Malaria is an important health and development challenge in Africa, where pregnant women and young children are most at risk. Each year approximately 800,000 children die from malaria. Malaria in pregnancy contributes to a vicious cycle of ill-health in Africa, causing babies to be born with low birthweight (LBW), which increases the risk of newborn and infant deaths.

Effective interventions exist to break this cycle, like insecticide treated bednets (ITN) and intermittent preventive treatment of malaria during pregnancy (IPTp). In recent years, increased attention to and funding for malaria control has resulted in a significant improvement in the coverage of malaria interventions, particularly for children. Further reduction of the burden of malaria and malaria-related problems, especially in pregnancy, requires strong linkages between malaria control programmes and maternal, newborn, and child health (MNCH) programmes as well as better communication between homes and health facilities. MNCH services offer the best mechanism through which malaria prevention and control interventions can have a significant impact on newborn health. The question remains, however, as to how these programmes can collaborate most effectively to save more lives, not only from malaria and its effects, but from other causes, too.
Opportunities for Africa’s Newborns

Recent research on the interaction between malaria and HIV infection in pregnancy shows that pregnant women with HIV and malaria are more likely to be anaemic, and that the baby is at higher risk of LBW, preterm birth, and death than with either HIV infection or malaria infection alone.14 The same studies suggest that malaria infection may also result in an increased risk of postpartum sepsis for the mother. Some investigators have shown that malaria contributes to increased HIV replication and may increase the risk of mother-to-child transmission (MTCT), while others have suggested that placental malaria has a protective effect in reducing MTCT of HIV.14,15 In any case, in areas with high prevalence of HIV and malaria, the interaction between the two diseases has significant implications for programmes. Effective service delivery to meet the demands of HIV/AIDS and malaria requires the strengthening of antenatal care (ANC) and postnatal care (PNC) for delivery of a comprehensive and integrated package of interventions (Section III chapters 2, 4 and 7).

Africa bears the highest burden of malaria in the world, with approximately 800,000 child deaths and about 300 million malaria episodes per year.1 Malaria costs Africa more than US$12 billion annually and slows economic growth of African countries by 1.3 percent per capita per year.2 High levels of malaria are not just a consequence of poverty; as malaria-endemic countries have lower incomes and have experienced slower economic growth. Every year, 30 million women become pregnant. For women living in endemic areas, malaria is a threat to both themselves and their babies. Malaria-related maternal anaemia in pregnancy, low birthweight (LBW) and preterm births are estimated to cause 75,000 to 200,000 deaths per year in sub-Saharan Africa.2 Pregnant women are particularly vulnerable to malaria, whose effects are summarised in Figure III.8.1.

**Problem**

**Effects on women:** Pregnancy alters a woman’s immune response to malaria, particularly in the first malaria-exposed pregnancy, resulting in more episodes of infection, more severe infection (for example, cerebral malaria), and anaemia, all of which contribute to a higher risk of death. Malaria is estimated to cause up to 15 percent of maternal anaemia, which is more frequent and severe in first pregnancies than in subsequent pregnancies.3,4 The frequency and gravity of adverse effects of malaria in pregnancy are related to the intensity of malaria transmission.

**Effects on the fetus:** Malaria is a risk factor for stillbirth, particularly in areas of unstable transmission, where malaria levels fluctuate greatly across seasons and year to year and result in lower rates of partial immunity. A study in Ethiopia found that placental parasitaemia was associated with premature birth in both stable and unstable transmission settings. The investigators also found that although placental parasitaemia was more common in stable transmission areas, there was a seven-fold increase in the risk of stillbirth in unstable transmission areas.5 Even in the Gambia, where malaria is highly endemic, the risk of stillbirth is twice as high in areas of less stable transmission.6

**Effects on the baby:** Malaria is rarely a direct cause of newborn death, but it has a significant indirect effect on neonatal deaths since malaria in pregnancy causes LBW – the most important risk factor for newborn death. Malaria can result in LBW babies who are preterm (born too early), small for gestational age due to in utero growth restriction (IUGR), or both preterm and too small for gestational age (See page 10 for more on the definitions of preterm birth and small for gestational age). Consequently, it is imperative that MNCH programmes address the problem of malaria in pregnancy while specific newborn care is also incorporated into malaria control programmes, especially in relation to extra care of LBW babies.

Additionally, malaria in pregnancy indirectly influences newborn and child survival through its effects on maternal mortality. If a mother dies during childbirth, her baby is more likely to die, and any surviving children will face serious consequences for their health, development, and survival.7 Several studies suggest that if a woman dies during childbirth in Africa, the baby will usually not survive.8,9
This chapter will discuss the current package and coverage of malaria interventions during pregnancy and present opportunities for integrating a comprehensive malaria package with MNCH programmes. Challenges will also be discussed along with practical steps.

**Package and current coverage**

It is estimated that in some areas, malaria contributes to almost 30 percent of preventable causes of LBW, and the majority of all newborn deaths occur among babies with LBW. It is crucial, therefore, to prevent and manage LBW, particularly the proportion of cases associated with preterm birth, which has a much higher risk of death than term LBW. It was previously thought that malaria causes IUGR primarily, but recent work has shown that malaria also results in a significantly increased risk of preterm birth.16

The evidence based interventions for newborn survival within the continuum of care have been introduced in Section II, and the following interventions have been shown to reduce the effects of malaria during pregnancy.17

- **Prevention** using vector control, ITN, and IPTp
- **Case management** of women with malaria and malaria-associated severe anaemia

Strategies for prevention and control of malaria in pregnancy may vary according to the local transmission rate and are summarized in Table III.8.1.

---

**FIGURE III.8.1** Consequences of malaria infection in pregnancy

<table>
<thead>
<tr>
<th>Pregnant woman</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morbidity</td>
</tr>
<tr>
<td>anemia</td>
</tr>
<tr>
<td>febrile illness</td>
</tr>
<tr>
<td>cerebral malaria</td>
</tr>
<tr>
<td>hypoglycaemia</td>
</tr>
<tr>
<td>puerperal sepsis</td>
</tr>
<tr>
<td>Mortality</td>
</tr>
<tr>
<td>severe disease</td>
</tr>
<tr>
<td>haemorrhage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fetus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abortion</td>
</tr>
<tr>
<td>Stillbirth</td>
</tr>
<tr>
<td>Congenital malaria infection (rare)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Newborn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low birthweight</td>
</tr>
<tr>
<td>prematurity</td>
</tr>
<tr>
<td>in utero growth restriction</td>
</tr>
<tr>
<td>Congenital malaria infection (rare)</td>
</tr>
<tr>
<td>Mortality</td>
</tr>
</tbody>
</table>

**Adverse consequences of malaria during pregnancy:**

**Areas of low or unstable transmission**

- **Acquired immunity** – low or none
  - Clinical illness
    - Risk to mother
    - Risk to fetus especially of preterm birth
  - Severe disease

**Areas of high or moderate (stable) transmission**

- **Acquired immunity** – high
  - Asymptomatic infection
    - Anaemia
      - Placental sequestration
      - Altered placental integrity
    - In utero growth restriction and increased risk of preterm birth
  - Maternal morbidity
  - Low birthweight
  - Higher infant mortality

Source: Adapted from reference11
Prevention through insecticide treated bednets (ITN)
The effects of ITN on malaria in pregnancy have been studied in five randomised controlled trials. A recent Cochrane analysis showed that in Africa, the use of ITN, compared with no nets, reduced placental malaria in all pregnancies (relative risk (RR) 0.79, 95 percent confidence interval (CI) 0.63 to 0.98). Use of ITN also reduced LBW (RR 0.77, 95 percent CI 0.61 to 0.98), stillbirths, and abortions in the first to fourth pregnancy (RR 0.67, 95 percent CI 0.47 to 0.97), but not in women with more than four previous pregnancies.18 For anaemia and clinical malaria, results tended to favour ITN, but the effects were not significant. In conclusion, ITN beneficially influences pregnancy outcome in malaria-endemic regions of Africa when used by communities or by individual women. Given the evidence of efficacy of ITN for children and pregnant women in both stable and unstable transmission settings, combined with the opportunity to achieve high coverage of services for women and children through ANC services, recommended programmatic approaches include distribution of ITN to pregnant women in all transmission settings through ANC or similar platforms. This way, newborns benefit directly from ITN interventions, especially during the first few months of life, when they are particularly vulnerable to malaria.

A few countries, such as Eritrea and Malawi, have reached ITN coverage rates of over 60 percent for both pregnant women and children (Box III.8.1). Rapid scaling up is happening in several countries such as Benin, Niger, Ethiopia, Kenya, Togo, and Zambia, and the prospects for achieving the coverage targets in many countries are improving. The main reasons for low coverage appear to have been the high cost of nets and the historical lack of availability of ITN, especially in eastern and southern Africa. While social marketing and other activities have been successful in raising ITN coverage among the wealthier sectors of the community, they were less successful in targeting the poorest rural communities, which include those most at risk from malaria. This has led to a recent global shift in policy towards providing pregnant women and children with highly subsidised or free ITN. This is reflected in the revised Roll Back Malaria (RBM) ITN strategic framework.19 A recent WHO resolution called for the application of expeditious and cost-effective approaches, including free, or highly subsidised, distribution of materials and medicines to vulnerable groups, with the aim of at least 80 percent of pregnant women receiving IPTp and using ITN, wherever that is the vector control method of choice. Additionally, an increasing number of pregnant women, especially in areas of unstable transmission, are being protected from malaria infection through the expansion of indoor residual spraying programmes.

**Prevention through intermittent preventive treatment during pregnancy (IPTp)**
IPTp is the administration of full, curative treatment doses of an effective antimalarial medicine at predefined intervals during pregnancy, beginning in the second trimester or after quickening, and delivered through routine antenatal services. Currently, sulfadoxine-pyrimethamine (SP) is the only available drug for use in

<table>
<thead>
<tr>
<th>Table III.8.1: Malaria intervention strategies during pregnancy, according to transmission intensity of malaria</th>
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<tbody>
<tr>
<td><strong>Insecticide treated bednets (ITN)</strong></td>
</tr>
<tr>
<td>High/medium transmission Perennial (stable)</td>
</tr>
<tr>
<td>High/medium transmission Seasonal (stable)</td>
</tr>
<tr>
<td>Low transmission (unstable)</td>
</tr>
</tbody>
</table>

⑥In low transmission settings, the risk of malaria is low; therefore, the benefit from the presumptive use of drugs is likely to be reduced. And, because women in these settings are more likely to have symptoms with their malaria infection, control programmes should focus on case management strategies and use of ITN.

Source: Adapted from reference11
IPTp. IPTp doses using SP should not be given more frequently than monthly. IPTp is recommended in areas of stable malaria transmission, where most malaria infections in pregnancy are asymptomatic and the usual case management approach of treating symptomatic individuals is not applicable. Current evidence on the effectiveness of IPTp in areas of low transmission, where symptomatic case management can be used, is insufficient to support its use in these settings.

The effectiveness of IPTp in reducing maternal anaemia and LBW has been demonstrated from studies in Kenya, Malawi, Mali, and Burkina Faso. In Kenya, a trial conducted with SP given twice during pregnancy at ANC visits reduced maternal anaemia in first pregnancies by about 39 percent, while lowering rates of LBW. Another study in western Kenya demonstrated that the two-dose SP regimen was adequate in areas of low HIV prevalence, but more doses were needed in areas with higher HIV prevalence. From the programmatic perspective, IPTp with SP is a feasible intervention because SP is administered as a directly observed treatment through scheduled ANC visits, and ANC reaches a high proportion of pregnant women in most African countries. However, the effectiveness of SP for IPTp is likely to be compromised due to the increase in resistance to SP, particularly in eastern and southern Africa. While pregnant women may currently benefit from IPTp with SP, there is an urgent need to identify alternative drugs that are safe, cheap, and easy to administer.

Figure III.8.2 illustrates the status of policy adoption and implementation of IPTp in the WHO African region. With the exception of one country, all countries in the region have adopted IPTp as a policy for malaria prevention and control during pregnancy where recommended, but implementation of this policy remains very low in most countries. In the remaining countries, given the transmission pattern, IPTp is not a recommended policy, based on current evidence of IPTp efficacy in areas of low transmission.

Data from 11 Demographic and Health Surveys (DHS) within the past three years indicate that although two-thirds of pregnant women attend at least one ANC visit, only 10 percent had taken at least one dose of SP (Figure III.8.3). Though slower than perhaps anticipated, IPTp uptake has increased in countries where IPTp has been adopted in national policy as a malaria control intervention (1993 in Malawi, 1998 in Kenya, Uganda, and Tanzania, and 2002 in Zambia). The ITN coverage in these countries ranges from about 5 to 35 percent. Figure III.8.3 highlights the missed opportunities that exist when mothers who attend at least one ANC visit are not provided with effective, integrated services. This is a result of many factors, including a lack of perceived need for IPTp by pregnant women; late and few ANC visits; health system inadequacies, such as supply shortages of ITN, SP, or iron/folate; human resource limitations; reluctance among service providers to prescribe SP during pregnancy; weak laboratory services to support case management; and weak monitoring systems and health referral systems to support case management.
Although knowledge of malaria and attendance at ANC services are both generally high among African populations, several studies have shown that this knowledge does not necessarily translate to increased demand for IPTp or improved IPTp coverage within ANC. These findings have been corroborated by several other studies, and low uptake appears to be related to unavailability of adequate SP supplies at the point of service, negative perceptions among both health workers and pregnant women regarding the usefulness of the strategy, and concerns over the use of the drug during pregnancy. In addition, since SP is only taken in the second and third trimesters, poor timing of ANC visits and the recommended IPTp schedule may be adversely influencing implementation. (Section III chapter 2).

**BOX III.8.1 Progress towards malaria prevention in Malawi: Rapidly scaling up use of insecticide treated bednets (ITN) and intermittent preventive treatment of malaria in pregnancy (IPTp)**

According to the March 2004 National Household Malaria Survey in Malawi, 53 percent of urban and 22 percent of rural children under the age of five and 36 percent and 17 percent of urban and rural pregnant women, respectively, sleep under ITN. While inequity between urban and rural populations is still significant, this marks progress since the year 2000 and a step in the right direction for reaching underserved populations. Overall, coverage is increasing. With the distribution of an additional 1.8 million nets since the March 2004 survey, the coverage of children and pregnant women using ITN is estimated to be 60 percent and 55 percent respectively. Overall, this demonstrates that coverage is increasing and Malawi has likely achieved the Abuja targets for the distribution of ITNs. The Ministry of Health estimates that coverage of pregnant women receiving a second dose of IPTp has increased from 55 percent in 2004 to 60 percent by the end of 2005. These gains have come alongside massive amounts of effort. In addition to ITN distribution, four million treatment kits were procured and distributed in 2005 and three million nets were treated with insecticides during an annual net re-treatment campaign.

Malawi’s increased attention to ITN and IPTp could be reflected in decreasing mortality rates. Between 1990 and 2000, infant and child mortality rates remained unchanged at 112 and 187 per 1000 live births, respectively. Over the past four years (2000-2004), however, a remarkable decline has been observed. 2004 DHS data indicate that infant and child mortality rates decreased to 76 and 133 per 1,000 live births, respectively. Improvement has occurred in all age groups, most dramatically during the first month of life: DHS reported a decrease in the neonatal mortality rate (NMR) from 40 to 27 per 1,000 live births. There are some uncertainties around the NMR measurement, as DHS tends to underestimate NMR, but progress has certainly been made. While the association between increased malaria prevention efforts and declining MMR is an ecological level association, it is likely that scaling up malaria interventions contributed significantly to the observed decline in mortality rates.

Source: Malawi 2000 and 2004 Demographic and Health Surveys and 2004 National Household Malaria Survey

For more discussion of NMR and under-five mortality rate, see Section I and the data notes as well as the country profile for Malawi (page 200). For more discussion of countries that are progressing towards NMR reduction, see Section IV.
Opportunities to integrate MNCH and malaria control programmes

Malaria control programmes target pregnant mothers and in doing so, benefit the mother and fetus, which contributes to improved health for the newborn and child. It has been noted that if mothers understand that interventions also protect their unborn babies, they put their own fears aside for the health of their unborn baby. In Zambia, uptake of IPTp was found to be low because SP was perceived as being "too strong" and dangerous to the unborn baby. However, when health workers changed the message to focus on the unborn baby, better compliance to SP was noted. These messages demonstrate the importance of considering the health of mother and baby together and the potential benefit of stronger linkages between malaria programmes and MNCH. Several opportunities exist to benefit newborn health through malaria programmes. These include both direct and indirect approaches.

Direct benefit in saving newborn lives will result from increasing coverage of IPTp and ITN and improving case management of pregnant women with malaria. As ANC is the logical point of entry for malaria services (IPTp and ITN), strong collaboration is necessary between malaria and MNCH programmes, specifically in terms of training, procurement of drugs and supplies, health education, etc. For example, commodities needed for IPTp and ITN delivery are often procured under malaria control programmes, but interventions are normally delivered through reproductive health services. This could provide an opportunity for integration even beyond malaria programmes and MNCH, but lack of communication could minimise possible gains.

Another under-explored possibility is the use of private providers and community-based organisations to deliver more services. Historically, ITN distribution has been linked with community-based programmes, but IPTp is still limited to health facilities. Many mothers live far from these facilities and miss out on key services. Evidence emerging from community programmes in Uganda, Kenya, and Zambia shows that not only is community delivery of IPTp useful in improving coverage, but it also increases ANC attendance at an important time during pregnancy. Community outreach programmes should support and complement health facility services and vice versa. In particular, the development of three-way linkages between outreach services for newborn health, malaria programmes, and community Integrated Management of Childhood Illness (C-IMCI) should be encouraged.

Indirect benefit to newborns is possible when investment in malaria programmes leads to the strengthening of general health system vehicles for service delivery, such as ANC and PNC. The Global Alliance for Vaccines and Immunisation (GAVI) is leading the way in promoting the investment in health system strengthening, using funds earmarked for immunisation, a more vertical programme. Even without this significant level of investment, a similar approach by otherwise vertical malaria programmes to strengthen local infrastructure, capacity, and supplies has the potential to benefit both malaria intervention coverage and other essential MNCH interventions.

There are also other opportunities for more innovative linkages.

- Where communities are being sensitised to early care seeking for babies with malaria, education about danger signs for pregnant women and newborns could be included
- Where community health workers (CHWs) are being trained in the case management of children with malaria, training in newborn care could also be undertaken
- Where supplies for malaria case management are being strengthened, pre-referral medicines for newborns could also be included for the management of sepsis, which also presents with fever
- Strategies for behaviour change communication could be expanded to include health messages that benefit both mother and newborn while incorporating malaria-specific messages, such as the importance of mothers sleeping alongside their newborns under ITN
- The case management of women with malaria or severe anaemia could be integrated with emergency obstetric care

Challenges to integrating MNCH and malaria control programmes

Malaria programmes have been extremely successful in focusing global attention and seizing policy opportunities. The RBM partnership in particular has garnered the attention of global and national policy agendas. Funding for malaria has increased, and coverage of essential interventions, particularly ITN, is beginning to accelerate. The linking of MNCH and malaria control programmes has a significant role to play in the achievement of Millennium Development Goals (MDGs) 4 and 5 for child and maternal survival as well as MDG 6 for HIV/AIDS, tuberculosis (TB), and malaria. For the biggest gains in both malaria control and MNCH, implementation of malaria-specific interventions must take place within an efficient, working health system that includes effective ANC, strong community health systems that emphasise the importance of the recognition of complications, and prompt case management and/or referral. However, lack of implementation of policies promoting these opportunities for integration as well as general health system weaknesses continue to pose challenges.
Opportunities for Africa’s Newborns

WHO recommendations, most African countries have moved from monotherapies to Artemisinin-based combination therapies (ACT). However, Artemisinin derivatives are not yet recommended for treatment of malaria during the first trimester unless there is no suitable alternative; ACTs are recommended for use in the second and third trimesters. Quinine is the drug of choice throughout pregnancy, but this poses adherence problems, as quinine has to be given over seven days. An additional issue is that treatment of malaria in children weighing less than 5 kg with ACTs is not recommended. The recommended treatment for these children is also quinine.

In situations where SP has been withdrawn for routine treatment of malaria, it is sometimes difficult to rationalise the approval of SP use for IPTp by national pharmaceutical boards or other regulatory authorities. The emergence of \textit{P. falciparum} resistance to SP, which has now been documented in many African countries, has raised concerns about the efficacy of SP for IPTp. The fact that there are limited data to guide countries with moderate to high levels of SP resistance on use of SP for IPTp threatens the future of this strategy. A WHO consultative meeting held in October 2005 has now clarified this issue (Box III.8.2).

**Policy challenges**

At the level of national policy, malaria and reproductive health programmes are usually housed under different departments or directorates within Ministries of Health. This separation can impede collaboration and result in policy duplication or confusion. For example, in one country, the reproductive health programme is under the commission of community health, while malaria control is under the commission for the control of communicable diseases. These two departments have separate meetings; therefore, decisions are often made without due consultation on the implications for the other programme. The problem is magnified when the responsibilities of each programme are not clearly defined. Past approaches to malaria prevention have been vertical, fragmented, and not always integrated in MNCH services, resulting in limited access and public health impact. There is an urgent need for multilateral collaboration in every country to address malaria in pregnancy while strengthening routine MNCH services and linking with other related interventions, such as HIV and sexually transmitted infection (STI) care. Ongoing work towards the targets set out in the Abuja Declaration continues to reflect the kind of convergence of political momentum, institutional synergy, and technical consensus needed in order to combat malaria.

On a more programmatic level, there is a need to consider the challenge of malaria treatment policy in the particular context of malaria during pregnancy. Following WHO recommendations, most African countries have moved from monotherapies to Artemisinin-based combination therapies (ACT). However, Artemisinin derivatives are not yet recommended for treatment of malaria during the first trimester unless there is no suitable alternative; ACTs are recommended for use in the second and third trimesters. Quinine is the drug of choice throughout pregnancy, but this poses adherence problems, as quinine has to be given over seven days. An additional issue is that treatment of malaria in children weighing less than 5 kg with ACTs is not recommended. The recommended treatment for these children is also quinine.

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**BOX III.8.2 Recommendations from World Health Organization (WHO) consultative meeting on SP use in settings with different levels of SP resistance**

WHO recommends the following for malaria prevention and control during pregnancy in moderate to high levels of SP resistance:

**In areas where up to 30 percent parasitological failure at D14 is reported**, countries should:
- Continue implementing or adopt a policy of at least two doses of intermittent preventive treatment of malaria in pregnancy (IPTp) with SP; implement other malaria control measures, such as insecticide treated bednet (ITN) use as well as anaemia and malaria case management
- Evaluate the impact of SP for IPTp on an ongoing basis.

**In areas where 30 to 50 percent parasitological failure at D14 is reported**, countries should:
- Continue implementing or adopt a policy of at least two doses of IPTp with SP
- Emphasize the use of ITN
- Strengthen anaemia and malaria case management
- Evaluate the impact of SP for IPTp on an ongoing basis

**In areas where 50 percent parasitological failure at D14 is reported**, countries should:
- Emphasise ITN use as well as anaemia and malaria case management
- If an appropriate policy already exists, continue IPTp with at least two doses of SP; evaluate the impact on an ongoing basis
- In the absence of policy, consider adopting the use of IPTp with SP only after further evidence is available

Source: Reference^28
Weak health systems

Even where good policy is in place, health system weaknesses, particularly human resource shortages and commodity procurement and supply, can slow policy implementation. Malaria diagnosis, especially in high transmission settings, already presents a challenge. A combination of overburdened health workers and changing treatment policies without adequate in-service training can result in poor quality services. A quality assessment of public and private ANC services in Tanzania, for example, reveals that guidelines for dispensing medicines for anaemia and malaria prevention are not being followed.29 Africa’s current human resource challenges and possible solutions are covered in more detail in Section IV.

The inadequate or unreliable supply of medication and other commodities is a major challenge that threatens the health system overall. Several of the effective interventions proposed for significant and rapid improvement of maternal and newborn health and survival are reliant on the provision of commodities such as SP, ITN, tetanus toxoid vaccine, and antibiotics. The global manufacture and supply of ITN, especially Long Lasting Insecticidal Nets (LLIN), failed to keep pace with demand during 2004 and 2005, but these bottlenecks have significantly eased in 2006, with global production of nets estimated to exceed 70 million during the year. The need for accurate and timely procurement forecasting is evident.30

Weak referral systems continue to impede care. The recognition of danger signs and complications at the community level needs to be complemented by an efficient referral process and backed up by high quality, effective care at health facilities. This will improve the management of malaria and ensure that obstetric emergencies and other complications identified at community level are managed with skilled care at a facility.

Health system strengthening requires stronger linkages at all levels between groups working for MNCH and groups focusing on specific causes such as malaria or HIV. The recent integration of global level partnerships to form the Partnership for Maternal, Newborn & Child Health (PMNCH) offers great potential for integration and improved communication with the RBM partnership and other specific initiatives. Mechanisms to ensure effective communication and information flow among the different partnerships are urgently required to facilitate the exchange of ideas, experiences, and best practices as well as streamline operations, increase funding, and ensure supplies, thereby avoiding duplication of effort and improving outcomes for the betterment of children’s and mothers’ health.

Practical steps to advance integration

This chapter has emphasised that the impact of malaria control programmes on newborn health is primarily realised through effective MNCH services. There is a fundamental need, therefore, for convergence between malaria programmes and MNCH; a process which can be strengthened with the following steps.

Advocate for a holistic approach that secures funding to strengthen the continuum of care. Ensuring that a holistic approach to MNCH is included in malaria funding opportunities is of paramount importance. A case in point is the potential for expanding services targeting malaria control during pregnancy to include neonatal interventions through support from the Global Fund for AIDS, TB and Malaria, the Presidential Malaria Initiative, and the World Bank Malaria Booster programme as well as other funds. Premature birth resulting from malaria parasitaemia can justify the inclusion of targeted interventions at both community and health facility levels within a malaria funding proposal.

Integrate policy, implementation guidelines, and delivery with MNCH services. The policies facilitating delivery and use of various strategies need to be harmonised across MNCH and malaria control programmes. In most cases, policies are developed and published by one programme without consultation or a review of potential negative effects on other programmes. A review of policy implementation guidelines will need to be undertaken to ensure that newborn health is addressed rather than implied.

Use the opportunity of strengthening malaria services to improve other care delivered through ANC and integrated management of childhood illness (IMCI) programmes. Addressing constraints in malaria management could also benefit mothers and newborns
with other conditions through ANC and IMCI. For example, while strengthening malaria services in ANC and IMCI, other aspects of ANC and IMCI may also be improved, especially in terms of advocating for the provision of other commodities and services. The distribution of ITN during ANC visits and other outreach opportunities has resulted in increased uptake of these services. Improved referral of neonatal sepsis could be integrated with efforts to improve case management of children with malaria. Malaria policies are often well regarded by decision makers, presenting an opportunity to utilise this goodwill by advocating for a minimum package to address the special requirements of malaria-related fever in newborns, for example.

Use the opportunity of strengthening laboratory facilities and supplies for malaria to improve overall logistics for supplies in emergency obstetric and newborn care and IMCI. Strengthening procurement of drugs and commodities, supplies management, and laboratory services would benefit not only malaria programmes but also management of neonatal sepsis and provision of emergency obstetric care. Linking with malaria programmes could strengthen IMCI by addressing the need for supplies of pre-referral drugs that can be used in the management of neonatal sepsis, in particular. (Section III chapter 5).

Use the opportunity of social mobilisation and behaviour change communication techniques to increase demand for MNCH services. Early recognition of danger signs in mothers, newborns, and children needs to be incorporated into social mobilisation and communication interventions at the community level, using a range of tools and approaches, from mass media to interpersonal communication. Recognition of malaria danger signs and home management of malaria programmes could be extended to include recognition of newborn danger signs and signs of obstetric complications. Communication interventions can create demand for newborn health care services, especially in countries where mothers and newborns traditionally remain in the home for several days. Another potential opportunity is the addition of clean birth kits to the pre-packaged drug kits provided for home management of malaria.

Conclusion

Improving newborn health in resource-poor settings is an enormous challenge but not an insurmountable one, particularly because newborn morbidity and mortality is not attributable to a single cause, but to a multiplicity of factors, of which many can be addressed through existing programmes. Malaria is one of these factors affecting the health of the mother and leading to ill health of the newborn. Effective interventions are available to address malaria in pregnancy - the use of ITN by pregnant women and uptake of IPTp. However, coverage of both of these interventions currently remains relatively low compared to ANC, which can provide an optimum delivery platform. Challenges to scaling up IPTp implementation include the need to create demand among pregnant women for IPTp through ANC, increase recognition by families and communities that pregnant women and their unborn babies are at serious risk from malaria, and improve the supply and management of commodities. Other limiting factors include increasing resistance to SP, which may ultimately have a negative impact on the effectiveness of IPTp with SP. Alternative antimalarial prophylaxis for IPTp and for the treatment of pregnant women with malaria are urgently required.

With heightened policy attention and an increased availability of resources for malaria prevention and control from a variety of sectors, more pregnant women will be able to access IPTp, more pregnant women and their babies will be sleeping under ITNs, and the number of mothers and children receiving effective treatment for malaria will increase. The funding environment is currently supportive of greater integration of MNCH with malaria control programmes. Coordination among malaria control programmes and MNCH is required for implementation of integrated, effective services.