

4. Malaria during pregnancy

Abuja target

In the Abuja Declaration African heads of states agreed to achieve by 2005:

- at least 60% coverage of pregnant women at risk of malaria with the most suitable combination of personal and community protective measures
- at least 60% of all pregnant women at risk of malaria, especially those in their first pregnancies, shall have access to intermittent preventive treatment (1).

Malaria infection during pregnancy is a major public health problem in tropical and subtropical regions throughout the world. In most endemic areas of Africa, pregnant women are the main adult risk group for malaria. The main burden of malaria infection during pregnancy results from infection with *Plasmodium falciparum*. The impact of the other three human malaria parasites (*P. vivax*, *P. malariae*, and *P. ovale*) is less clear. Every year at least 30 million women in malarious areas of Africa become pregnant; most of these women live in areas of relatively stable malaria transmission.

The symptoms and complications of malaria during pregnancy differ with the intensity of malaria transmission and thus with the level of immunity acquired by the pregnant woman (2). Since malaria transmission intensity may vary within the same country from areas of relatively stable transmission to areas of unstable or epidemic transmission, the clinical picture of malaria infection during pregnancy may likewise range from asymptomatic to severe, life-threatening illness.

In areas of epidemic or low (unstable) malaria transmission, adult women have not acquired any significant level of immunity and usually become ill when infected with *P. falciparum*. For pregnant women in these areas the risk of developing severe malaria is 2–3 times higher than that for non-pregnant women living in the same area. Maternal

death may result either directly from severe malaria or indirectly from malaria-related severe anaemia. In addition, malaria may result in a range of adverse pregnancy outcomes, including low birth weight, spontaneous abortion, and neonatal death (Figure 4.1).

In areas of high and moderate (stable) malaria transmission, most adult women have developed sufficient immunity that, even during pregnancy, *P. falciparum* infection does not usually result in fever or other clinical symptoms. In these areas, the principal impact of malaria infection is malaria-related anaemia in the mother and the presence of parasites in the placenta. The resulting impairment of fetal nutrition contributes to low birth weight and is a leading cause of poorer infant survival and development (Figure 4.1). In areas of Africa with stable malaria transmission,

Strategic framework for malaria control during pregnancy in WHO Africa Region

To reach the Abuja Summit goal^a, a three-pronged approach is recommended:

- Intermittent preventive treatment
- Insecticide-treated nets
- Effective case management of malarial illness.

a: The original Abuja declaration also recommended chemoprophylaxis, but present WHO and RBM policy strongly recommends IPT – and not chemoprophylaxis – for prevention of malaria during pregnancy.

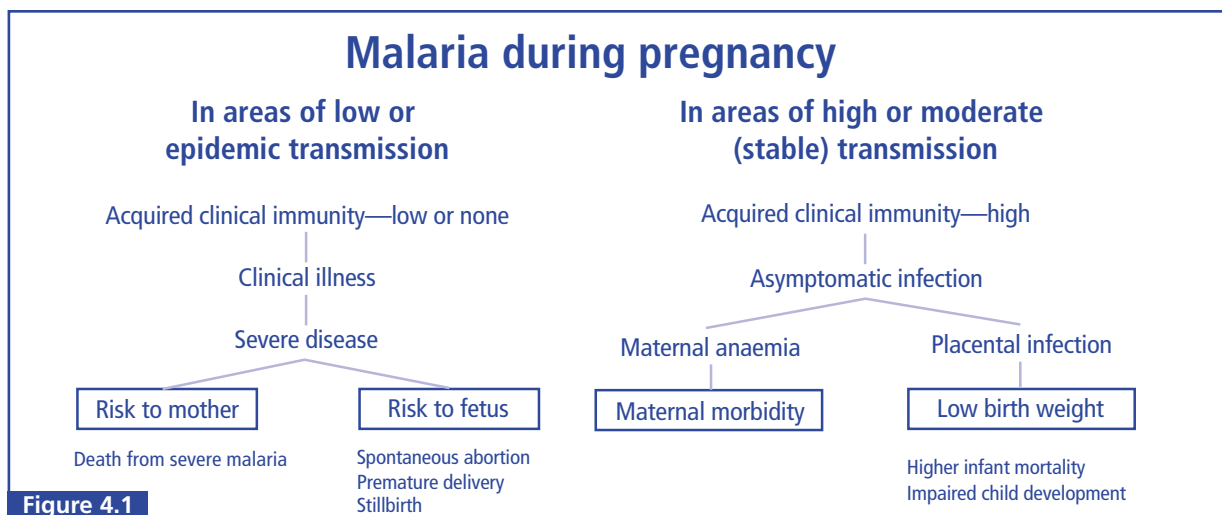


Figure 4.1

P. falciparum infection during pregnancy is estimated to cause an estimated 75 000 to 200 000 infant deaths each year (3).

Despite the toll that malaria exacts on pregnant women and their infants, this was – until recently – a relatively neglected problem, with less than 5% of pregnant women having access to effective interventions. During the past decade, however, potentially more effective strategies for prevention and control of malaria in pregnancy have been developed and shown to have a remarkable impact on the health of mothers and infants.

4.1

Evidence

Intermittent preventive treatment (IPT)

For many years WHO recommended that pregnant women in malaria endemic areas should receive an initial antimalarial treatment dose on their first contact with antenatal services, followed by weekly chemoprophylaxis (given at less than therapeutic dose) with an effective and safe antimalarial drug (4). In most countries in Africa, chloroquine (CQ) has been the drug of choice. However, the emergence and spread of CQ-resistant *falciparum* malaria, poor patient compliance with multiple doses, and a high incidence of CQ-induced pruritus have limited the effectiveness and hence the implementation of this policy.

In 2000, the WHO Expert Committee on Malaria recommended that intermittent treatment with an effective, preferably one-dose, antimalarial drug, should be made available as a routine part of antenatal care to women in their first and second pregnancies in highly endemic areas (5). At present, sulfadoxine–pyrimethamine (SP) – given at a therapeutic dose – is the single-dose antimalarial with the best overall effectiveness for prevention of malaria in pregnancy in areas with high transmission, and low resistance to SP. Other antimalarials are being evaluated for potential use in IPT.

Studies in Kenya (6,7) and Malawi (8) have shown that IPT with at least two treatment doses of SP is highly effective in reducing the proportion of women with anaemia and placental malaria infection at delivery. The benefits of IPT for both maternal and infant health have been seen in a range of different malaria transmission settings (Figures 4.2–4.4).

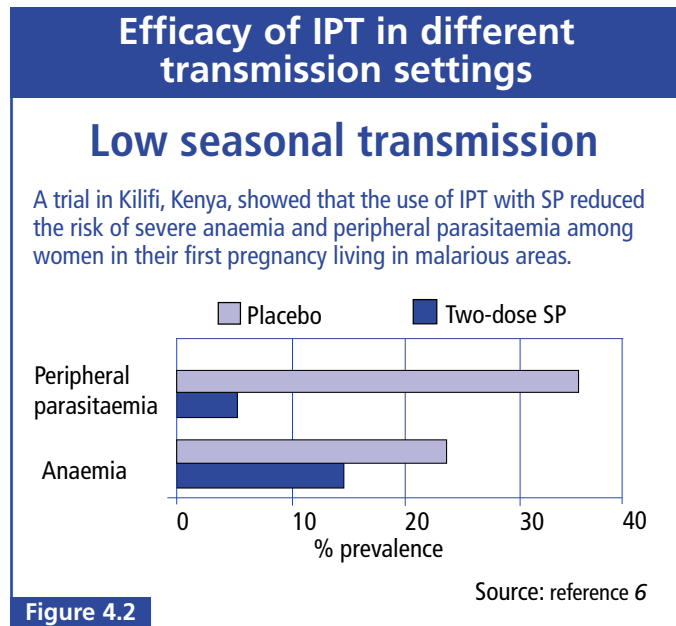


Figure 4.2

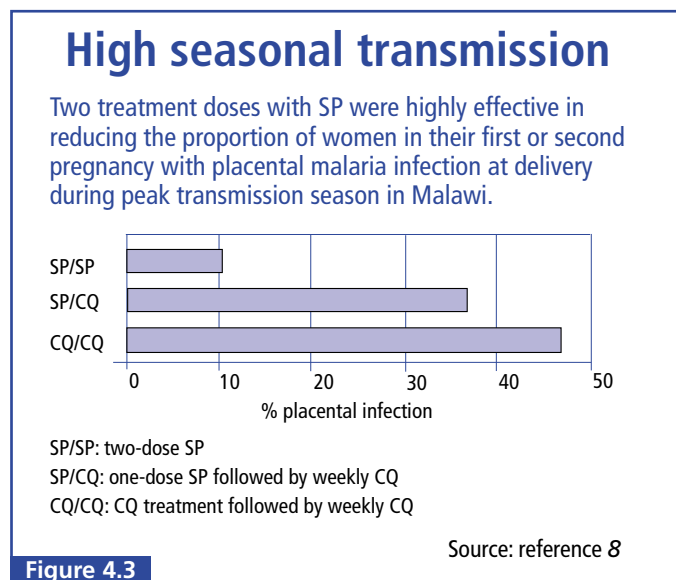


Figure 4.3

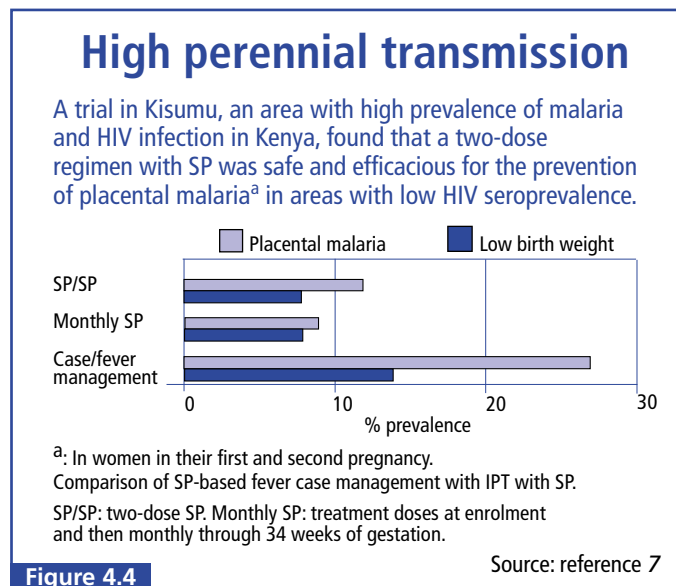


Figure 4.4

ITN use among women in their first four pregnancies reduced LBW and premature birth by 25%

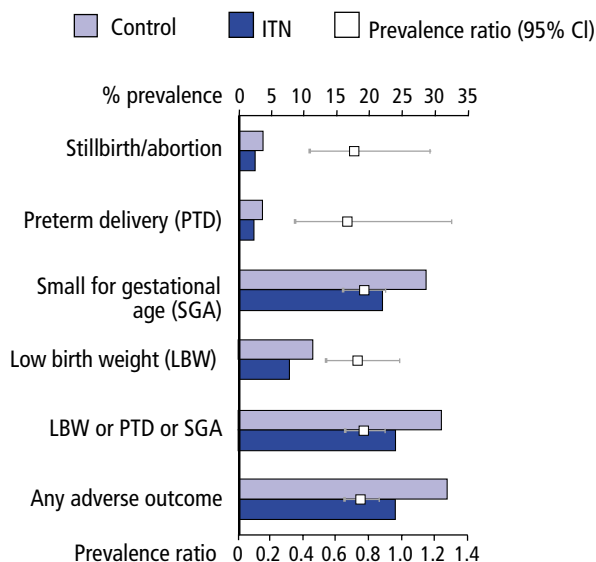


Figure 4.5

Source: reference 11

Most women in Africa south of the Sahara attend an antenatal clinic at least once

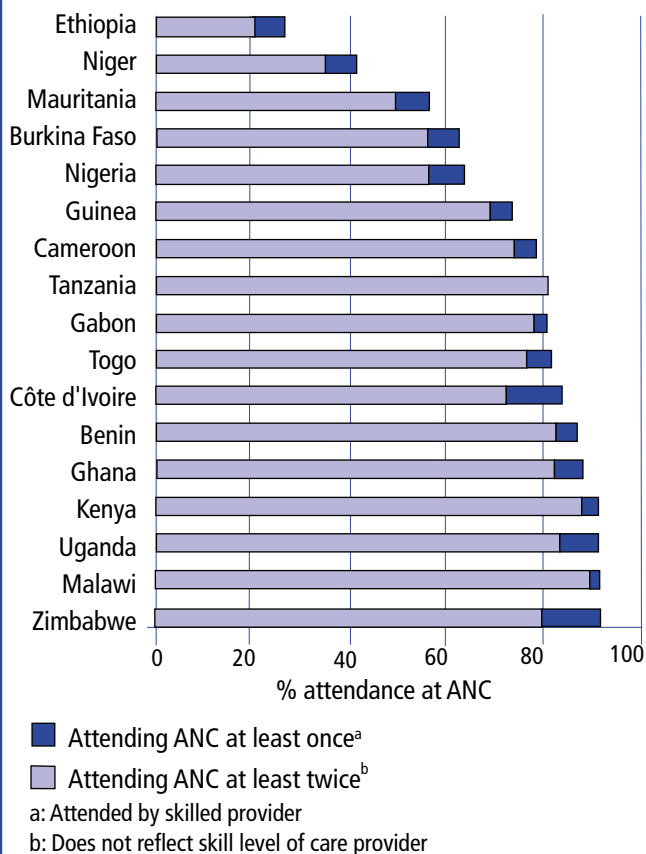


Figure 4.6

Source: DHS, 1998–2001

Insecticide-treated nets

If used during pregnancy in areas of stable malaria transmission, ITNs reduce the overall risk of morbidity and mortality among pregnant women and their infants. A trial in the Gambia found that, during the rainy season in villages where ITNs were used, the prevalence of malaria infection among pregnant women was lower and fewer babies were classified as premature (9). Further evidence comes from a recent study in a highly malarious area of Kenya. During the first four pregnancies, women who were protected by ITNs at night gave birth to 25% fewer premature or small-for-gestational-age babies than women who did not sleep under ITNs (10) (Figure 4.5).

Case management of malaria illness

Malaria in pregnant women requires immediate treatment, focusing on complete cure of the infection. Each country in malaria-endemic areas of Africa needs a policy that guides effective management of malaria in pregnant women. Collaboration between malaria control programme and reproductive health programme staff can facilitate the development of systematic management protocols and drug supply strategies (11).

Cost-effectiveness

Weekly CQ chemoprophylaxis was compared with two-dose IPT using SP in primigravidae in an area of moderate to high malaria transmission: IPT-SP proved to be more cost-effective than CQ chemoprophylaxis, largely because of lower costs and higher compliance with SP (12). In a further cost-effectiveness analysis, three different SP regimens were compared with febrile case management using SP for a hypothetical cohort of 10 000 pregnant women in Kenya. The results suggested that the two-dose SP regimen (when the costs only of antenatal care are considered and at HIV seroprevalence below 10%) would be the least expensive strategy for preventing low birth weight (13).

ITN use by children has been shown to be cost-effective in several settings (14,15). The substantial benefit of ITNs in reducing the burden of malaria during pregnancy makes it likely that the cost-effectiveness of ITN use by pregnant women will be of similar attractiveness to that for children.

4.2

Progress

Antenatal care

WHO recommends that IPT be administered to pregnant women during routine visits to antenatal clinics. As recent surveys confirm, at least two-thirds of pregnant women in most countries do have access to, and use, antenatal care, and most of them attend antenatal clinics at least twice (Figure 4.6). The high level of antenatal care coverage and use provides a unique opportunity to deliver prevention packages to pregnant women in the Africa region.

Prevention with IPT and ITNs

Coverage of pregnant women with IPT and ITNs is a fundamental part of prevention of malaria during pregnancy. Although there are examples of successful delivery of IPT and ITNs through antenatal clinics, large-scale programmes to deliver these prevention tools to pregnant women are only now being developed. Thus, data on IPT and ITN coverage are limited at present.

Surveys conducted on a national scale indicate that net use among women of reproductive age (15–49 years) – an indication of use by pregnant women – remains very low. Among pregnant women, coverage with any net (treated or untreated) was less than 10% in three of the four countries for which recent data were available. Coverage with ITNs in these three countries was even lower, at 3% or less (Figure 4.7). As countries accelerate efforts to control malaria during pregnancy, ITN coverage is expected to increase.

4.3

Challenges

Bottlenecks

Timely antenatal clinic attendance is key for delivering the prevention package to pregnant women. Some 40% of pregnant African women present for the first time to antenatal clinics in the second trimester of pregnancy, and about 25% come for the first time in the third trimester (16) (Figure 4.8). This means that at least the first dose of IPT could be given in time to most pregnant women. The ITN part of the prevention package delivered during the first antenatal

Use of ITNs by pregnant women is a fundamental part of the Strategic Framework for Africa

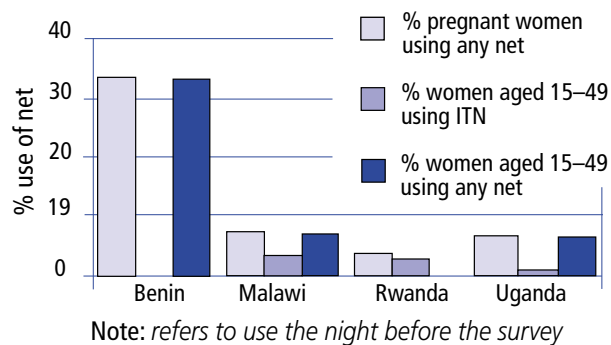
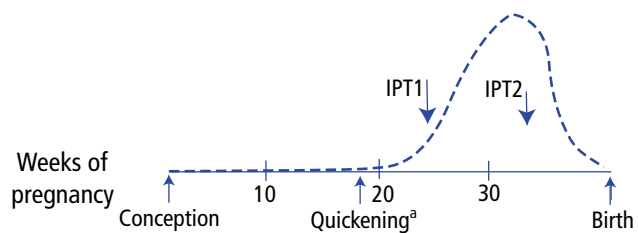


Figure 4.7

Source: DHS, 2000–2001

Timing of intermittent preventive treatment



a: Quickening is the first noted movement of the fetus

When do pregnant women attend antenatal clinics?

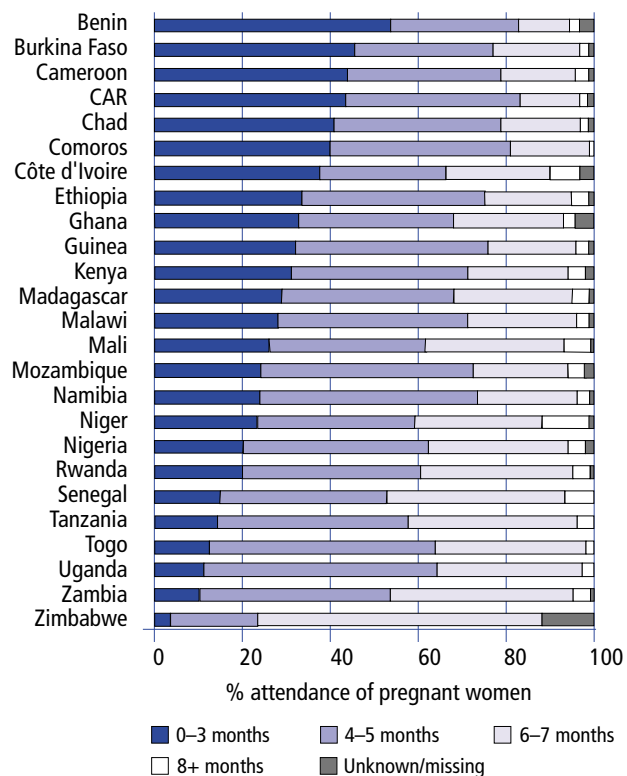
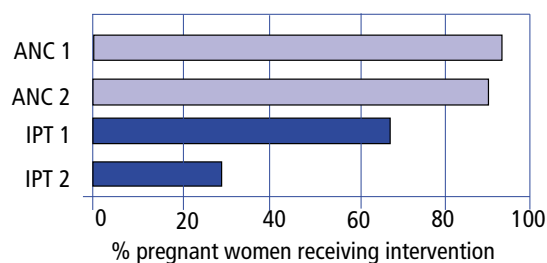


Figure 4.8

Source: reference 16

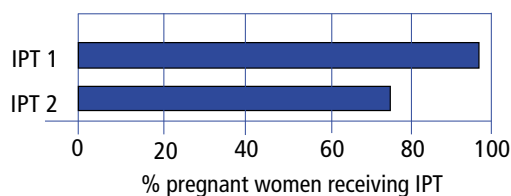
Malawi demonstrates the feasibility of achieving high coverage with two doses of SP

In 2000, less than half of pregnant women attending ANC received the full course of IPT



ANC 1 and 2: Proportion of women attending ANC at least once or twice

Follow-up surveys in the Blantyre district in late 2002 indicate high coverage with two doses of SP

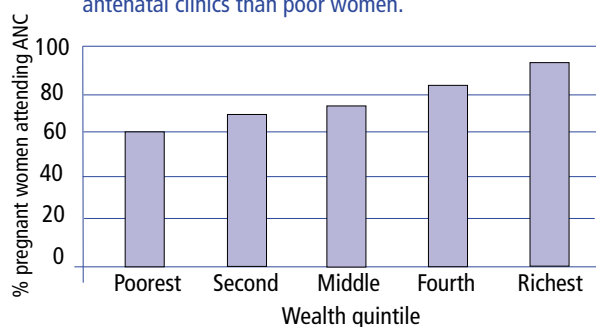


Sources: DHS 2000 and Malawi Ministry of Health, 2003

Figure 4.9

Does household wealth affect antenatal care?

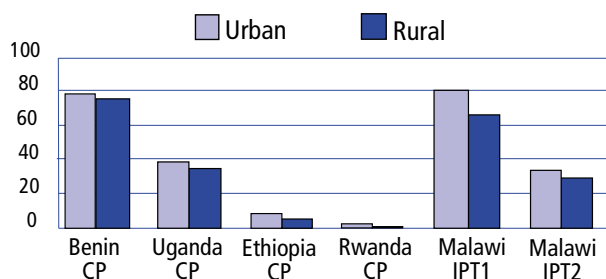
Across 22 countries in Africa south of the Sahara, rich women were about 1.5 times more likely to attend antenatal clinics than poor women.



Source: reference 16

Figure 4.10

Coverage with chemoprophylaxis/IPT in pregnant women is lower in rural areas



Note: CP= chemoprophylaxis

Source: DHS, 1999–2001

Figure 4.11

clinic visit would provide additional protection for the mother during the remainder of the time of pregnancy and into the post-partum period, as well as protection for the newborn through at least the first year of life.

Overcoming challenges

High coverage with antenatal care, i.e. a minimum of two visits to an antenatal clinic, does not necessarily translate into full coverage with IPT. However, a multidisciplinary team in the Blantyre district in Malawi (population about 950 000, with approximately 35 000 births annually) focused from mid-2001 through 2002 on resolving barriers to complete coverage with IPT. Improved education about the benefit of IPT and modified recommendations for the scheduled antenatal clinic visits after quickening resulted in a rapid increase to 75% coverage, with two doses of SP in pregnant women (Figure 4.9).

Disparities

A striking determinant of attendance at antenatal clinics is household wealth. According to a recent study, poor women are less likely to use antenatal services than are women from the richest households (16) (Figure 4.10). In seven African countries south of the Sahara for which recent data are available, the percentage of rich women attending antenatal clinics was at least twice that of poor women. The same study indicated that antenatal care coverage was significantly higher in urban than in rural areas.

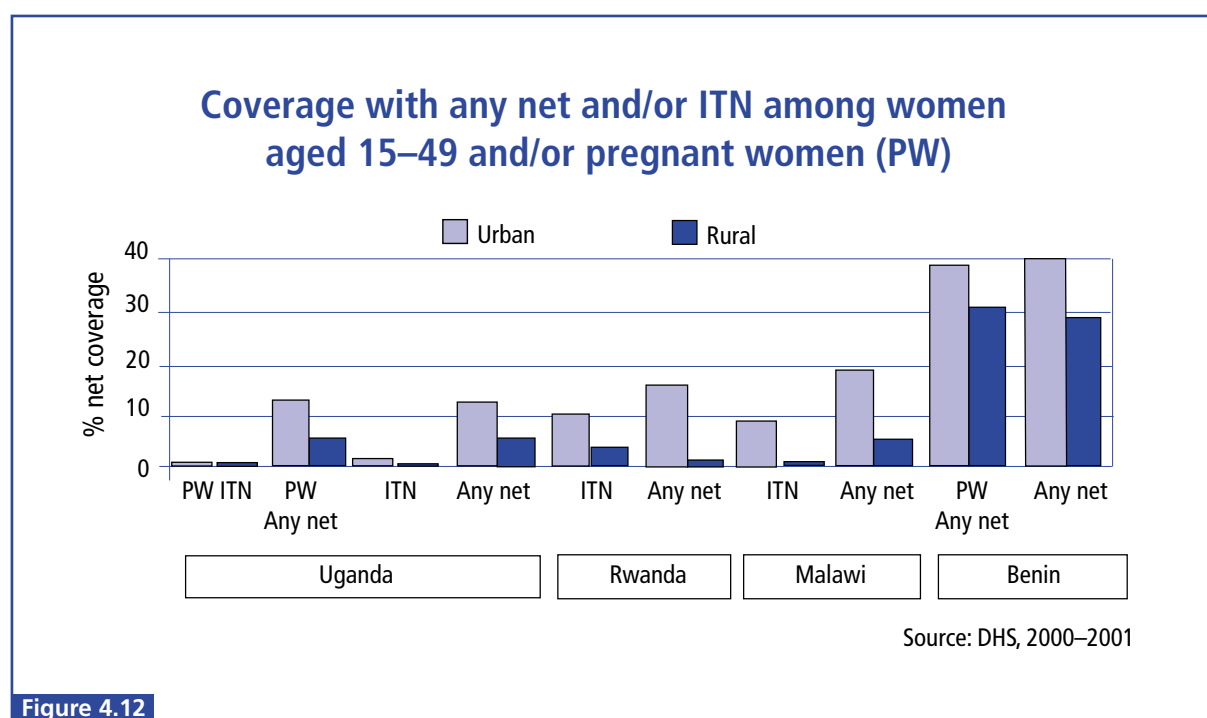


Figure 4.12

Nationally representative surveys confirm similar difference in coverage of pregnant women with chemoprophylaxis, IPT, or nets (Figures 4.11 and 4.12). Women living in rural areas were less likely to receive chemoprophylaxis or, in Malawi, IPT with SP.

4.4

Opportunities

At present, strategies to ensure safe pregnancy in malaria-endemic areas are planned with a focus initially on strengthening malaria preventive services and correct case management for pregnant women attending antenatal care. A number of opportunities will facilitate the accelerated implementation of malaria control during pregnancy:

- High levels of coverage with antenatal care visits make a clinic-based approach feasible
- Partnerships have been established between RBM and programmes such as Making Pregnancy Safer and national reproductive health services committed to strengthening entry-level antenatal clinic services
- The Strategic Framework for Malaria Control During Pregnancy in the WHO Africa Region (2) has been developed

Policy summary: Best practices for malaria control during pregnancies

- Effective case management of malaria illness for all women of reproductive age in malarious areas must be ensured.
- The policy for malaria control during pregnancy should emphasize a preventive package of intermittent preventive treatment (IPT) and insecticide-treated nets (ITNs), particularly in areas of stable transmission.
- All pregnant women should receive at least 2 doses of IPT after quickening, during routinely scheduled antenatal clinic visits as recommended by WHO.
- Programmes should seek the highest possible coverage of pregnant women with these interventions – at least 60% (Abuja RBM goals) and preferably higher – and document this accomplishment. Given current high rates of antenatal clinic attendance in most African countries south of the Sahara, this should be achievable.

Source: adapted from reference 2

Making Pregnancy Safer: access to essential care for pregnant women and their newborns

In support of the Safe Motherhood Initiative, the WHO Making Pregnancy Safer focuses on effective evidence-based interventions that target the major causes of maternal and newborn morbidity and mortality. Making Pregnancy Safer aims to strengthen health systems and to identify actions at community level needed to ensure access to essential care for pregnant women and their newborns.

Skilled attendance at delivery and provision of an appropriate and effective continuum of antenatal and perinatal care are particularly important in this initiative.

The evidence-based interventions of Making Pregnancy Safer focus on six areas:

- Technical and policy support
- Advocacy
- Partnership building
- Development of norms and tools
- Research and dissemination
- Monitoring and evaluation



Picture: WHO/TDR

- Several countries are in the process of updating policies that are consistent with new evidence and with WHO recommendations for prevention and control of malaria during pregnancy

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Commitment to accelerating prevention and control of malaria during pregnancy

Countries are developing national policies on the prevention of malaria in pregnancy according to WHO recommendations and have started to document experiences from control efforts.

In March 2002, a technical meeting on malaria prevention and control during pregnancy was held in Malawi where reproductive health and malaria staff from five countries, Kenya, Malawi, Uganda, the United Republic of Tanzania, and Zambia, came together to discuss a coordinated approach to accelerating prevention and control of malaria in pregnancy. The participants and RBM partners have agreed to forge the East and Southern Africa Coalition for malaria prevention and control during pregnancy, MIPESA. The coalition was inaugurated in June 2002.

This coalition is a unique concerted effort in which national reproductive health programmes, Making Pregnancy Safer and malaria control programmes are coming together

- to support inter-country programme collaboration in accelerating prevention and control of malaria in pregnancy
- to provide a forum of information exchange between and among countries, partners and involved institutions
- to strengthen models for programme collaboration between national reproductive health, Making Pregnancy Safer and Malaria Control Programmes for quality evidence-based antenatal care
- to develop mechanisms that facilitate consultation among member programmes
- to support documentation of best practices
- to develop a collaborative monitoring and evaluation system
- to develop collaborative approaches to information, education and communication that improve knowledge of antenatal care providers and pregnant women
- to facilitate the development of a sub-regional operational research agenda and conduct of key research protocols.

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