

Malaria in Pregnancy: The Dynamic Relationship Between Policy and Program Implementation

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Malaria is a leading cause of morbidity and death in Africa with the greatest burden affecting pregnant women and young children. Nearly 10,000 pregnant women die annually as a result of malaria.¹ The World Health Organization (WHO) recommends a three-pronged strategy to prevent and control malaria in pregnancy (MIP) in countries of stable malaria transmission. This strategy, which includes: a) uptake of intermittent preventive treatment in pregnancy (IPTp), with an appropriate anti-malarial {currently sulfadoxine-

pyrimethamine (SP)} delivered through focused antenatal care (ANC), b) use of insecticide treated nets (ITNs), and c) prompt diagnosis and case management of malaria illness, can reduce the burden and consequences of malaria in pregnancy (MIP) in stable transmission countries.² In 1993, Malawi was the first country in Africa to change its malaria policy, adopting the WHO strategy.³ Today, nearly every sub-Saharan African nation with stable malaria transmission has adopted a malaria policy that is based on the WHO three-pronged strategy for MIP prevention

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and control.

This paper discusses MIP-related policy experiences from five countries ranging from affecting policy change in Burkina Faso to moving from MIP policy adoption through implementation in Kenya, Madagascar, Tanzania and Uganda. We also discuss lessons learned and recommendations for future policy direction for the prevention and control of MIP.

Background

Prior to the three-pronged strategy, WHO recommended an initial full treatment dose of an antimalarial followed by weekly chemoprophylaxis, usually with chloroquine (CQ). This policy was challenged by a number of factors including: (a) drug resistance to CQ; (b) poor compliance among pregnant women with a weekly regimen of CQ; and (c) adverse effects, especially pruritis, associated with CQ. Weekly chemoprophylaxis is no longer recommended.⁴

Since the majority of pregnant women in Africa attend ANC at least once during their pregnancy, delivery of IPTp and promotion of ITNs during routine ANC visits is an important opportunity to reach pregnant women. Since MIP is both a maternal and newborn health issue, the partnership between reproductive health and malaria control programs is critical to ensure that policies and service delivery guidelines are integrated and effectively implemented. Health policies are meaningful only when they are implemented at the point of service delivery. Reproductive health programs play the vital role of providing the antenatal care platform for MIP services.

Malaria control programs play the key role of providing technical oversight for all malaria interventions.

While many African countries have made great strides in addressing the prevention and case management of MIP, no countries have achieved the global targets set during the Roll Back Malaria (RBM) Summit in Abuja, Nigeria, in 2000, which stated that by the end of 2005, 60% of pregnant women at risk for malaria would have access to IPTp and ITNs.⁵ The new RBM goals have set targets for reducing the world's malaria burden by 50%, and for ensuring that 80% of pregnant women receive at least two doses of IPTp and sleep under an ITN by 2010.⁶ Achieving this will require a collective sense of urgency and commitment among countries and partners.

Jhpiego's Approach

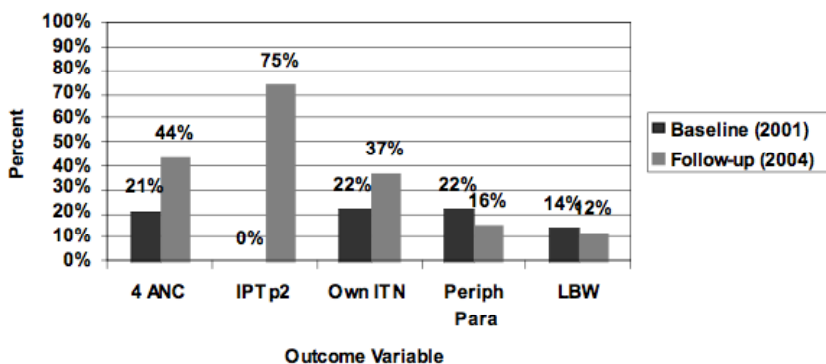
Since 2002, Jhpiego, an Affiliate of the Johns Hopkins University, has helped to establish appropriate MIP policies in 10 countries and supported program implementation for MIP prevention and case management in 12 countries across Africa. Jhpiego's approach promotes the WHO three-pronged strategy across the continuum of care (from community to facility) for the prevention and case management of MIP in areas of stable malaria transmission.

The key elements of Jhpiego's technical approach across the continuum of care include:

1. Strengthening the partnership between reproductive health (RH) and malaria control programs;

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Figure 1. ANC and MIP Related Outcomes in Burkina Faso; Baseline (2001) and Follow-up (2004)



P Values where statistically significant: 1) 4 ANC: $P=0.01$; 2) IPTp2: $P=0.02$; 3) Periph Parasitemia: $P<0.0001$.
Data source: ... Sirima, Cotte, et al, Malaria Prevention During Pregnancy: Assessing the Disease Burden One Year after Implementing a Program of IPT in Koupela District, Burkina Faso, *Am. J. Trop. Med. Hyg.*, 75(2), 2006, pp. 205–211

2. Improving provider and supervisor skills;
3. Creating and applying performance standards to improve service delivery;
4. Strengthening record keeping, reporting and decision-making;
5. Advocating for MIP commodities including SP, ITNs and drugs for treatment; and
6. Mobilizing communities to use MIP interventions.

First, Jhpiego focuses on strengthening the enabling environment for successful MIP program implementation by assisting in developing relevant policies, guidelines and clinical standards. This is really the underpinning of MIP prevention and control since it sets not only the policy but also the standards that will support program implementation. Second, Jhpiego reaches communities to engage women and their families early in pregnancy to increase understanding of the effects of MIP

and increase demand for ANC services. Third, Jhpiego works with health facilities to improve the delivery of focused ANC services that integrate MIP. Jhpiego's approach is straightforward yet comprehensive and is adapted to the current situation and particular needs of each country; each key element is applied within this framework.

Implementation in Five African Countries

This section reviews five African nations' (Burkina Faso, Kenya, Madagascar, Tanzania and Uganda) experiences in MIP policy adoption and implementation. It also highlights the dynamic relationship between policy adoption and program implementation; specifically, how program results influence policy adoption, review and revision. In each of these countries, Jhpiego has provided technical assistance to: (a) test innovative concepts for MIP programming or

(b) apply proven practices at a national level. Where innovative concepts have been tested and applied successfully, these proven methodologies have been adopted nationally and implemented on a wide scale. Where efforts have focused nationally, program results are guiding policy direction.

Burkina Faso (2001- 2004)

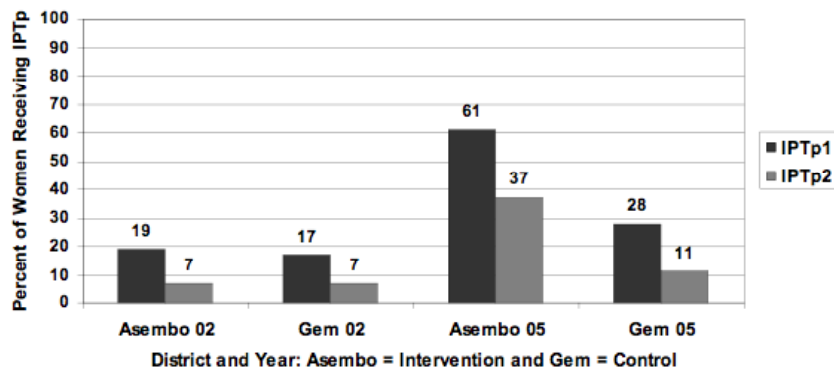
In 2001, Jhpiego, through the United States Agency for International Development (USAID) Maternal and Neonatal Health Program, in collaboration with the Centers for Disease Control and Prevention (CDC) and the Centre National de Recherche et Formation sur le Paludisme, an institution within the Ministry of Health, undertook one of the first pilot studies of MIP prevention and case management in West Africa. At the time, there was very little evidence from West African nations showing the effectiveness of IPTp as a preventive measure for MIP.

The pilot study was conducted in the

Koupéla district and tested the acceptability, feasibility, and effectiveness of implementing IPTp using ANC as the platform for service delivery. The project also assessed the effect of deliberate community involvement on improving maternal and newborn health outcomes. Key elements applied included: a) fostering partnerships between reproductive health and malaria control programs, including policy promotion; b) training and supervision; c) quality improvement; d) community mobilization; and e) improved record keeping. Twenty-three health facilities were included in the pilot study and eight sites were selected for the baseline and follow up assessment. A total of 2,014 women were enrolled in the assessment.

Results of the pilot study revealed significant increases in the proportion of pregnant women attending four or more ANC visits, receiving 2 doses of IPT, and owning an ITN.⁷ Noteworthy health impacts were documented at follow-up in the form of significantly reduced number of cases of periph-

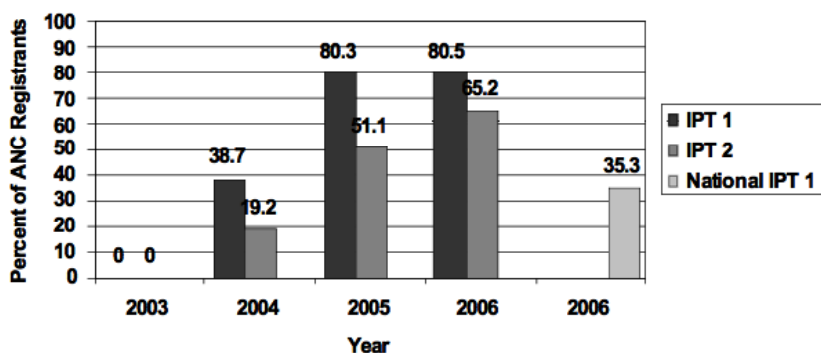
Figure 2. IPTp Coverage Among Recently-delivered Mothers Who Attended ANC in Intervention and Control Districts in Kenya; Baseline (2002) and Follow-up (2005)



Data Source: Ouma et al, TMIH ; 2007

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Figure 3. IPT Coverage Among ANC Clients at Five Facilities in Madagascar; Baseline (2003) and Follow-up (2004-2006)



Data Source: Data from five sites provided by National Malaria Control Program in the MOH/FP. These data are derived from health facilities. National Data is from, PSSIP 2006; health facility data

eral parasitemia and low birth weight. Moreover, the proportion of pregnant women with anemia was significantly lower in 2004 (59.3%) compared with those in 2001 (75.8%; RR= 0.78, P =0.003). The proportion of pregnant women with moderate-to-severe anemia was also significantly lower in 2004 (3.5%) when compared with pregnant women in 2001 (11.0%; RR= 0.32, P = 0.004). (data not shown).

The result of this pilot study directly influenced policy adoption for MIP including IPTp, ITNs and prompt case management in Burkina Faso in 2005. Since policy adoption, the program approach applied during the pilot study in the Koupéla district has been replicated in new districts throughout Burkina Faso.

Kenya (2001-2005)

Kenya adopted its MIP policy in 1997; however, program implementation did not commence until 2002. Baseline data for MIP did not exist and programming tools were not developed

until 2002. In 2002, the Division of Reproductive Health (DRH) promoted and introduced focused ANC as a platform to deliver comprehensive healthcare services to pregnant women including MIP prevention. Jhpiego collaborated with the MOH, the DRH, and the Division of Malaria Control (DMOC), to support this effort. Key elements applied included: a) fostering partnerships between DRH and DMOC; b) training and supervision; and c) community mobilization. The initial clinical phase targeted four districts followed by scale up to an additional 12 districts and then ultimately 23 endemic districts throughout the country. The community component targeted three districts, including Asembo. CDC conducted a pre/post evaluation in one intervention and one control district and included a cross-sectional household survey of women who recently delivered at baseline (2002) and follow-up (2005).

Figure 2 illustrates that uptake of IPTp1 and IPTp2 in the intervention district increased significantly ($p < 0.05$), suggesting that training combined with

community sensitization contributed to increased uptake of IPTp among pregnant women, although coverage of the second dose of IPTp did not increase as dramatically as coverage with the first dose. The smaller increase in the uptake of IPTp2 could be due to the majority of pregnant women attending ANC late in pregnancy.⁸ In addition, women from Asembo were more likely than women from Gem to attend four or more ANC visits and significantly more likely to state that SP is helpful and safe during pregnancy (data not shown; $p < 0.001$).

In Kenya, the success of MIP programming using a platform of focused ANC influenced expansion of the program and policy direction; specifically, the platform discussed integration of new technical areas including HIV/AIDS and tuberculosis (TB). In 2007, Kenya updated its malaria policy, which now includes promotion of three doses of IPTp for HIV positive pregnant women. The National AIDS and Sexually Transmitted Infection Control Program and the National TB program collaborate closely with the DOMC and DRH to support integrated imple-

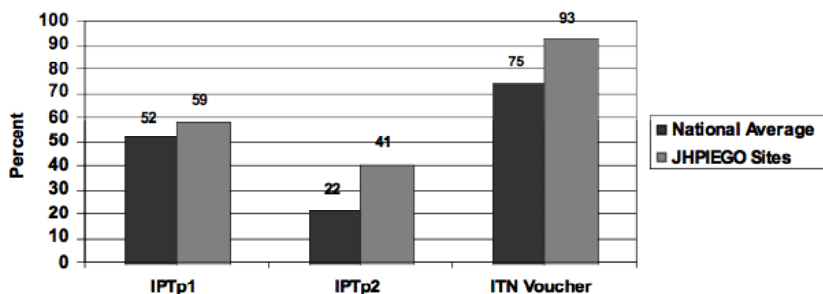
mentation.

Madagascar (2003-2006)

From 2003 - 2005, Jhpiego, in collaboration with CDC and WHO, supported the government to establish its MIP policy. During this same period, the Madagascar Ministry of Health of Family Planning and of Social Protection (MOH/FP) identified five health facilities in a highly endemic province to initiate MIP prevention and control using ANC as the platform for service delivery. Jhpiego provided technical assistance in this effort; key elements supported included: a) fostering partnerships; b) training and supervision; and c) quality improvement. This effort led to wide-scale implementation of IPTp throughout Madagascar by other partners, including WHO. Program results revealed substantially better IPTp uptake at program facilities compared with the national average (Figure 3).⁹

Jhpiego also supported the development of national service delivery guidelines and clinical performance standards for malaria including MIP. With national guidelines and clinical perfor-

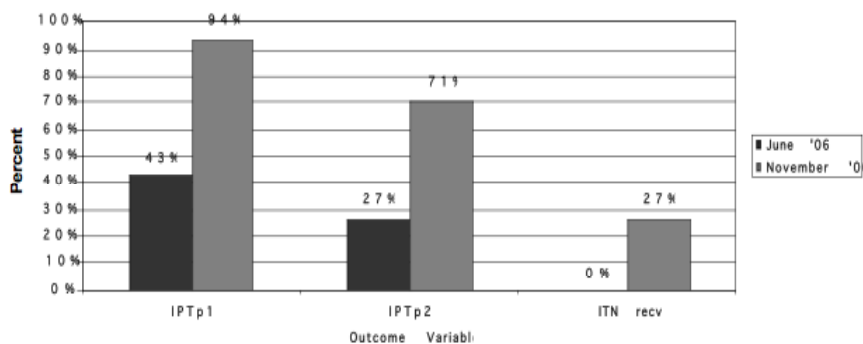
Figure 4. IPTp Uptake and Receipt of ITN Vouchers Among ANC Clients in Tanzania; National Baseline (2004) and Jhpiego Follow-up (2007)



Data sources: Baseline=DHS (2004); Follow-up=Tanzania HMIS (2006-2007)

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Figure 5. IPTp Uptake and Provision of ITNs at Five Facilities in Uganda: Baseline (May 2006) and Follow-up (November 2006)



Data Source: ACCESS Program Brief; 2007

mance standards in place, managers and providers had the tools to improve the quality of care for their clients; specifically, they were able to identify gaps in performance and plan actions to close those gaps. The success of this effort in Madagascar led to wide scale adoption of this approach known as performance and quality improvement.

Tanzania (2004-2007)

Tanzania adopted its MIP policy in 1999, however, MIP implementation efforts did not commence until 2003. Jhpiego supported implementation efforts; key elements applied to date include: a) fostering partnerships between reproductive and child health and malaria control; b) training and supervision; c) preservice education; d) improving monitoring and record keeping; e) advocating for commodity availability; f) community mobilization; and g) quality improvement. Training directly supported rollout of Tanzania's national MIP policy through focused ANC. Like Kenya, implementation results led to expansion of the program into new technical areas including HIV/AIDS

and syphilis prevention. Jhpiego's support to strengthen preservice education in Tanzania's 51 nursing and midwifery training institutions led to the adoption of a national curriculum supporting focused ANC as a platform for comprehensive health services, including MIP.

Comparisons of IPTp uptake and provision of ITNs at baseline (national average) and follow-up (Jhpiego sites) are provided in Figure 5 above. IPTp uptake and receipt of ITN vouchers among ANC clients at 102 Jhpiego-supported facilities as of October 2007 were higher than the national average in 2004 when the 'Access to clinical and community, maternal, neonatal and women's health services' (ACCESS) Program began, as documented by the Tanzania Demographic and Health Survey. Although Jhpiego does not manage the national voucher scheme, the program contributes to it through training of ANC providers in improved counseling on use of ITNs and the importance of providing vouchers for ITNs.^{10, 11, 12} Since about a quarter of facilities represented in Figure 4 experienced stock-outs of SP during the reporting period, IPTp coverage according to presence/

absence of SP stock-outs was stratified. Among facilities with no reported stock-outs (n=76), IPTp1 and IPTp2 coverage was 78% and 57%, respectively, illustrating the adverse effects of stock outs on IPTp coverage. Jhpiego is working with other stakeholders to improve the availability of SP.

Uganda (May-November 2006)

Uganda adopted its MIP policy in 1998. In an effort to increase MIP service delivery through the faith-based sector in Uganda, Jhpiego collaborated with the MOH and IMA World Health to test and introduce focused ANC services including MIP in five health facilities in Kasese District in 2006. This directly supported implementation of the national policy and expanded the provider network to increase coverage for pregnant women through the faith-based sector. Key elements supported included: a) fostering partnerships between faith-based organization and the MOH; b) training and supervision; and c) community mobilization. The implementation augmented existing public sector efforts, and the MOH led in coordination with faith-based leaders. A pre/post program evaluation was conducted by the USAID ACCESS Program, with results displayed in Figure 5.

The evaluation revealed improved outcomes related to prevention of MIP, including increased IPTp uptake and increased receipt of ITNs by ANC clients.¹³ Following implementation of this program, the MOH applied Jhpiego's approach to additional districts throughout Uganda with support from

other partners including WHO.

Lessons Learned: Policy to Implementation

In each of the five countries showcased, MIP implementation efforts have influenced policy dialogue, including engagement with new technical partners leading to comprehensive and integrated implementation. Each country's program has yielded important lessons learned that should be considered as countries continue to review and implement policies for MIP prevention and case management. This section highlights these lessons learned.

Policies and guidelines do not roll themselves out

Evidence for their effectiveness and feasibility must be generated. Technical support is needed to build health system capacity and community acceptance for the policies that are established. The dynamic relationships between national policies and program implementation cannot be understated. While policies are in place to support program implementation, outcomes generated through program implementation directly influence further development of policies in place and new policies when appropriate.

Involve the communities from the start

There is increasing recognition of the importance of involving communities in their own healthcare from plan-

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ning, at the policy level, right through to implementation. It is essential that women and their families are sensitized to MIP prevention and case management, and mobilized to demand services to complement the training of health providers. Collaboration with HIV partners is important, too, recognizing that pregnant women should be attending ANC early to be tested for HIV and receive appropriate care.

ITNs and Case Management: The Forgotten Prongs

MIP programs must do a better job of incorporating ITNs and case management into program implementation. This means policy makers must support this integrated effort. To date, IPTp uptake has been a main focus of MIP country programs. However, ITN use and correct case management are recognized as essential components of a comprehensive MIP program. Engagement with ITN partners can help to increase awareness among pregnant women about the importance of ITN use, and increase awareness among those partners about the role of ANC in routine distribution (“keep-up”) of ITNs. Promoting the role of national RH programs to manage ITN distribution through ANC will help streamline program support and avoid vertical program implementation and disjointed policy implementation. Increased support to help monitor treatment of pregnant women with malaria will provide insight about the adverse effects of artemisinin-based combination therapies (ACTs) for treatment, which is still fairly nascent. As MIP programs expand and scale up, full recognition and inclusion of each ‘prong’ into policy development and programming is essential.

Advocate for stronger MOH partnerships

Strong partnerships between reproductive health and malaria control programs are only realized when malaria control programs (and other technical programs, e.g. HIV, TB, Diagnostics and Lab) understand the importance of strengthening maternal and newborn health systems for improved outcomes in MIP, HIV, TB, etc. Planning between RH and malaria control must be harmonized to support implementation.

Advocacy efforts are a key component to MIP programming and must begin at the policy level and continue throughout program implementation. Advocacy begins with the national RH and national malaria control programs to ensure effective integration, leadership, and promotion of integrated service delivery. Advocacy efforts should then continue with all stakeholders at the national, regional, district and community levels. It is critical to have an MIP “champion” in the RH Department and the malaria control program.

No product, no program

As countries transition to adoption and implementation of ACTs for treatment, ensuring that SP continues to be delivered to the ANC clinic is of critical importance for pregnant women. Providing appropriate drugs for treatment is also necessary. This is an important policy issue affecting many countries throughout Africa. If stock-outs of SP or other essential supplies are a problem, it is essential to advocate with the MOH and other stakeholders involved in the management of this commodity to improve the supply chain.

Integrate monitoring and record keeping into programs

Routine monitoring of key MIP-related indicators helps demonstrate program trends and inform the direction of the program. This requires a harmonized effort among technical leaders including those of malaria and RH. Record keeping of supplies is also important to ensure that supplies (e.g. SP, ITNs) are ordered routinely and in adequate quantities. It is best to use and strengthen national health management information systems (HMIS) to the greatest extent possible rather than develop new data systems that may overburden service providers. Collaboration with monitoring and evaluation partners to ensure effective data collection, analysis and use by facilities, districts and national programs for programming should be a key component of MIP prevention and control programs. Recordkeeping must be addressed during preservice and inservice training of providers and supervisors.

Incorporate MIP into preservice

For ultimate sustainability and cost effectiveness, MIP programs need to be incorporated into preservice education for medical, nursing and midwifery schools. Preservice provides more 'bang for the buck' in healthcare improvement since it augments inservice training and alleviates the burden of routine training. Policy makers should advocate for inclusion of MIP into preservice education to yield lasting results for MIP prevention and case management.

Target the public and private sector together

To achieve country goals and global

targets, programs must target both the public and private sector, which will bring the widest reach. Policy makers can direct this effort with clear guidance (e.g. policy guidelines) that outlines multi-sector program implementation. In Tanzania, the faith-based sector has been part of all MIP programming efforts from the inception. This has yielded greater program coverage and resulted in a more capable work force to address MIP prevention and case management. The private commercial sector is also becoming more involved in addressing MIP prevention and control and should be targeted and utilized as programs scale up.

Comprehensive Service Delivery Systems

MIP programming, as a component of MNH services, must advocate for and work towards improvements in the existing health system in order to ensure that pregnant women receive appropriate quality services- especially in the context of emerging issues affecting malaria prevention and control. A comprehensive and flexible approach – including community engagement and mobilization – is essential to support MIP programming efforts. As pointed out earlier, the partnership between RH and malaria control, in coordination with HIV, TB and Lab Diagnosis as programs expand, is the foundation of this effort and should be fostered from the beginning and through implementation. This effort requires strong leadership and clear policy guidelines to support program implementation.

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Future Challenges for MIP Policy and Programming

In the last five years, the ‘face’ of malaria has changed dramatically and will influence national policies for MIP. As countries continue with program implementation, the following factors need to be considered, as policies are reviewed, in the context of each country to ensure the most effective care for pregnant women and their newborns. Therefore the MIP policy process is an ever-evolving one, and stakeholders need to be on the cutting edge of changes – epidemiological, organizational, and economic – that demand for updating and changing of policy.

Introduction of new treatment drugs

As countries move forward with the adoption and implementation of artemisinin combination therapy (ACT) drugs for treatment of malaria, it is important to outline and disseminate correct policy guidance concerning pregnant women to program managers and healthcare providers. For example, as countries shift from sulfadoxine-pyrimethamine (SP) to ACTs for treatment, policies need to support the continued availability of SP as an essential drug for IPTp through ANC.

Addressing MIP in low transmission settings

WHO currently recommends use of insecticide treated nets and prompt treatment of malaria for pregnant women living in low malaria transmission settings. As prevalence rates for malaria decline, with the introduction of new treatment drugs (ACTs) and preven-

tion tools (e.g. long lasting insecticide treated nets), it will be important to assess burden of malaria among pregnant women in these populations and determine the most appropriate prevention and control mechanisms, which directly impact policies.

HIV/Malaria Co-interactions

Co-infection with malaria and HIV leads to exacerbated negative effects for pregnant women and their newborns. HIV positive women have a reduced immunity to malaria infection, and co-infection with malaria and HIV results in an increased viral load.¹⁴ WHO recommends at least 3 doses of IPTp, use of ITNs, and prompt case management for co-infected pregnant women in areas of stable malaria transmission. Additionally, women receiving cotrimoxazole during pregnancy should not receive IPTp.¹⁵ It is important for HIV and malaria partners to work together to outline appropriate integrated policies and guidelines.

Additionally, routine monitoring, as an integrated component of MIP programs, will help countries not only monitor program results but also provide the necessary data to make decisions for future policy recommendations. Monitoring efforts should be augmented when possible with evaluations that comprehensively examine malaria prevention and control implementation outcomes, which will provide insight to what has been achieved and also insight to the existing challenges and changes in MIP prevention and control. This is critical, now more than ever, in the changing ‘face of malaria’.



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