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SUPPLEMENT ARTICLE

Evolution of malaria in pregnancy control: Jhpiego's 10-year contribution

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ABSTRACT

Malaria continues to be a life-threatening illness throughout Sub-Saharan Africa, with pregnant women and children being particularly vulnerable and an estimated 10 000 women and 200 000 newborns dying each year as a result of malaria in pregnancy (MIP). Since 2004, WHO has supported a three-pronged MIP approach: (1) intermittent preventive treatment with sulfadoxine-pyrimethamine; (2) use of insecticide-treated bed nets; and (3) effective case management. The present article identifies benchmarks in Jhpiego's 10-plus years of MIP experience at the regional and national levels that have contributed to its global MIP leadership and aligned programs and policies with global approaches toward malaria elimination. As countries continue to develop and expand MIP programming, support will continue to be essential in the following eight MIP program areas: integration, policy, capacity development, community engagement, quality assurance, commodities, monitoring and evaluation, and financing.

1. Introduction

The *2013 World Malaria Report* estimated that malaria led to 207 million cases of malaria illness and an estimated 627 000 deaths in 2012 worldwide [1]. Ninety percent of all malaria deaths occur in Sub-Saharan Africa due to infections caused by the *Plasmodium falciparum* parasite. Pregnant women and young children are among the most vulnerable populations. Each year, approximately 25 million African women become pregnant in malaria-endemic areas of Africa with intense transmission of *P. falciparum* [2]. An estimated 10 000 of these women and 200 000 of their newborns die as a result of malaria in pregnancy (MIP) [3,4].

In areas of stable malaria transmission, WHO supports a three-pronged approach to addressing MIP, ideally delivered through antenatal care: (1) intermittent preventive treatment (IPTp), with sulfadoxine-pyrimethamine (SP) (IPTp-SP); (2) use of insecticide-treated bed nets (ITNs), specifically long-lasting insecticide-treated nets (LLINs) and (3) effective case management of malaria illness [5]. WHO's three-pronged MIP approach, officially made policy in 2004, marked a pivotal change in MIP programming from the use of weekly chemoprophylaxis.

In 2000, in Abuja, Nigeria, the Roll Back Malaria (RBM) Partnership set a target coverage rate for these three interventions of 80% by 2010 [6]. Since then, the RBM partnership has set targets for IPTp uptake and universal coverage for LLINs at 100% [7]. The US President's Malaria Initiative (PMI) targets are 85% for both IPTp and ITN coverage for those countries with PMI support [8]. While 39 countries in Sub-Saharan Africa have MIP policies in place, most countries are far from achieving target coverage goals for these interventions [9].

For more than a decade, Jhpiego has been a committed partner to the RBM partnership, which includes governments of endemic countries, nongovernmental organizations, donor organizations, and corporate members. Jhpiego has been involved in advancing the MIP global dialogue through the RBM MIP Working Group as an active technical participant since the group's inception and has served as co-chair for seven years. In addition, Jhpiego has provided technical assistance to more than 20 countries to help accelerate malaria prevention and control. The present article presents an historical overview of Jhpiego's MIP programs starting around 2002, reviewing the methods by which Jhpiego has achieved leadership in MIP control. It presents as benchmarks the seminal contributions of Jhpiego in three countries (Burkina Faso, Kenya, and Nigeria) as well as regional MIP efforts in Sub-Saharan Africa. We examine gaps in implementation and key actions required to ensure scale-up of MIP interventions across the region to guide other implementing organizations.

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2. Methods

Jhpiego's MIP programming is represented in the present paper using a case study approach documenting Jhpiego's contribution to major benchmarks in MIP program evolution. Benchmarks were defined as either technical or managerial innovations that moved MIP efforts to the next level of comprehensiveness and expanded coverage of MIP interventions. A start date of around 2002 was chosen because that was when both the MIP working group and the US Agency for International Development's (USAID) Malaria Action Coalition, comprised of USAID's ACCESS and RPM Plus programs, the US Centers for Disease Control and Prevention (CDC), and the WHO/AFRO, began in earnest.

Jhpiego reviewed program activity reports and other publications over a 10-year period to identify and subsequently describe major MIP programming benchmarks. These benchmarks included the following: (1) testing the efficacy of IPTp-SP on a platform of antenatal care (Burkina Faso); (2) integration of focused antenatal care services (FANC), in which providers focus on assessment and actions needed to make decisions and provide care for each woman's individual situation, with MIP nationwide (Kenya); (3) support to regional networks to accelerate MIP implementation (regional); (4) documentation of MIP program implementation processes to learn best practices and bottlenecks (regional); and (5) adaptation of the community-directed intervention (CDI) approach to increase MIP service coverage and overcome service delivery bottlenecks (Nigeria).

Countries and programs were chosen for further analysis based on their contribution to MIP programming both at the country level and regionally. An in-depth review of publications related to target countries in Sub-Saharan Africa, including MIP country program reports, ministry of health (MOH) reports, strategy documents, and peer reviewed articles, was performed to determine what countries did to implement MIP programs, what the results were, and what implementation challenges were faced.

3. Findings

The five benchmark contributions of Jhpiego are shown in Table 1.

3.1. Benchmark 1 (technical): Testing the efficacy of IPTp-SP (Burkina Faso)

In 2001, the Burkina Faso MOH, in collaboration with Jhpiego and the CDC, designed and implemented one of the first pilot programs in West Africa testing FANC as a platform for malaria in pregnancy interventions [10]. A total of 23 health facilities were included in the pilot study, and eight sites were selected for the baseline and follow-up assessment. A total of 2014 women were enrolled in the assessment.

Table 1
Benchmark contributions of Jhpeigo to malaria in pregnancy control.

	Benchmark 1 Testing the efficacy of IPTp-SP (Burkina Faso)	Benchmark 2 Integration of FANC services with MIP nationwide (Kenya)	Benchmark 3 Accelerate MIP implementation (East, Southern and West Africa)	Benchmark 4 Documentation of MIP implementation practices (Regional)	Benchmark 5 Community-directed interventions (Nigeria)
Type	Technical	Technical	Managerial	Technical	Technical
Issue(s)	Bottleneck of IPTp-SP, health workers not following uptake procedures, and health facilities charging for SP treatments.	Integration of Kenya's MOH MIP policy with WHO's FANC model.	Accelerate MIP implementation in East, Southern and West Africa.	Low national coverage of IPTp and ITNs in Sub-Saharan Africa.	Low ANC utilization, poor community attitude toward ANC, and low IPTp and ITN coverage in Nigeria.
Solution(s)	Between 2001 and 2004, eight sites adopted comprehensive, system-wide approach fostering partnerships between reproductive health and malaria control programs; trained and supervised district health staff on quality improvements; community mobilization; and improved record keeping.	• Between 2002 and 2004, developed a two-phase service package called "Focused Antenatal Care and Malaria in Pregnancy" that was expanded to 19 malaria endemic districts. • Fostered partnership between the MOH's Division of Reproductive Health and the Division of Malaria Control. • Trained frontline healthcare providers on FANC. • Provided supportive supervision reinforcing knowledge, skills, and addressing gaps in service delivery • Delivered community sensitization on ANC changes to create awareness	• In East and Southern Africa, five countries developed MIPESA coalition between 2002 and 2005 focusing on best practices learned; fostering relationships between national reproductive health and malaria control programs; and increasing capacity to support MIP programs at all levels. • West Africa established RAOPAG expanding to 10 countries and international partners. • Between 2003 and 2005, facilitating an information exchange between member countries on advocacy, research, MIP prevention and treatment. • Supporting regional expertise through planning and documentation.	Documented best practices and remaining challenges with MIP programs in Zambia, Malawi, and Senegal	Between 2007 and 2011, used two-pronged approach to increase MIP service coverage in Akwa Ibom State to increase access to MIP services through community-directed interventions; trained more than 600 frontline health facilities and 800 community-directed distributors on basic FANC, record keeping and data use for treatment; provided basic supplies to all clinics; and updated ANC registers reflective of MIP indicators.
Results	• Attendance of four or more ANC visits increased from 21% to 44%. • Receipt of two doses of IPTp increased from 0% to 75%. • Peripheral parasitemia decreased from 22% to 15%. • Increased ownership of ITN from 22% to 46%.	• One intervention and one control district. • IPTp1 and IPTp2 increased from 20.3% to 61.7% (intervention) and 9.3% to 28.3% (control). • Attendance at four ANC visits 17.0% (intervention) compared with 6.5% (control).	Repositioned MIP from innovation to a major ANC program component; demonstrated importance of peer influence.	Analyzed and developed eight key MIP program areas essential for health systems when addressing MIP morbidity and mortality rates.	• Five-times increase in intervention arm and three-times increase in control arm with IPTp uptake. • ANC attendance increased using community volunteer referrals. • Elderly community-directed distributors helped mobilize younger women to clinics.

Abbreviations: IPTp-SP, intermittent preventive treatment with sulfadoxine-pyrimethamine; MIP, malaria in pregnancy; ITN, insecticide-treated bed nets; SP, sulfadoxine-pyrimethamine; MOH, ministry of health; FANC, focused antenatal care; ANC, antenatal care; MIPESA, Malaria in Pregnancy East and Southern Africa; RAOPAG, Réseau d'Afrique de l'Ouest contre le Paludisme pendant la Grossesse [Roll Back Malaria's West African Network for the Prevention and Treatment of Malaria in Pregnancy].