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Addressing Malaria in Pregnancy in Low Transmission Settings

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A JOINT ROLL BACK MALARIA PARTNERSHIP AND WORLD HEALTH ORGANIZATION MEETING

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List of Abbreviations

ACT	Artemisinin based Combination Therapy
ACCESS	Access to clinical and community maternal, neonatal and women's health services
ANC	Ante-Natal Care
AFRO	World Health Organization Regional Office for Africa
ARV	Anti retroviral drug
ASEAN	The Association of Southeast Asian Nations
CDC	Centres for Disease Control
DHP	Dihydroartemisinin-piperaquine
DHS	Demographic Health survey
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GMAP	Global Malaria Action Plan
HCW	Health care workers
HIS	Health Information System
HMIS	Health management information system
IPT	Intermittent Preventive Treatment
IPTp	Intermittent preventive treatment of malaria in pregnancy
IRS	Indoor Residual Spraying
ITN	Insecticide Treated Nets
IST	Intermittent screening and treatment
Jhpiego	Jhpiego Corporation
JHU/CCP	Johns Hopkins University, Center for Communication Programs
LA	Latin America
LBW	Low birth weight
LLIN	Long-lasting Insecticidal Net
MDG	Millennium Development Goals
MIP	Malaria in Pregnancy
MIPESA	Malaria in Pregnancy for East and Southern Africa
MIPWG	Malaria in Pregnancy Working Group
MIS	Malaria Indicator Survey
MMR	Maternal Mortality Rate
MNCH	Maternal, Newborn and Child Health
MoH	Ministry of Health
MPS	Making Pregnancy Safer
MQ	Mefloquine
NGO	Non-governmental Organization
NMCP	National Malaria Control Program
QN	Quinine
PNG	Papua New Guinea
PMTCT	Preventing mother-to-child transmission of HIV
PMI	President's Malaria Initiative
RBM	Roll Back Malaria
RH	Reproductive Health
RDT	Rapid Diagnostic Test
SP	Sulphadoxine Pyrimethamine
TOR	Terms of Reference
UNFPA	United Nations Population Fund

UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VMW	Village malaria workers
WHO	World Health Organization
WB	World Bank
WWARN	Worldwide Antimalarial Resistance Network

Executive summary

The Roll Back Malaria – Malaria in Pregnancy Working Group (RBM-MIPWG) meeting was held in WHO Headquarters in Geneva, Switzerland (18-20 April 2011) to address malaria in pregnancy (MIP) issues in the Asia Pacific Region (APR) and other low malaria transmission settings. The meeting combined information sharing from country experiences in delivering MIP intervention program and research findings. The information is then used as a base to provide recommendations to improve program outcomes.

A total of 42 participants attended the meeting. Country representatives were from the Asia Pacific region (Cambodia, India, Solomon Islands and Indonesia) and Africa (Tanzania-Zanzibar, Senegal and Zambia). Representatives from RBM, Unicef, WHO, JHPIEGO, universities and research institutions were also present.

The **main objectives** of the meeting are:

- Review existing programmatic experiences in addressing malaria in pregnancy in low transmission settings
- Share country experiences, highlighting best practices to prevention the consequences of malaria in pregnancy
- Identify operational challenges and opportunities for scaling up MIP interventions
- Identify knowledge gaps and map out resources to address these gaps.

The **final outcomes** of the meeting are:

1. The action plan for 2011-2012 developed jointly by MIPWG representatives in accordance with the RBM partnership strategic plan (GMAP)
2. To be completed

The **main conclusions** of the meeting are:

- In low to moderate transmission settings, malaria in pregnancy is associated with high morbidity and mortality to both mothers and the babies. There are good political and financial momentums in scaling up MIP intervention program in the Asia Pacific region. The initiative is well supported by global commitments to improve maternal and child survival through Millennium Development Goals (MDG) number 4 and 5. The working group recommendations will be instrumental in setting up priorities for MIP programming agenda.
- All delegates agree that MIP intervention strategy should be included in the national policy. Most countries in the APR region have implemented a varying degree of MIP intervention program (Case management, insecticide treated nets distribution, early detection and treatment and Intermittent Preventive Treatment).

- There are still gaps on evidences of the most effective intervention method in low to moderate malaria transmission settings or in places where malaria is declining. Early detection and prompt treatment could be the best option available to save lives. SP resistance status should be monitored in places where SP is used as intermittent preventive treatment in pregnancy (IPTp). These issues are well addressed by The MIP consortium research projects. New information on the strategy should be available in 2012-2013.
- Integration and coordination between Reproductive Health/Maternal and Child Health (RH/MCH) unit and National Malaria Control Program (NMCP) is central to ensure program implementation. Antenatal care (ANC) is the focal point in delivering MIP intervention program. Best practices, successes and lesson learnt from African and Asia Pacific countries provide important insights on the possible ways to improve the implementation process. Global fund and other funding opportunities would supplement the efforts to scale up MIP intervention program.
- Community participation plays a major role in achieving universal coverage of the program. Current experiences and evidences on various community involvements projects have shown promising results.

Background

In all malaria endemic settings, maternal malaria is associated with adverse outcomes and contributes to maternal and infant deaths. Pregnant women with malaria are at risk of having severe anaemia, abortion, low birth weight (LBW) babies, preterm delivery and perinatal deaths. In low malaria transmission settings, maternal malaria can cause cerebral or pulmonary symptoms and can be fatal. Providing treatment and intermittent prophylaxis therapy (IPT) with an effective antimalarials drug, together with insecticide treated nets (ITN) are currently the three main strategies in averting the burden of malaria in pregnancy in moderate to high malaria endemic settings.

Malaria prevention and control program in pregnancy is relatively well defined in high malaria transmission area in Africa where *P. falciparum* is the predominant parasite of infection. On the other hand, little is known on the effectiveness of MIP intervention strategy in area outside of Africa where malaria transmission is generally lower and both *P. falciparum* and *P. vivax* are prevalent. Apart from this, ensuring program implementation and achieving universal coverage of MIP intervention strategies remains as a major challenge in most countries.

This meeting addresses key issues on **policy development, intervention strategy and program implementation** of malaria prevention and control in pregnant women in the Asia Pacific region and other low transmission settings.

Meeting Highlights

The followings are summary of presentations and discussions during the meeting. The complete presentation can be requested from MPS department at WHO HQ.

1. Global Policy and Support for MIP Programming

In the Asia Pacific region, 50 to 85 million pregnant women are at risk of *P. falciparum* and *P. vivax* malaria and the importance of programming MIP intervention strategy outside of Africa is globally acknowledged.

1.1. Welcome and Introduction - Dr. Thomas Teuscher

Dr. Teuscher reiterated the importance of developing consensus for MIP problems outside of Africa. The role of ANC in delivering malaria control and prevention program in pregnancy is central to service delivery. Major issue that has been raised is the lack of dialogue between RH/MCH unit and National Malaria Control Program. This has severely affected program operation. In addition, scaling up the intervention must also be done so that every woman can have access to ANC. This can be achieved by resource mobilization and addressing bottleneck problems. This meeting aims to further review the opportunities and challenges in program implementation.

1.2. MIP in the context of the Global Malaria Program and Millennium Development Goals – Dr. Andrea Bosman

Dr. Bosman pointed out that malaria control, prevention and elimination program is directly associated with the success in achieving MDG 4 and 5. Effective intervention strategies has led to a marked reduction in malaria cases to > 50% in 11 African countries and 32 countries outside of Africa. However, this may result in reduced efforts in controlling malaria and could cause rebound of malaria cases (as seen in Rwanda). This condition would have serious impact to pregnant women. Therefore, national commitment for malaria elimination should be maintained.

<u>MIP programming in highly endemic area Africa</u>

In high endemic area, malaria intervention program in pregnancy focuses on prevention with IPT using SP (2 doses during pregnancy) and ITN distribution. The coverage of both interventions is far below the target of 80%. The median percentage of the second IPTp-SP uptake in Africa is 55% and ITN use is 17%. On the other hand, the effect of SP resistance to program effectiveness should also be assessed. Little is known on what level of SP resistance and what level of malaria transmission in which IPTp is no longer effective. Practical approach in monitoring IPTp-SP effectiveness is currently not available. The safety and efficacy data of alternative drug for IPTp is limited. In addition, SP is becoming less popular in Africa.

MIP programming in area of moderate malaria transmission

MIP intervention program has not been well defined in endemic area between low and high malaria transmission. In fact the number of pregnancy at risk in this area is high and malaria infection can lead to adverse pregnancy outcomes, severe disease and death.

Research program has an important role in answering questions on the future of IPTp with sulfadoxine-pyrimethamine (SP) and the effectiveness of malaria intervention program in area with low to moderate endemicity.

1.3. MIP in the context of Maternal Neonatal and Child Health – Dr. Liz Mason

Dr. Mason emphasized the importance of seeing MIP prevention and control program as an integral part of improving the overall maternal, infant and child health outcomes. Malaria in pregnancy contributes significantly to maternal and infants deaths. The infection accounted for up to 15% of maternal anaemia, 8-14% of low birth weight, 30% of preventable low birth weight and 3-8% of infant death. In addition, malaria has a significant effect on the productivity and quality of human resources and at the end will have impact on the socioeconomic development of a country.

The role of ANC as a key entry point of malaria control in pregnancy is again emphasized. However, there is indication that MIP intervention program has not been fully integrated into the FANC package. This is demonstrated by the huge discrepancy between TT immunization coverage (80%) and the proportion of pregnant women receiving second dose of IPTp-SP (10%).

Therefore it is important to ensure MIP intervention program delivery by strengthening the capacity of ANC in delivering all service packages. Effective intervention strategy should start from the program level and translated into the actual service delivery. This includes capacity building, adequate supply (including antimalarial drug and ITN) and ensuring quality of care.

Since malaria in pregnancy issue has been part of global maternal and child survival agenda, several global support has provided opportunities in scaling up the complete package of ANC (including MIP prevention program). A good and effective planning would facilitate a good program outcome.

1.4. Update from President's Malaria Initiative Countries: MIP Priorities – Dr. Kwame Asamoa

President's Malaria Initiative (PMI) supports some African countries in the implementation of IRS, case management (diagnostics and Artemisinin Combination Therapy-ACT), ITN distribution/procurements and malaria in pregnancy control program. The initiatives started in June 2005 and external evaluation has been done in 2011 to measure the impact of PMI resources leaderships and management to the initiative goals.

Dr. Asamoa showed that LLIN use and second IPTp-SP uptake is improving from 2005-06 to 2007-09. However, there are challenges in measuring the program impact. Most data are in absolute number and there are no reported data on the amount of the denominator (target group). RH Unit should have this data but the information sometimes does not reach the NMCP staff. This is partly due to RH staff are rarely included in malaria program planning process. This has led to inaccurate information on the coverage and outcome indicators for program planning and management. Therefore in this meeting recommendation on optimal data use for planning and management should be outlined as highly important.

PMI phase 2 (2009-2014: USD 5 billion) supports malaria control and prevention program in several non PMI countries in Africa and also in Mekong region and Latin America (Amazon). More funding is allocated for research and innovation program. In addition, PMI also addresses other global health issues such as maternal and child health, health system strengthening, strategic coordination and integration and also multisectoral collaboration.

Discussion points

- The importance of identifying solutions to problems of integration and collaboration between RH unit and NMCP is strongly emphasized by the working group, as this is fundamental in improving the service delivery of MIP control program. The discussion comes up with some possible strategies of task sharing between the two program:
    - Policy level: Integration and collaboration aspect of delivering malaria prevention and control in pregnancy program should be supported by the national policy in order to ensure sustainability of the program
    - Responsibility sharing: RH and MCH program should lead the MIP prevention and control program whereas NMCP would provide with policy and funding.
    - Promote collaboration: NMCP should always involve RH program staffs in programming malaria prevention and control in pregnancy.
- Accurate baseline data in target group is required to enable a good planning and evaluation process.
    - It is important that the planning process should involve both RH and NMCP managers. They also have to work together in getting the funding.
    - The outcome and impact indicator of MIP intervention should also be considered as RH/MCH indicator, as this related to the maternal and infant health outcomes.
- The problem with IPTp is not funding, but more on problems in service delivery strategy by MCH program. This is often related to the high workload of MCH field staff and logistic issues of SP availability. In addition, SP becomes less popular among the community.

- The decision to move from preventive treatment to IST should be guided by clear terms of what level of malaria transmission this approach would be effective. This information is important not only in APR but also in Africa as the number of malaria cases starts to decline.
- The existing evidence based intervention program of MIP prevention and control activities would inform recommendations developed by the working group to the programmatic people at RBM.

2. Review on the existing evidence of Malaria in Pregnancy in the Asia Pacific Region – Dr. Marcus Rijken

2.1. Present data/burden of disease

Dr. Rijken presented a review on the existing evidence on malaria in pregnancy situation in the Asia Pacific regions. Malaria problems in the APR are different from those in Africa. The malaria transmission within each country is hugely variable and this condition results in different levels of immunity and susceptibility. In addition, apart from *P. falciparum* infection, *P. vivax* infection is also prevalent. Maternal malaria in this region is associated with a high risk of adverse maternal (severe malaria, anemia and maternal death) and pregnancy outcomes (low birth weight, preterm delivery, perinatal deaths and congenital malaria), including those with *P. vivax* infections. The findings are confirmed by the studies carried out in the Thai Burmese Borders, India, PNG and Indonesia.

The number of pregnant women at risk is high in the APR, but data on the actual burden of malaria in this special group is limited. The review shows that most information on the prevalence of MIP is based on point prevalence. As each infection during pregnancy would have impact on the maternal and pregnancy outcomes, cumulative malaria infections data would provide the actual disease burden.

Challenges in defining malaria intervention program in pregnancy in APR are the lack of universal clear method in defining malaria transmission level to base the recommendation. In addition, the relapsing nature of *P. vivax* infections in pregnancy would have impact on the treatment and prevention strategy (primaquine is contraindicated in pregnancy). In Thailand, *P. falciparum* malaria prevalence is declining, but *P. vivax* prevalence is relatively stable. Diagnosis of peripheral parasitaemia in low transmission setting is also problematic as some women have low parasitaemia and this could also be missed if rapid diagnostic test (RDT) is used. Quality control of malaria smear readings is needed as the quality depend largely on the skills of the technician. Placental malaria prevalence is low in this region, also in documented, but well treated malaria episodes. The only positive placentas on the TBB are associated with positive peripheral parasitaemia at the time of delivery. However, in India, where no ACTs were used RDT detected more placental malaria than peripheral ones.

In Africa, the contribution of MIP to maternal deaths is not high, on the other hand, in the APR, malaria can contribute directly to maternal deaths. In this region, malaria in non immune pregnant can rapidly result in severe disease (mostly severe anaemia, cerebral malaria and pulmonary edema) and deaths. In addition, a single infection of (asymptomatic) malaria in pregnancy is also associated with adverse maternal and pregnancy outcomes. Early detection and prompt treatment with an effective antimalarial drugs is therefore very important in both Asia Pacific and African malaria endemic area.

Discussion points:
The varying level of malaria endemicity within countries suggests a local specific approach of malaria prevention and control program in pregnancy than one size fits all policy. Since every single infection has negative effect to the mothers and babies, early detection and prompt treatment should be available in these settings. There are some issues to be answered in order to identify the best intervention program.

- Malaria transmission: How to measure the burden and identify local specific approach based on malaria transmission level?
- Diagnostic capacity in low transmission setting: The importance to have a reliable diagnostic tools and access to good treatment
- The timing of infection: Every infection at any time during pregnancy could have adverse effect to the mother and the foetus. Placental malaria is not the main problem in this setting and the mechanism of the development of adverse outcome is more on the systemic causes. In TBB, intensive weekly screening resulted in a marked decrease of maternal deaths related to malaria.

2.2. Present policy and treatment guidelines

Dr. Rijken presented the evidences of the effectiveness of main malaria intervention strategies in pregnancy in the APR.

Malaria treatment
Most ACT efficacy data in pregnancy comes from the Thai Burmese Border (TBB). The efficacy of some ACTs in pregnancy has been defined, but little is known on the efficacy of chloroquine (CQ) to *P. vivax* infections. Primaquine is contraindicated in pregnancy and therefore preventing relapses is a huge issue in pregnancy. Quinine monotherapy has unacceptably low cure rates and should be combined with another drug, e.g. clindamycin for first trimester infections.

In the 2nd and 3rd trimesters of pregnancy, WHO recommends locally effective ACTs for the first line treatment for uncomplicated *falciparum* malaria and CQ for *vivax* malaria in area where CQ is still sensitive. In area where CQ is resistant, ACT should be considered as the first line treatment for *P. vivax* malaria.

AL has been recommended by some countries in the APR as the first line treatment for *P. falciparum* malaria and in some countries also used for *P. vivax* infections in the 2nd and 3rd trimesters of pregnancy. Recent data suggests that

the efficacy of AL in treating *P. falciparum* in pregnancy is only <90% and other study in non pregnant individuals showed that AL is not efficacious against *P. vivax* infections. Dihydroartemisinin-piperaquine (DHP) is effective for the treatment of both *P. falciparum* and *P. vivax* malaria in non pregnant individuals in Indonesia. The Indonesian Ministry of Health (MOH) recommends DHP as the first line treatment for any malaria in the 2nd and 3rd trimesters of pregnancy.

Malaria treatment in the first trimester of pregnancy remains problematic as limited safety and toxicity data of ACT is available. Quinine and clindamycine remains as the drug of choice, but in severe cases, intravenous artesunate is highly recommended as a live saving treatment.

Pharmacokinetic studies of antmalarials in pregnancy show that most treatment doses are suboptimal for pregnant women. Dose optimization studies are urgently needed.

IPT and Screening and Treatment

The only efficacy data on IPTp in Asia Pacific is a small PK study from Papua New Guinea (PNG) where IPTp with SP-CQ has 60-70% efficacy in preventing *P. falciparum* malaria in pregnancy. Therefore alternative drug for prevention is urgently required. DHP shows a potential post treatment prophylactic and prevention effect. Study on the prophylactic effect of giving monthly DHP to adult males showed that it requires at least 3 months (3 DHP doses) in order to reach adequate piperaquine level that protects from malaria infection and monthly dosing is required. Experiences of using DHP as the first line treatment for 2nd and 3rd trimester for pregnancy in Indonesia also showed a longer post treatment prophylactic effect in pregnancy compared to those treated with Quinine and CQ.

In TBB, intensive screening and treatment with effective antimalarial drug has resulted in a marked decrease of maternal deaths related to malaria.

ITN use in the APR

In places where ITN is distributed, there are problems in ensuring the usage by the target group. Community sees that pregnant women are not the first priority to use ITN. ITN do not prevent recrudescent episodes from resistant parasites or suboptimal treatments, and do not prevent relapses from *P.vivax*.

Discussion points:

Early detection and prompt treatment with and effective antimalarial drugs would reduce the morbidity and mortality from maternal malaria. Intermittent preventive treatment could be a good option provided a good alternative drug to replace SP is identified. Although with some limitations, ITN distribution could provide some level of protection in combination with other intervention strategy.

Some knowledge gaps and challenges identified:

- Routine malaria screening and treatment would be the best option available and there are some knowledge gaps and issues to be addressed:

    - The implementation of screening and treatment would be potentially expensive. In places where malaria transmission is declining, like in Africa, maintaining interest of IST would be a potential problem in the implementation.
    - DHP appears to be potential for malaria treatment in pregnancy, therefore we need PK results of the drug in pregnancy.
    - Identifying the most effective frequency and timing of screening during pregnancy would be good in places with limited resources and accessibility to health care. This needs to be addressed in an operational research.
- As single infection in pregnancy in the APR is associated with adverse pregnancy outcomes, prevention strategy becomes very important. Data on the effect of low parasitaemia and subpatent infection to maternal and pregnancy outcomes would provide a firm base of implementing prevention measures with IPT. Unpublished data from Indonesia showed that subpatent malaria is associated with low birth weight and maternal anaemia.
- The effectiveness of ITN and screening and treatment program to *P. vivax* malaria in pregnancy has not been well defined.

3. Country Experiences in MIP Programming

3.1. SEARO Country Presentations: Indonesia, India, Cambodia and Solomon Islands

Four country representatives shared their best practices, challenges and lesson learned of MIP programming in their country.

Country Presentations from Indonesia (dr. Niken Wastu Palupi), India (Dr. Neeru Singh), Cambodia (DR. Po Ly) and Solomon Islands (Dr. Lyndes Wini)

The peripheral and placental malaria prevalence in pregnancy in Cambodia, India and Solomon Island are generally low (< 5%) whereas in Indonesia higher figures are found (12-18%). Despite this, maternal malaria in these regions is associated with anaemia, low birth weight, preterm delivery and foetal deaths. The proportion with asymptomatic malaria is also high. Given the varying level of malaria transmission within countries, all country presentations highlight that MIP programming in their area should be local specific approach based on an agreed and valid indicator of malaria transmission level.

<u>Integration and Coordination</u>

The integration and collaboration between RH/MCH program and malaria control program at National level is a good base to ensure program implementation and sustainability. Program integration and coordination has been well implemented in Indonesia through continuing efforts in strengthening the program management. In Cambodia, a collaborative pilot study between RH/MCH unit and NMCP in delivering MIP intervention program is ongoing with the main aim to inform national policy on the most effective way of service

delivery. Antenatal care is a focal point in delivering malaria control and prevention program in pregnancy. This includes ITN distribution and different forms of malaria screening and treatment.

Malaria Screening and Treatment

In Indonesia, pregnant women are screened for malaria on their first ANC visit and only those with symptoms on subsequent visits. Cambodia implement routine screening on every antenatal care visit to pregnant women living within the area of 2 km from the forest. In addition, village malaria worker in Cambodia are providing community based MIP prevention and control program. In India, malaria screening in pregnancy is part of routine screening to all symptomatic patients. GF supported MIP intervention program in Indonesia and Cambodia.

Preventive Treatment

India and Solomon Islands implement preventive treatment to pregnant women. Weekly CQ is used in India whereas in Solomon Islands both IPT with SP and weekly CQ are used, although the latter is more popular among pregnant women. Currently, there is no IPTp program introduced in Indonesia due to the high prevalence of SP and CQ resistant parasites found in this region.

MIP Treatment Policy

Indonesia and Solomon Islands use ACT for the treatment of *P. falciparum* and *P. vivax* malaria in the 2nd and 3rd trimesters of pregnancy. DHP is recommended in Indonesia and artemether-lumefantrine (AL) in Solomon Islands. Cambodia uses Artesunate-Mefloquine (Art-Mef) for *P. falciparum* malaria and chloroquine for *P. vivax* infections. India recommends Artesunate-SP as their first line treatment for P. *falciparum* and mix (*P. falciparum* and *P. vivax*) infections in the 2nd and 3 rd trimesters of pregnancy. Chloroquine is used for *P. vivax* malaria treatment in pregnancy in India, however this has not been included in the national guideline.

ITN

ITN distribution has also been implemented by all country represented. The usage of any bed nets in India is high, but ITN use is low. ITN distribution has been part of routine ANC in malaria endemic area in Indonesia. ITN use in pregnant women in Cambodia is low (23-28%) but any net use in the community is high (70-90%). LLIN use in Solomon Islands is 70%.

Case management and Referral System

Delivering and improving case management and a functioning referral system of pregnant women with malaria are an integral part of national malaria control program in all presenting countries.

Challenges:

Indonesia

The number and capacity of human resources delivering the intervention strategy is still limited. Logistics for MIP intervention program in the districts are still dependent to the central/national level.

India

Currently, national policy on malaria control program specific to pregnant women is not available.

Cambodia

- There is no program component dedicated to MIP
- MIP data not included in HIS
- No representative survey published
- Very limited clinical and operational research
- Limited resources
- Poor knowledge and attitudes
- Inaccessibility to at risk population particularly in rainy season
- No national guidelines on asymptomatic MIP

Solomon Islands

The low malaria prevalence in pregnancy found in this region could lead to unclear policy on MIP intervention program.

Discussion points:

- Measuring impact of MIP intervention program to maternal and children mortality rate in low endemic settings is a big job. This would need a good reporting system from an integrated service delivery and all indicators required must be analysed. Therefore, what matter is to develop an effective MIP intervention program to contribute to achievements of MDG 4 and 5.
- Screening and Treatment:
    - The implementation of single screening and treatment in Indonesia is based on the logical consideration of delivering early detection and prompt treatment to pregnant women. There has been no study evaluating the effectiveness of this method.
    - Frequency of screening can be based on the presence of history of fever during pregnancy as this condition increases the risk of having maternal malaria. In TBB, these pregnant women will be offered weekly screening.
    - Antenatal malaria screening would be integrated into the existing ANC service delivery.
- Indonesia's MIP intervention program was presented in the ASEAN MOH meeting and would be replicated in Myanmar, Laos and Cambodia.
- The MIP consortium will address issues related to identifying effective treatment and intervention strategy for malaria in pregnancy in low to moderate malaria transmission setting.

3.2. AFRO Country Presentations: Tanzania-Zanzibar and Senegal

An overview of best practices and lesson learnt of MIP programming in Africa (Ms Elaine Roman)

The overall MIP program achievements in African malaria endemic area are still behind the RBM and PMI's target (80%-85% coverage of ITN, IPTp-SP and case management). Ms Roman outlined best practices and lesson learnt from best performing African countries in the implementation of MIP program.

The evaluation includes all logical aspects of programmatic stages from integration and policy-making to field implementation and how this would reach MIP targets. Zambia and Senegal show high implementation score but still haven't reached the MIP intervention program targets.

Ms Roman pointed out that having a clear policy of MIP program from the National level up to the district level would facilitate the next steps required for program implementation. Policies ensuring logistic supplies (SP and ITN) and capacity building of the staffs (midwives and health staff training) are also an important part of the process. Community participation is an integral part in ensuring universal coverage of service delivery. Routine data are collected and analysed for program planning and decision-making.

Nonetheless, none of these countries have reached the RBM and PMI's targets for MIP programming. Challenges outlines in the presentation are related to human resources, problems in logistic and supply managements. Other problems raised were sustainability of community health worker and high dependency to funding from donors. Best practices shown by Senegal is in providing free commodities to pregnant women and involving community in ANC attendance. Lastly, the evaluation at least shows strength and weaknesses of MIP programming in a country so that issues can be addressed.

Country Presentations from Tanzania-Zanzibar (Dr. Khadija Suleiman Said and Maryjane Lacoste) and Senegal (Dr. Moussa Thior)

Dr. Said highlighted the effect of declining trend of overall malaria prevalence in Zanzibar following ACT deployment, LLIN and IRS program to the reduction in the number of MIP cases. MIP programming in Zanzibar includes ITN distribution, case management and IPTp with SP. In 2009 the coverage of ITN and IPTp-SP1 was 50-60% and IPTp-SP2 was 26%. Data in 2007 showed that only 1% pregnant women found to have positive peripheral malaria. Therefore, the need of IPTp with SP should be assessed in places where malaria transmission is declining.

Dr. Thior pointed out that integration and coordination between RH/MCH unit and NMCP in Senegal are well implemented. Annual integrated work plan, quarterly coordination meetings and other forms of coordination activities have contributed to a successful program implementation. In 2009, 50% of pregnant women slept under ITN, 76% received the first dose of SP and 52% received the

second dose of SP. This results in a reduction in the number of pregnant women with malaria from about 47,000 in 2006 to about 6000 in 2009. Further actions are required to improve coverage of IPTp-SP2 and to assess the need for screening and treatment in low transmission area. Senegal experiences highlight the importance of maintaining integration and reassessments of current malaria control strategy in pregnancy where malaria transmission is declining.

Focused ANC has been the main focal point for delivering MIP intervention program in Tanzania. Health workers are trained in FANC package (including MIP program) and this is also incorporated as in-service training. Maintaining SP supplies is a priority in MIP program. In 2010, IPTp-SP1 coverage is 55% and IPTp-SP2 is only 39%, the majority of the causes are inadequate supply of SP. Issues related to stock outs are addressed. This is done through improving recording system, supervision, increase community awareness and providing discount vouchers for pregnant women (to increase coverage). Moreover, improving logistics system is a critical need for the health system as a whole. ITN use among pregnant women is increased from 15% in 2004 to 57% in 2010.

Discussion points:

- Integration and Policy:
    - Optimize resource allocation between RH/MCH unit and MIP intervention program
    - Pre-service training is an important step for program integration
    - MIP intervention program should be integrated within FANC (6 day training of the whole ANC package which includes IPT, PMTCT, Family Planning etc)
- Intermittent preventive treatment with SP:
    - Strengthen the capacity of ANC in delivering MIP intervention program. IPTp should be included in ANC package.
    - Supply and logistic management should be improved to prevent stock outs of SP
    - Increase community participation to encourage IPTp-SP2 coverage
    - The role of IPT with SP in low transmission settings and high SP resistance: This would require data on what level of transmission that IPT with SP would be effective
- Screening and treatment: As malaria transmission is declining, malaria screening and treatment could be the next strategy required. The effectiveness of this intervention needs to be assessed.
- Monitoring and evaluation process should also look at the impact indicators not only service delivery data.

4. MIP Research: Where are we now?

4.1. Overview of MIP Research – MIP Consortium - Prof. Feiko Ter Kuille and Dr. Azucena Bardaji

The MIP Consortium is addressing some of the key questions on finding the most effective malaria intervention strategy in pregnant women. This is a 6 years

project started in 2008. Research projects are carried out in different malaria transmission setting in Africa, Asia Pacific region and Latin America. The research covers a wide range of MIP aspects, from the burden, patophysiology, immunology, treatment, prevention, service delivery to the socioeconomic-public health impact. Communication between MIP consortium and policy makers at global, regional and national level will be mainly done through RBM MIP working group.

Pregnant women at risk and MIP burden

As a start, the MIP consortium has already quantified the number of pregnant women at risk of malaria. The actual number of pregnant women affected by malaria would need to be defined further. This two information would be useful for planning, monitoring and evaluation purposes. Difficulties are particularly in defining the actual burden of *P. vivax* malaria, since this infection is relapsing and tends to be asymptomatic. Studies on *P. vivax* malaria in pregnancy (and also *P. falciparum* infection) are ongoing and carried out in India, Latin America and PNG. The study will define the burden, impact and immunological consequences of *P. vivax* malaria in pregnant women. Preliminary result suggests that submicroscopic *P. vivax* infections occur frequently. Data on the impact of submicroscopic infections to the pregnancy outcomes is expected in October 2011.

Malaria treatment and prevention

Clinical trials identifying the efficacy of different forms of ACT (artesunate-amodiaquine, artesunate-mefloquine and DHP) for the treatment of uncomplicated malaria in the 2nd and 3rd trimesters of pregnancy are carried out in Africa, Asia and Latin America. Several alternative drugs for SP as preventive treatment are also being studied in Africa (using Mefloquine) and in the APR and Latin America (using SP-Azithromycine). Another potential drug for preventive treatment could be piperaquine (in a form of DHP). In addition, the pharmacokinetic properties of the trial drugs in pregnancy will be assessed to achieve optimal dosing. Safety and toxicity data of antimalarial drug exposures during pregnancy are monitored and evaluated through a centralized pharmacovigilance database.

MIP intervention strategy

The issue of MIP control in low or reduced malaria transmission setting is that pregnant women will be less immune and more susceptible to malaria. Good monitoring and vigilance system would be required and diagnostic capacity would be central in this situation.

Study on the effectiveness of intermittent screening and treatment (IST) with ACT compared with IPTp with SP in pregnant women protected with ITN is carried out in area where malaria transmission is declining and SP is failing (West Africa and Malawi) and in low malaria transmission setting (India).

The effectiveness of IPTp using SP should also be monitored in area with high or increasing SP resistance level. This will be discussed in the next session. Interestingly, the IPTp-SP uptake is found to be the lowest in high malaria

transmission area. The reason for this is unclear. Some of this issue will be addressed in a research on the socio economic determinants of low program uptake of MIP prevention and control program. The result would inform policy and optimize service delivery.

Key Elements:

- Data on the effectiveness of new drug and strategies should be available in 2013.
- There is no funding currently available to study the effectiveness of IPTp with PQ and IST trials in low transmission area where both *P.falciparum* and *P. vivax* are prevalent.
- Early engagement with decision makers is required to inform policy on evidence based intervention program.

4.2. Pharmacovigilance: What have we learned from country pilot programs? How this can inform MIP programming? – Dr. Melba Gomes

Assessing the effect of antimalarial drugs to pregnancy outcomes is a complex issue. This is related to difficulties in stratification of any medication or substances taken during pregnancy. In malaria endemic areas, antimalarials drugs are usually given with ARV. In addition, the lack of baseline data on birth defect rate has made it difficult to identify the relative risks of drug exposures.

Pharmacovigilance system integrated into routine health service delivery as a part of standard care for pregnant women and the newborn has been piloted in several countries. Pregnant women visiting ANC are followed up until delivery and the neonates are examined. There is a shift from clinical documentation towards research level documentation. The additional procedure is in fact improving maternal and neonatal care. The program has been seen to increase early ANC attendance, facility deliveries and quality of care. The major issue is that referral system for newborns with birth defects or having complications has not been well established.

Preliminary findings on the acceptability and feasibility of pregnancy registry to the community suggest the importance of continuing community education on the objective of pregnancy registry and improving positive health staff attitude towards the community (related to birth defects) and to the program.

Discussion points:

- Defining strata for malaria transmission level is a complex issue and should be discussed in a separate WHO meeting. This is very important to define a local specific approach for MIP control strategy in low transmission settings. There is option in using pregnant women as a sentinel group to track population dynamic of malaria transmission.
- Ensuring links between research results and policy: Policy liaison group in MIP consortium will maintain communication with policy makers at global, regional and national level on the results of MIP research projects.

- What are problems in reviewing birth defects? Time is the major constraint. The examination process takes longer time than the usual care. Nonetheless the procedure has improved the quality of care and maternal and neonatal health outcomes.

4.3. How is increasing SP resistance affecting MIP? – Prof. Feiko Ter Kuille and Prof. Stephen Rogerson

IPTp with SP aims to reduce the risk of malaria not providing umbrella protection. SP resistance would have impact on IPTp in terms of reduced treatment effect, shorter post treatment prophylaxis and more placental malaria. The effectiveness of IPTp is related to the local SP resistance status. Studies in places with high resistance SP showed that giving SP would select higher resistant parasites in the placenta. However, this does not necessarily translated into severe infections or adverse outcomes.

In view of increasing SP resistance problem in Africa, SP resistance monitoring study is ongoing in Malawi and probably will start in Kenya. The project includes in vivo and molecular studies of SP used as IPTp in asymptomatic parasitaemic pregnant women. The increase of quintuple mutant in Malawi is associated with the lack of protective effect of IPTp to LBW and parasitaemia. In Mali, on the other hand, where quintuplet mutant is absent, SP is still effective. Mapping of SP resistance area in Africa showed that SP resistance is prevalent in most of Eastern and Southern Africa.

The impact of more frequent SP dosing is also examined. Meta analysis in 4 trials suggests that adding 3rd and 4th SP dose improves birth weight. This approach would fit into FANC package and can be implemented in areas with low SP resistance level.

In light of the above findings, alternative drug for preventive treatment/alternative strategy is urgently required in East and Southern Africa whereas in Central and West Africa, increasing SP dose would be an option.

Discussion points:

- Practicality of increasing SP dose to 3 or 4 times should be discussed in a specific meeting. Integration with FANC program is a good way to ensure coverage. Results from LA shows that malaria at the end of pregnancy has an impact to maternal and infants health, therefore dosing close to delivery might be indicated.
- The rationale of using SP for East Africa is questioned and the working group should provide recommendations on this issue.

4.4. Community Directed Initiatives – Dr. Koki Agarwal

Dr. Agarwal highlighted that addressing demand side of MIP intervention program would help improve program outcomes. CDI is community based

activity which has formal link with health facility. This makes CDI different from other community participation model. The initiative began in 1995. In this concept, community takes an active role in ITN distribution, maintaining register and promoting ANC attendance and health education. On the other hand, health facility provides training, supervision, mobilization and supply deliveries.

Nigeria implemented CDI to help improve MIP intervention program coverage. Community directed distributors actively encourage ITN use and provide SP for IPTp. This has resulted in an increase of ANC attendance, ITN use and second IPTp-SP uptake.

The causes of low IPTp-SP uptake in Uganda are inequitable access and lack of demand of ANC services. Uganda has also implemented CDI to address the low IPTp uptake. Improvements were also observed following implementation. In fact, 77% of IPTp-SP2 coverage is delivered by CDI and only 23% are from health facility. In addition, first ANC attendance is also increase to 95%.

Discussion points:

- The sustainability of the program is questioned, since most community based activities are often suffered from this issue. However, since CDI has strong link with health facility this will help in maintaining support from the government or other sources.
- The role of community in delivering IPT-SP has been long debated in terms of sustainability, quality and acceptability.
- Community participation must also be translated into their active involvement in program planning.

5. Funding Opportunities

5.1. Global Fund Proposal Preparations R11 – Dr. Peter Olumese

Harmonization working group (HWG) is addressing issues and barriers related to proposal development for GF funding application. The HWG will provide a systematic technical support to countries in developing proposal for program scaling up to ensure high success rate (target >70% success rate). Technical assistance will also be given to overcome problems during implementation in timely manner. This initiative is strongly supported by RBM secretariat.

A set of indicators has been developed to identify target countries. Country team will develop proposals with consultant support as required. Partners will support program implementation follow up. Detailed briefing notes on key lesson learned and new key areas of support are on the way.

Timelines: GF Round 11 application opened in January 2011. Proposal development is from15th August to 15th December 2011 and country will hear the result in April/May 2012. New R11 policies that relates to MIP is that there will be opportunities to apply for Health System Strengthening (HSS) not limited to disease specific program (in this case malaria) but also can be attached to

MCH activities. In optimizing service delivery, GF will also support maternal and child health program related to malaria-HIV/AIDS-TB prevention and control program

5.2. MNCH: Technical guidance for the Global Fund – Dr. Viviana Mangiaterra

In order to accelerate MDG 4 and 5 achievements, GF provides support for MNCH components related to AIDS/HIV-TB-Malaria (ATM) control and prevention program. WHO, key UN agencies and partners, will develop clear guidance to strengthen MNCH program capacity in delivering ATM intervention program. The guidelines will help countries in identifying priorities and developing proposals for improving integration process of the ATM program into the MNCH continuum of care.

Technical and normative guidance will provide evidence based intervention program related to program integration between MNCH and ATM control program whereas information note will help countries to synergize their needs with key GF principles. The documents will be disseminated through road shows, country meetings, website and will be shared with partners.

Example of successful proposals covered a wide range of malaria program strategy achievements. Following support, some countries have increased the number of skilled health worker related to MIP program and increased accessibility to ANC packages (including ITN distribution and IPTp).

Discussion points:

- Guidelines and tools dissemination for planning, implementation, monitoring and evaluation would help countries in proposal development. Indicators should include outcome and impact indicator, not just input indicators.
- Include RH people in the planning, unless the guidelines will only be sitting in Malaria program desk.
- Proposal development in Indonesia would need support from head quarters and regional office.
- HSS component is too broad and sometimes can be vague. Therefore it would be good to concentrate more on the actual implementation of the integration program.

6. Working Group Discussion: Key Issues, Recommendation and Research priorities

6.1. Group 1: Identification of pregnant women at risk

Challenges:

- Highly variable malaria transmission in Asia and, increasingly so, in Africa
- No clear and reliable method for stratifying malaria transmission exists, especially at low levels of transmission
- No clear cut-off of endemicity to trigger implementation of focused MIP activities (IPT + LLINs or IST + LLINs)
- Reaching remote and migratory populations, where malaria endemicity is high, is a challenge

Identification of pregnant women at risk

Recommendations:

- Malaria stratification by district to be provided by NMCP to the MCH program, based upon routine HIS data, corrected, where possible, by survey data.
    - Operationally, the malaria program should not ask to MCH program to stratify activities at units below district level
- Cut-off for implementation of MIP activities to be determined by NMCP. All PW in 'at risk' districts are targeted by MIP services.
    - In Indonesia, this is API > 1
    - In Cambodia, this is for villages < 2 km from forest
- CCM through CBWs can be used to bring MIP services to remote areas via outreach.
- Program effectiveness may be monitored through measurement of birth weight coupled with RDT determination of infection of PW at delivery, probably through a sentinel site approach.

Research priorities:

- Impact of plasmodium infection on women and their children in low transmission areas needs to be measured, and linked with recommendations for stratification. In other words, we need evidence to support a stratification threshold.
- We need operational assessment of effectiveness and feasibility of microscopy and RDTs for diagnosis of malaria in pregnant women

Discussion points:

- It is important to quantify cumulative prevalence of malaria during 9 months pregnancy not just point prevalence at any time in pregnancy. This should be taken into account when measuring burden.
- Testing the effectiveness and feasibility of microscopy and RDT is still required since RDT will be used as a screening method in asymptomatic pregnant women with usually low parasitaemia.

- The sensitivity of RDT in diagnosis placental malaria should also be defined.
- Low birth weight incidence as an indicator of program effectiveness is feasible in most countries, since birth weight data is routinely collected. The idea of sentinel site approach in monitoring effectiveness through newborn outcomes is good.
- Routine NMCP data can be used to stratify the level of transmission.

6.2. Group 2: Malaria Prevention in Pregnancy

Key Issue	Concrete Action/Recommendations	Responsible Unit
1. Development of template language to help countries in the development of policy and guidelines for prevention	1. Develop Strategic Framework for Asia 2. Support development process	1. WHO 2. MIP Working Group 3. Jhpiego/ MCHIP
2. Mapping the parasite resistance for currently available antimalarials that are potential candidates for IPTp and prophylaxis	1. Mapping the parasite resistance for currently available antimalarials that are potential candidates for IPTp or prophylaxis	1. MIPc 2. Countries 3. WHO
3. Chemo-Therapeutic-Intermittent Screening and Treatment (IST)-Program Feasibility (acceptability) study including costing	1. Conduct program feasibility studies re: IST and SST (single screening and treatment) and IPTp; specifically, acceptability and costing.	1. Countries 2. Jhpiego (with funding support) 3. WHO 4. MIPc
4. Association between maternal and placental malaria	1. Conduct study to assess placental malaria as a part of IST and SST implementation (this includes the effect of the drug)	1. Countries 2. MIPc 3. WHO
5. SP resistance and IPTp effectiveness	1. Monitor the impact of SP resistance for IPTp	1. Countries 2. MIPc 3. WHO
6. Strengthen vector surveillance	1. Set up surveillance to monitor vector susceptibility to insecticides.	1. Countries 2. MIPc 3. WHO
7. Vector behavior (use of nets, repellants or IRS)- OR	1. Support OR for vector behavior	1. MIP working group 2. RBM IVM working group 3. Countries 4. WHO
8. Social and anthropological	1. Conduct KAP studies to better understand MIP	1. Countries 2. WHO

studies	programming components to increase program effectiveness.	3. Jhpiego (with funding support)

Discussion points:

- Monitoring SP resistance could include WWARN as well.
- In Africa, IRS protects women and children. In view of this, since ITN usage is low, ensuring IRS coverage would help prevent malaria in this vulnerable group.
- Vector control in the community should also include mass distribution of ITN.
- Study on vector behaviour is not necessary. Strengthening routine vector control program would be more beneficial. Vector control is important in low transmission setting.
- The role of IPTp in low transmission area needs to be discussed and well researched.
- Malaria prevention program in adolescent girl is a good idea but experiences in Indonesia showed that the program implementation is hugely expensive and complex. High coverage of ITN distribution in the community would have included adolescent girl and would provide some level of protection.
- Indonesia would probably need to map out SP resistance in their area. In India SP is effective against *P. vivax* malaria.

6.3. Group 3: Intervention and treatment for MIP

Specific Problems of MIP in The Asia Pacific:

- Different level of malaria transmission with varying malaria premunition status
- Asymptomatic malaria is associated with adverse maternal and pregnancy outcomes
- High prevalence of *P. vivax* malaria in pregnancy and the infection is also associated with adverse outcomes

Main Objectives:

- Ensure every woman has access to early detection and prompt treatment with an effective anti-malarial drug
- Ensure ACT is used as the first line treatment for uncomplicated malaria and intravenous artesunate for severe malaria in the 2nd and 3rd trimesters of pregnancy (Recommended by WHO malaria treatment guidelines in 2010)

Top Challenges:

- How to reach pregnant women at risk?
- How to maintain supply chain of ACT and RDT?
- How to convince the program of implementing rapid detection and treatment in pregnant women at risk?
- Is the current ACT dosing in pregnancy right?

Intervention and Treatment for MIP

Recommendations:

- ANC program should include ACT and RDT as one of their supplies package
- Pregnant women should get malaria detection and treatment in every contact points
- Using every opportunity to reach pregnant women at risk and encourage them to attend ANC (eg Government recognized community support)
- Countries should improve the capacity of drug procurement and logistic management

Research Priorities:

- PK studies for ACT in pregnancy and dose optimization study
- Operational research to identify the best method of screening and treatment in terms of frequency and timing during pregnancy
- Cost effectiveness study of different methods of malaria screening and treatment

Discussion points:

- Evidences on the effectiveness of malaria screening and treatment in pregnant women are still limited. Nonetheless, the group thinks that providing early detection and treatment to every pregnant women in low transmission setting would save lives.
- In places where diagnostic capacity are limited (particularly in diagnosing mix *P. falciparum* and *P. vivax* infections), considering using ACT for both species would be a good option.

7. Workplan

8. Annexes

Annex 1

Annual Meeting of the RBM Malaria in Pregnancy Working Group:
Addressing malaria in pregnancy in low transmission settings
18-20 April 2011
WHO Headquarters, Salle C, Geneva

DAY ONE: Monday 18th April 2011

Day 1 Objectives:
1. **Understand global MIP updates from RBM, WHO and PMI**
2. **Review and discuss MIP programming in the Asian Region**
3. **Review and discuss MIP country programming experiences**

09:00 – 09:15 Registration

09:15 – 09:30
- Welcome and Introduction (Thomas Teuscher)
- Review of agenda and meeting objectives and expected outcomes (Koki Agarwal)

09:30 - 10:00 Review and Adoption of October 2005 meeting minutes (Koki Agarwal)

10:00 - 11:00 Global Priorities: MIP Updates
- MIP in the context of the Global Malaria Program and Millennium Development Goals – (Andrea Bosman)
- MIP in the context of MNCH (Liz Mason)
- Update from President's Malaria Initiative: MIP Priorities (Kwame Asamoa)
- Discussion

11:00 - 11:30 **TEA/COFFEE BREAK**

MIP programming in the Asian Region

11:30 - 01:00 Presentation and Discussion of background paper - re: MIP in Asian Pacific Region (Marcus Rijken)
- Part 1: Present data/burden of disease
- Discussion- Recommendations and input for finalization
- Part 2: Present policy and treatment guidelines
- Discussion- Recommendations and input for finalization

01:00 – 02:00 **LUNCH** - buffet at the D building cafeteria

Regional Updates
02:00 - 02:30 SEARO (Dr. Anand Joshi)

Country Experiences in MIP Programming - SEARO
02:30 - 03:30

- Country Specific Presentation - Indonesia (Niken Wastu Palupi)
- Country Specific Presentation - India (Prof. Neeru Singh)

- Discussion-
  - Specific recommendations for scale up
  - Specific recommendations to address bottlenecks

03:30 - 04:00 **TEA/COFFEE BREAK**

04:00 - 05.00

- Country Specific Presentation - Cambodia (Dr. Po Ly)
- Country Specific Presentation - Solomon Islands (Lyndes Wini)

- Discussion-
  - Specific recommendations for scale up
  - Specific recommendations to address bottlenecks

05:00 - 05:15 Day 1 Wrap up/Review (Viviana Mangiaterra)

DAY TWO: Tuesday 19 April 2011

Day 2 Objectives:

1. **Understand regional support for MIP programming in Africa region**
2. **Review and discuss MIP Research**
3. **Review and discuss Global Fund preparation for MIP programming**

Regional Updates
09:00 - 09:30 An overview of best practices and lesson learnt of MIP programming in Africa (Ms Elaine Roman)

Country Experiences in MIP Programming - AFRO (best practices, lessons learned)
09:30 - 10:30

- Country Specific Presentation – Tanzania-Zanzibar (Dr. Khadija Suleiman Said and Maryjane Lacoste)
- Country Specific Presentation – Senegal (Dr. Moussa Thior)
- Discussion-
  - Specific recommendations for scale up
  - Specific recommendations to address bottlenecks

10:30 - 11:00 **TEA/COFFEE BREAK**

MIP Research: Where are we now?
11:00- 11.45

- Overview of MIP research- MIP Consortium (Feiko Terkuile and Azucena Bardaji)
- Discussion

11.45- 12:15

- Pharmacovigilance: What have we learned from country programs? (Melba Gomes)
- Discussion- How can/ should this inform MIP programming?

12. 15 – 01.30 **LUNCH** – buffet in the D building cafeteria

01.30- 03.00

- Drug Resistance: How is increasing SP resistance affecting MIP? (Feiko Terkuile and Stephen Rogerson)
- Discussion - How can/ should this inform MIP programming?

03:00- 03.30

- Community Directed Initiatives (Koki Agarwal)
- Discussion - How/when should CDI be applied in the context of MIP programming?

03.30- 04: 00 **TEA/COFFEE BREAK served in the WG rooms**

04:00 - 05:15 Working groups on Background paper (3 WGs)

05:15 - 05:30 Day 2 Wrap up/Review (Boi-Betty Udom)

DAY THREE: Wednesday, 20 April 2011

Day 3 Objectives

1. **Synthesize meeting discussions to inform MIP working group recommendations to the RBM Secretariat**
2. **Synthesize meeting discussions to inform Asian background paper**
3. **Review and discuss MIP working group work plan**
4. **Define next steps and meeting dates**

Global Fund Preparation: Accelerating MIP programming
09:00 - 10:15

- Global Fund Proposal Preparations: R11 (Peter Olumese)

- MNCH Technical Guidance for the Global Fund (Viviana Mangiaterra)
- Discussion (Elaine Roman, followed by plenary discussion)

10:15 – 10:45 **TEA/COFFEE BREAK**

10:45**-** 12:30 Working groups discussions continued

12:30 - 02:00 **LUNCH**

02:00 - 03:30 Working groups presentations in plenary

03:30 - 04:00 MIP Work plan Review and Update (Koki Agarwal)

04:00- 04:30

- Meeting Close (Viviana Mangiaterra and Koki Agarwal)
  - Next steps
  - Next meeting

04:30 - 05:00 **TEA/COFFEE**

Annex 2.

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