells out three main approaches - advocacy, social mobilization and BCC.

Table 12: Changes in Strategic directions from year 2000 to 2010

Policy	Highlights
Zimbabwe National Health Strategy (1999-2007),	The strategy was focusing on quality and equity in health. One of the areas of focus for Health Strategy was to 'Give priority to disease prevention, health promotion and protection' and to 'Increase community participation and responsibility in the promotion of healthy life styles and responsible behaviour.'
Zimbabwe Roll back Malaria Strategy (2000-2007),	There have been great achievements noted from (2000-2007) RBM to NMCS 2008. In 2000-2007 there was lack of appropriately trained staff with advocacy skills but currently 34 out of 59 established HPO posts are filled. Partner collaboration in the field of advocacy was weak according to 2000-2007 RMB but now collaboration has improved through the establishment of BCC/IEC Subcommittee.
Zimbabwe National Health Strategy (2008-2013),	The goal was to have halted, by 2015, and begun to reverse the increasing incidence of malaria. One of the BCC strategies is to increase community participation and competence on correct malaria prevention and control measure to 85%.
National Malaria Control Strategy (2008-2013),	Through BCC, the NMCP will mobilize all sectors of society to promote malaria prevention and control strategies and increase adoption of positive behaviours through the use of mass media and audio visual materials in accordance with the Ministry of Health and Child Welfare policy framework.
Monitoring and Evaluation Plan for the Zimbabwe Malaria Control Strategy (2008-2013),	To strengthen community and other stakeholder participation to maximize achievement of universal access to malaria control interventions. a) Increasing community participation and competence on correct malaria prevention and control measure to 85%. b) Strengthening the participation of other stakeholders in malaria
The National Health Promotion Policy for Zimbabwe (July 2010)	National Health Promotion Policy states that health promotion is an integral part of interventions such control of communicable (including malaria).
National Malaria Communication Strategy	The purpose of the malaria communication strategy is to provide a framework for guiding service providers and implementing partners for a well-coordinated and sustained communication for malaria prevention and control. The overall goal of the communication strategy is to contribute to the reduction of malaria morbidity from 9.5%in 2007 to 4.5% by 2013 and mortality from 4.5% in 2007 to 2.5% by 2013.

The National Malaria Communication Strategy (2008-2013) clearly articulates the role of the programme at all the various levels including the community of implementation, it is however, silent on the roles of partners and other

stakeholders and the document does not have a comprehensive implementation guideline. This makes it difficult for the partners to buy in the BCC activities and it makes it difficult to monitor their activities on the ground.

9.2 Approved Materials, Posters, Pamphlets, Flip Charts, Jingles, Songs, Films

BCC materials were produced during the period under review. From year 2000 to mid-2005, most material production was being produced by the provinces and districts. The materials produced were mostly to raise community awareness and they covered mostly signs and symptoms of malaria, prevention, treatment, indoor residual spraying and personal protection.

From 2006 to date materials produced supported all the major strategic areas which include indoor residual spraying (IRS), long lasting insecticidal nets (LLINs), intermittent presumptive treatment (IPTp) and case management. The material production was guided by the results of the research such as the Zimbabwe Population Based Malaria Survey (2001) which revealed that the majority of the respondents were knowledgeable on causes (80%) and symptoms (81%) of malaria. Almost 90% regarded malaria as a problem. The combination of perception of severity and high knowledge of malaria guided the production of the BCC materials. This saw most of the produced materials (posters and pamphlets) covering general information and the strategies to facilitate utilization of malaria prevention and control by communities. The Reaping Mission (2004) revealed that considerable efforts had been made to mobilise resources for developing IEC/Advocacy interventions on malaria including development of a wide range of IEC materials by districts and development of TV spots and malaria jingles.

The material produced targeted the populations at the greatest risk for malaria living in the 45 malaria transmission districts of Zimbabwe including the most vulnerable groups such as children under 5 years of age, pregnant women, the elderly, people living with Human Immune Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS), and malnourished children.

The behaviours that place them at risk were identified through rapid assessments, surveys[12] observations and discussion with target populations and were taken into consideration during the development of BCC materials. The behaviours include:

- Sleeping outside due to high temperatures or guarding fields
- Low utilization of ITNs/LLINs
- Abuse of LLINs- making fowl runs, wedding dresses and fishing nets
- Playing outside in the evening
- Bathing outside during the night
- Working in the fields early morning and evening
- Movement of peoples to and from areas of different malaria endemicity
- None use of repellents
- Late booking for ante- natal care by pregnant women
- Low utilization of IPT_p services- (poor social support, myths and misconceptions about IPT_p among the community)

[12]Population Based Survey (2001), Reaping (2004), Roll Back Malaria Rapid Assessment (2006), Zimbabwe Demographic Health Survey (2005-2006), Zimbabwe Malaria Indicator Survey (2008), Case Management Audit (2009), Community Reactions Towards The Introduction of Treated Rectangular Bed Nets For Malaria Control (2009), and the Minority Languages Malaria Needs Assessment (2010),

- Late treatment seeking

9.3 Organization

The health education unit (HEU) was established in 1982 and later changed to health promotion unit (HPU) in the mid-90s. The HPU oversaw malaria BCC activities and spearheaded the designing and production of all malaria IEC materials.. The materials were then sent to the provinces for onward distribution to the districts. In 1990 Provincial and Districts Health promotion posts were established. This led to the decentralization of malaria BCC activities to the provinces and districts up to early 2005. This structure, although it facilitated reach of communities with target specific information, it made it difficult to standardize the information being disseminated. From mid-2005 material production was again centralised. In 2006 a malaria BCC/IEC focal person was hired to ensure that BCC component are prioritized and to facilitate attainment of the 2010 Abuja Targets as a recommendation from REAPING (2004). Although the IEC subcommittee was commissioned in 2005, its operations were not consistent up until 2008. The work being done by the IEC subcommittee is commendable evidenced by the quarterly meetings conducted, standardization of key messages, successful planning of National malaria commemorations. In 2006 PSI Zimbabwe was appointed by MOHCW to partner with NMCP for implementation of BCC activities funded by the Global Fund.

Overall, current structure is effective, particularly where the health promotion officer is at the district and the Malaria focal person at province is available. In districts where the HPO position is vacant there are challenges in the implementation of malaria BCC activities.

9.4 Delivery structures

The implementation of BCC activities at ward level are coordinated by the districts and the reporting followed the national reporting structures which are from the health facilities to the district, then province and finally the national. The BCC reports are sent quarterly to the national level. These reports are to assess progress towards set targets and the implementation plan.

The coordination and reporting of BCC activities at provincial level is done by the Provincial Health Promotion officer. BCC plans, activities and challenges are discussed during meetings such as the weekly Provincial Health Executive (PHE) meetings and the Provincial Health Team (PHT) meetings. The coordination and reporting of BCC activities at district level follows the provincial structure.

Although staffing levels for Health Promotion officers has greatly improved (34/59 or 58%) coordination and reporting of BCC activities in the absence of District Health Promotion officers (DHPO) remains a great challenge. In districts where there is no DHPO, coordination of BCC activities is split between the community nurse and the environmental health officer. In such situations routine reporting of BCC activities become a challenge as the activities are incorporated in the environmental or community nursing reports.

At national level quarterly BCC subcommittee meetings are conducted with representatives from all the provinces, implementing partners and NMCP representatives. During the IEC subcommittee meetings BCC plans are also reviewed and upcoming events are discussed as well as BCC achievements, challenges and key messages that are being disseminated.

Findings revealed that routine reports from provinces were sent to the national offices from 2000 up until 2004, there after reporting became very erratic with most reports coming from Mashonaland East and West and these were mostly for national malaria day commemorations. BCC implementing partners were supposed to send reports quarterly to NMCP. However, the flow of implementation reports by partners was a challenge during the period under review. Partners' sent mostly end of project reports. Reports indicated progress towards achieving set targets of activities or projects. The details of the reports included the objectives, number of people reached, key messages disseminated, Promotional and BCC materials distributed and their theme.

9.5 Access and delivery points

The target audience for this thematic area were reached though advocacy, social mobilization ad BCC.

9.6 Advocacy

Advocacy activities that were being conducted during the period under review include advocacy meetings, National Malaria Day commemorations, National Malaria Conferences, Workshops and seminars, Media Briefs and Press Conferences. National Malaria Day commemorations are key events on NMCP calendars with the Africa Malaria Day commemorated in April annually from 2001 to 2007, World Malaria Day from 2008 and SADC Malaria day in November annually. Venues for commemorations are selected on the basis of high malaria burden districts and each province is given a chance to commemorate. The planning and coordination of the event emanates from the Districts, Province to the National level. The National level plays the facilitative and supportive role (resource mobilization and providing technical guidance) while the district does the implementation. Pre and post planning meetings for the event are held at all levels. Each commemoration has a unique theme, slogan and key messages. The themes and slogans are normally provided by the International and regional malaria advisory bodies. In instances where slogans were not provided the IEC subcommittee crafts the slogans and develops the key messages. These messages are disseminated through dramas, songs, poetry, quiz and speeches. Inter-sectorial partners always supported these events. Senior government officials and UN agency officials also grace the functions. The 2007 World Malaria Day was graced by the President showing high political commitment. Participants also include traditional leaders, religious leaders, uniformed forces, heads of ministries and departments, school children and community members from the area.

The success of this is indicated by the presidential participation in both the country and Regional meetings e.g. ALMA.

9.7 Social Mobilization

Social mobilization activities conducted in the past decade include sensitization meetings, net hang up campaigns and patient education. Pre-season sensitization meetings and campaigns (including IRS campaigns) were conducted routinely at ward level. The objectives of the sensitization meetings were to increase village acceptance of IRS as well as increasing malaria prevention knowledge levels. Communities participate actively during the IRS exercise where they supply water for the spray operators and remove property from the household before spraying. Pre and post distribution, LLIN hang up campaign with an objective of encouraging net utilization are also popular social mobilization activities. Malaria committees to monitor correct net utilization and deter net abuse are active.

Daily patient education by health workers during the malaria season are also conducted as a way of sensitizing the community of the dangers of malaria and how it can be prevented. Communities are expected to identify and report malaria outbreaks. Communities also participate actively during the commemorations through resource mobilization and

disseminating information through drama and songs. The media has also been trained to disseminate information on malaria. Promotional materials developed for specific campaigns were distributed to the final users during the same campaigns.

9.8 Behaviour Change Communication

BCC materials are developed annually in the three main languages Shona, Ndebele and English (see Table 2 below). Printed BCC materials are sent to the provincial offices for onward distribution to district hospitals and clinics. At clinic or ward level some educational materials are supposed to be posted in the clinics, shops and schools. The minority groups want information in their language (minority group study, 2010). Translations are now being done to carter for the minority groups which include the Tonga, Nambya and Venda. Adequacy of promotional materials, BCC materials and IPC activities has always been a challenge. Since BCC interventions are supposed to cover all the 45 malarious district, with all interventions adequacy is compromised. Due to the realization that resources will never be enough to cover everyone BCC interventions were restructured. Where radio transmission is not available road shows and dramas were introduced. For example in 2010, PSI facilitated the implementation of 900 road shows in 30 malarious districts- 30 shows per district and 1 show per ward. During the road shows BCC materials are distributed to shop owners and the community. Net hang up meeting were also increased to two meetings per ward to increase reach. IRS sensitization meetings were done at village level. School children were being reached through schools competitions (drama, songs and poetry on malaria) in PLAN International supported districts. The school competitions were done at ward level to district level. Children and community members also disseminated information on malaria during commemoration of malaria days. Their participation enhanced knowledge levels as well as awareness on malaria prevention. The introduction of Community Malaria Committees in 6 districts supported by Plan has contributed to the increase of knowledge on malaria issues (95%) and net utilization.

The health workers conduct regular group health education sessions and IPC on malaria at health facilities. The community health workers (village health workers (VHW) and school health coordinators) also played an active role in the dissemination of malaria information and IPC. This method is going to be used more and more in future as already indicated by research studies that it is the most effective method of BCC. [Population based malaria survey (2001), Reaping (2004), RBM rapid assessment (2006), Minority group needs assessment (2010)] which revealed that the communities preferred interpersonal communication (IPC) activities.

9.9 Coverage and Trends

BCC is a strategy that supports other strategies; therefore its successes are inferred on the progress of these core strategies. The impact of BCC activities can only be measured through research studies. Survey findings for BCC activities over the years (see Table xxx below), revealed that general knowledge on malaria has increased significantly so has net utilization and early treatment seeking behaviours.

Table 13: trends of indicators

	2001 Zimbabwe Population Based Malaria Survey	2005-2006 ZDHS	2008 Malaria Indicator Survey	2009 Case Management Audit	CBEMPC	Trac 2010
Malaria general knowledge	80%	79.5%	79.6%	80%	95%	
Net Utilization-U5 children	6.8%	7%	9%	-	46	53%
Access to treatment within 24 hours for children under 5 years	-	3.6%	9%	40.5%		
Intermittent presumptive treatment (IPTp) 2 doses (10 RBM Districts)	80.9%	7%	-	28%		

**End of Project Evaluation for European Commission Funded Community Based Enhanced Malaria Prevention and Control Project (CBEMPC) 6 Districts*

From the results of BCC, it is clear that though there is high knowledge of malaria in the communities, this has not translated to adequate behaviour change.

Best practices

The best practices identified during the period under review are:

- Net hung up campaigns conducted pre and post distribution
- Existence of community malaria committees in some districts
- Use of CBHW (VHW and SHC) for malaria IPC and information dissemination

9.10 Key issues

- Lack of detailed implementation guidelines for the communication strategy
- Inadequate funding for BCC/IEC
- Inadequate BCC/IEC materials at all levels
- Lack of operational research & KABP
- BCC/IEC materials not catering for minority languages
- Public/Private sector collaboration low
- No case definitions in all facilities visited

9.11 Action points

- Develop and disseminate the implementation guidelines to further operationalize malaria communication strategy.
- Develop adequate BCC/IEC materials, including for minority languages and information packages for travellers.
- Conduct operational research, KAP and behavioural studies.
- Strengthen and expand BCC through CBHWs and Community Malaria Committees (CMCs) in all malaria transmission districts to provide continuous community BCC.

10 Surveillance, Monitoring and Evaluation

10.1 Surveillance, Monitoring and Evaluation

A sound monitoring and evaluation (M&E) programme of malaria control at country level is critical in order to demonstrate progress in achieving outcomes and impact in prevention and control efforts. It contributes to more efficient use of data and resources by ensuring that indicators, their definitions and means of data collection and measurement are comparable over time and reduces duplication of efforts.

Over the last ten years, the NMCP has implemented two Malaria strategic plans NMCS 2000/1 – 2005/6 and the current National Malaria Control Strategy, 2008 to 2013. Following successful completion of the M&E Systems Strengthening Assessment in 2008 the first and current M&E plan 2009-2011 was developed. This M&E plan defines national malaria indicators, sources and frequency of data collection, measurement as well as mechanisms to track progress towards set indicators. Currently the MOH&CW has a new malaria policy developed in 2010.

Surveillance, M&E & Research in malaria has evolved over time with the NHIS processing morbidity and mortality data through the newly launched District Health Information System

10.2 Organization and capacity

All Health Related Data is managed by the NHIS, in the department of epidemiology and Disease control. NMCP collects this data from the NHIS for use in programmatic monitoring and evaluation

This routine data is electronically transmitted from district level to provincial level and then relayed electronically to national level. At each level, the data is stored electronically and is used as a backup system in cases where the data may be lost at any stage. Only, IRS related programmatic data does not follow the routine flow of Health information. It is transmitted using the same structures but in a parallel manner (it is vertical). Finalization of the WHO prototype database will result in the streamlining of all data through the NHIS channel.

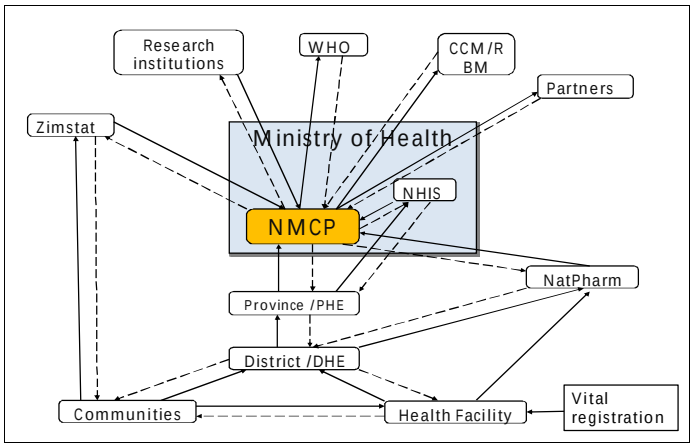
10.3 Data Flow

The figure below diagrammatically summarises malaria data transmission in the NHIS. Once collected at the health facility, information is analysed and interpreted at each level before it is transmitted to the next level (District to Province to Head Office) until it reaches the MOHCW's National Health Information Unit with feedback loops at each stage. Data is entered into computers at the district and hospital level and electronically transmitted to the PMD which transmits it further to head office. Monitoring and supervisory visits by district and provincial managers are used as opportunities to collect completed data collection forms as well as for providing feedback on data analysis to health facilities.

As information is transmitted from the collection points upwards, each level above is responsible for providing feedback to those below in order to ensure timely corrective measures. The flow of information, vertically and horizontally, follows the diagrammatic presentation.

Malaria data also comes from other sources such as the vital registration system, censuses, surveys, assessments and researches. In each of these cases, this information filters into the health information system at various levels and is fed into the programme for effective planning and decision making

Figure 18: Data flow, with particular reference to Malaria Control



Data from the vital registration currently is not systematically collected and varies in pattern from one province to another.

10.4 Programme Monitoring

A set of core health sector indicators for monitoring health programmes were identified and endorsed by Surveillance Monitoring and Evaluation Subcommittee (SMEO) and were included in the M&E plan. Some of the indicators constitute a list of 99 health sector indicators. The implementation of the National Malaria Control Strategy will be measured by the capability of the malaria programme to supply adequate data to address all core malaria indicators.

Monitoring and evaluation provide a framework for tracking progress and taking stock of progress and challenges in the implementation of the malaria strategy. The SMEO is responsible for ensuring that an M & E plan with clear activities is implemented. More specifically, the following key M & E activities were carried out to ensure that the operationalisation of the strategy is on course.

- Health information unit produced reports for morbidity and mortality, completeness and timeliness of reporting of the health facilities. Personnel at the facility, district, provincial and head office levels were trained on the data collection tools and the production of reports during the transition period of the old T5 system and the DHIS. Progress reports are shared on successes and challenges experienced during the malaria strategy implementation. These reports are discussed during the regular meetings of the malaria management committee and malaria technical sub-committee committee. Feedback is then provided on the reports as a way of improving data collection, quality control, timeliness and completeness although there is room to expand information sharing and dissemination
- Regular review meetings conducted (weekly disease surveillance meetings, weekly malaria meetings) to ensure implementation of NMCP strategy activities as prioritized by the strategic framework. The national malaria control programme subcommittees conduct such meetings on quarterly basis while the NMCP met on monthly

basis, or more frequently, as demanded by the situation. During these meetings, the respective malaria focal persons representing different malaria thematic areas submit regular reports to provide updates on progress and challenges met.

- Quarterly progress updates are also produced and these show progress summaries on selected indicators. The focus of reporting was however on the indicators in the Global Fund performance framework. Other indicators in the basic malaria M&E framework are difficult to monitor due to lack of funds to track the indicators.
- As detailed above quarterly monitoring and supervision visits were conducted to selected districts (health facilities, district and provincial health offices). A standard checklist to assess compliance with minimum standards set regarding a good malaria monitoring system are not always used in all cases. This compromised the quality of supervisory visits. To ensure success of these visits, the personnel at provincial and district health offices had access to national level MOHCW vehicles and fuel for all planned visits.
- Annual National Malaria Control Programme Reviews and IRS specific Programme Reviews: In addition, specified reviews are held following country wide roll out of the new malaria treatment policy and strategic policies. The reviews are used to assess implementation successes and failures in order to make the necessary improvements.
- Evaluations in form of MIS and case management audits were held in 2008 and 2009 respectively to assess interventions coverages, quality of care and to take stock of achievements and challenges in the implementation of the malaria strategy. The aim of these were to ensure that the national malaria control programme is capable of producing all the information required for monitoring nationally and internationally agreed health goals.

Table 14: Summary of some key indicators reported

Indicator Description	DHS 05/06	MIS 2008	Case Mgt Audit
1. Proportion of households with at least one ITN	8.9%	22%	NA
2. Proportion of households with at least one mosquito net – any type	20.3%	69.9%	NA
3. Proportion of children under 5 years old who slept under an ITN the previous night	6.7%	42.1%	NA
4. Proportion of households with at least one ITN and /or sprayed by IRS in the last 12 months	20.3% /15%	49.2%	NA
5. Proportion of households sprayed with insecticide in the last 12 months	63% (NMCP)	59.6%	NA
6. Proportion of children under 5 years old with fever in the last 2 weeks who received any antimalarials treatment	NA	21%	NA
7. Proportion of children under 5 years old with fever in the last 2 weeks who received antimalarials treatment according to national policy (using ACT) within 24 hours from onset of fever	NA	9%	40.5%
8. Proportion of children under 5 years old with fever in the last 2 weeks who had a finger or heel stick	NA	NA	NA
9. Proportion of pregnant women who slept under an ITN the previous night	3.2%	27.5%	NA
10. Proportion of women who received intermittent preventive treatment for malaria during ANC visits during their last pregnancy (IPTp2)	6.3%	7%	28%

10.5 Programme evaluations

Zimbabwe is implementing several thematic interventions in the prevention and treatment of malaria. Other interventions relate to behaviour change and communication among the target communities at risk. Formative, inter and post-term evaluation for such interventions, to obtain baseline data or measure programme impacts is being done through some operational research methods and activities. Those activity monitoring and evaluation systems include Malaria Case Management Audit (MCMA), Household surveys such as Malaria Indicator Survey (MIS), Demographic Health Surveys (DHS) and other institutional assessments that are carried out at specific periods.

There are other non-scheduled operational studies that are instituted in response to immediate programmatic needs, regularly implemented, covering community knowledge, attitudes and other related parameters.

10.6 Routine Information System

Accurate raw data is the cornerstone of an effective health information system. NHIS is a facility based system where each facility reports inputs, outputs and outcomes as the routine information system. These are then collated and reported monthly and annually at district, provincial and national levels. Data is collected at health facilities from all levels of the health delivery system: primary, secondary, tertiary and quarterly in both public and private sector. Data is collected and summarized through various data collection tools: vouchers, registers, stock cards and a series of tally sheets. Each tool is used to collect specific information.

At health facilities health workers record all statistics in line with the list of core health indicators using various data collection forms. Data is aggregated further into monthly summaries for onward transmission to the next level. Based on the new DHIS, key malaria indicators are reported and disaggregated by sex, age (less than five years and 5 years or more). Specific malaria indicators collected include number of suspected malaria cases at OPD, number of suspected malaria cases tested by RDT or microscopy, slide/RDT positivity rates and IPT1 as well as IPT2. The mortality and morbidity data (inpatient malaria cases and malaria deaths) is captured in admitting institutions but have experienced delayed update of the T9 software resulting in data not being transmitted to the higher levels from 2008 to date. The NHIS also collects information on stock-out of first and second line anti-malarial medicines and other health management indicators. At health facilities data is compiled manually and stored on duplicate hard copies. Using appropriate HIS software, data is entered into the computer, processed and stored at the district level and transmitted to national level through the province. In each case, back-up copies (on CDs, flash disks) is encouraged to minimize the risk of accidental loss of information

Since inception of the NHIS strategy 2009-2014 a number of problems limited the effectiveness of the NHIS. Delayed harmonisation of malaria indicators in the integrated DHIS resulted in parallel systems being instituted as an interim measure to report malaria indicators in line with the new malaria policy. The NHIS was on the verge of collapse due to financial and human resource crisis that affected the health sector. Timeliness and completeness of reporting was far below the recommended benchmarks. The NHIS have not been able to capture data generated at community level. Innovations to report community based data in the form of locally monitored conditions including malaria have been difficult to sustain over the years due to its being voluntary in nature

As described earlier, routine malaria data is captured and transmitted collectively under the NHIS, systematically on specified periods. Deadlines have been set for each level for the submission of such data to the next level, as markers for timeliness. This, together with other feeder programmatic subsystems, when put together qualify the completeness of the periodic data set. Raw data verification at all levels has been formalized (NHIS) throughout the system levels since 2005, while other parallel malaria data returns are checked differently. Malaria data is verified routinely and validated periodically as a quality control measure. (T5 Data Validation Protocol 2005)

10.7 Weekly Disease Surveillance System

The Weekly Disease Surveillance System (WDSS) is used to monitor and detect epidemic prone diseases including malaria. The system calculates epidemic thresholds that are set as sensitive indicators at each WDSS sentinel site. The thresholds which have "alert" and "outbreak" reflector lines are an evidence-based "whistle blowing tool", triggering appropriate responses from the epidemic prepared response teams at all levels*(Malaria M & E Plan for Zimbabwe – 2010).* Using a set criteria, 46% Health Facilities (700/1500 HF) report through the weekly surveillance system where HF report to district every Monday, District to province every Tuesday and to National level from province every Wednesday. Two indicators namely completeness and timeliness are used to track the reporting system benchmarked at 80% at all levels.

10.8 ITN monitoring system

As a sub sub-committee of Vector Control Subcommittee the ITN Working Group directed LLIN delivery guided by the Zimbabwe Insecticide Treated Nets Implementation Strategy/Guidelines. The period under review was characterised by mass net distribution from 2009 to 2010. Data was tracked manually supported by Microsoft Excel sheets. An Excel data base was developed and implemented for tracking of the LLIN imported into the country and delivered to the districts. This also helped in tracking partner activities and to coordinate LLIN distribution in the various districts. The distribution strategy used was one LLIN per two people or per sleeping space. To ensure effective monitoring of the strategy each distribution point comprised of a trained LLIN distribution committee supported by an LLIN distributor and an Environmental Health Technician. An LLIN register was the main tool for data collection at the distribution point. The main data collected included name of beneficiary, number of occupants for the household, ideal number of LLINs required, number of available LLINs, number of LLINs issued. Duplicate copies were sent to the nearest clinic and district. The district collated the returns and forwarded to national level through the province. A composite GMP data base available in most districts was used for data storage.

10.9 IRS monitoring system

Zimbabwe implements IRS as the main vector control strategy. The Vector Control Subcommittee, comprising of partners and experts in vector control, meet quarterly and more frequently during the IRS cycle, to provide guidance and technical advice to the programme. Based on the M&E framework IRS indicators are tracked to measure all the indicators: inputs, outputs and outcomes. Monitoring and evaluation of IRS has two components which involve the activity monitoring (weekly and monthly reporting system) and the entomological surveillance system. At all levels during IRS operations the following main indicators are collected: the proportion of the targeted rooms sprayed, , the proportion of the targeted population protected and the refusal that help the programme to estimate the acceptability of the IRS exercise by the local communities. Chemical utilisation rates and man hours are also monitored to assess resource utilisation during the spraying cycle.

IRS tools that include weekly return forms, vouchers, stock cards and registers, have been designed and are used to capture IRS data. Well trained IRS team comprising of IRS coordinator, data manager, spray operators, warders and supervisors use the tools to capture data. Using a Rapid Weekly IRS reporting system a weekly return (report) on the output indicators is compiled and transmitted to the district on a weekly basis using mobile phone. Data is further collated by supervisors and summarized by IRS data managers to generate monthly administrative coverage (monthly returns) at wards and district levels before they are forwarded to the M0H&CW- NMCP through the district and provincial level offices. In addition to weekly performance review meeting held by the teams, the district and provincial level supervisors carry out regular supportive visits to the sites. The data is entered into Excel databases at district, provincial and national levels for storage and easy retrieval.

10.10 Routine/Campaign performance reporting in NMCP

Monitoring inputs, processes and outputs is important for tracking programme performance, and ensuring availability of financial, human and other resources. Monitoring outputs is crucial for determining the level of service delivery that is achieved during implementation efforts. In Zimbabwe routine implementation reports are compiled to understand progress of district-level implementation of selected interventions. At national level, compilation of activity/campaign reports by the programme and the stakeholders are coordinated by the Team leader/focal person responsible, sent to the relevant M&E unit for further analysis, synthesis of level of achievement of relevant indicators, compilation of performance reports. A number of reports (sometimes with unique formats) are required periodically from different national and international centres including the CCM meetings, Health Cluster, Alma, MOH&CW Policy and Planning dept. , PR for Global Fund, and others along the reporting hierarchy.

Like the NHIS, M&E activity processes, systems and reports are faced with several challenges causing among others late and incomplete reporting. Lack of SOPs for reporting, delays in submission of activity reports needed to finalise major reports; deliberate withholding of information, caused by unnecessary friction and lack of cooperation have been sighted as major hindrances in quality of reporting.

10.11 Data quality audits

Data quality checks are done during the support supervision visit. The MOH&CW provides malaria technical supportive supervision to all the districts at least once every quarter through its structures. Currently the supervisory approaches include integrated supervision by the DHEs, PHEs and national level covering all aspects of malaria control using standard checklists developed by the NMCP in consultation with other stakeholders. Supervision by malaria focal persons is also conducted by malaria focal persons at provincial and district level. Data from these supervisory activities is meant to be analysed, used and stored for easy access by those responsible for carrying on subsequent supervision visits. However, due to lack of funds, most provinces and districts have not carried out planned quarterly visits. NMCP was able to conduct 4 rounds of 8 districts per quarter (2 per province) bringing to total number of districts supervised to 64 in 2009. Focal persons in NMCP also carry out support visits when ever need arises to assess and address programme issues. Supervision in some cases for a select number of districts is done by partners to the malaria control programme (sub recipients to NMCP) although the number of districts visited was low. Information from support supervision in most cases has not been properly analysed and documented as expected by the programme.

Funding for supervision activities has been a challenge at all levels and this affects the effectiveness of supervision efforts since follow up cannot be regularized.

10.12 Malaria Surveys (such as DHS, MIS, health facility surveys)

10.12.1 DHS

Zimbabwe conducted DHS in 1988, 1994, 1998, 2004 and 2010. The results of the last DHS are not yet published.

10.12.2 Drug Efficacy Sentinel Surveillance System

Anti-malarial drug efficacy monitoring in Zimbabwe was initiated in 1982. In 1999, eight sentinel sites were established, one per province, for routine monitoring of the drug efficacy. The SSS aims at complementing the existing information subsystems by facilitating the collection of more specific epidemiological information over a period of time. It thus enables the collection of relevant data, such as malaria drug efficacy, parasite resistance and parasite distribution, for a specified catchment area of site and may also be used to extrapolate to other areas with similar characteristics. (NIHR 2010, Dr Mutambu) *(Malaria M & E Plan for Zimbabwe – 2010)*

10.12.3 Sentinel Vector Surveillance Systems

Vector surveillance is a systematic regular collection of data on the occurrence, distribution and bionomics of malaria vectors, which provides a basis for malaria vector control decision making. The vector surveillance sites determine bionomics of malaria vectors among other things, biological vector behaviour, and susceptibility to insecticides, vector density and other survival characteristics. A total of 16 sentinel sites in different parts of the country were planned of which 8 of them are functional (National malaria annual report 2010).

10.13 Operational Research

Research is spearheaded by NIHR and The University of Zimbabwe's Community Medicine Department (particularly MPH programme) who contribute to knowledge generation in various aspects of malaria.

Regional and international collaborators include Johns Hopkins's School of Public Health (USA), Witwatersrand University (SA), Macha Research Institute (Zambia), Southern Africa Regional Network Research Constituency (MOZIZA, TZMI).

Operational research: aimed at optimizing the coverage of interventions and their impact was conducted and best practices documented to improve programme quality, efficiency and effectiveness. Some of the operational research studies conducted were:

- Monitoring and assessment of drug efficacy in uncomplicated cases of *Plasmodium falciparum* at sentinel sites
- Monitoring of insecticide resistance
- Laboratory and field evaluations of insecticides for registration
- KAP studies
- Population based malaria surveys

Basic research was conducted in:

§ Vaccine candidate antigens for *P. falciparum* from various endemic areas in Zimbabwe.
§ Molecular markers for resistance to chloroquine and pyrimethamine in *P. falciparum* from Zimbabwe.
§ Association of house spraying with suppressed levels of drug resistance in Zimbabwe.
§ Seven essential oils inhibiting Anopheles arabiensis mosquito biting.
§ Perceptions about malaria transmission and control using anti – malarial plants.
§ Validation of malaria drug sensitivity studies and case management in sentinel sites in Zimbabwe.

Development, planning and prioritization of the operational research agenda will be key in guiding the programme in identification of key gaps and new intervention plans that will require further evidence and tracking of intervention effectiveness and efficiency.

10.14 Information Dissemination

Information generated from Operational Research, Surveillance, Monitoring and Evaluation activities is disseminated in using various forums and channels, which include programmatic meetings and an assortment of reports as well as updates. However it has been noted that there is a need for increased information and data sharing with various partners involved in malaria control and prevention in the country.

10.15 Achievements and Best Practices

- Malaria M&E Plan and National Health Information Strategy (NHIS) are in place.
- The NHIS is an integrated system that captures morbidity and mortality data on weekly, monthly and quarterly basis.
- Roll out of :
    - DHIS as a platform for all routine data collection to all districts
    - GMP data base for malaria data storage
- High timeliness and completeness of routine data at health facility level
- Some health facilities are already using mobile phones for disease surveillance.
- Additional 1200 mobile phones have been procured for surveillance nationally.

10.16 Key Issues

- Inadequate system of monitoring of vector bionomics including bioassays
- Inadequate monitoring of completeness and utilization of data from the NHIS at national level.
- RDT data collection tool not standardized.
- Inadequate feedback to lower levels
- Inadequate information sharing with partners.

- Although there are several indicators in national malaria M&E plan, emphasis is on monitoring on Global Fund performance framework

10.17 Action Points

- Strengthen malaria data management functions to improve on monitoring, analysis and utilisation.
- Conduct routine data validation in collaboration with NHIS to improve data reliability at all levels.
- Share malaria data and reports with all stakeholders in malaria control
- Ensure that all indicators in the malaria M&E plan are monitored and comprehensive quarterly and annual report that meets all report requirements and demands.
- Strengthen the implementation of the national malaria control database to capture all malaria data at all levels.
- Establish the malaria research agenda, including operational research.

11 Conclusions and Recommendations

11.1 Conclusions

This Malaria Programme Review provided important findings regarding the epidemiology of malaria, the policy, programming framework, progress and performance in the delivery of the key interventions. The review noted the high overall priority and commitment to malaria control, the evidence-based plans and strategies, the provision of free malaria services and the relative increases in funding. Furthermore there has been a marked improvement in intervention coverage and use, which has resulted in the general decline in the number of new malaria cases and deaths nationally. Zimbabwe has almost reached universal coverage by 2010 on LLINs and IRS, but is lagging behind on providing universal access to early diagnosis and treatment. These gaps need to be filled in order to reach the MDGs by 2015.

The MPR recognizes the very strong and committed set of partners in malaria control in Zimbabwe and strongly encourages them to join in addressing and resolving the issues and needs identified in this report.

Implementation of the recommendations of the review will help place Zimbabwe on the road to a malaria free future.

The following strategic directions are recommended for the Zimbabwe malaria control programme in the next three years:

- Urgently leverage additional funds and engage partners to fill the 2012-13 malaria control resource gaps.
- Strengthen partnership and programme management to address human and financial resource needs, commodity requirements, monitoring and evaluation and operational research.
- Urgently expand community based malaria control services through strengthening community health systems.
- Scale up and direct interventions based on epidemiological evidence, including district level targeted elimination activities.
- Strengthen malaria monitoring and evaluation, surveillance and utilization of evidence for effective programming.

11.2 Recommendations and Way forward

There is a shift in risk mapping of the country that calls for a change in strategy for malaria control in the country. The table below shows the stratification for 2002 and the proposed new stratification for 2010 based on the incidence rates of malaria in the different areas. This brings out a stratification map given in the following figure with the tabled approaches to malaria control given in table 15.

Table 15: Endemicity and Epidemic Risk Mapping and Stratification 2002 & 2010

	Total Provinces	Total Districts	High and seasonal	Moderate and seasonal	Low and short seasonal	Sporadic	Free
2002	10	59	5	11	15	20	8
2004	10	62	6	11	16	21	8
			MIR - >15	MIR – 6-15	MIR – 2-5	MIR -</=1	
2010	10	62	27	4	15	16	

Figure 19: Proposed stratification of Malaria transmission in Zimbabwe based on the incidence rates for 2010

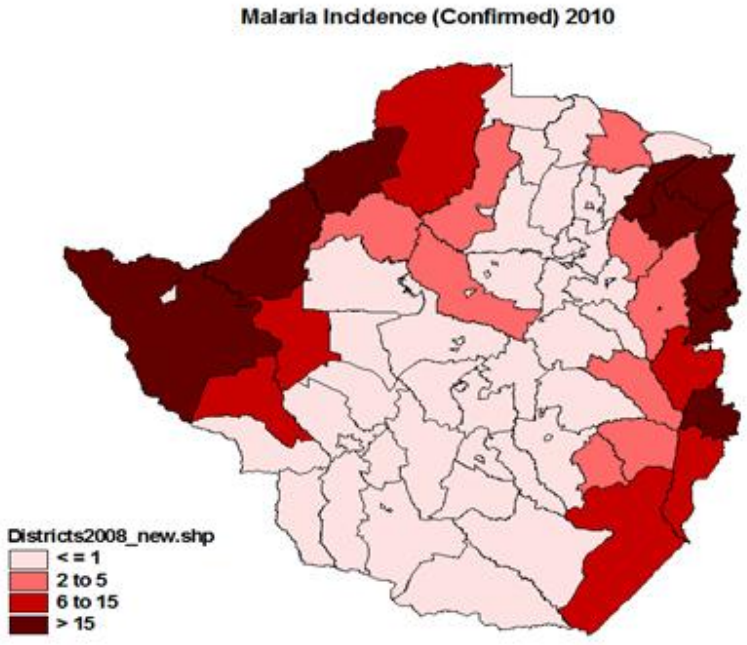


Table 16: Proposed strategies/interventions in all transmission zones

strategies	Incidence rate</+1(16) and 2-5/100	Incidence rate 6-15/1000	Incidence rate >15/1000
	13	4	27
Vector control/personal protection			
IRS (universal coverage)			
IRS and larval control (universal coverage in hotspots – focal)			
IRS (focal coverage – reactive to outbreak threat)			
LIIN universal coverage			
LIIN focal (hotspots) & high risk group			
Case management			
Non-Radical (ACT) treatment for confirmed cases			
Radical treatment (ACT+primaquine) for confirmed cases			
Surveillance			
Active case detection using RDT/PCR/microscopy + radical treatment			
Active case detection using RDT/microscopy + non radical treatment			
Cross border control			
BCC targeted for travellers and migrants			
Classification of all cases			
Identifying and Mapping of foci			
Chemoprophylaxis			
Pregnant women and other resident high risk group			
Travellers/migrants to low and sporadic zone or to malaria endemic countries			
Effective programme planning and management			
IEC and Advocacy & community involvement			
Efficient health facility based surveillance system including private sector			
Epidemic preparedness and response			
Good procurement & supply chain management system			
Good Quality control and assurance system			
Continuous training & supportive supervision			
Monitoring & evaluation (annual & strategic)			

12 Annexes

12.1 Annex 1: MPR SWOT ANALYSIS

Table 17: Epidemiology of Malaria SWOT analysis

Strengths	Weaknesses
• There is some stratification of malaria transmission	• Malaria risk mapping and stratification are outdated
Opportunities	**Threats**
• Significant reduction in malaria burden • Prevalent parasite and vector species known • Malaria transmission is highly seasonal • There is a geographical variation in malaria transmission with well demarcated malaria free areas	• Malaria transmission remains high in the border areas with weak cross-border collaborations • Poor collaboration between Ministry of Health and Child Welfare and the Meteorological Department in malaria risk mapping

Table 18: Programme Management SWOT analysis

Strengths	Weaknesses
• Availability of the strategic documents and policies • Active & coordinated partnerships • Dedicated unit for malaria • Functional structures at various levels • Functional basic infrastructures for health service delivery.	• Inadequate funding • Late disbursement of funds • Heavy dependency on external funding • Verticalisation of some programmes • Limited community involvement
Opportunities	**Threats**
• Strong political will • High adult literacy rate in the country • Availability of training institutions for health personnel. • Increased donor/partner interest in malaria programmes • Increased Cross Border collaboration • Expanding Communication networks	• Continued staff attrition/brain drain • Donor hesitancy • Continued use of multiple currencies • Continued deterioration of the economic infrastructure • Global warming-affecting the malaria epidemiology

Table 19: Malaria Vector Control SWOT analysis (IRS)

Strengths	Weaknesses
• Experience due to long history of effective IRS implementation (1959 to date) • Availability of IRS training manuals, SOPs and guidelines • Vector still susceptible to insecticide • Trained personnel in IRS including vector entomology • Established 16 sentinel sites for vector bionomics • Increasing financial support from GOZ • Existence of vector control technical sub-committee • Increasing community participation	• High vacancy rate for EHTs, H/Os, F/Os and HPOs • Limited stakeholders capacity to support IRS activities • IRS not prioritized in terms of resource provision • Dissemination and utilization of results is limited • Outdated information on vector bionomics and distribution • Information on vector resistance monitoring not consistent • Lack of vector surveillance • Lack full implementation of bioassays • Insecticide waste disposal facilities not appropriate • Inadequate provision of PPE, camping equipment, sprayers and spare parts
Opportunities	**Threats**
• Increase in funding resources for malaria globally • constant output of professionals from training institutions • Willing donor community to support IRS • Existence of technical expertise • Cross fertilization of ideas within the region • MODO, PHT and DHT provide good forum • Well established research institutes • Existence of a WHO vector resistance group	• Global recession • hyper inflations • Perceived unfriendly investor environment • Donor dependency syndrome • Unfavourable socio-economic conditions • Loss of international recognition

Table 20: Vector Control SWOT analysis (LLINS and larviciding)

Strengths	Weaknesses
LLINS • Availability of ITN implementation strategy • Effective multi sectorial ITN Working Group • Strong partnership (public, private and NGO) • A high coverage (83%) of LLINs in targeted areas of 30 districts • Existence of community based LLIN, distribution and monitoring committees • Existence of data base for LLIN distribution Larviciding • Availability of guidelines for larviciding	LLINS • Strategy not widely known by all stakeholders • Pilferages, misuse or abuse of LLINs • No guidelines on disposal of LLINs waste • Low utilization levels of LLINs (MIS 2008) • Lack of efficacy monitoring • Unavailability of LLIN manufacturers in the region Larviciding • Perennial mosquito breeding sites not mapped • No basic training for larviciding amongst ……
Opportunities	**Threats**
LLINS • Increase in funding resources for malaria control globally • Increase in the number of LLIN manufacturers Larviciding • Willing community participation • Wide range of insecticides which can be used to curb resistance	LLINS • Emerging resistance to pyrethroids • Procurement is not locally conducted Larviciding • Conduct mapping for perennial breeding sites • Conduct basic training for larviciding

Table 21: Malaria Diagnosis and treatment and Malaria in Pregnancy SWOT analysis

Strengths	Weaknesses
• Training materials available • SOPS available • Legislation • Two types of manuals developed: for health and community based health workers. • Microscopists & CBHW being trained. • Laboratory focal person in place at national level. • Lab scientists at national, provincial & district level • MIP conference • IPTp diagnostics and treatment objectives are part of the National Malaria Strategic Plan • LLIN Universal Coverage Policy covers all women • MIP Policy in place for high transmission areas	• External Quality Assurance • Abuse misuse, misinterpretation • Lack of Monitoring & Evaluation structures • Microscopists posts not yet established • RDT usage not fully captured • Inadequate research in MIP • Inadequate collaboration between Reproductive Health and NMCP • Inconsistent supply of SP & Quinine • Lack of adequate support and supervision • Lack of awareness of importance of IPTp in the community • Inadequate BCC and IEC on MIP
Opportunities	**Threats**
• Partner support e.g. UNFPA supporting Blood coupons	• Partner support e.g. UNFPA supporting Blood coupons

Table 22: EPR SWOT analysis

Strengths	Weaknesses
• Availability of guiding documents • Availability of risk map • Health workers trained on IDSR and RRTs appointed and some trained. • Availability of EPR plans at all levels. • A functional RDNS system. • Availability of TLVs at all levels. • Transport improvement • Pre-positioning of EPR resources to high risk areas • Ability to identify & respond to outbreaks early	• Insensitive Early Warning System – weakening NHIS & poor disease surveillance. • Poor communication systems. • Lack of updated Malaria stratification - last done 2002 • Lack of feedback to different levels. • Poor utilization of data at community level
Opportunities	**Threats**
• Support from partners including UN Agencies • Financial support from GFATM • Good network mobile network coverage in some provinces • SADC Malaria control initiatives. • Willing community to participate in EPR activities. • Availability of weather forecast data from district to National level • Functional cross-border Initiatives – RSA, Mozambique & Zambia.	• High staff attrition leading to poor institutional memory • Inadequate resources – financial & material • Poor Economic environment affecting adequacy of resources. • Low risk perception of implications of malaria outbreaks.

Table 23: PSM SWOT analysis

Strengths	Weaknesses
Product selection • Availability of policy, strategic documents, guidelines and SOPs • Presence of regulatory and procedural framework • Well-structured and functional NMTPAC. • Presence of malaria standard treatment guidelines in the EDLIZ • Regular review of the EDLIZ • Existence of Hospital Therapeutics Advisory Committees (HTAC) Forecasting& quantification • Functional HMIS – availability of data • Qualified personnel • Trainable professionals to provide accurate data. Procurement • Functional technical subcommittees • Existence of various procurement systems • National Pharmaceutical Company (NatPharm)-designated procurement entity. • National Procurement Regulations and a strong State Procurement Board. Inventory management and storage • Adequate storage capacity at NatPharm • Well-developed logistics management information system(LMIS) • Well-resourced logistics subunit(LSU) • Good inventory management system-all processes have SOPs • Batch and expiries tracking • Functional materials handling equipment e.g. forklifts • 24hrs security and full insurance cover • MCAZ inspectorate for the private sector Distribution • Presence of mobile cell phone service in rural areas • Dependable delivery fleet for NatPharm • Strategically positioned NatPharm warehouses for distribution • Adequately resourced distribution systems-trucks, monitoring personnel and vehicles • Re-categorization of Artemether/Lumefantrine to PIM increases accessibility Rationale Medicines unit • High literacy levels in the community • Pre service inclusion of supply chain management in pharmacy & nursing curricula • Availability of a Post marketing surveillance system • Regular training of health workers on RMU	• Insensitive Early Warning System – weakening NHIS & poor disease surveillance. • Poor communication systems. • Lack of updated Malaria stratification - last done 2002 • Lack of feedback to different levels. • Poor utilization of data at community level
Opportunities	Threats

• Support from partners including UN Agencies • Financial support from GFATM • Good network mobile network coverage in some provinces • SADC Malaria control initiatives. • Willing community to participate in EPR activities. • Availability of weather forecast data from district to National level • Functional cross-border Initiatives – RSA, Mozambique & Zambia.	• High staff attrition leading to poor institutional memory • Inadequate resources – financial & material • Poor Economic environment affecting adequacy of resources. • Low risk perception of implications of malaria outbreaks. • Multiple procurement agencies with different procurement systems

Table 24: BCC SWOT analysis

Strengths	Weaknesses
• Increased political and social support from GOZ (National Malaria Day, Conference and Budget allocation reports) • Increased funding from partners (GF 5,8 and 10 proposals and budgets) • Establishment of IEC malaria focal person post (NMCP organogram) • There is an established IEC structure in place from the National to the district level (NMCP and MOHCW organogram) • There is a national malaria communication strategy (NMCP Communication Strategy 2010) • High knowledge level on the causes of malaria (TRac 2009) • Availability of evidence based key messages on specific areas of interventions, (TRAC, 2009-2010 and GF 8 BCC Campaign concepts). • Manuals for school health master training developed (Participatory Malaria Health Education Tools 2010).	• Limited funding for advocacy from the overall malaria budget (GF 5, 8 and UNICEF) • High attrition for staff (National Control Annual Report 2009) • National malaria communication strategy lacks implementation guidelines, (National malaria conference recommendation, 2009). • Limited involvement of other sector ministries (Reaping, 2004) • Lack of evidence based IEC materials with over reliance on print media (Reaping, 2004). • Limited private sector partnership (Reaping, 2004). • The malaria national policy does not state what the partners should do (National Malaria Policy, 2010. • Limited documentation on best practices, experiences and lessons learnt (Reaping, 2004). • Ad hock Partners support for IEC interventions (Reaping, 2004). • KAP surveys lack the use of Health promotion behavior change theories as their conceptual framework (TRac, 2009 &2010) • Evaluation of activities is poor, especially in respect to the evaluation of training quality and effectiveness and IEC/BCC activities (M&E Policy 2010). • Limited funding for social mobilization activities (GOZ malaria budget 2009 & GF5 & GF8 budget).
Opportunities	Threats
• High literacy levels (DHS 2005-06) • High technical expertise (MPHHEP) • SADC regional integration (SARN, Roll Back Malaria and SADC) • Partner involvement (There is a gap Reaping, 2004) • High literacy rate of 95% among men & 91% among women in the communities (ZDHS, 2005-2006). • A viable primary health care infrastructure with more than 71% living within 8km radius (GF 8 Proposal). • Involvement and participation of school children in school health approach (National Malaria Commemorations Days reports, Plan International operational reports)	• Donor dependence of funding and resources (GF 5, 8 & 10 Proposals and Budget). • Staff attrition (RBM Needs Assessment, 2008). • Unavailability of radio and television in hard to reach areas (RBM Needs Assessment, 2008 & BCC needs assessment report for minority languages, 2010)

Table 25: Surveillance Monitoring and Evaluation and Operational Research SWOT analysis

Strengths • Monitoring and evaluation Plan Aligned to the Malaria strategic plan • Availability of reporting tools at all levels • Availability of case definitions • Malaria Case management audits carried out every 2 years Operational research conducted routinely on first line antimalarial, bioassays, and vector bionomics and insecticide susceptibility tests.	Weaknesses • No separate malaria reporting • Data collection tool for RDTs not standardised • Data storage and utilisation is weak at all levels
Opportunities • Malaria reporting integrated into national health information system • 1200/1500 facilities have been supplied with cellphones for transmitting data	Threats • Different reporting systems for vector control data other malaria control data

12.2 Annex 2: People involved in MPR

Table 26: thematic desk review teams

Thematic area	Members	
Programme Management and Finance	1. Joseph Mberikunashe 2. Dr Charimari 3. Emily chitate	
Epidemiology, Surveillance, monitoring and operational research	1. Andrew Tangwena 2. Dr C Tshuma 3. Dr Susan Mutambu 4. Munashe Madinga	5. Wonder Sithole 6. Mr Katiyo 7. Mr Katikiti
Case management	1. Staneford Mashaire 2. Abden Svisva 3. Dr J Mujuru 4. Dr R Mudyiradima	5. Dr Borerwa 6. Dr L Charimari 7. Lt. Col. Alexio Tafirenyika
Vectors Control	1. Jasper Pasipamire 2. Shadreck Sande 3. Regis Magauzi 4. Lukwa Nzira 5. Mr A M Tozivepi	
Epidemic preparedness and Response	1. Anderson Chimusoro 2. Efison Dhodho 3. Vimbai Chikwavaire	4. Mr Chimbaru 5. Mr Masuku 6. Mr Timothy Chauke
Behaviour Change communication	1. Fortunate Manjoro 2. Blessing Masunungure 3. Mr W Chauke 4. Mrs Chatsama 5. Joy Chikwena	
Procurement supply management	1. Hugo Mapfumo 2. Arthur Sanyanga 3. Charles Mwaramba 4. Mr Mugwisi 5. Tapuwa Lynette Muchemwa 6. Arthur Sanyanga	

Table 27: Field Teams

Team	Members	Offices/People Visited
Central team	Charles Paluku Joseph Mberikunashe Emanuel Boadi Josephine Namboze Khoti Gausi Desta Tiruneh Andrew Tangwena Wonder Sithole	Hon Deputy Minister, Permanent Secretary, Principal Director, Policy Planning and M&E, NIHR, Laboratory services, Traditional Medicines, NHIS, Pharmacy Services, Malaria Control Programme team, European Union, DFID, USAID, PMU/UNDP, WHO, PSI, Private Hospital Association of Zimbabwe, Harare City, Nat Pharm, ZINQAP, MCAZ, CCM secretariat, Crown Agent, Uniformed Forces-Health Services, CHEMPLEX Plan Zimbabwe, UNICEF
Mashonaland West	Fortunate Manjoro Timothy Chauke Rusia Rashamira Fortunate Manjoro Susan Mutambu Kafula Silumbe	PMD office Chinhoyi Hospital Kariba D/Hospital Kanyati Clinic Siyakobvu Hospital
Manicaland	Blessmore Vimbai Chaibva Eunice Tendai Nyamadzawo Olivia Chatsama Anderson Chimusoro Shadreck Sande Abdul Mussa	PMD Manicaland- PHE Mutate district health Executive Mutate Provincial Hospital- Hospital Executive and wards Berzely Bridge Clinic Staff Burma Valley clinic staff
Masvingo	Staneford Mashaire Joy Chikwena Shiva Murugasampillay Amadeus Shamu Munoitei Bheka	PHE Masvingo Masvingo Provincial Hospital DHE Chiredzi Chiredzi District Hospital Hippo Valley Medical Centre Chilonga Health Centre
Matabeleland South	Odette Cossa Jasper Pasipamire Abden Svisva Tapuwa Lynette Muchemwa Notho Dube	Gwanda Provincial Hospital Gwanda DHE Offices BeitBridge District Hospital Dulibadzimu Town council clinic Chituripasi RHC Shabwe RHC Shabwe (FGD/Community Dialogue) MSF District Administrator's Office

Team	Members	Offices/People Visited
Matabeleland North	John Govere Regis Magauzi Smockie Dube Arthur Sanyanga Efison Dhodho	Provincial Health Management Team District Health Management Team Senior Staff Members in adult, paediatric, maternity and OPD wards; laboratory, pharmacy, OPD, ANC units at Victoria Falls District Hospital, Wankie Colliery Hospital Sister in charge of Lukunguni Mission Clinic Focus group discussion at Lukunguni Clinic
Midlands	Luciano Tuseo Nokuthula Mujuru Vimbai Chikwavaire Nzira Lukwa Temba Moyo	PMD Midlands- PHE Zvishavane Hospital – DHE and Wards Shabanie mine Hospital Vugwi RHC

Table 28: List of all participants to the Zimbabwe MPR

Name	Organisation	Name	Organisation
Bheka Mrs Munoitei	Chiredzi District	Mberikunashe, Dr Joseph	NMCP, Zimbabwe
Bhusumani, Dr William	NMCP, Zimbabwe	Moyo, Mr Temba	Zvishavane District
Boadi, Mr Emanuel	UNDP, Zimbabwe	Muchemwa, Mrs Tapuwa L.	UZ
Chaibva, Ms Blessmore Vimbai	PMD Manicaland	Mujuru, Mrs Nokuthula	UNDP, Zimbabwe
Chatsama, Mrs Olivia	PSI	Murugasampillay, Dr Shiva	WHO, GMP
Chauke, Mr Timothy L.	PMD Mash West	Mussa, Dr Abdul	NMCP, Mozambique
Chikwavaire, Mrs Vimbai Febie	PMD Midlands	Mutambu, Dr Susan	NIHR
Chikwena Joy	Plan International	Mwaramba, Mr Charles	NatPharm
Chimusoro, Dr Anderson	WHO, Zimbabwe	Namboze, Dr Josephine	WHO/IST/ESA
Chitate, Ms Emily	NMCP, Zimbabwe	Nyamadzawo, Eunice Tendai	Mutare District
Cossa, Dr. Odette	WHO/IST/ESA	Nzira, Mr Lukwa	NIHR
Dhodho, Dr Efison	PMD Mat North	Paluku, Dr Charles	WHO/IST/ESA
Dube, Mr Smockie	Partner	Pasipamire, Mr. Jasper	WHO, Zimbabwe
Dube, Mr Notho	BeitBridge Hospital	Rashamira, Ms Rusia.	DHE, Kariba District
Fall, Dr Soce	AFRO	Sande, Mr Shadreck	NMCP, Zimbabwe
Gausi, Mr Khoti	WHO/IST/ESA	Sanyanga Arthur	MOHCW
Govere, Dr John	WHO/IST/ESA	Shamu, Dr Amadeus	PMD Masvingo
Luciano Tuseo	WHO Madagascar	Silumbe, Mr Kafula	MACEPA
Magauzi, Mr Regis	PSI, Zimbabwe	Sithole, Mr Wonder	NMCP, Zimbabwe
Manjoro, Mrs Fortunante.	NMCP, Zimbabwe	Svisva, Dr Abden.	PMD Mat south
Mapfumo, Mr Hugo	NMCP, Zimbabwe	Tafirenyika, Lt. Col. Alexio	ZDF
Mapuranga Ms Shamiso	NMCP, Zimbabwe	Tangwena, Mr Andrew	NMCP, Zimbabwe
Mashaire, Dr Staneford	NMCP, Zimbabwe	Tiruneh, Dr Desta	WHO, Nambia
		Tuseo, Dr Luciano	WHO, Madagascar

12.3 Annex 3: MPR Aide Memoir

12.4 Annex 4: Community Malaria Committees

Plan International has introduced Community Malaria in their project districts in a move intended to improve community participation in malaria control

- The formation of CMCs focuses on the measures that can be taken by households, jointly or individually, in order to reduce their risk of contracting malaria.
- There is an emphasis on community members participating and being empowered to engage with the formal health structures at various levels in order to represent local interests.

Formation

- Two Community malaria committees are formed in each ward
- Participants are drawn from the community
- EHT and Nurse ex-officio members
- The committee is composed of 9 members
- The CMCs will then form the DMC (District malaria committee)at District level

Composition

- MOHCW
- Councilor
- Extension workers e.g. Arex officer
- Farmer Groups
- Community representative(s).
- Ministry of education (SHM)
- NGOs personnel in the local area
- Youth representative.
- Village head
- Faith Based Organizations
- PLWAH
- Woman's representatives

Training

- The committee is trained using the School Health Coordinators syllabus
- In addition there would be discussion on identification and use of local available indigenous plants with mosquito repellent properties and means of processing them into items such as soap, oils or candle
- After the committees have been trained they would start instituting the neighbor to neighbor approach. This implies that they will be entitled to train 5 other community members, after gaining the knowledge the 5 will train 5 others up until the whole community members are trained. The communities will understand much

better from peer education. The myths and misconceptions will be dealt with at local level as all of them will be in the same picture ,but the CMC will be having technical expertise

Duties of CMCs

- Identify Knowledge gaps, negative attitudes and beliefs.
- Educating other community members through various means- dramas, active lecture at community meetings etc.
- Identify and facilitate healthy environments through home visits, site visits etc.
- Up-scaling of vector activities
- Participate in IEC material development and distribution - formulating key messages in collaboration with MOHCW and partners.
- Surveillance of malaria in their ward.
- Malaria resources management. They will be expected to liaise with the MOHCW for constant supply of anti-malarials to CQ holders, spearhead LLINs distribution etc.
- Identification of LLINs beneficiaries(Household listing
- Promoting hang up campaigns
- Development of malaria plans at local level
- To carry out community mapping
- Conducting larviciding
- Referral of malaria cases
- Any other related duties

Activities to raise community-wide awareness and knowledge on Malaria issues, coupled with effective local structure support to Malaria prevention, treatment and control practices, will therefore form the basis of this program.

- The use of peer education and monitoring activities, through the neighbour-to-neighbour and child-to-child approaches, will develop local knowledge and resources, creating sustainability through a sense of ownership among the people who are most directly affected by the problem of Malaria.
- Communities will be supported to locally access the materials and expertise they need to tackle the high infection and mortality rates seen in the target areas.
- The development of CMCs at community and District levels to co-ordinate interventions will ensure that activities are closely aligned with those of other stakeholders, providing a greater impact and more efficient use of resources.

Achievements

- High IRS coverage in areas where there are CMCs
- Increase in net utilisation
- High retention of LLINs in communities due to follow ups by CMCs
- Identification of mosquito breeding areas, and contributing to malaria breeding free environment

- Social mobilisation on malaria activities
- Conduct local malaria commemorations in wards

District malaria committees

- The DMCs will consist of the project partners, wider stakeholders within the District and representatives from each of the wards a Rural Health Centre staff and CMC member.
- They will meet six-monthly to co-ordinate and plan all Malaria related activities within the District.
- Proposing the committee to be part of social services ,like DAAC