President's Malaria Initiative

MCHIP Maternal and Child Health Integrated Program

A MALARIA IN PREGNANCY CASE STUDY:

Zambia's Successes and Remaining Challenges for Malaria in Pregnancy Programming

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Acronyms

AL	Artemether-lumefantrine
ANC	Antenatal care
CHAZ	Churches Health Association of Zambia
CHW	Community health worker
CIDRZ	Center for Infectious Disease Research in Zambia
CSO	Central Statistics Office
DHMT	District Health Management Team
DHO	District Health Office
DHS	Demographic and Health Survey
DOT	Directly observed therapy
EmONC	Emergency obstetric and neonatal care
Hb	Hemoglobin
HCP	Health Communication Partnership
HIV/AIDS	Human immunodeficiency virus/Acquired immunodeficiency syndrome
HMIS	Health management information system
HSSP	Health Services and Systems Program
IEC	Information, education, and communication
IPTp	Intermittent preventive treatment in pregnancy
IRH	Integrated reproductive health
ITN	Insecticide-treated bed net
KAP	Knowledge, attitude, and practice
LBW	Low birth weight
MACEPA	Malaria Control and Evaluation Partnership in Africa
M&E	Monitoring and evaluation
MCHIP	Maternal and Child Health Integrated Program
MICS	Multi-indicator cluster survey
MIP	Malaria in pregnancy
MIPESA	Malaria in Pregnancy Eastern and Southern Africa [Coalition]
MIS	Malaria Information System (Sentinel Surveillance)
MNCH	Maternal, neonatal, and child health
MOH	Ministry of Health
NHC	Neighborhood Health Committee
NMCC	National Malaria Control Centre
NMCP	National Malaria Control Programme
NMIS	National Malaria Indicator Survey
NMSP	National Malaria Strategic Plan
PA	Performance assessment

PHO	Provincial Health Office
PMI	President's Malaria Initiative
PMTCT	Prevention of mother-to-child transmission of HIV
PSI	Population Services International
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
RH	Reproductive health
SFH	Society for Family Health
SMAG	Safe Motherhood Action Group
SP	Sulphadoxine-pyrimethamine
SPA	Service provision assessment
SUFI	Scale-Up for Impact
TWG	Technical working group
USAID	United States Agency for International Development
WG	Working group
WHO	World Health Organization
ZPCT	Zambia Prevention, Counseling, and Testing

Executive Summary

Introduction and Background: Throughout sub-Saharan Africa, malaria in pregnancy (MIP) programs are at a crossroads. While many countries have made important strides in achieving their goals, most countries are still far from achieving the Roll Back Malaria (RBM) Initiative targets (80%), the President's Malaria Initiative (PMI) targets (85%) for intermittent preventive treatment in pregnancy (IPTp), and insecticide-treated bed net (ITN) coverage among pregnant women.

The numbers and types of surveys that collect data related to MIP have grown over the last decade, but gaps in information remain. Coverage data should be linked with MIP program implementation documentation to determine implementation bottlenecks, as well as success stories, and why these deficiencies or successes exist. Among malaria-endemic countries in Africa, Zambia stands out as a leader in the successful implementation of interventions to prevent and control MIP. With support from PMI, the Maternal and Child Health Integrated Program (MCHIP) conducted a case study from August through November 2009 to examine MIP implementation in Zambia. The country was purposively selected based on two MIP-related indicators: IPTp uptake and ITN use, as well as cultural/geographic considerations. The country is considered "high performing" with respect to MIP programming and likely to have applied successful strategies or best practices that could potentially be adapted and replicated in other malaria-endemic countries.

Objectives and Methods: As countries scale up their prevention and control of MIP programs, there are critical lessons learned, as well as promising implementation practices, that should be considered, adopted, and applied, based on the contextual needs of each country (Jhpiego/ACCESS 2008). The purpose of this case study is to gain a better understanding of MIP programming in Zambia, specifically:

1. Best practices[1]/strategies that have supported MIP programming success;
2. Existing bottlenecks in MIP program implementation and how these are addressed; and
3. Lessons learned that inform future MIP programming.

The case study will also contribute to the development of a standardized framework for the analysis of best practices and bottlenecks in MIP implementation. The methodology used consisted of a desk review of secondary data sources, as well as in-depth qualitative interviews. The findings were then analyzed according to the MIP Readiness Scale, a framework developed by Jhpiego and Malaria Action Coalition partners to determine a country's stage of MIP program implementation and guide actions to strengthen MIP control. The framework examines eight key areas of MIP programming:

Integration	Capacity Building
Policy	Community Awareness and Involvement
Commodities	Monitoring and Evaluation (M&E)
Quality Assurance	Financing

Best Practices: Overall, Zambia can be said to have achieved a moderate to high level of implementation of the essential MIP program components. Major strengths have been observed in the areas of: integration, policy, training, and community-based programming. Areas that

[1] For the purposes of this assessment, the term best practice will be used in the context of innovative practices since the assessment will primarily be based on existing data analysis and qualitative interviews.

require further, significant strengthening include: commodities, quality assurance, M&E, and financing.

Key best practices identified that contributed to the strengths observed include:

- Integration of the MIP program into the Ministry of Health (MOH) Reproductive Health (RH) Unit
- Roll-out of MIP through focused antenatal care (ANC) package
- ITN distribution through ANC
- Integration of focused ANC/IPTp into the prevention of mother-to-child transmission of HIV (PMTCT) in-service curriculum
- Provincial focused ANC mentorship teams
- Community involvement through Neighborhood Health Committees (NHCs) and Safe Motherhood Action Groups (SMAGs)

Bottlenecks and Lessons Learned: A number of challenges as well as mitigation strategies and lessons learned were reviewed, and are presented in the table below.

Bottlenecks and Lessons Learned in Zambia's MIP Implementation

COMPONENT	CHALLENGE/ BOTTLENECK	CURRENT MITIGATION STRATEGIES	LESSONS LEARNED
Integration	Weak linkage between the National Malaria Control Centre (NMCC) and the MOH RH Unit and HIV/PMTCT	▪ Ongoing discussions between NMCC and MOH RH Unit regarding establishment of MIP program officer position to coordinate RH and NMCC MIP programming ▪ Preliminary, ongoing discussions regarding reviving of National Malaria Taskforce	In addition to integrating MIP into reproductive health, a strong linkage must be maintained between the MOH RH Unit, PMTCT Unit, and the NMCC in order to ensure a holistic package of MIP services. A forum in which the MIP technical areas (IPTp, ITNs, case management) regularly share plans and progress can be key in fostering communication and cooperation.
Commodities	Lack of hemoglobin (Hb) testing	▪ MOH/partners distributing HemoCues to health centers and conducting training of service providers (within both focused ANC and PMTCT programs)	In such settings where transport is lacking and microscopy facilities are few, widespread distribution and training on HemoCues are essential to increasing detection of anemia in pregnancy. Even among trained providers, many still do not provide the service because of human resources shortages and high client loads. Strong supportive supervision is thus needed to ensure compliance.
	Stock-outs of SP	▪ NMCC and DELIVER piloting new essential drugs system ▪ National Malaria Control Programme (NMCP) to conduct "verification exercise" to ensure quantification is accurate ▪ MOH and partners addressing SP misuse in case management trainings and focused ANC updates	Misuse of sulphadoxine-pyrimethamine (SP) for clinical cases and RDT-negative cases of malaria is contributing to stock-outs. All malaria trainings for managers and health care providers should address consequences of misuse and promote confidence in RDTs. Quantification of SP should also be reviewed to take misuse into account.

COMPONENT	CHALLENGE/ BOTTLENECK	CURRENT MITIGATION STRATEGIES	LESSONS LEARNED
	ITN shortages for distribution through ANC	▪ Malaria Control and Evaluation Partnership in Africa (MACEPA) to provide support to NMCP in quantification for 2010 and 2011	Distribution of ITNs through ANC can increase ownership and usage of nets among pregnant women and provide an additional incentive for ANC attendance. Such efforts, if not complemented by proper quantification and sufficient procurement of the commodity, can be counter-productive. As ITNs are one of the most cost-effective MIP interventions, national governments must be willing to commit resources to this effort.
Quality Assurance	Weak supportive supervision	▪ Training of provincial mentorship teams for focused ANC, including MIP ▪ Roll-out of Integrated Reproductive Health Supervisory Tool	Particularly in situations of human and material resource shortages, strong and regular supervision must be provided to health workers in order that they adhere to guidelines and appropriately administer services within resource constraints. Supervision, combined with mentorship, can quickly and effectively improve the quality of services.
Capacity Building	Human resources shortage	▪ Utilization of community health workers (CHWs) and Safe Motherhood Action Groups in community and ANC clinic education ▪ Ongoing CHW RDT pilot for home-based management of fever	CHWs and other community volunteers can help alleviate human resources crises by taking responsibility for patient education and empowering communities to take a proactive role in their own health. Use of CHWs in diagnosing malaria cases in the community with RDTs (and referring MIP cases) may help to streamline client loads.
	Human resources shortage within RH Unit	▪ Ongoing discussions between NMCC and MOH RH Unit regarding establishment of MIP program officer position to coordinate RH and NMCC MIP programming	Regardless of partner support, without sufficient staff, MOH cannot effectively participate in the planning, coordination, and monitoring of programs. In devoting more resources to its own staffing, government and donor funds can be managed and utilized more effectively, for greater impact.
Community Awareness and Involvement	Late attendance at ANC	▪ MOH/partners rolling out Safe Motherhood Action Groups to conduct community sensitization on focused ANC, including MIP and male involvement	Community sensitization can contribute to early and more frequent ANC attendance and must go hand in hand with scaling up quality services. Male involvement plays a crucial role in increasing ANC attendance.
Monitoring and Evaluation	Poor record keeping and data reporting	▪ Data management trainings being conducted for district staff	The process and importance of record keeping should be incorporated into all technical trainings for managers and health care providers. Providers should understand the importance of quality data collection and management so that it is not overlooked as a result of HR shortages and high client loads.

Recommendations: To ensure that the target—80% of pregnant women have access to the package of MIP interventions—is achieved, the following are recommended:

- Seek funding from within MOH/NMCC and/or from partners to hire MIP program officer
- Revive Malaria Working Group or initiate similar forum
- Develop clear procurement plan for SP and ITNs and include in the overall MOH procurement plan
- Strengthen existing M&E systems and surveys to better capture key quality MIP data
- Critically review malaria interventions, evaluating impact and cost-effectiveness
- Strengthen comprehensive quality assurance program
- Develop guidelines for role of community volunteers in concert with the CHWs' strategy being developed by the MOH
- Design more nuanced messaging in information, education, and communication materials on malaria that addresses community about fevers and related expectations for treatment

Zambia is the first country to document and analyze its MIP implementation best practices and bottlenecks, utilizing a combination of the framework and stakeholder interviews. This exercise will not only help the country to analyze its current status of implementation readiness, but also to identify lessons learned that can inform future efforts. A similar process, using Zambia's case study as a model and adapting it to specific local situations, can assist other African countries to evaluate their progress in MIP prevention and control and determine next steps. The information elicited from such a combined effort, shared and discussed in a regional forum, has the potential to rapidly accelerate progress in reducing MIP.

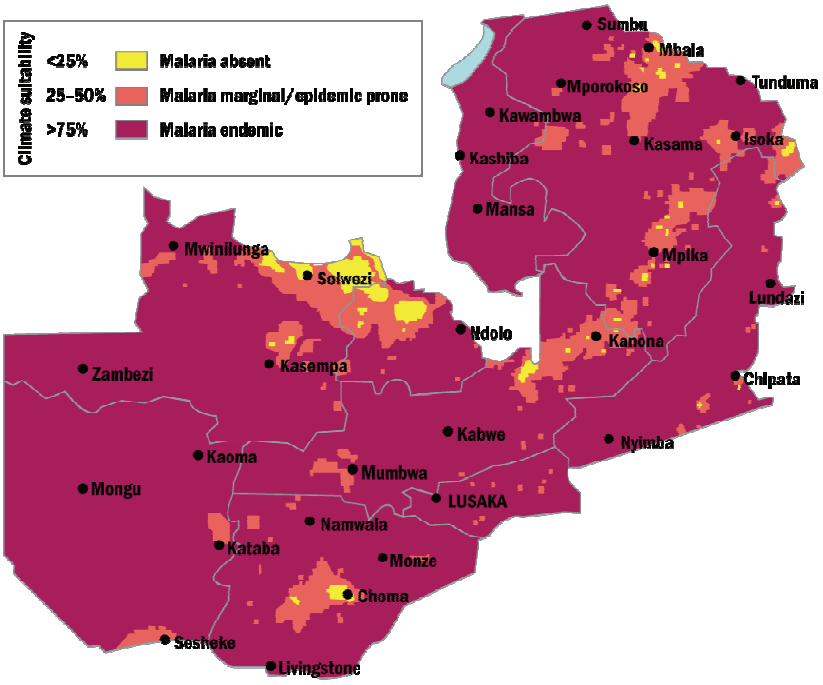
A Malaria in Pregnancy Case Study:

Zambia's Successes and Remaining Challenges for Malaria in Pregnancy Programming

INTRODUCTION

Throughout sub-Saharan Africa, malaria in pregnancy (MIP) programs are at a crossroads. While many countries have made important strides in achieving their goals, most countries are still far from achieving the Roll Back Malaria (RBM) Initiative targets (80%), the President's Malaria Initiative (PMI) targets (85%) for intermittent preventive treatment in pregnancy (IPTp), and insecticide-treated bed net (ITN) coverage among pregnant women.

The number and type of surveys that collect data related to MIP have grown over the last decade. There are several nationally representative population-based surveys that now collect data on key RBM and PMI indicators of IPTp uptake and ITN use, including the Demographic and Health Survey (DHS), the malaria indicator survey (MIS), and the multi-indicator cluster survey (MICS). Despite having a range of surveys that collect MIP-related data, the reasons that prevention and control of MIP services/programs in most African countries are not making greater progress are still not fully understood. Gaps in information remain, and countries have different gaps. Specifically, coverage data should be linked with MIP program implementation documentation to determine implementation bottlenecks, as well as success stories, and why these deficiencies or successes exist. Such lessons learned can lead to the development of best practices that can help all endemic countries work harder to meet MIP and other malaria indicators.



Adapted from: MARA/ARMA collaboration (http://www.mara.org.za). July 2005, Medical Research Council, PO Box 70380, Overport, 4067, Durban, South Africa.

Among malaria-endemic countries in Africa, Zambia stands out as a leader in the successful implementation of interventions to prevent and control MIP. With support from PMI, the Maternal and Child Health Integrated Program (MCHIP) conducted a case study from August through November 2009 to examine MIP implementation in Zambia. The country was purposively selected based on two MIP-related indicators: IPTp uptake and ITN use, as well as cultural/geographic considerations. The country is considered "high performing" with respect to MIP programming and likely to have applied successful strategies or best practices that could potentially be adapted and replicated in other malaria-endemic countries.

BACKGROUND

Zambia is a vast, land-locked country in southern Africa. It covers approximately 752,612 square kilometers and is divided into nine provinces and 72 districts, with a population estimated at 12 million people, the majority of whom are concentrated in urban areas (MOH 2009b). The country experiences three main seasons: a hot, dry season from September to October, a warm, rainy season from November to April, and a cool, dry winter from May to August (Central Statistics Office [CSO] 2009). Although the road network extends to all of the district capitals, in rural areas, the roads are often poor or non-existent, particularly in the rainy season.

Zambia faces a myriad of health challenges, perhaps the most prominent of which are HIV/AIDS and malaria. As of 2007, approximately 14.3% of the country's population was known to be HIV positive (CSO 2009). Malaria is endemic throughout Zambia, with highest transmission during the rainy season, and is the leading cause of health facility attendance and of school and workplace absenteeism (MOH 2006). Co-infection with both malaria and HIV exacerbates the negative health outcomes of these diseases. Preventing, as well as recognizing and treating malaria, is thus imperative for both the health of the population and the economic performance of the nation. Zambia's government, including the MOH, is committed to this effort.

Malaria poses a particularly high threat to the pregnant woman and her unborn baby, contributing to elevated levels of maternal and neonatal death and morbidity. In Zambia, the maternal mortality ratio currently stands at 591 per 100,000 live births—evidence that there is much work to be done (CSO 2009). The MOH and National Malaria Control Centre (NMCC), together with the MOH Reproductive Health (RH) Unit, and in collaboration with donor governments and local and international organizations, have thus undertaken an array of programs aimed at decreasing the incidence of MIP and increasing access to quality diagnosis and management of malaria services for pregnant women.

PURPOSE AND OBJECTIVES OF THE CASE STUDY

As countries expand their prevention and control of MIP programs and work toward scale-up, there are critical lessons learned, as well as promising implementation practices, that should be considered, adopted, and applied, based on the contextual needs of each country (Jhpiego/ACCESS 2008). The purpose of this case study is to gain a better understanding of MIP programming in Zambia, specifically:

1. Best practices[2]/strategies that have supported MIP programming success;
2. Existing bottlenecks in MIP program implementation and how these are addressed; and
3. Lessons learned that inform future MIP programming.

The case study will also contribute to the development of a standardized framework for the analysis of best practices and bottlenecks in MIP implementation. It is expected that Zambia's documentation will provide insight to countries throughout sub-Saharan Africa as countries expand and accelerate their MIP programming efforts.

[2] For the purposes of this assessment, the term best practice will be used in the context of innovative practices since the assessment will primarily be based on existing data analysis and qualitative interviews.

METHODOLOGY

The methodology used consisted of a desk review of secondary data sources as well as qualitative interviews with key stakeholders. In order to obtain a full picture of the levels of MIP indicator coverage and MIP implementation, an MIP framework (Appendices I and II) for analysis was developed in 2008 by the USAID-supported Malaria Action Coalition (the Centers for Disease Control and Prevention, the World Health Organization (WHO) Afro, ACCESS/Jhpiego, RPM+/Management Sciences for Health), which aimed to collate and make better use of existing MIP-related information (Jhpiego/ACCESS 2008). The framework examines eight key areas of MIP programming:

Integration	Capacity Building
Policy	Community Awareness and Involvement
Commodities	Monitoring and Evaluation (M&E)
Quality Assurance	Financing

In relation to these program areas, the framework offers specific guidance on:

- Identifying and obtaining MIP-related coverage data available at the country level;
- Determining the level of a country's MIP program implementation on a scale of 1–4;[3]
- Suggesting methods to gather additional information based on gaps in the first two bullets; and
- Linking coverage and implementation information in order to identify bottlenecks and best practices.

Data from existing population-based surveys, such as the DHS, the National Malaria Indicator Survey (NMIS), MOH surveys, and program-specific ITN surveys were reviewed. In-depth qualitative interviews were conducted with national MIP stakeholders, including: the National Malaria Control Program, National Reproductive Health Program, RBM, and PMI, and implementing partners.

FINDINGS

Epidemiological Profile of Malaria in Zambia

Endemicity

All nine provinces in Zambia are considered highly endemic for malaria. The parasite P. *falciparum* is transmitted year-round by the female anopheles mosquito, though transmission rates tend to be highest during the rainy season, which lasts from approximately November to April. The entire population in Zambia is at risk for malaria, which has particularly severe health implications for pregnant women, children under five, and people living with HIV/AIDS. In pregnant women, infection rates have been shown to be highest in the first and second pregnancies, with lower rates in subsequent pregnancies (Steketee et al. 2001). As data on the reported cases of MIP are not routinely aggregated at the national level, it is unknown what the current incidence of MIP is in Zambia. Based on extrapolations from 2000 census figures, however, it is estimated that there will be approximately 716,192[4] pregnancies in Zambia in 2010, all of which will be at risk for malaria (CSO 2000).

[3] Level of implementation is broken down by: a) integration; b) policy; c) commodities; d) quality assurance; e) training; f) community-based MIP programs; g) monitoring and evaluation; and h) financing.
[4] This figure is estimated from 2008 projections by the CSO, assuming a population growth rate of 2.9 for 2009 and 2010.

Morbidity and Mortality

Malaria is one of the leading causes of morbidity and mortality in Zambia. In 2008, 3.2 million cases (clinically or laboratory diagnosed) were reported, causing 3,871 deaths (MOH 2009a). It is believed that malaria is responsible for up to approximately 47% of the overall disease burden for pregnant women (Steketee 2008). The effects of MIP are many. For the mother, the most common effect is maternal anemia, which reduces her ability to cope with bleeding, leading to hemorrhage during childbirth. As the malaria parasite is sequestered in the placenta, there are additional risks for premature birth, intrauterine growth retardation, low birth weight, spontaneous abortion, stillbirth, and congenital malaria in the newborn.

Malaria/HIV Interactions

HIV also compounds MIP infection. An analysis of several studies demonstrated that HIV contributes to approximately 25% of maternal malarial infections (Steketee et al. 2001). Additionally, HIV contributes directly to maternal anemia. Although HIV infection is on the decline in Zambia, official figures remain high at 14.3%, according to the 2007 DHS, and there remains greater prevalence among women (16.1%) than men (12.3%) and among urban women (23.1%) in particular (CSO 2009).

Strategy

The Government of Zambia made its first major commitment to reducing the incidence of malaria at the Abuja Summit in 2000. At this global meeting, Zambia committed to ensuring access to the following for at least 60% of the population at risk for malaria by 2005:

> Correct, affordable, and appropriate treatment within 24 hours of onset of symptoms
>
> Suitable personnel and community protective measures, such as ITNs, particularly for pregnant women and children under five
>
> IPTp for all pregnant women who are at risk of malaria, especially those in their first pregnancies

(WHO/CDS/RBM 2000; MOH 2006a)

This third target aimed at increasing IPTp coverage to 60% was later increased to 80% by 2008,[5] in line with WHO guidelines.

In 2005, Zambia developed its first national malaria strategic plan (NMSP), "A Road Map for Impact on Malaria in Zambia 2006–2011," which outlines a package of interventions aimed at achieving a "malaria free Zambia." A central and core intervention outlined in the strategy is that **at least 80% of pregnant women have access to the package of MIP interventions by December 2008.** The MOH aimed to achieve this goal by focusing its efforts specifically on:

> Improving access to IPTp with sulphadoxine-pyrimethamine (SP) at least three times during the second and third trimesters
>
> Improving access to and use of ITNs by pregnant women
>
> Reducing [maternal] anemia through the above two methods, as well as with micronutrients and improved nutrition
>
> Improving diagnosis and treatment for pregnant women with clinical malaria

(MOH 2006a)

All malaria services, including MIP, are included in the "Basic Health Package" as per the National Health Strategic Plan. This package is a set of basic services provided at no or low-cost as close to the family/individual as possible for select, highly prevalent and high-impact health

[5] This date is expected to be revised with the development of a new National Malaria Strategic Plan in 2011/2012.

conditions (PMI 2008). The above-listed services are thus intended to be economically accessible to all pregnant women.

Policy Development

Prior to 2002, policy stipulated that pregnant women should be routinely given malaria prophylaxis with chloroquine, though this policy was not well implemented at the service delivery level, as many health care providers were unaware of the policy and stocks of chloroquine were inadequate, among other contributing factors (Jhpiego 2004). Implementation of IPTp thus began in earnest from 2000–2003 when there was regional rallying around MIP after the Abuja Summit, and Zambia revised its IPTp drug policy. This policy mandated that all pregnant women receive three doses of sulphadoxine-pyrimethemine (SP) as directly observed therapy (DOT), beginning at 16 weeks of pregnancy and repeated one month apart, and also receive education/promotion on ITNs[6] within the context of at least four focused antenatal care (ANC) visits (MOH 2002; NMCC 2003). Focused ANC is a package of services designed to provide high-quality, focused care for pregnant women in a minimum of four visits for women without pregnancy-related complications. The previous policy stipulated that women should attend as many as 10 or more visits throughout their pregnancies, which placed a high burden on clients and providers alike. Zambia's decision to set a goal of three doses of SP, rather than two or two or more, was in part because of the high burden of HIV in the country. When a pregnant woman is HIV-positive, she requires more doses of SP to treat a malarial infection than an HIV-negative woman (Filler et al. 2006).

Formulation of the revised policy first began under the National Malaria Drug Policy Technical Advisory Group, composed of pharmaceutical, medical, research, and policy representatives and members of the DHMTs (Sipilanyambe et al. 2008). This group produced a consensus document in 2000, which recommended the change in IPTp policy to three doses of SP (and a switch from chloroquine to artemether-lumefantrine [AL] for treatment in the general population). Because malaria control was considered a "statutory activity," rather than submit the policy to parliament for approval, the change was incorporated into the National Health Services Act of 1995, in order to quicken its adoption (Sipilanyambe et al. 2008). The drug policy technical advisory group further outlined a nine-step transition strategy, which included:

1. Policy formulation and approval by policymakers
2. Regulatory, procedural, and administrative changes, such as in drug scheduling and monitoring for quality and efficacy
3. Drug procurement
4. Formation of a transition committee composed of key stakeholders
5. Revision of the treatment guidelines, specifically the inclusion of IPTp into ANC
6. Incorporation of guidelines into pre-service training and existing in-service training curricula, and the development of additional materials for the training of health workers, including private practitioners and drug vendors, prior to introduction of SP

Rapid Roll-Out of MIP

- Members of the National Malaria Taskforce first oriented personnel at the provincial and district levels, including both managers and select service providers.
- This orientation provided for the inclusion of further insight into the process of implementation and for immediate problem-solving.
- These initial orientation participants then formed provincial teams, which ensured implementation in the districts.
- Additional orientations were conducted for training institutions, medical/nursing schools, church associations, military, etc.
- In this way, the focused ANC and MIP guidelines were rapidly rolled out across the country, down to the facility level.

[6] ITNs were sold through ANC at a subsidized cost at this time. The policy changed to free ITNs with the 2006–2011 national malaria strategic plan.

7. IEC campaigns to raise public awareness about the drug policy change, couched in broader malaria prevention messages, and sensitization for clinicians
8. Budgeting for additional resources for the above
9. Provisions for the longer term, including mechanisms for the surveillance of adverse effects, efficacy studies, and the maintenance of a permanent anti-malarial drug policy advisory group.

(NMCP/CBOH 2000)

According to partners who were involved in the roll-out, this process was advanced with strong NMCC leadership and the cooperation of RBM partners and other stakeholders who came together under the National Malaria Task Force (Sipilanyambe et al. 2008). Through the taskforce, stakeholders contributed their various expertise and, guided by the recommendations of the drug policy technical advisory group, formulated an implementation plan. These stakeholders also met under several technical working groups (TWGs), which included the Case Management TWG (under which an MIP TWG was formed) and the IEC TWG, helping to facilitate implementation of the plan.

The policy was outlined in various forms and to various degrees in several documents, including: the Integrated Technical Guidelines for Frontline Health Workers (second edition), the focused antenatal care guidelines for health care providers, and the MIP orientation guide for providers, managers, teachers, and trainers. The latter two documents became the core components of the national training package for focused ANC and MIP. From 2003–2004, the MOH and partners oriented managers and ANC providers countrywide to the new guidelines.

> "The formation of MIPESA created an important forum for strongly identifying a package of MIP services integrated into RH and for sharing successes and challenges, and also created a sort of competition between countries to perform well in the scale-up."
>
> *Funding organization*

This rapid policy development and implementation were also facilitated by Zambia's participation in the Malaria in Pregnancy Eastern and Southern Africa (MIPESA) Coalition, which includes government and international/NGO partners from Zambia, Kenya, Malawi, Tanzania, and Uganda. The Coalition's meetings created fora to share best practices and lessons learned in developing and implementing MIP strategies and policies (MIPESA 2006). According to an interview with a funding organization, the MIPESA Coalition was also instrumental in "identifying a package of MIP services integrated in RH" and "created a sort of competition between countries to perform well in the scale-up."

Prevention Guidelines

The table below illustrates how the MIP policy should be implemented in Zambia through focused ANC according to the national MIP in-service training package for ANC providers (NMCC 2003).

Table 1: Schedule for MIP Service Delivery

Visit	Counseling	Provide IPT	Provide Micronutrients/ITNs
First	▪ Malaria prevention/ITNs ▪ Anemia prevention/ micronutrients	▪ If at least 16 weeks or quickening has occurred: give 3 tablets of SP as DOT during ANC	▪ Iron ▪ Folic Acid ▪ Deworming ▪ ITN

Visit	Counseling	Provide IPT	Provide Micronutrients/ITNs
Second	▪ Assess and repeat/review	▪ Give 3 tablets of SP as DOT during ANC	▪ Iron ▪ Folic Acid
Third	▪ Assess and repeat/review	▪ Give 3 tablets of SP as DOT during ANC	▪ Iron ▪ Folic Acid
Fourth	▪ Assess and repeat/review	▪ Give 3rd dose, if still due	▪ Iron ▪ Folic Acid

Ideally, the first ANC visit should be made during the first trimester, at which time the pregnant woman should be given an ITN; however, she would not yet be eligible for IPT. During the subsequent three visits, the pregnant woman should receive the three doses of IPT according to national policy.

At the time that this package was rolled out, ITNs were promoted during ANC, but not yet provided free of charge. Society for Family Health (SFH) was socially marketing an ITN called "Mama Safenite" available at the health centers at a subsidized cost. In 2008, this policy was changed to distribution of ITNs through ANC at no cost to the client.

In 2006, the new focused ANC and MIP guidelines were incorporated into the "Safe Motherhood Guidelines," a tool consisting of algorithms to guide health care providers in the provision of preventive, curative, and emergency services to women during the antenatal, delivery, and postpartum periods (MIPESA 2006; MOH 2007b). These guidelines are intended to be available at all government health facilities, though not all providers have received them or been oriented to their use.

Case Management Guidelines

In 2009, the case management guidelines for MIP were revised (see Table 2).[7] The first-line treatment for uncomplicated cases in the first trimester continues to be oral quinine, with now a second-line treatment option of AL. In the second and third trimesters, the first-line treatment is AL, with quinine as the second-line option. This is a change from the previous guidelines, which stipulated SP as the first-line treatment in the second and third trimesters, and did not offer a second-line treatment in the first trimester (MOH/RBM 2009). For complicated or severe malaria, the treatment remains intravenous quinine (MOH 2007c).

Table 2: MIP Case Management Guidelines

Trimester	Uncomplicated Malaria	Complicated/Severe Malaria
First	**1st line**: Quinine 10 mg/kg every 8 hours for 7 days **2nd line**: Artemether-lumefantrine 4 tabs twice daily x 3 days	Quinine—first loading dose 20mg/kg in 5% dextrose given over 4 hours (no more than 1,200 mg); continue with 10/kg 8 hourly
Second/Third	**1st line**: Artemether-lumefantrine 4 tabs twice daily x 3 days **2nd line**: Quinine 10 mg/kg every 8 hours for 7 days	Quinine—first loading dose 20mg/kg in 5% dextrose given over 4 hours (no more than 1,200 mg); continue with 10/kg 8 hourly

Source: NMCC 2009

Under MOH policy, midwives are mandated to treat simple cases of malaria at the health center level, but are to refer complicated or severe cases to a higher level (most often the district

[7] These guidelines were still in the draft stage at the time of this writing, and had yet to be published and disseminated.

hospital) (MOH 2006c). As policy meets reality, however, environmental health technicians and nurses provide treatment for simple malaria cases at the health center level as well.

MIP Program Management and Coordination

In addition to scaling up IPTp uptake and ITN usage among pregnant women, Zambia has been recognized for having been particularly successful in integrating MIP into the national RH program. This success is evident in the level of MIP integration into national policy, strategy, and guidelines as well as the roles of both the MOH RH Unit and the NMCC in managing implementation and providing technical oversight. MIP interventions are implemented through a platform of focused ANC services, recognizing that the majority of Zambian women will attend an ANC clinic at least once (93.7%) and often four or more times (60.3%) during pregnancy (CSO 2009). It is important to note, however, that, while promotion of ITNs and case management of MIP are included in focused ANC activities coordinated by the RH Unit, it is the NMCC that coordinates malaria/MIP case management training and ITN distribution, as well as procurement of SP. Effective communication and cooperation between the RH Unit and the NMCC is thus essential in order for Zambia to implement a smoothly functioning, holistic MIP program.

> "Previously, bringing all the partners together [under the MIP WG], they reinforced each other's work and drove each other and MOH because they had to report on progress. There is less accountability now."
>
> *MIP partner*

This cooperation and partnership are also important, as funding for the MIP program is channeled through both the NMCC and the RH Unit. Each year, all of the MOH units meet with their cooperating partners to reflect on the previous year's progress and challenges, and to develop an annual plan and budget for the year ahead. Ideally, the NMCC and the RH Unit sit together for this process. According to interviews with the NMCC, the MOH, and partners, however, the participation of the RH Unit in the last few years has been minimal. The result has been that the NMCC takes responsibility for finalizing the budget for MIP activities conducted by the RH Unit. The RH Unit, which must request those funds as needed from the NMCC, does not always do so, and the NMCC, fearing that the funds will go unused, sometimes reprograms them to other NMCC activities. The RH Unit also directly receives general RH funding from the government cabinet office, but according to the RH Specialist, these funds are not always sufficient for MIP. The programs within RH are prioritized according to their contribution to reducing the maternal morality ratio, with emergency obstetric and neonatal care (EmONC) being first and MIP second

Activities related to the prevention of mother-to-child transmission of HIV (PMTCT) are maintained in a separate budget, but also fall under the RH Unit. While focused ANC, including MIP, was first rolled out as a stand-alone in- service training package for ANC providers, it was later made a component of the national PMTCT in-service training curriculum for midwives, doctors, dispenser/pharmacists, and laboratory technicians (MIPESA 2006). By incorporating focused ANC and MIP into the PMTCT curriculum, the MOH acknowledged that these services are most effectively delivered as a holistic package of care. This approach to combating malaria and HIV also allows for greater coverage of training in focused ANC, including MIP, and reinforces the knowledge and skills of providers reached in the initial roll-out. According to an officer at the MOH, this additional coverage is also facilitated by the fact that PMTCT receives "much more funding than RH" from donors, such as the Global Fund to Fight HIV/AIDS, Tuberculosis and Malaria (Global Fund). The RH Specialist also reports that, while opportunities for direct, central level coordination between PMTCT and other RH programs are limited, activity coordination does occur at lower levels, where all fall under the responsibility of the district Maternal, Neonatal, and Child Health (MNCH) coordinators. Additionally, all

PMTCT and RH programs utilize the same "Integrated Reproductive Health Supervisory Tool," a standards-based tool currently used by the central and provincial levels (and eventually, it is hoped, by all districts) to guide supportive supervision activities at the district and health facility levels. When personnel from the PMTCT or focused ANC programs conduct supervisory visits to health facilities using this tool, they assess those elements of service delivery specific to their program, as well as all RH services.

In addition to implementing programs directly, the RH Unit and the NMCC also act as coordinating bodies for a variety of multilateral and bilateral partners. The RH Unit primarily coordinates programs related to focused ANC, including MIP. The NMCC coordinates interventions that target pregnant women, in addition to the general and under-5 populations, including ITN distribution, case management, and SP procurement, as well as indoor residual spraying. There is currently a global push for national RH programs to manage ITN distribution for pregnant women, however, according to the Zambia MOH, the RH Unit does not currently have the funds or staffing to undertake this program.

Major donors contributing to these initiatives include: the Global Fund, the World Health Organization (WHO), UNICEF, the World Bank, PMI, and the Bill & Melinda Gates Foundation (MOH 2009b). These donors provide funding for distinct interventions, which together are meant to cater to a holistic malaria prevention and treatment program. Elements specific to MIP include:

- Training of health care providers in focused ANC, including IPTp and PMTCT
- Provision of and training on HemoCues
- Case management training
- Procurement of commodities:
  - SP
  - ITNs
  - AL and quinine (for case management)
  - Rapid diagnostic tests (RDTs)
- Production of IEC materials
- Training of community volunteers for community sensitization/demand generation

(See appendix III for a complete list of donor and implementing organizations and funding/programming scopes.)

The funding organizations frequently disburse monies through a combination of the following channels: direct grant/donation to the MOH; direct implementation of programs; commodity donations; and/or through local or international implementing organizations. The responsibilities of the funding entities and implementing partners (including the MOH/NMCC) in MIP programming/interventions are outlined yearly in the National Malaria Control Action Plan. Both the NMCC and partners report that the participation of funding and implementing organizations in the development of the plan has been consistent and effective.

Ongoing program coordination by the NMCC and the RH Unit is conducted through the various TWGs mentioned earlier. In previous years, there was also an MIP Working Group (WG), which was a sub-group of the Malaria Case Management TWG. The MIP WG brought together members of other TWGs with programs/interventions for MIP, including case management, IEC, and ITNs. The WG primarily focused on coordinating and pushing for the rapid roll-out of the MIP program. According to interviews with the MOH, NMCC, and partner organizations, there was no formal decision to disband the TWG—it naturally disbanded as the need for it declined. Some interviewees posited that the group was no longer necessary once the MIP program was effectively implemented and/or that the Case Management TWG was a suitable

enough forum for coordinating MIP activities. Others cited the frequent shifting of MOH/NMCC staff because of government restructurings (whenever a new government administration came into office) and the weakening WG leadership after the group's chair, Jhpiego, no longer had funding for MNCH activities.

Currently, MIP, as it is included in focused ANC, is covered by the RH Unit Safe Motherhood Task Working Group. This group brings together different partners in safe motherhood, including PMTCT, but does not routinely include those in other areas of MIP, such IEC and case management. Almost all interviewees acknowledged that there is a gap in MIP program coordination. Some suggested reviving the MIP WG group, while other partners noted efforts to revive the National Malaria Taskforce or a similar consultative group, which would facilitate communication among all malaria technical areas. One partner noted that a crucial role of the TWGs is maintaining accountability. Under the taskforce, partners reportedly shared updates on the progress of activities on a monthly or quarterly basis, which motivated them to push programs forward. Without this working group, the pace has slowed.

Progress in Interventions: MIP Indicators

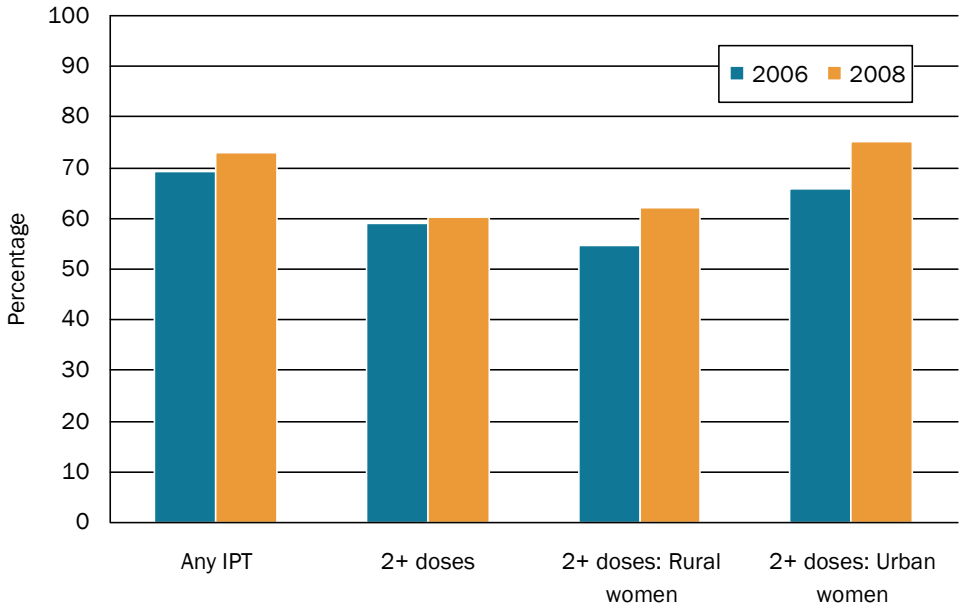
According to the 2006–2011 NMCC Strategic Plan, Zambia aimed to ensure that at least 80% of women have access to the package of interventions to reduce the burden of MIP by December 2008,[8] including three doses of IPTp, an ITN, and anemia reduction (MOH 2006). An analysis of Zambia's progress in meeting these goals follows below.

MIP Intervention Coverage and Output Indicators

According to the 2008 NMIS, 73% of pregnant women surveyed received at least one dose of IPTp during an antenatal visit and 60.3% received two or more doses. (Although Zambia's IPTp goal is three doses of IPTp, this indicator is not included in the NMIS or DHS.) Both of these indicators increased from what was reported in the 2006 NMIS, at 69.1% and 58.9%, respectively (see Figure 1). For 2008, there was a substantial difference between urban and rural populations, with 75.1% of urban women receiving two or more doses of IPTp compared with only 62.1% of rural women. There were also large differences between the provinces, with Copperbelt Province having the highest rate of uptake of two or more doses at 83.3% and Western Province the lowest at 34.4% (MOH 2008a). Several interviewees posited that these large differences in uptake of IPTp between provinces could be due to issues of accessibility and education levels. Copperbelt is a largely urban province with relatively good roads and extra, private support for health systems provided by the mining companies. Western Province is one of the most rural in Zambia, with large distances between many villages and health centers, some of which are accessible only by boat during the rainy season. Across Zambia, those in higher wealth quintiles and with more education were also more likely to receive IPTp. This is reflected in individual provinces with 77.5% of the population of Western Province in the *lowest* two wealth quintiles and 83.9% of Copperbelt Province in the *highest* two quintiles (CSO 2009).

[8] This deadline will be revised in the next National Malaria Strategic Plan.

Figure 1: Comparison of IPT Uptake

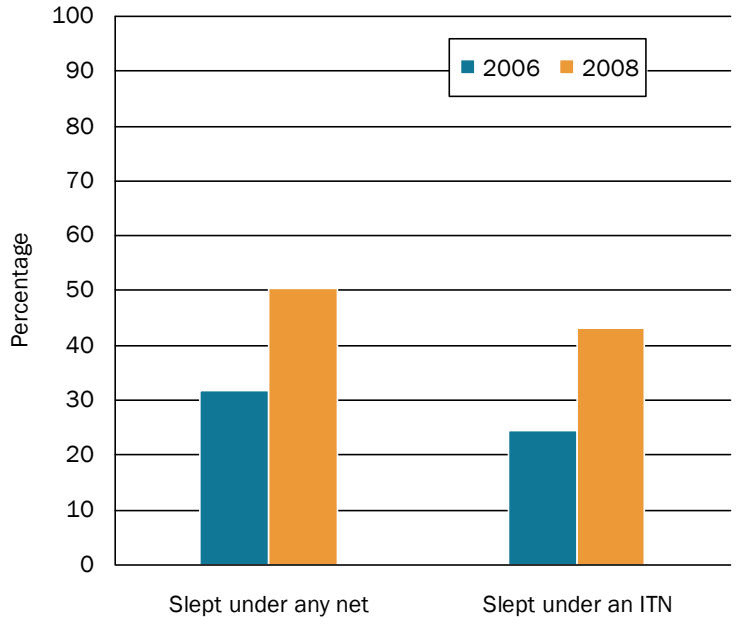


Source: NMIS

In regard to ITN coverage, the NMIS reported that in 2008, 50.3% of pregnant women reported sleeping under a mosquito net the previous night and 43.2% reported sleeping under an ITN (MOH 2008a). These are substantial increases from 2006, when 29.6% reported sleeping under any net and only 22.4%, under an ITN (MOH 2006b). That approximately half of pregnant women are still not sleeping under an ITN should, however, be examined in light of the fact that 62.3% of households own an ITN (MOH 2008a). None of the major surveys conducted in Zambia capture ownership of ITNs by pregnant women, but when asked about bottlenecks in ITN distribution to pregnant women, interviewees almost universally cited that there are not enough nets procured to meet demand and health centers are often out of stock. Distribution of ITNs through ANC is complemented by yearly mass distribution campaigns, but according to partners, these campaigns do not meet the needs of the entire population due to poor quantification. One ITN partner reported that, if the goal for Zambia is three ITNs per household, with current donor commitments, the country has a shortage of three million nets for areas not covered by indoor residual spraying and a shortage of seven million ITNs for all areas.

A high percentage of the population in Zambia is nevertheless aware of the role of ITNs in preventing malaria. In a 2005 knowledge, attitude, and practice (KAP) survey by the NMCC, 86.9% of respondents cited ITN use as a malaria control measure. In a 2008 survey of women ages 15–49 conducted by the SFH, 76.3% of respondents stated the same. A couple of interviewees, however, noted continuing misconceptions about ITNs, such as that they can cause suffocation or only need to be used during the rainy season. While such misconceptions are being increasingly dispelled through IEC initiatives, they may still persist to some degree. Although there has been a substantial increase in the proportion of pregnant women sleeping under ITNs in just two years time, it still remains unlikely that the PMI target of 85% will be reached by 2010 without rapidly increasing efforts to reduce stock-outs and to scale up this intervention.

Figure 2: ITN Use by Pregnant Women, 2006 and 2008



Source: NMIS

Zambia is nevertheless performing much better in ITN use among pregnant women than several other countries in the region, with Kenya the next highest at 33% and Mozambique the lowest at 7%, among those countries with recorded data (PMI 2009). It should be noted, however, that several of the partner and government interviewees cast doubt on the reliability of ITN usage data. Many felt that respondents are not honest about their ITN usage because they fear that they may be reprimanded and/or that it will prevent them from receiving a free ITN in the future. Another partner suggested that it may not be that Zambia is doing so much better in ITN use (and IPTp uptake) than other countries, but that the country is better at recording this information. Despite these reservations, a NetMark survey, conducted in 2000 and 2004, seems to indicate that Zambia is, in fact, on the path to improved ITN usage among pregnant women.

A Closer Look at ITN Use among Pregnant Women

A review by Baum and Marin on intra-household net use in Zambia examined 2000 and 2004 NetMark surveys on rates of ITN usage by pregnant women among households that owned a net. In 2004, 50.5% of pregnant women who owned a net had slept under it the night before—a large increase from only 17.6% in 2000. While the differing denominators in the NetMark survey and the NMIS make direct comparison difficult, the review confirmed that use of ITNs by pregnant women was on the rise. It was also found that, in four of the five countries surveyed, including Zambia, "at least 95% of nets in one-net households has a woman of reproductive age and/or a child under five under the net—and most often it was both" (Baum and Marin 2007). This information is particularly encouraging, given that the average number of ITNs per household in Zambia is 1.08 (MOH 2008a). The 2004 survey was also conducted in the dry season when ITN use tends to be lower. While there is a risk of malaria transmission year-round, it is hoped that in the rainy season, when transmission is highest, ITN use by pregnant women who own a net would be greater than 50.5%.

With respect to **ANC attendance**, the most recent DHS, in 2007, found that 93.7% of women attended at least one antenatal visit, with 60.3% of women attending four or more visits. However, only 19.2% of women attended ANC in the first trimester, the median gestational age at the first visit being 5.1 months (CSO 2009). Taking into account frequent stock-outs of SP, increasing the number of women who attend four or more antenatal visits is essential to increasing IPTp uptake and ITN use. ANC attendance, as well as IPTp uptake, is also captured at the facility level, first tallied in the Safe Motherhood Register, and then submitted monthly to the district for inclusion in the Health Management Information System (HMIS). The reliability of this information has, however, has been called into question.

Actions for Improving MIP Indicators

- Reduce SP and ITN stock-outs
- Encourage earlier initiation of ANC attendance at facilities that offer the full range of focused ANC services
- Provide focused ANC mentorship to all "qualified" providers in both public and private sectors
- Improve coordination between the NMCC and RH/MCH

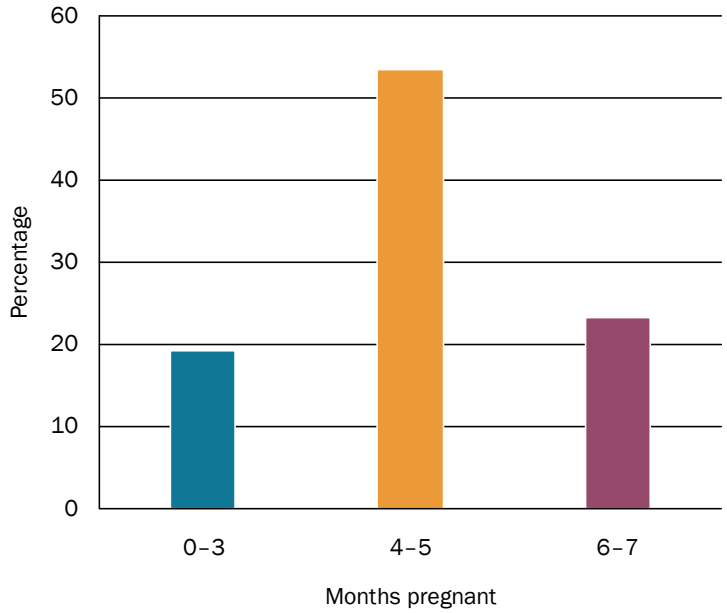
During a rapid assessment, conducted by the USAID-funded Health Services and Systems Program (HSSP) in 2008, several district officials expressed concern that their populations were drastically undercounted in the census, resulting in equally drastic underestimates of health center catchment populations (sometimes numbering more than a thousand persons). The result is that many districts report ANC attendance at well over 100% (HSSP 2008). Such was the case in 2007 in Mumbwa (160%) and Kabwe Districts (127%) in Central Province, as shown by service delivery data gathered directly from the district health offices (DHOs) (DHO Mumbwa 2008; DHO Kabwe 2008). Similar concerns were acknowledged by government and partner interviewees, who noted that facilities frequently fail to submit complete and correct data to the districts. There thus may be problems with the quality of both the numerator and denominator in calculating ANC attendance, and the services provided during ANC, in the HMIS. To address this situation, the Southern and Eastern Provinces are conducting malaria-specific data management trainings for district staff to improve district-facility feedback and supportive supervision.

National and international guidelines stipulate that women should attend ANC as soon as they know they are pregnant. While IPTp cannot be given until 16 weeks of pregnancy or quickening, ITNs can be given at any time, and are most effective the earlier they are provided (and used). Pregnant women can thus increase their benefit from this intervention if they attend ANC prior to 16 weeks gestation. In 2007, however, the majority of women began ANC in the second trimester, with 53.4% making their first visit between four and five months, and 23.2% of women between six and seven months. Given that ITNs should be distributed to pregnant women by the health center at the first ANC visit, starting ANC after the first trimester may delay the use of this prevention method during the period when the woman is not yet eligible for IPTp, thus increasing the likelihood of malaria infection.

Table 3: DHS Findings on ANC Visits

	DHS 2001–2002	DHS 2007
Received any ANC from a skilled provider	93.4%	93.7%
Attended two or more ANC visits	91.4%	94.3%
Attended four or more ANC visits	71.6%	60.3%
Attended first ANC visit at <4 months of pregnancy	14.3%	19.2%

Figure 3: Number of Months Pregnant at First ANC Visit



Source: 2007 DHS

In terms of **knowledge about transmission, symptoms, and prevention of malaria**, according to the 2008 NMIS, 85.2% of women aged 15–49 years reported mosquito bites as the cause of malaria and 71.1% recognized fever as a symptom. Mosquito nets were the most commonly cited prevention method among this population at 81.3%. An ITN was the second most commonly cited prevention method, followed by "keep the house surroundings clean" and "cut the grass around the house." Taking preventive medication was the sixth most commonly cited method by approximately 10% of women. For all of the prevention methods, urban women were more knowledgeable than rural women, and were also more likely to have heard or seen a malaria message (80.7%) than rural women (70.8%). All of the women respondents, however, reported a government hospital or clinic as the source of messages about malaria (69.9%). Radio and television were the second and third most common sources of messages. Less than 5% of respondents reported peer educators or community health workers (CHWs) as the source of messages about malaria (MOH 2008a). It should be noted, however, that knowledge is not necessarily directly linked to behavior and so, while rural women may have been exposed to less messaging on malaria than urban women, it does not automatically follow that they are less likely to take preventive measures. However, as previously stated, the most recent NMIS did show that rural women were less likely than urban women to receive IPTp as a preventive measure against MIP.

MIP-Related Impact Indicators

According to the 2007 DHS, 4.4% of weighed newborns were less than 2.5 kilograms—the measurement for **low birth weight** (LBW).[9] A mother was more likely to have a newborn of LBW the younger she was and if it was a first birth.

[9] The 2007 DHS found that 47.4% of all births were not weighed at all and a birth was less likely to be weighed the less education the mother had, the lower her wealth quintile, and if she was from a rural area.

Table 4: DHS Findings on Birth Weights

	DHS 2001–2002	DHS 2007
Percentage of weighed newborns <2.5 kilograms	4.6	4.4
Percentage of births weighed	~46.2[10]	47.4

The HMIS and the RBM sentinel sites[11] capture data on incidence of MIP, but the DHS and NMIS do not. **Anemia in pregnancy** is only captured by the sentinel sites as "malaria in pregnancy admissions with anemia." At the facility level, Hb should be tested at the first ANC visit and again at 36 weeks. The results are recorded on the client's ANC card, but are not recorded and tallied for the HMIS. No other national data source captures "anemia in pregnancy" as such. The NMIS does capture malaria parasite prevalence and anemia incidence in children under five. Some have suggested that it is possible then to apply the same data collection methods to capture this information from pregnant women. Discussions with the Malaria Control and Evaluation Partnership in Africa (MACEPA), however, highlighted the fact that, in household surveys, such as the NMIS, pregnant women are not specifically targeted, and with an average of 600 covered in the survey are too few to be statistically significant.

The DHS reveals that of the women who attended ANC, 90.4% received iron tablets and 59.0% had a blood sample taken (CSO 2009), as shown in Table 5.

Table 5: DHS Findings on Percentage of Women Receiving Iron Tablets or Having Blood Sample Taken at ANC

	DHS 2002	DHS 2007
Percentage of women who received iron tablets at ANC	70.6[12]	90.4
Percentage of women who had blood sample taken at ANC	44.4	59.0

Ferrous sulphate (iron) tablets should be routinely provided to all ANC clients and this commodity is generally in consistent supply. Blood samples may be taken for a variety of tests – HIV, RPR (syphilis), including Hb. In 2007, 41% of ANC clients reportedly did not have a blood sample taken and so we know that at least this percentage *were not* tested for anemia. Of the other 59%, we can assume that less than that percentage were tested for anemia, given that many of the health facilities, particularly rural ones, do not have the capacity to perform microscopy. HemoCues have yet to be distributed to all of these facilities and even where they do exist, overburdened health care providers are often reluctant to perform Hb testing for all ANC clients (HSSP 2008). This finding is supported by a 2006 Health Facility Baseline Survey, conducted by HSSP, which found that, of 2,403 currently pregnant women, only 7.8% had received an Hb test, as confirmed by review of their ANC cards (HSSP 2006).

ANALYSIS—STAGES OF MIP PROGRAM IMPLEMENTATION

Quantitative and qualitative data collected for the development of this report provide clearer insight to Zambia's "stages" of MIP implementation. The "Stages of MIP Program Implementation Matrix" (Appendix II), developed by Jhpiego as part of a broader MIP analytical framework, uses eight components to summarize and rank the MIP situation in a

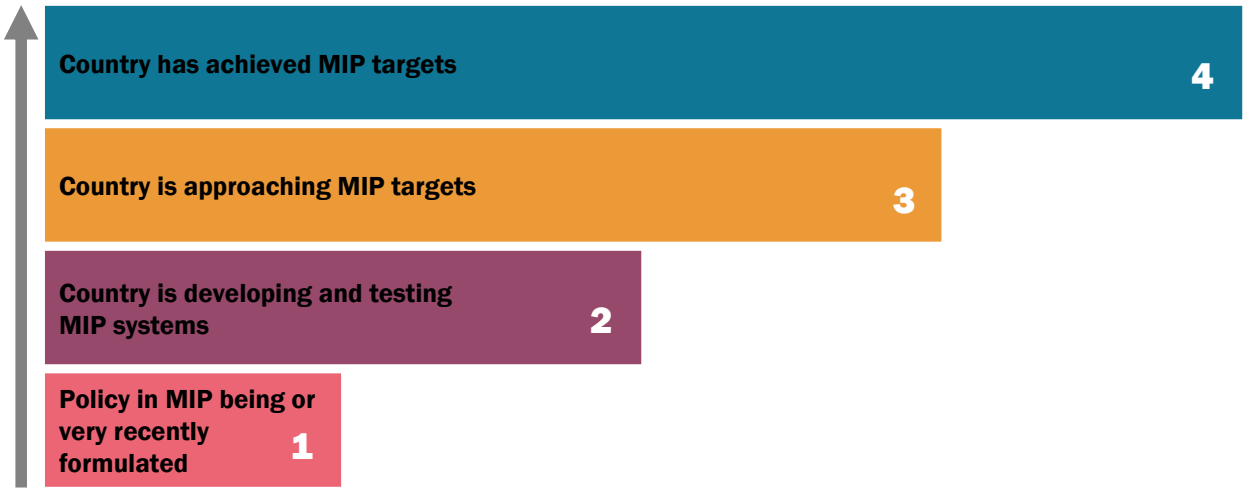
[10] The 2001–2002 DHS recorded "Percentage of births not weighed." The percentage of 46.2% equals 100% minus the percentage not weighed and does not take into account missing information.
[11] The RBM sentinel sites include all the health facilities in 10 select districts: Chibombo, Chingola, Chipata, Chongwe, Isoka, Kalomo, Kaputa, Mwinilunga, Samfya, and Senanga. They record malaria-specific data, which until the recent revision of the HMIS data collection tools in 2008, were not otherwise monitored.
[12] "Received iron tablets/iron syrup/folic acid."

country. The table and diagram below summarize the components of the stages matrix as well as how the scale is used.

Table 6: MIP Readiness Scale

Component	Score = 0	Score = 4
A. Integration	No integration among ANC, RH, malaria, HIV, and other related MIP service areas	MIP is integrated into ANC and other related services through joint planning
B. Policy	No MIP policy	MIP policy disseminated and used
C. Commodities	No MIP commodities	No MIP commodity stock-out
D. Quality Assurance	No MIP quality assurance standards developed	MIP quality assurance standards have been developed, disseminated, and systematically used; reinforced through supportive supervision
E. Capacity Building	No MIP in-service or pre-service training; inadequate human resources devoted to MIP	Adequate graduates and providers with MIP knowledge and skills deployed
F. Community Awareness and Involvement	No MIP community education or involvement	Communities and facilities partner to ensure pregnant women receive appropriate MIP services
G. Monitoring and Evaluation	No MIP data collected through HMIS system	Accurate MIP data available and used for planning
H. Financing	No MIP funding	Sufficient MIP funds available

Figure 4: Stages of MIP Readiness



Using the Stages of MIP Implementation Matrix as a reference, this section highlights Zambia's MIP level of progress for each component and intends to offer some explanation for the level of achievement of the indicators described above.

Integration (Stage 3)

According to the MIP Implementation Matrix, Zambia is at approximately stage 3 in terms of integrating MIP programming into the national RH program. The design of the national focused ANC and PMTCT programs ensures that MIP, including IPTp and ITN distribution, and PMTCT are addressed within focused ANC in clinical trainings and supervision, and in

integrated service delivery. This integration is standardized in the pre-service curriculum for nurses and midwives, the national focused ANC and PMTCT in-service training packages, and the Integrated Reproductive Health (IRH) Supervisory Tool. At the district level, all of these service areas fall under the supervision of the MNCH Coordinator, who participates in many of the trainings for both management and service providers and is expected to conduct quarterly supervisory visits to every facility.

Additionally, IPTp, ITN receipt (as indicated with a stamp), and HIV testing/PMTCT are all recorded on the client's antenatal card. When asked how she knew the integration had been successful, a current PMTCT program officer with Jhpiego, who previously supported scale-up of the original MIP program, stated of her recent experience working with providers, "You don't have to really emphasize MIP with service providers; they are doing it so well." Indeed, several partners interviewed noted that, when it was rolled out, the MIP program "naturally" fell under the MOH RH program because of the simultaneous adaptation of the focused ANC guidelines, of which it is a component. In this way, MIP was never approached separately from RH.

In the areas of planning and information sharing, however, there remains potential for improvement. MOH and several partners noted that although the NMCC invites the RH Unit to the annual planning meetings, its participation is weak. Almost universally, respondents cited the human resources shortage within the RH Unit as the reason, with staff too occupied with other activities to attend. The result, as noted earlier, is that the RH Unit does not always receive the funds needed to carry out its planned activities. This lack of coordination is furthered by the fact that the NMCC and the RH Unit are not on any of the malaria-specific technical working groups together. The RH Specialist cited this as a reason that focused ANC, including MIP, funds at NMCC were sometimes reprogrammed to other activities because the NMCC was not aware of their intentions for using the monies. Interestingly, this same disconnect was replicated in many of the partner organizations interviewed. In those organizations conducting programs in both focused ANC, including MIP and general malaria interventions, such as ITNs, the malaria and RH units were only vaguely aware of each other's activities.

Both the acting director of the NMCC and the RH Specialist emphasized the need to hire an MIP program officer—a process which is reportedly in progress. This person, who would sit at the NMCC, could then be responsible for participating in planning, coordinating activities, facilitating communication between NMCC/RH, and generally pushing MIP as a priority. Rather than revive the MIP WG, this person would also be designated to sit on groups that already exist, such as the ITN, IEC, and case management TWGs. Funding for this position, however, has yet to be secured.

Policy (Stage 4)

Zambia rapidly reached stage 4 of policy implementation with the initial roll-out of the MIP program in 2003. MIP policies have been translated into guidelines and implemented at all levels through to the community. These guidelines on IPTp, ITN promotion, and case management can be found in several health area-specific documents, such as the "Focused Antenatal Care Guide" and malaria case management guidelines, as well as in the "Integrated Technical Guidelines for Frontline Health Workers" and the "Safe Motherhood Guidelines," which should, in theory, be disseminated to all health facilities. For the community, these guidelines can be found in the CHW training manual and the recently developed draft of the Safe Motherhood Action Group (SMAG) training package. Several partners interviewed accredited this swift action to strong leadership by the NMCC and to the active participation and support of partner organizations. As stated by the National Technical Officer for Malaria at the WHO, "Partners were not just giving lip service, but contributing significantly with

advocacy and technical support." Much of this collaboration was achieved through the National Malaria Taskforce, as mentioned previously, with each partner providing their specific expertise and being backed by the Drug Policy TWG.

The RH Specialist reported that through her experience in conducting supervisory and mentorship visits, these guidelines are being adhered to within the constraints posed by lack of resources. This finding is corroborated by a 2008 assessment conducted by HSSP (HSSP 2008). One of the most common resource constraints is the stock-outs of SP, and this points to one area in which the guidelines are often ignored—case management of general malaria cases. Respondents overwhelmingly noted that health care providers are continuing to use SP for clinically diagnosed cases of malaria and RDT-negative cases of fever in the general population. Indeed, one interviewee stated that the reason the IPTp policy was so easy to implement was because "SP was already being given out like candy," and one could say, continues to be. This casual distribution of SP resulted in widespread resistance to the drug and the introduction of AL for first-line treatment of simple malaria. The MOH has thus more strictly emphasized only administering AL for RDT or laboratory-confirmed cases, leading providers to continue to use SP, further contributing to drug-resistance and stock-outs.

Misuse of SP is being addressed by the NMCC and partners in case management trainings and guideline updates. From 2008 to date, the NMCC has been conducting case management updates for the nine provincial health offices, with only Lusaka Province currently remaining. In these updates, provincial and select district managers and providers are re-oriented to the malaria (including MIP) case management guidelines. They, in turn, are responsible for orienting all providers, though this process is reportedly not tracked by the NMCC. It has also been reported that the NMCC will distribute the new MIP treatment guidelines document and a memo, but otherwise the districts are responsible for disseminating the information. Though misuse of SP has been addressed in the updates, respondents have the impression that the problem is still widespread. One issue, reported by the USAID DELIVER Project, is that consumption data for SP at the facility level do not exist. Were this information available (and DELIVER believes it will become available when a new essential drugs system is implemented in 2012), district management could more closely monitor this data to identify facilities with unusually high consumption, possibly indicating misuse. Until then, closer supervision of facilities must be conducted and provider confidence in RDTs and case management of non-malarial fevers be strengthened.

Commodities: Procurement and Supply Management (Stage 2)

In regard to the availability of ITNs and SP, Zambia currently stands at stage 2 in commodities. The drugs for prevention and treatment of MIP—SP, ACTs, and quinine—are approved, but SP is stocked out much of the time in health facilities and at the central level. As mentioned above, misuse of SP for the general population also contributes to this bottleneck. ITNs are available in all health facilities, but only periodically, as there are not enough procured to meet demand. The systems for procuring and distributing these commodities can be described as functional, though not efficient. In forecasting, procurement, and distribution of commodities, the MOH and NMCC rely heavily on donor support.

Sulphadoxine-Pyrimethemine

Funding for SP is channeled through the NMCC from the MOH basket fund for essential drugs. The NMCC must make a request for the drug through the MOH Pharmacy Unit, which, in turn, makes a request to the MOH Procurement Unit to purchase the drug. Like all drugs, the SP is then stored at Medical Stores Limited (MSL, a parastatal company), which distributes it to the DHOs. The current distribution system is a "push" system, wherein the districts order drugs monthly from MSL based on the estimated requirements of health center catchment

populations. The districts then deliver the monthly allocations to the health facilities or the health facilities may be required to retrieve them, which is not always feasible.

In 2009, the NMCC, with the support of DELIVER, conducted a seven-year quantification exercise for all anti-malarial drugs and RDTs, including SP. This is complemented by quarterly updates and monthly reviews of the MSL drug pipelines (e.g., what is in stock and what shipments are expected versus future needs). According to interviews, NMCP partners routinely provide the MOH with early warning of impending stock-outs of SP, but the stock-outs nevertheless persist. For example, the MOH and NMCC were warned six months in advance about the July 2009 stock-out. However, reportedly, no action was taken because the responsibilities of the NMCC and the MOH Pharmacy Unit in addressing the impending stock-out were not clearly defined. DELIVER had to shift $50,000 of its PMI funding for RDTs to procure an emergency stock of SP, which was expected in December of 2009. Such stock-outs remain an ongoing problem. A 2008 assessment by HSSP in Central and Eastern provinces found that of 54 facilities surveyed, 95% had experienced a stock-out of SP in the period of July 2007 to July 2008 (HSSP 2008).

Partners noted several contributing factors to the stock-outs. The NMCC and partners quantify the amount of SP needed, based on 90% of expected pregnancies receiving two doses of IPTp. This quantification of SP may not be correct considering the perceived high incidence of misuse. For this reason, the NMCP will be undertaking a "verification exercise" in 2009 to determine the situation on the ground. Even if more accurate quantification can be achieved, partners report that there is no solid procurement plan in place to ensure that needs are met. This is reportedly in part due to the fact that there are only one or two staff members in the MOH Pharmacy Unit, who are overburdened and thus unable to effectively plan and manage the system.

At the district level, there are further challenges related to stock-outs. As mentioned above, the fact that there is no accurate consumption data from health facilities adds to the challenge of quantification. It is the general belief among members of the MOH and partner organizations that health facility catchment population estimates are flawed due to: under-reported census figures and failure to account for clients coming from other catchment populations or other countries (as is the case with health facilities near borders with Mozambique and DR Congo). When SP is in stock at the central level, DELIVER reports that there remain challenges such as a lack of storage at districts and health facilities (limiting the amount of the commodity that can be kept in stock), transport/fuel to deliver the drugs to facilities, and a human resources shortage (currently, there is no staff person dedicated at the district level specifically to logistics). Additionally, there is no system in place to monitor the distribution of drugs to the facilities. The result is that facilities may be stocked out of SP, even when there are stocks available at higher levels. Indeed, one MIP partner reported, "Sometimes you go to a clinic and they are stocked out of SP and they say it is because there isn't any at the district. Then, you go to the district and find it. Sometimes, they are stocked out at the district, but you find it at the central level."

Currently, only the MOH and UNICEF are purchasing SP, with the UNICEF procurement, at 1.5 million tablets in 2009, intended only as a "buffer" against stock-outs. In addition to increasing human resources in the pharmacy unit and strengthening logistics management at the district level, it has been suggested that SP be included in the RH commodity security budget, with such commodities as contraceptives, in order to prioritize funding and ensure a more consistent supply. One solution already in process is the development of a new essential drugs system (piloted by DELIVER and MSL), which includes SP. In the pilot phase, the system is already improving facility-level consumption data, which will lead to better forecasting. The new system is expected to be implemented countrywide by 2012.

Insecticide-Treated Bed Nets

In Zambia, ITNs are distributed free-of-charge to the general population through yearly mass distribution campaigns (usually targeted to alternating areas of the country) and to pregnant women through ANC clinics. The quantification for these two populations is conducted separately, and funding commitments made accordingly. For all ITNs, the NMCC relies solely on donor organizations (primarily PMI and the Global Fund for pregnant women) to provide the funds for procurement. While the NMCC has a unit that works specifically on ITN provision, it does not procure the nets. PMI, which is committed to 400,000 ITNs a year for pregnant women until 2011 (with an increase to 800,000 for 2010), distributes funding to DELIVER, which conducts the procurement. Churches Health Association of Zambia (CHAZ) receives Global Funds with which it is expected to procure 90,000 ITNs this year for pregnant women. Both DELIVER and CHAZ provide the nets to SFH, which distributes them to the district health offices. It is then the district's responsibility to distribute the ITNs to the health facilities, though if requested, SFH will also provide some assistance in this process. The "Guidelines on the Distribution and Utilization of Insecticide-Treated Nets for Malaria Prevention and Control," published by the MOH in 2007, outline this process and the role of the MOH and partners. According to the guidelines, the district health management teams (DHMTs) are tasked to "ensure that there is no stock-out at the HC level and that a buffer stock is maintained at the districts to facilitate quick re-supply to the HCs" (MOH 2007b). The NMCC and partners reported, however, that stock-outs of ITNs at facilities are frequent because of a lack of funds to procure the quantity needed.

In regard to why Zambia is not able to meet the ITN demand for pregnant women, there are a number of factors at play. As with SP, many partners interviewed regard the quantification as inaccurate also due to incorrect estimates of the target population. Interviewees also mentioned the lack of a procurement plan. Rather than methodically planning how Zambia will meet its ITN needs, the MOH/NMCC, as one partner stated, "just goes with what funders provide." All partners agreed that the MOH/NMCC rely too much on funding organizations for ITNs and on Global Funds in particular. The NMCC and partners all cited repeated delays in the receipt of funds. As one ITN partner stated, "Zambia needs to learn how the Global Fund works. People don't understand the system and there are a lot of delays, re-writing proposals, realigning budgets…." This is problematic given that the annual planning process for procurement and distribution of ITNs assumes the timely receipt of these ITNs. For 2011, the situation may become even more dire, with only 25,000, rather than 90,000 ITNs, to be procured by CHAZ. Currently, only CHAZ and the MOH are permitted to apply for Global Funds. Partners have suggested that they be given more support throughout the process, with one person suggesting that perhaps Global Fund open up the application process to other organizations. It was also suggested that, "If MOH budgeted for ITNs, even a small quantity; donors might be willing to give more."

All interviewees agreed that if there are sufficient quantities of ITNs, distribution through ANC is effective. It provides women with an extra incentive to attend ANC and, by distributing the nets directly to them (preferably in combination with education), increases the chance that they will use them. This system is acknowledged to be most effective in combination with mass distribution. If other family members are not sleeping under a net and become infected with malaria, it increases the likelihood that the pregnant woman will contract it as well. Additionally, if all household members are sleeping under an ITN, they reinforce each other's behavior.

Quality Assurance (Stage 2)

The quality assurance program in Zambia, as it relates to MIP, is currently at stage 2. Information on this topic proved difficult to gather from interviewees and most were unaware of a comprehensive program, though many were able to cite individual assessment and supervision activities conducted by the MOH. Indeed, the RH Specialist stated that she was not aware of any specific quality assurance program or written guidelines, but that there is a "combination of quarterly supervisory visits and the performance assessment every six months." The Malaria Case Management Officer/Acting NMCC Director was likewise unaware of a quality assurance program, but noted that there are quarterly assessments conducted by the provinces to health facilities. According to one MOH staff member, this confusion is likely due to the fact that the quality assurance program, which falls under the Clinical Care Directorate, has been inactive for several years. As a result, quality assurance is being conducted "piece meal."

The core tool for quality assurance is the performance assessment (PA) tool, which provides evaluation standards with indicators to assess structures and systems that support health service delivery. There is one tool each for the DHO, training institutions, level one and two hospitals, health centers, and health center self-assessments. These tools are used every six months by provincial and district staff to "grade" facilities and institutions on performance. For example, in the health center tool under "Integrated Reproductive Health," standard 5.2.2 is "80% pregnant women accessing focused ANC as per guidelines." The indicator for this standard is "number of women receiving focused ANC [divided by] total number of ANC visits." The "source of information" for this is the HMIS, interviews, observations, and the safe motherhood register (in which ANC visits and the services provided during those visits are recorded). The supervisor collects this information and grades the facility on whether or not the standard is being met. The standards are reevaluated after another six months and over time, if improvements are not made, reportedly, the facility in-charge may be replaced, though no specific guidelines for sanctions seem to be in place.

The PA tool is also used to design supervisory visits. According to a former district Clinical Care Specialist, quarterly supervisory visits are targeted to address those areas that were identified as sub-standard during the PA. For example, if a facility was identified during the previous PA as being weak in meeting ANC standards, the district will form a team of specialists in ANC who will visit the facility and focus specifically on providing supervision in that area. The primary purpose of the quarterly visits is not to grade a facility, but instead to provide participatory observation and mentorship. In 2006, the MOH, in collaboration with partners, created a specific tool to guide these visits called the Integrated Reproductive Health Supervisory Tool. This tool consists of a list of key standards for integrated RH services with verification criteria to be assessed during observation of service provision. MIP falls under the verification criteria for focused ANC. These criteria include: group and individual education on MIP, specifically ITN use and IPTp for HIV-positive clients; patient history of ITN use and IPTp; Hb testing; provision of IPTp; and case management of MIP and anemia. It is important to note that, for case management, the verification criteria specifies that if "the woman is suspected of having uncomplicated malaria," the provider should first give three tablets of SP by DOT. If there is no improvement after three days, a blood slide for malaria parasites should be taken; there is no provision for conducting an RDT *before* treatment. In regard to ITNs, the tool does not assess whether an ITN is given, only that an ITN voucher was prepared with the other necessary focused ANC supplies. This is significant given that ITN vouchers are no longer in use in Zambia.

In addition to service delivery, the tool also assesses whether the physical structure is adequate for provision of such services and whether the necessary supplies and drugs, such as SP, are

available (MOH 2007b). This tool was reportedly first sent to the districts in 2007, however, according to an interview with MOH staff, it was not widely used because no orientation on the tool was conducted. In early 2009, MOH conducted an orientation for the provincial health offices (PHOs), which are then expected to orient the districts. At the time of this writing, it was unknown to the MOH whether this had been completed and whether the tool is in use at the district level.

Reports from the supervisory visits and the PAs are sent to the PHOs and the Directorate of Technical Support at the central MOH, which, it is important to note, falls under a separate directorate from quality assurance. In order to obtain the reports, the RH Unit must make a specific request, which they do not routinely do. The RH Specialist stated that, because of this, they do not know if supervisory visits are being conducted quarterly at all facilities. Despite these challenges, data from a 2006 Health Facility Baseline Survey conducted by HSSP were encouraging. Of 40 districts surveyed, 39 conducted "regular supervision,"[13] and of those, 37 had formal supervision schedules (HSSP 2006).

The RH Unit, with the support of the WHO, has also trained mentorship teams, composed of Provincial Nursing Officers, district MNCH Coordinators, and select health center nurses from the nine provinces. These teams, in collaboration with the RH Unit and partner organizations, conduct their own supervisory visits to select health facilities, as funds are available. While facilities are evaluated using the IRH supervisory tool, the purpose of the visit is "interactive mentorship," which the RH Specialist describes as the "most effective way of doing supervisory visits." Since this program was initiated, the RH Unit has targeted facilities with low ANC attendance that are also trained in EmONC (in order that both services can be evaluated at once and funds stretched further).

Because the RH Unit does not receive the PA and supervisory visit reports or for mentorship, only low-performing facilities are targeted, making it difficult to assess the quality of MIP services for the purposes of staging Zambia in the implementation of quality assurance.

Capacity Building (Stage 4)

In terms of pre-service training, Zambia has reached stage 4.

The curricula for Medical Officer, Clinical Officer, Bachelor of Science in Nursing, Registered Nursing Diploma, and Basic Midwifery Practice have all been revised since 2007 in accordance with the updated focused ANC and MIP guidelines. The midwifery curriculum is currently undergoing revision and draft document includes updated information on focused ANC and IPTp.

According to the Human Resource and Training Officer at HSSP, these updated curricula are being used in all clinical pre-service education institutions countrywide for competency-based training. The primary component of the training focuses on the implementation of theory into practical skills, with tools for both peer and faculty assessment.

In regard to in-service training, as mentioned previously, the MOH and Jhpiego conducted countrywide trainings on focused ANC and MIP in 2003. There are no longer stand-alone focused ANC and MIP trainings, as these have been integrated into the national PMTCT training package currently being used by several partner organizations. Case management (in-service) trainings are also being conducted. The frequency and targeting of the PMTCT and case management trainings are largely dependent upon availability of funding from partner

[13] "Regular supervision" is not defined.

organizations and the geographical scope of those organizations' programs, and do not necessarily reach all providers requiring updates on focused ANC and MIP.

Training needs to be considered in light of human resources capacity. According to the Clinton Foundation in 2008, "Zambia is 28,000 professionals short of MOH staffing targets; operating at 47% of required staffing." Pre-service training could meet needs, but attrition is a problem. Improving human resources capacity for MIP should, therefore, be addressed in the context of ameliorating attrition caused by salary structure problems, "pull" factors enticing health workers to leave Zambia, and even death due to HIV/AIDS. In the short run, task shifting to CHWs may provide some relief in terms of delivering MIP services. However, when seen within a wider systems context where MIP services require a referral process that links communities with ANC and other primary health care services, the broader issue of human resources retention must be addressed, not just improvements in pre-service curriculum.

Monitoring and Evaluation (Stage 3)

The implementation of M&E systems for malaria is currently at stage 3. National monitoring and surveillance of MIP interventions and outcomes fall primarily under the purview of the NMCC, with support from the MACEPA and the CSO. Routine data from the HMIS on MIP service delivery are regularly collected, reported, and used for decision-making. However, the quality of the data, according to stakeholders, is not good. At the facility level, data are recorded on clients' ANC cards (this includes three IPTp doses, Hb results, and a stamp for provision of an ITN) and/or in the Safe Motherhood Register, in which client's names are recorded and focused ANC services received are checked off. The register includes IPTp doses, but not data on Hb or ITNs. The data from the register are transferred to tally sheets and reported monthly to the DHMTs. The DHMTs aggregate the data quarterly into district-level HMIS reports, which are then submitted to the central HMIS Unit. Once a year, the central level releases an HMIS bulletin, but the information pertaining to MIP is limited, with only ANC attendance regularly included. Additional information is available upon request from the HMIS Unit. Figures on facility-level HMIS data completeness were not available for this report. However, it is widely acknowledged by the MOH and partners that documentation often suffers when providers are overburdened.

Previously, the sentinel surveillance MIS captured malaria data monthly from RBM-supported sentinel sites, which include all the health facilities in 10 districts in each of the nine provinces (with two districts in Luapula Province). The long-term goal is to incorporate the collection of the MIS data into the routine HMIS. This process began at the end of 2008 when IPTp uptake was first included. Because several priority indicators are now included in the HMIS and the reporting from the sentinel sites has been poor (with an average of 20% reporting completed in most districts in 2007), attempts to obtain data from the sites have been abandoned.

Two population-based surveys, the DHS and NMIS are conducted every five and two years, respectively. The NMIS is a malaria-specific household survey, which relies on a smaller sample size than the DHS, with the first one undertaken in 2006, followed by another in 2008, and the next planned for 2010. The purpose of the NMIS is primarily to assess coverage of interventions, rather than the outcomes of those interventions (MOH 2008; WHO 2007). Although interviewees reported the HMIS data as flawed due to poor facility data recording, they generally regarded the DHS and NMIS data as accurate and reliable, particularly with regard to IPTp uptake.

The MOH, NMCC, and partners frequently use data from the NMIS and DHS to target interventions and supervision activities to poor-performing provinces and districts. The DHS and NMIS use standard indicators, many of which can be found in the WHO's "Guidelines for

measuring key monitoring and evaluation indicators" so that "information can be compared across surveys," according to the MACEPA. In regard to baseline data, the 2001–2002 DHS captured information on MIP prophylaxis with chloroquine and ITN usage by pregnant women before MIP interventions were scaled up in earnest, but not on MIP incidence and anemia. Because of the large sample size covered in the DHS, it must be conducted in the dry season, when malaria is less prevalent and ANC attendance may be higher and ITN use lower. The NMIS, however, requires a smaller sample size and can be conducted during the peak malaria (rainy) season.

Zambia also conducted an MICS in 1999, an HIV Service Provision Assessment (SPA) in 2005, and a Health Facility Baseline Survey in 2006, all of which provide data related to MIP and/or focused ANC. The HIV SPA offers the most limited of the surveys, as it does not parse out MIP from general malaria interventions/services, and often groups malaria with other infectious diseases. For example, the SPA reports whether there were any anti-malarial medicines available in facilities, but does not distinguish between quinine and SP, even though these data were gathered separately in the questionnaires. In terms of pre- and in-service training and supportive supervision, providers of "TB, malaria or STI services" were grouped together (MOH 2005). The MICS, sampling women who had given birth in the previous year, reported the percentage of pregnant women who received any ANC from skilled provider (83.1%) and the percentage of LBW (<2500g) singleton live births (7.5%) (UNICEF 1999). The Health Facility Baseline Survey captured the most information, including: proportion of pregnant women who received an Hb test during ANC (7.8%); the percentage of facilities with at least a two-week supply of SP (98%); the percentage of women who received doses of SP—one, two, and three (6.3%, 19.0%, 74.7%); as well as data on ANC visitation (HSSP 2006).

In "Guidelines for measuring key monitoring and evaluation indicators," the WHO outlines key indicators for monitoring and evaluating MIP interventions by type—output, outcome, and impact—which should be captured by population-based surveys (such as the DHS and NMIS) and routine health information and supervisory systems (such as the HMIS and MIS). Most of these are captured in Zambia's DHS and NMIS. On the following page is a list of data gathered by each data source, with those indicators recommended by WHO identified with an asterisk.

Table 7: M&E Indicators for MIP Interventions

Level	Indicator	Data Source
Inputs	Percentage of health facilities reporting stock-outs of SP in the past month*	HMIS
		MIS
Outcomes	Percentage of pregnant women receiving at least one ANC visit from a skilled provider	DHS
		HMIS
	Percentage of pregnant women attending 2–3 ANC visits	DHS
		HMIS
	Percentage of pregnant women attending four or more ANC visits	DHS
		HMIS
	Percentage of women >4 months pregnant at first ANC visit	DHS
		HMIS (>20 weeks)
	Mean number of ANC visits per client	DHS
	Percentage of pregnant women who received any IPT	NMIS
	Percentage of pregnant women who received IPT by dose (dose 1, dose 2, dose 3)*	HMIS
	Percentage of pregnant women who received two or more doses of IPTp	DHS
		NMIS
	ANC attendance with IPT (dose 1, dose 2, dose 3)	Malaria Information System
	Percentage of households with at least one ITN	DHS
		NMIS
	Percentage of pregnant women who report sleeping under an ITN the previous night*	DHS
		NMIS
	Knowledge about prevention of malaria	DHS
Impact	Confirmed cases of MIP	HMIS
		Malaria Information System
	Confirmed cases of deaths from MIP	Malaria Information System
	Percentage of births with a reported birth weight less than 2.5 kg*	HMIS
		DHS
	Percentage of screened pregnant women with severe anemia*	HMIS
	MIP facility admissions with anemia	Malaria Information System

A few indicators recommended in the WHO guidance are, however, notably missing, including:

- **Percentage of antenatal staff trained in the control of MIP in the past 12 months**
  According to the WHO, this data should be collected at least once yearly per health facility during supervisory visits. While the MOH Integrated Reproductive Health Supervisory Tool monitors whether providers are giving correct patient education and services on MIP prevention and treatment, the tool does not record whether or not the providers have received specific training (MOH 2007b).

- **Percentage of screened pregnant women with severe anemia in third trimester, by gravidity**
  The results of anemia testing for pregnant women, when performed, are recorded on the clients' ANC cards, but not in any facility-level records. Cases of anemia in all outpatient department clients are recorded on the HMIS reporting forms, but pregnancy status is not identified. The WHO recommends that the percentage of pregnant women with severe

anemia in the third trimester be gathered during household surveys. Currently, the DHS and NMIS only record anemia in under-five children (WHO 2007). MACEPA suggests that a separate survey, specifically targeting pregnant women, could be undertaken to obtain a large enough sample size for the data to be statistically significant.

At the time of this writing, plans were currently under way to perform a Malaria Health Facility Survey, which will reportedly provide more insight into MIP service delivery, regarding service availability, equipment and supplies, drugs and commodities, and training of staff.

Community Awareness and Involvement (Stage 3)

Zambia's community-based MIP programs currently stand at stage 3. In health facilities countrywide there are a variety of cadres of community volunteers, who are increasingly involved in community sensitization in MIP and service delivery assistance at health centers and in the community. In terms of training resources, the community health worker training manual is currently being updated to include in-depth focused ANC and IPT guidelines.

The NMCC and partners are also training CHWs to identify clinical symptoms of malaria and perform RDTs (as well as treat non-pregnant positive cases with ACTs). This program was piloted in November of 2008, with a concurrent roll-out begun in early 2009, which will reach CHWs in 28 districts by the end of 2010, with future implementation in the remaining 44 districts as funds become available. A policy to accompany this program has, however, yet to be put into place. SMAGs, which focus on community sensitization and group education at ANC clinics, were rolled out by the MOH and partners in 2007, targeting high-need rural communities. A training package for these groups, of which a significant component covers focused ANC, including MIP, is currently being pre-tested. In 2009, SMAGs and NHCs in two provinces were trained specifically in focused ANC and MIP sensitization, and were provided with job aids. The Health Communication Partnership (HCP) has also been working with NHCs in its respective districts on malaria and MIP community activities. With several partners engaging in these activities (particularly with the SMAGs), resources are increasingly becoming available, though the RH Unit still lacks funds, given that MIP competes with other priority programs.

Interviewees noted the largest funding constraint in community-based programming as the provision of continuing support for community volunteers who, while benefiting from MOH-led trainings, are not institutionalized or compensated in any consistent manner. As stated by the Community Mobilization Program Officer for Malaria at HCP, "Volunteers want to do a lot of work, but they need incentives." Currently, NHC and SMAG members receive material support, such as T-shirts (which identify them as a SMAG/NHC member and confer authority) and bicycles. However, these resources are distributed sporadically within the funding limitations of the MOH and partner organizations, and do not meet the needs of all CHWs. Though the groups are supervised by their local health centers, these centers are low on resources and can only provide minimal material support, such as stationery. Health facilities receive a small imprest each quarter, which can be used for community activities, however, it is used for cleaning supplies and other necessities, and sometimes to purchase SP from private pharmacies during stock-outs.

Given that many of these community activities have only been scaled up within the last two years, there are few reports documenting their impact, though qualitatively, partners involved in such programs readily affirm their success in paving the way for and increasing uptake of interventions, particularly related to ITNs. A recent program follow-up report by the HSSP found that ANC attendance had increased in the year since the MIP program with SMAGs and NHCs was implemented (creating more opportunities for ITN education/distribution and IPTp

administration), but because of frequent stock-outs and poor record-keeping, no improvements were seen in IPTp uptake (HSSP 2009). The MOH, NMCC, and partners consider community involvement as even more essential in light of health system challenges, particularly the human resources crisis. As the ITN Specialist at the NMCC noted, we must nevertheless be careful to craft interventions in such a way as to ensure that we are not "creating a demand that can't be met."

Financing (Stage 2)

In terms of financing for MIP, Zambia stands at stage 2. The national government is contributing funds to MIP programs, but still relies heavily on donor support. As MIP competes with other NMCC and RH activities, the RH Unit finds itself unable to scale up community programs and conduct supervision without significant partner assistance. Funding for SP, in particular, is extremely lacking. A variety of donors are contributing to MIP programming, particularly in the area of ITN procurement and distribution, but this funding does not meet the country's needs. USAID has also procured large amounts of HemoCues for health centers.

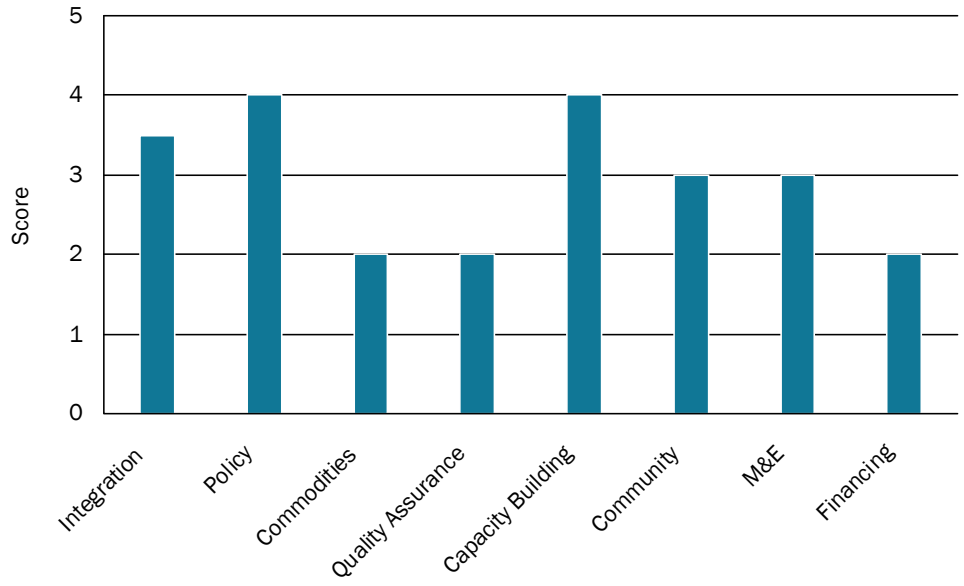
In 2009, the MOH and government funds contributed to the procurement and distribution of HemoCues, procurement of SP, the strengthening of case management, conduct of supportive supervision, and the roll-out of SMAGs (MOH 2009b). Relative to the number and extent of programs and interventions being implemented, the MOH contribution appears significant, but still lacking, particularly in light of the fact that stock-outs of SP are frequent and HemoCues are not present in many health facilities (HSSP 2008).

Partners and the NMCC repeatedly identified SP and ITNs as having the biggest funding gaps in the national MIP program, and expressed a need for partners and the MOH to commit more monies to these areas. In regard to how donors contribute, the RH Specialist stated that it was effective to have a combination of mechanisms, with some donors providing funds directly to the MOH, some donating commodities, and others directly funding activities. In this way, if one system was slowed by bureaucratic obstacles, the RH Unit could fall back on another.

Several partners also pointed to the fact that Zambia may not be calculating its financing needs in relation to malaria correctly. In addition to commodity shortages, NMCP partners report that there are also commodity excesses, such as with ACTs. These funds could be reallocated to SP and RDTs, which, if used appropriately, would reduce misuse of SP. It is also interesting to note that World Bank funds are not currently being used for MIP interventions.

Overall, Zambia can be said to have achieved a moderate to high level of implementation of the essential MIP program components. Figure 5 on the following page presents all the MIP implementation stage component scores for Zambia.

Figure 5: Zambia's MIP Implementation Stage Component Scores



DISCUSSION AND LESSONS LEARNED

Factors Influencing Bottlenecks and Overcoming Bottlenecks

There are a host of bottlenecks in the prevention and treatment of MIP in Zambia that have been identified in the literature and in stakeholder interviews. Some of these bottlenecks are already being addressed, while others require further programmatic and financial commitment. These challenges, the current strategies in place to overcome them, and the greater lessons learned are outlined in Table 8 that follows.

Table 8: Bottlenecks and Lessons Learned in Zambia's MIP Implementation

Component	Challenge/ Bottleneck	Current Mitigation Strategies	Lessons Learned
Integration	Weak linkage between NMCC and MOH RH Unit and HIV/PMTCT	▪ Ongoing discussions between NMCC and MOH RH Unit regarding establishment of MIP program officer position to coordinate RH and NMCC MIP programming ▪ Preliminary, ongoing discussions regarding reviving of National Malaria Taskforce	In addition to integrating MIP into RH, a strong linkage must be maintained between the MOH RH Unit, PMTCT Unit, and the NMCC in order to ensure a holistic package of MIP services. A forum in which the MIP technical areas (IPTp, ITNs, case management) regularly share plans and progress can be key in fostering communication and cooperation.

Component	Challenge/ Bottleneck	Current Mitigation Strategies	Lessons Learned
Commodities	Lack of Hb testing	▪ MOH/partners distributing HemoCues to health centers and conducting training of service providers (within both focused ANC and PMTCT programs)	Where transport is lacking and there are few microscopy facilities, widespread distribution and training on HemoCues are essential to increasing detection of anemia in pregnancy. Even among trained providers, many still do not provide the service due to HR shortages and high client loads. Strong supportive supervision is thus needed to ensure compliance.
	Stock-outs of SP	▪ NMCC and DELIVER piloting new essential drugs system ▪ NMCP to conduct "verification exercise" to ensure quantification is accurate ▪ MOH and partners addressing SP misuse in case management trainings and focused ANC updates	Misuse of SP for clinical cases and RDT-negative case of malaria is contributing to stock-outs. All malaria trainings for managers and health care providers should address consequences of misuse and promote confidence in RDTs. Quantification of SP should also be reviewed to take misuse into account.
	ITN shortages for distribution through ANC	▪ MACEPA to provide support to NMCP in quantification for 2010 and 2011	Distribution of ITNs through ANC can increase ownership and usage of nets among pregnant women and provide an additional incentive for ANC attendance. Such efforts, if not complemented by proper quantification and sufficient procurement of the commodity, can be counter-productive. As ITNs are one of the most cost-effective MIP interventions, national governments must be willing to commit resources to this effort.
Quality Assurance	Weak supportive supervision	▪ Training of provincial mentorship teams for focused ANC, including MIP ▪ Roll-out of Integrated Reproductive Health Supervisory Tool	Particularly in situations of human and material resource shortages, strong and regular supervision must be provided to health workers so that they adhere to guidelines, and appropriately administer services within resource constraints. Supervision, combined with mentorship, can quickly and effectively improve the quality of services.
Capacity Building	Human resources shortage	▪ Utilization of CHWs and SMAGs in community and ANC clinic education ▪ Ongoing CHW RDT pilot for home-based management of fever	CHWs and other community volunteers can help alleviate human resources crises by taking responsibility for patient education and empowering communities to take a proactive role in their own health. Use of CHWs in diagnosing malaria cases in the community with RDTs (and referring MIP cases) may help to streamline client loads.

Component	Challenge/ Bottleneck	Current Mitigation Strategies	Lessons Learned
	Human resources shortage within RH Unit	▪ Ongoing discussions between NMCC and MOH RH Unit regarding establishment of MIP program officer position to coordinate RH and NMCC MIP programming	Regardless of partner support, without sufficient staff, MOH cannot effectively participate in the planning, coordination, and monitoring of programs. In devoting more resources to its own staffing, government and donor funds can be managed and utilized more effectively, for greater impact.
Community Awareness and Involvement	Late attendance at ANC	● MOH/partners rolling out SMAGs to conduct community sensitization on focused ANC, including MIP and male involvement	Community sensitization can contribute to early and more frequent ANC attendance and must go hand-in-hand with scaling up quality services. Male involvement plays a crucial role in increasing ANC attendance.
Monitoring and Evaluation	Poor recordkeeping and data reporting	▪ Data management trainings being conducted for district staff	The process and importance of recordkeeping should be incorporated into all technical trainings for managers and health care providers. Providers should understand the importance of quality data collection and management so that they are not overlooked as a result of HR shortages and high client loads.

Successes and Best Practices

Despite many challenges, from 2006 to 2008 there were increases in IPTp uptake and in the proportion of pregnant women sleeping under an ITN—signifying the effectiveness of MIP programming in Zambia. Several of Zambia's innovations in program development and implementation, which can serve as models for and be adapted to other country situations, stand out, including:

Development of a clear IPTp policy

The MIP policy, which promotes uptake of IPTp in Zambia, provides clear guidelines to health care providers as to when pregnant women should receive the three doses of IPTp within the context of focused ANC. The policy takes into account women who attend their first ANC visit before 16 weeks (when they are not eligible for IPTp) and those who receive all three doses before their fourth visit. This clarity is essential for the correct and consistent implementation of the policy at the service delivery level, as well as its easy translation into community-level IEC.

MOH/NMCC/partner collaboration in policy development and implementation

Interviewees overwhelmingly cited the strong collaboration of partners and the NMCC in the development and implementation of MIP policy as the NMCC's key achievement. Strong NMCC leadership was credited with this success, particularly in its adeptness at recognizing the expertise of the various partners, and mobilizing resources through the TWGs.

Integration of the MIP program into the MOH Reproductive Health Unit

Though linkages between the RH Unit and NMCC require strengthening, the integration of MIP into RH programming has successfully facilitated the roll-out of a holistic package of focused ANC services. This integration has resulted in a more efficient scale-up of the MIP program, enhanced access to stakeholders, and increased incentives for women to attend

ANC (MIPESA 2006). Sustainability of MIP prevention interventions has also been increased, as they have been rooted in the well-established MNCH program at the MOH.

Roll-out of MIP through focused ANC package
By rolling out MIP interventions through the focused ANC package, integration of MIP into the national RH program was more easily achieved—rooting the program in a strong, existing foundation that has thus far ensured its sustainability. At the service delivery level, this approach has resulted in a holistic package of services that can ensure a healthier mother and baby.

ITN distribution through ANC
Although distribution of ITNs through ANC is not currently consistent, this effort, combined with mass distribution campaigns, has dramatically increased usage of ITNs by pregnant women. As with IPTp, the inducement of free ITNs attracts more women to ANC clinics and creates an opportunity to provide the ITN directly to the pregnant woman (with education), and may increase the likelihood that she will be the household member to utilize it. Because ITNs are the most effective intervention in preventing malaria, we can expect dramatic reductions in MIP if this initiative is strengthened.

Integration of focused ANC/IPTp into the PMTCT in-service curriculum
The inclusion of focused ANC, including IPTp, into the national PMTCT training package has allowed RH programs to train additional providers, who were not reached in the original roll-out, in MIP and to reinforce the skills and knowledge of previously trained providers. Integrating the services into training can also increase the likelihood that they will be provided in an integrated way at the health facility level.

Focused ANC mentorship teams
The training and utilization of provincial focused ANC mentorship teams is a quick and low-cost method for improving the quality of focused ANC and MIP services among ANC providers and for strengthening the supervisory skills of managers. Teams can conduct on-the-spot training and problem-solving that take into account the specific strengths and challenges of individual health facilities and providers, leading to more sustainable improvements in service delivery.

Community involvement
Since 2007, community outreach through NHCs and SMAGs has raised the profile of MIP in rural communities and is a step toward empowering ANC clients to take a more active role in ensuring that they receive necessary services. In situations of continuing IPTp stock-outs, community sensitization plays a crucial role in scaling up alternative MIP prevention strategies, such as ITN use, as well as environmental interventions. Given that these programs are still in the early stages and no comprehensive impact studies have yet to be done, community outreach remains a "promising practice," which should be watched closely in the near future.

Conclusions and Recommendations

Zambia is the first country to document and analyze its best practices and bottlenecks in MIP implementation through a combination of framework and stakeholder interviews. This exercise will not only help the country analyze its current status of implementation readiness, but also will identify lessons learned that can inform future efforts that will lead to lasting scale-up. A similar process, using Zambia's case study as a model and adapting it to specific local situations, can assist other African countries to evaluate their progress in MIP prevention and control, and determine next steps. The information elicited from such a combined effort, shared and discussed in a regional forum, has the potential to rapidly accelerate progress in addressing MIP.

Overall Zambia has achieved a moderate to high level of implementation of essential MIP program components. Major strengths have been observed in the areas of: integration, policy, training, and community-based programming. Areas that require further, significant strengthening include: commodities, quality assurance, M&E, and financing.

Integration

From the inception of the MIP program, Zambia achieved a relatively smooth integration of MIP programming into the MOH RH Unit. This integration was facilitated by the inclusion of MIP in the focused ANC package, so that MIP "naturally" fell within RH programming. This integration was also observed at the district level, where MIP, PMTCT, and focused ANC activities fall under the administration of the MNCH coordinators. At the health facility level, IPTp and ITN distribution are fully incorporated into focused ANC (when commodities are available), and at the community level, where volunteer educators incorporate MIP into broader safe motherhood messaging.

Improvement is needed, however, in the linkages between the NMCC and RH Unit, particularly in annual planning and in communication regarding their separately administered MIP programs. The RH Unit and NMCC expressed optimism that the hiring of an MIP program officer would strengthen the link between the two units and overcome many of the current challenges. Several partners also support reestablishing the MIP WG to facilitate continual communication and coordination of programs in the various technical areas related to MIP, including focused ANC, case management, ITNs, and IEC. As an alternative to the creation of a separate WG, the existing Safe Motherhood Task Working Group could hold an "MIP focus session" to address bottlenecks in MIP programming.

Policy

While the initial MIP policies were successfully disseminated and implemented, questionable adherence by service providers to the simple malaria case management guidelines has negatively impacted IPTp delivery. The underlying causes of this weakness (i.e., lack of confidence in RDTs, human resources shortages) need to be addressed in order to achieve complete policy implementation. As MIP and malaria policies are adapted to ever-more-challenging situations, continued efforts must be made to ensure that changes to this policy are incorporated into all clinical guidelines and that they are widely disseminated, reaching the periphery, and adhered to. Systems need to be put into place for ensuring that the revised malaria case management guidelines (and also recently revised Integrated Technical Guidelines) reach all managers and service providers and that these personnel are oriented to their use.

Commodities

The MOH has approved and routinely procures drugs for the prevention and treatment of MIP, including SP, AL, and quinine. It also routinely procures ITNs, though only through donors and quantities do not meet demand. While stock-outs of SP are frequent, as a result

of misuse of the drug and problematic quantifications, uptake of IPTp remains relatively high. This, in itself, is a success because it indicates that when SP is in stock, health facilities are giving it out regularly. If Zambia can achieve commodity security and consistent stocks of SP, the country can expect to quickly meet the goal of reaching 80% of pregnant women with three doses of IPTp. Similarly, if ITN procurements can be increased to meet demand, the increase in ITN usage among pregnant women will likely increase, as it did between 2001/2002 and 2007.

Quality Assurance

Quality assurance is perhaps the weakest area of implementation readiness in Zambia, given that the MOH is not administering a comprehensive quality assurance program. Yet, the "building blocks" of a program have been developed, including a PA tool to grade structures and systems that support service delivery, and an Integrated Reproductive Health Supervisory Tool to guide standards-based participatory, supportive supervision. The revitalization of a quality assurance unit to concretely implement and monitor these systems and tools is needed to ensure that gains made in the other areas of MIP implementation are not lost.

Capacity Development

Zambia has achieved a high level of implementation in pre-service training with the revision of all the medical officer, clinical officer general, midwifery, and nursing curriculums in the last several years and the inclusion of updated focused ANC and MIP guidelines (though note that these will not include the new case management guidelines). These efforts have further institutionalized MIP interventions, and have reduced the need to conduct pre-service trainings with ANC providers. The further inclusion of MIP in the in-service PMTCT and case management curriculums has allowed for greater training coverage of health care providers and reinforcement of guidelines for those who were previously oriented. Overall MIP capacity building should be linked with efforts to improve overall health worker retention.

Community Awareness and Involvement

This intervention is one of the most recently developed and promising in Zambia. The MOH and partners are working with various community groups—CHWs, NHCs, and SMAGs—to raise community awareness about MIP and empower people to take more active roles in their own health. This also has the benefit of alleviating some of the burden on health care providers in settings of severe human resources shortages. Preliminary reports of such programs show promising gains in community acceptance of MIP interventions, though resources are necessary to sustain these activities.

Monitoring and Evaluation

With the conduct of the first NMIS in 2006 and the integration of IPTp and MIP case data into the routine HMIS in 2008, great strides have been made in scaling up M&E of MIP interventions. The NMIS and DHS are using standard indicators, providing an ongoing picture of progress in two- to three-year intervals. Quality of HMIS data does nevertheless remain problematic and small-scale efforts are under way resolve this issue. With expansion of such efforts, Zambia could obtain a clearer picture of the implementation and impact of MIP interventions, directing resources to where and to what is most needed and most effective.

Financing

Though Zambia has received a large amount of financing, the government's own contribution remains small and large gaps have been identified in ITN and SP procurement.

Partners repeatedly cited problems with Zambia's heavy reliance on the Global Fund and the frequent delay of receipt of those funds. Strategies need to be explored to obtain more and diverse funding for ITNs and SP, including from within the government's budget.

In order to ensure that the target—80% of pregnant women have access to the package of MIP interventions—is achieved, the following are recommended:

Seek funding for establishment of MIP program officer position

There is currently no staff member in the MOH or NMCC specifically dedicated to the promotion and coordination of the full package of MIP interventions. An MIP program officer, who liaises between the RH Unit and NMCC, could ensure that MIP programs are supported with the necessary planning, logistics, and commodities, which are often overlooked. Such a program officer could best achieve this goal as a (permanent) member of the MOH RH Unit, in order to alleviate RH staffing shortages and avoid promoting MIP as a parallel program.

Revive Malaria Task Force or initiate similar forum

The Malaria Task Force, which existed at the time of the initial roll-out, brought together all partners in malaria programming and interventions. This task force provided a forum for the different technical areas, such as ITNs, IEC, RH, and case management, to share information and expertise essential to the smooth implementation of all components in addressing MIP. The interviewees said that reestablishing this group could do much to further program coordination and effectiveness, as well as collectively address the existing outlined challenges.

Develop clear procurement plan for SP and ITNs

All stakeholders involved in the quantification, funding, procurement, and distribution of these commodities must work together to develop a forward looking procurement plan to meet demand. The NMCC and MOH should demonstrate commitment to these efforts by exploring strategies for dedicating more of their funds to the procurement of SP and ITNs, in addition to seeking support from the donor community. This effort must be undertaken in conjunction with the development of strategies to deliver the current and increased quantities of commodities to ANC clinics.

Strengthen existing M&E systems and surveys to better capture key quality MIP data

In order to build skills in and increase the understanding of the importance of quality documentation and data management, all technical trainings for managers and health workers should incorporate these elements into their programs. Such trainings should go beyond skilled providers, recognizing that casual daily employees and community volunteers often assist in service delivery. Facility-level data collection tools should be examined to ensure that they include currently missing information, such as anemia in pregnancy and IPTp3, and are designed in a user friendly manner that will encourage compliance. Additionally, future HIV SPA data analyses should be revised to monitor availability of specific anti-malarials, such as SP. The next NMIS (2010) and DHS (2012) should also measure if three doses of IPT were given (in addition to two or more), as this is the number of doses indicated by national policy in Zambia. By strengthening the quality of data on the implementation and impact of MIP interventions, programming can be more targeted and resources used more efficiently.

Conduct additional research to fill information gaps

Formative qualitative research to identify cultural barriers in the community that inhibit ANC and IPTp uptake could further inform the development of IEC/BCC campaigns. This

research could be done through a KAP survey, specifically examining factors that impede the use of MIP interventions. Although a KAP study was conducted by the NMCC in 2005, it did not assess barriers.

Critically review malaria interventions, evaluating impact and cost-effectiveness
With implementation of the above recommendation and the improvement of data quality, the impact of interventions relative to input can be more critically assessed. As has been recognized with indoor residual spraying, not all interventions apply equally to every place or situation. A more thoughtful application of interventions in low-resource situations may yield greater, positive health outcomes.

Strengthen comprehensive quality assurance program
The fragmented nature of quality assurance is inhibiting Zambia's potential for delivering quality health services. The MOH must direct and/or seek technical and financial resources to revitalize the quality assurance unit and strengthen collaboration between this unit and the Technical Support Unit. Strategies for ensuring communication between these units and the various health programs, such as RH, should be developed. The use of the IRH Supervisory Tool by all districts should be ensured and the tracking of supervisory visit and PA results improved. In this way, issues, such as mistrust of RDTs, could be monitored for correlation to particular areas of the country or cadre of providers, enabling more effective targeting of interventions.

Ensure adequate human resources for MIP are available at the health facility level
Better staffing of health facilities will be needed to meet the increased demand that will be created by community MIP. Health worker shortages in Zambia are a major constraint at all levels of the public health care system.

Develop guidelines for the role of community volunteers
There are a plethora of community health volunteers being utilized in safe motherhood, malaria, tuberculosis, and HIV programming, with new, informal cadres in constant development. The MOH must work with partners to outline guidelines on training and on how to appropriately utilize these workers. These guidelines should include standards for the provision of material and technical support so that these volunteers have the resources necessary to carry out their duties, and are treated with the respect they've earned as individuals actively committed to the health of their communities. Community programs, while linked directly with health facilities, should be managed by the communities themselves to maintain ownership and continued momentum.

More careful messaging in IEC on malaria as cause of fever
IEC campaigns in Zambia on malaria and MIP have seen great success in increasing people's awareness of the causes and symptoms of malaria. The unintended consequence, however, has been the common association of any fever with malaria, which puts pressure on health care providers to treat fevers with anti-malarials in the absence of RDTs or in spite of negative results. Malaria campaigns should thus craft messages more carefully to avoid frequent misuse of SP, increased drug resistance, and negative health outcomes (in the event that other causes of fever are overlooked).

Although Zambia is a leader in MIP program implementation, it has not yet achieved its 2008 country targets. With a great deal of emphasis on Zambia as a "success story," it is important not to become complacent. When asked about the future of MIP programs in Zambia, one partner asked, "Malaria incidence is going down, but can we sustain the interventions year

after year? We're not very sure where things are coming from; we just don't know." Indeed, especially as community outreach is scaled up, there is the risk that Zambia will create a demand that cannot be met. MIP programming must be approached holistically—from the central level with planning and coordination, to management at the district level, and service delivery at the community level. As with the initial roll-out, sustained progress will take a concerted effort and collaboration by the MOH, NMCC, and partners. A partner who sat on the original MIP WG noted, "The trend has been that when we do well, we relax. We need to address MIP as vigorously as we did before."

Though many obstacles still remain in eradicating malaria and MIP, progress so far demonstrates that they are not insurmountable. With increased stakeholder coordination and the MOH's commitment to sustainability, significant gains can be made in bringing Zambia closer to achieving Millennium Development Goals 4, 5, and 6. The aspiration of achieving a "malaria-free Zambia" is within reach.

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Appendix 1

FRAMEWORK FOR THE ANALYSIS OF MIP IMPLEMENTATION BOTTLENECKS

Table A1-1: Country Data Sources for Case Studies

Data Source	Zambia
DHS	2001–2002, 2007
MICS	1999
MIS	2006, 2008
SPA	HIV SPA 2005
HMIS (routine)	Data compiled quarterly; available upon request from MOH HMIS Unit
Program and government (MOH/NMCP) surveys and reports	Netmark Survey (AED 2004)
	Evaluation of IEC Report: *Knowledge, attitudes and perceptions of malaria control and prevention interventions in Zambian districts* (NMCC, 2005)
	Health Facility Baseline Survey (HSSP, 2006)
	TRAC Survey (PSI, 2007)
	MIP Rapid Assessment (HSSP, 2008)
Research studies	ITN usage (Baume and Marin 2007)
	ITN awareness, ownership, usage (Baume and Marin 2008)
	CHW RDT training (Harvey et al. 2008)
	RDTs (Harvey et al. 2008)
	Process of drug policy change (Sipilanyambe et al. 2008)
	Zambia's malaria control strategy (Skeketee et al. 2008)
	Cost-effectiveness of diagnosis strategies (Chanda et al. 2009)
Sentinel Site Surveillance System	MaMIS: RBM sentinel sites in 10 districts (currently inactive)

Table A1-2: Priority MIP Indicators and Corresponding Data Sources

Level	Indicator	Data Source	Data/ Value	Location of data [report section (s) and page numbers, URL]	Comments
Outputs	▪ Percentage of antenatal clinic staff trained (pre-service, in-service or during supervisory visits) in the control of MIP during the past 12 months (including IPT, counseling on use of ITNs and case management for pregnant women	Integrated Reproductive Health Supervisory Tool	n/a	n/a	Tool currently being rolled out for use in quarterly supervisory visits; data currently unavailable
	▪ Percentage of health facilities reporting stock-out of the recommended drug for IPT (currently SP) in the past month or in the determined period (according to national guidelines)	HIV/AIDS SPA 2005	n/a	n/a	Recorded 88% of facilities as having any anti-malarial in stock (appendix A, p.69)
		HMIS	n/a		Data on facility stock-outs not available from HMIS
Outcomes	▪ Percentage of pregnant women who received any ANC from skilled provider	DHS 2007	93.7	Maternal Health chapter, p.128	
		DHS 2001–2002	93.4	Maternal Health chapter, p.128	
		HMIS	98	Annual Health Statistical Bulletin 2008, Chapter 8: Maternal Health, p.57–8	
		MICS 1999	83.1	Appendix D, p.31, Table 38	Only recorded those women who had delivered in the last year

Level	Indicator	Data Source	Data/ Value	Location of data [report section (s) and page numbers, URL]	Comments
	▪ Percentage of pregnant women who attended two or more ANC visits	DHS 2007	94.3	Maternal Health chapter, p.129	
		DHS 2001–2002	91.4	Maternal Health chapter, p.129	
		HMIS	n/a		Only data on first attendances available
	▪ Percentage of pregnant women receiving IPT under DOT (first dose, second dose, third dose, according to national guidelines)	DHS 2007	Any: 86.8 Two or more: 65.7	Malaria chapter, p.187	Records any SP taken and two or more doses
		DHS 2001–2002	35.8	Malaria chapter, p.158	The table states "percentage of pregnant women who took ant-malarial during pregnancy," including chloroquine or SP, but the text before the table says it is anti-malarials taken as prevention
		NMIS 2008	Any: 80.0 Two or more: 66.1	Chapter 3: Coverage of Malaria Interventions, p.24–25	Records any SP taken and two or more doses
		NMIS 2006	Any: 71.6 Two or more: 58.9	Chapter 3: Coverage of Key Malaria Interventions, p.19	Records any SP taken and two or more doses
		HMIS	n/a		Data not available for 2008; 2009 data incomplete according to HMIS Unit
		Health Facility Baseline Survey 2006	1st: 6.3 2nd: 19.0 3rd: 74.7		Sampled women who had given birth in the previous 12 months

Level	Indicator	Data Source	Data/ Value	Location of data [report section (s) and page numbers, URL]	Comments
	▪ Percentage of households with at least one ITN	DHS 2007	53.3	Malaria chapter, p.182	
		DHS 2001–2002	13.6	Malaria chapter, p.155	
		NMIS 2008	62.3	Chapter 3: Coverage of Malaria Interventions, p.14–16	
		NMIS 2006	44.4	Chapter 3: Coverage of Key Malaria Interventions, p.13	
	▪ Percentage of pregnant women who report having slept under an ITN the previous night	DHS 2007	32.7	Malaria chapter, p.186	
		DHS 2001-2002	7.9	Malaria chapter, p.157	
		NMIS 2008	43.2	Chapter 3: Coverage of Malaria Interventions, p.24–25	
		NMIS 2006	24.5	Chapter 3: Coverage of Key Malaria Interventions, p.16	
		PSI 2007 TRAC Survey	38.6 (rural women)	Table 2, p.7	Also reported that 48.7% of all pregnant women reported sleeping under an ITN throughout the year

Level	Indicator	Data Source	Data/ Value	Location of data [report section (s) and page numbers, URL]	Comments
Impact*	▪ Percentage of LBW singleton live births (<2500g), by parity	HMIS (2008)	7	Available upon request from HMIS Unit	
		DHS 2007	9.3	Child Health chapter, p.144	Records percent distribution of births with a reported birth weight below 2.5 kilograms
		DHS 2001–2002	4.6	Maternal and Child Health chapter, p.135	Records percent distribution of births with a reported birth weight below 2.5 kilograms
		MICS 1999	7.5	Appendix D, p.14, Table 20	
	▪ Percentage of screened pregnant women with severe anemia (Hb < 7g/dl) in the third trimester, by gravidity	HMIS	n/a		Recorded on ANC card; HMIS only records whether women are screened for anemia (but not the results) at the first ANC visit
		NMIS	n/a		Currently the NMIS is only designed to test anemia in children under five

Appendix 2

Table A2-1: Stages of MIP Program Implementation Matrix*

MIP Readiness Component	Stage 1	Stage 2	Stage 3	Stage 4
Integration	▪ No meetings or communication between NMCP and RH program at national level ▪ Poor or coincidental integration at district level ▪ No integration of MIP with other public health programs	▪ Some meetings or communication between NMCP and RH program at national level ▪ Attempts at integration at district level ▪ Attempts to integrate MIP with other public health programs	▪ Sharing of information and regular meetings occur between the NMCP and RH program at national level ▪ Stated focus of integration at district level ▪ Some MIP, RH, child health, and/or HIV/AIDS services have been bundled together in health services	▪ Joint strategies, planning, and sharing of information between NMCP and RH programs at national level ▪ District level promotes integration of RH, child health, HIV/AIDS and MIP in administration and supportive supervision ▪ MIP, RH, child health, and/or HIV/AIDS are provided together in health services
Policy	▪ No or minimal MIP policies, strategies or service delivery guidelines available in country	▪ Some MIP policies, strategies or service delivery guidelines developed ▪ Dissemination not done or not yet completed	▪ MIP policies, strategies or service delivery guidelines developed ▪ Partial dissemination ▪ Utilization unknown or incomplete	▪ MIP policies, strategy, and service delivery guidelines developed and being used at all levels of the health system
Commodities	▪ Malaria drug and ITN procurement and distribution systems for ANC clinics poorly functional (e.g., stock-outs) ▪ WHO-recommended medicines for malaria and/or MIP have not been approved	▪ Malaria drug and ITN procurement and distribution systems for ANC clinics functional ▪ WHO-recommended medicines for malaria and/or MIP have been approved but not widely available ▪ ITNs available sporadically	▪ Malaria drug and ITN procurement and distribution systems for ANC clinics functional ▪ WHO-recommended medicines for malaria and/or MIP have been approved and are widely available ▪ ITNs available in many places	▪ Malaria drug and ITN procurement and distribution systems for ANC clinics efficient ▪ WHO-recommended medicines for malaria and/or MIP are always available ▪ ITNs always available
Quality Assurance	▪ MIP quality assurance standards have not been developed	▪ MIP quality assurance standards have been developed but are not widely used	▪ MIP quality assurance standards have been developed and are used in some areas	▪ MIP quality assurance standards have been developed and are used systematically

MIP Readiness Component	Stage 1	Stage 2	Stage 3	Stage 4
	▪ Supportive supervision not in place to maintain quality in MIP services ▪ Quality of MIP services poor	▪ Supportive supervision for MIP services in place to limited extent ▪ Quality of MIP services low	▪ Supportive supervision for MIP services increasingly utilized ▪ Quality of MIP services moderate	▪ Supportive supervision for MIP services utilized systematically ▪ Quality of MIP services high
Capacity Building	▪ No competency-based training on MIP has been planned ▪ Pre-service nursing, midwifery, and medical curricula outdated in regards to MIP	▪ Competency-based in-service training on MIP planned or has occurred on limited basis ▪ Pre-service nursing, midwifery, and medical curricula have been revised in regards to MIP but not consistently taught to students	▪ Competency-based in-service training on MIP conducted for many health service providers ▪ Updated pre-service nursing, midwifery, and medical MIP curricula are being taught at most academic institutions	▪ Competency-based in-service training on MIP conducted for all appropriate cadres of health service providers ▪ Updated pre-service nursing, midwifery, and medical MIP curricula are being taught at all academic institutions
Community Awareness and Involvement	▪ Community action/awareness on MIP low ▪ No resources available for community ▪ Low community acceptance of MIP prevention and treatment measures (ITNs, IPTp, and case management)	▪ Community action/awareness on MIP raised through research, advocacy, and/or programs ▪ Few resources developed for communities ▪ Some community acceptance of MIP prevention and treatment measures	▪ Community action/awareness on MIP strong through research, advocacy, and/or programs ▪ Appropriate resources widely available ▪ Moderate community acceptance of MIP prevention and treatment measures	▪ Community action groups are strong partners in national MIP prevention efforts ▪ Appropriate resources widely available ▪ Widespread community acceptance of MIP prevention and treatment measures

MIP Readiness Component	Stage 1	Stage 2	Stage 3	Stage 4
Monitoring and Evaluation	▪ Routine data for MIP service delivery not available ▪ No MIP indicators developed ▪ No baseline[14] information or research results exist for country	▪ Routine data for MIP service delivery available ▪ MIP indicators designed but not integrated into national system ▪ Some baseline information or research results exist for country	▪ Routine data for MIP service delivery available, collected, and reported on ▪ MIP indicators agreed upon and data collection started ▪ Baseline information or research results exist for country	▪ Routine data for MIP service delivery available, collected, reported on, and used for decision-making ▪ MIP indicators being collected regularly ▪ Some endline studies designed to capture achievements and/or impact studies being conducted
Financing	▪ National government has not committed funds to MIP programs ▪ No donor funding exists for MIP ▪ No proposals submitted to donors for MIP funding	▪ National government has not committed adequate funds to MIP programs to cover projected costs ▪ Limited donor funding exists for MIP	▪ National government has committed funds to MIP programs that significantly contribute to projected costs ▪ Strong donor funding exists for MIP	▪ National government has committed and disbursed funds to MIP programs that significantly contribute to projected costs ▪ Ample donor funding exists for MIP and is being used effectively

* The sections highlighted in purple represent Zambia's stage of implementation for the particular component.

[14] Relevant baseline information includes: community utilization of MIP, epidemiology of malaria transmission and pharmacovigilance

Appendix 3

Table A3-1: MIP Partner Organizations

Organization	Funding	Implementing	Scope of MIP Program	Location	Funding Source	End Date
Churches Health Association of Zambia (CHAZ)		X	▪ Commodities procurement: – ITNs – ACTs – RDTs[15] ▪ Case management training for health care providers ▪ MIP diagnosis/treatment at CHAZ health facilities ▪ Community outreach	57 districts	Global Fund (Round 7)	2013
Global Fund to Fight AIDS, Tuberculosis, and Malaria	X		▪ Provision of grants to MOH and CHAZ for malaria interventions	N/A	Donor countries	N/A
Health Communication Partnership (HCP)		X	▪ BCC training for Environmental Health Technicians and district Malaria Task Forces ▪ Provide material support to NHCs for community sensitization ▪ Develop and disseminate IEC materials	▪ Western Province – Kalabo District – Mongu District – Senanga District ▪ Southern Province – Kazungula District – Choma District – Siavonga District ▪ Lusaka Province – Luangwa District – Chongwe District ● Central Province – Mkushi District – Serenje District	PMI	November 2009

[15] A recent, but not current element of CHAZ programs due to lack of funding.

Organization	Funding	Implementing	Scope of MIP Program	Location	Funding Source	End Date
				• North-western Province – Solwezi District – Mfumbwe District – Kasempa District ▪ Copperbelt Province – Mpongwe District – Luanshya District ▪ Eastern Province – Petauke District – Chadiza District ▪ Northern Province – Mpika District – Mpulungu District ▪ Luapula Province – Mansa District – Kawambwa District – Chienge District		
Health Services and Systems Program (HSSP)		X	▪ Focused ANC (including IPTp) guidelines updates for health care providers ▪ MIP community sensitization training for Safe Motherhood Action Groups	▪ Central Province ▪ Eastern Province	PMI	November 2009
USAID I DELIVER Project		X	▪ Commodities procurement – ITNs – SP[16] • Essential drugs system pilot (includes SP)	N/A	PMI	2011
PATH/MACEPA		X	▪ Central level planning ▪ Fill gaps in annual plan ▪ ITN procurement	N/A	Bill and Melinda Gates Foundation	2013

[16] SP is currently being procured on an "emergency basis" due to the current stock-out, but is not a regular component of the DELIVER program.

Organization	Funding	Implementing	Scope of MIP Program	Location	Funding Source	End Date
Malaria Consortium		X	▪ Case management training (for all cadres) ▪ CHW RDT training	▪ Southern Province ▪ Katete District ▪ Chama District	Irish Aid	Mid-2010
Population Services International (PSI)/Society for Family Health (SFH)		X	▪ ITN distribution (for ANC clinics) ▪ Development of IEC materials	Countrywide	PMI	2019
PEPFAR	X		▪ Fund ITN procurement/distribution, IPTp, and case management activities through implementing organizations	N/A	United States Government	
UNICEF	X	X	▪ Procure SP ▪ Focused ANC, including MIP mentorship for health care providers ▪ Support Safe Motherhood Action Groups for community sensitization	N/A	UN member countries	N/A
World Health Organization (WHO)	X	X	▪ Support development of policy and guidelines ▪ Provide technical support for quantification of SP	N/A	UN member countries	N/A
World Bank	X		▪ Fund NMCC to fill gaps in action plan[17] ▪ Distribute funds to MOH for community booster program for community grants to address malaria issues	N/A	Donor countries	2010 (with expected 3-year extension)

[17] Funds not currently going toward MIP-specific interventions.

Organization	Funding	Implementing	Scope of MIP Program	Location	Funding Source	End Date
PMTCT[18]						
Boston University		X	▪ PMTCT training for health care providers and lay counselors	▪ Southern Province – Choma – Gwembe – Kalomo – Kazungula – Livingstone – Mazabuka – Monze – Siavonga	CDC	2014
Center for Infectious Disease Research in Zambia (CIDRZ)		X	▪ PMTCT training for health care providers and community workers ▪ HemoCue procure distribution and training	▪ Western Province ▪ Eastern Province – Mambwe – Katete – Nymiba – Petuatke – Chipata ▪ Lusaka Province	CDC	2013–2015
Zambia Prevention, Counseling, and Testing (ZPCT)		X	▪ PMTCT training for health care providers and community workers ▪ HemoCue procurement distribution and training	▪ Central Province ▪ Copperbelt Province ▪ Northern Province ▪ Luapula Province ▪ Northwestern Province	USAID	2014
Jhpiego		X	▪ PMTCT training for health care providers and lay counselors	16 Department of Defense sites	PEPFAR	2012

[18] These organizations conduct PMTCT activities, using the national training package, which includes FANC and IPT.