Case Management Working Group (RBM CMWG)
11th Annual Meeting, 28-30th June 2022

Lemigo Hotel, Kigali, Rwanda

Co-Chairs: Elizabeth Juma & Larry Barat
Secretariat: Konstantina Boutsika
Support: Lina Heltsche
Rapporteur: Adam Nothem & Charlotte Eddis

Day 1

Session 1: Introductions, objectives, key updates: Chair, Dr. Lawrence Barat, PMI Impact Malaria and Co-Chair, CMWG

Introduction of participants, including 20 NMCP participants

List of attendees: https://endmalaria.org/sites/default/files/u221/LOP%20RBM%20CMWG-11%20meeting_final.pdf)

Dr Elizabeth Juma, WHO Ghana and Co-Chair, CMWG

Presentation: https://endmalaria.org/sites/default/files/u221/1_Introduction_0.pdf

- CMWG TORs reviewed (https://endmalaria.org/our-work-working-groups/case-management)
- Meeting objectives:
  - To provide updates on state of the art and hot topics in malaria case management.
  - To convene country representatives and malaria partners to share experiences and evidence on best practices for improving malaria case management.

Welcome Remarks from:

- Professor Claude Muvunyi, Director General, Rwanda Biomedical Centre (RBC)
- Dr. Peter Olumese, WHO Global Malaria Programme
- Dr. Corinne Karema, Interim CEO, RBM Partnership to End Malaria

Meeting Opening: Dr. Daniel Ngamije, Minister of Health, Rwanda

Talking points:
https://endmalaria.org/sites/default/files/u221/CMWG%202022%20Talking%20Points%20Minister%20for%20Health%20Rwanda%20.pdf

- Welcome to 20 African malaria program representatives and partner agencies.
- Access to quality care and mitigating drug resistance are critical to ensuring no-one dies from malaria.
- According to the World Malaria Report, malaria cases have been increasing since 2017 in the African region.
- In Rwanda, malaria cases increased in 2014, with peak in 2016-17. From 2017, Rwanda intensified its control efforts and made progress in reducing malaria burden back to pre-2014 levels. For success we need to focus on: strengthening the skills of health workers and access to health services, community participation, multisectoral collaboration.
- Moving forward, we must strengthen cross-border collaboration. This will require financing, coordination, engaged partners and communities.
- We can achieve our vision of a malaria-free Rwanda.

Dr. Aimable Mbituyumuremyi, MOPDD Rwanda: Rwanda Malaria Control Efforts Coordination: Progress towards Malaria Elimination

Presentation: https://endmalaria.org/sites/default/files/u221/2_Aimable%20Mbituyumuremyi.pdf

Key control interventions

- LLIN: Primary channel is continuous distribution through ANC and EPI clinics. Mass campaigns conducted every 3 years. Other small channels include schools, refugee camps, prisons, and hospitals.

- IRS in 12 high-burden districts, which represent 75% of malaria burden in 2016. Limited, targeted IRS conducted in other districts to address malaria upsurges.
- Case management at community and facility levels: Level 1 is community level. There are two CHWs in each village (binome: 1 male and 1 female) managing malaria in all age groups, and pneumonia and diarrhea for children under 5 years. Nationwide. 60% of all malaria cases are managed by CHWs. Following resurgence peaking in 2016, community diagnosis and treatment of malaria was extended to all ages and provided free of charge for the two lowest income categories.
- SBC: Cross-cutting to support other interventions to make sure people know where services are found and to accept interventions on time.
- Surveillance: From village to hospital level collecting data on monthly basis. Also include surveillance for drug resistance through TES.
- Other tools: Targeting mosquitoes that bite outdoors through mosquito repellents and larviciding.

Key indicators

Goal: 50% reduction by 2024 from 2019 baseline. Rwanda achieved 63% reduction by 2021. Goal for severe malaria and malaria related deaths also targets a 50% reduction by 2024, which also was exceeded in 2021.

Malaria incidence dropped to 86 per 1000 population. Most heavily affected districts are in the South of the country.

In September, Malaria Strategic Plan will be reviewed, and new targets set.

Recent Program Innovations

Community-based vector surveillance is a new tool. Local leaders, CHWs, and other key groups trained to help track mosquitoes and detect breeding sites in rice plantation areas which will inform targeting of larval source management and larviciding.

IRS has been maintained in all districts with pyrethroid resistance, while also increasing number of PBO nets distributed in those areas.

Moving towards Elimination

In order to track progress towards elimination, malaria surveillance data must be available down to sector and village levels, which would enable accurate risk mapping. Based on available data from 2016, people in the highest risk areas had 3-5 episodes of malaria per year.

By 2021, almost all sectors had less than 100 cases per 1000 population, with some remaining hotspots within IRS districts. Capacity is being built to enable local responses based on local data. Currently, MOPDD is only receiving data from health facilities. Now digitizing collection of community level data so we can get results in real time enabling real-time response.

New Challenges

Some vulnerable groups are not receiving core interventions, including rice farmers, female sex workers, outdoor security staff, mine workers, refugee camps, and prisons. Truck drivers and mobile populations and border crossers are also at higher risk.

Summary of Program Successes

- Drop in Malaria Burden from 2016 to 2021:
    - Incidence from 408 to 86 per 1,000
    - Malaria cases from 4.6 M to 1.1M
    - Severe malaria cases from 18K to 2K

    - Deaths from 700 to 69
- Innovations:
    - Multisector Collaboration (MINAGRI, MINEDUC, MOE, MINALOC, Private Sector, Local NGOs,..).
    - Community Engagement in IVM (CHWs, Farmers, Mining Company Staff,..).
    - Drone-based larviciding targeted areas.
- Data Use for Decision Making
    - Malaria burden (Incidence): guiding the Central level for interventions deployment.
    - Mosquito Resistance : Guiding the Central level for interventions deployment).
    - Scorecards: Guiding Local NGOs and HFs efforts.

WHO Malaria Technical Updates (Case Management and other uses of antimalarial medicines): Dr. Peter Olumese

Presentation: https://endmalaria.org/sites/default/files/u221/3_Peter%20Olumese.pdf

WHO will no longer publish separate guidelines for treatment or vector control. All guidelines for malaria will now be brought together through its Malaria Toolkit App (MAGIC App) https://www.who.int/teams/global-malaria-programme/malaria-toolkit-app.

In the next couple of months, WHO will issue updated recommendations on the use of ACTs in the first trimester of pregnancy. Updated recommendations on Pyramax are also coming soon, building off the information note issued in 2019. Additional guidelines will be published on seven-day primaquine treatment for and use of tafenoquine for radical cure of *P. vivax*, including recommendations on G6PD testing.

Recommendations on community IPTp (cIPTp) also will be forthcoming based on the results of the Transforming Intermittent Preventive Treatment for Optimal Pregnancy (TIPTOP) studies.

Guidelines continue to recommend the use rectal artesunate (RAS) for severe malaria, while strengthening community platforms and continuum of care. WHO Information Note provides guidance to countries on implementation of programs to deliver RAS and highlights the need to strengthen delivery of health services at all levels to achieve maximum impact from this intervention.

Update from RBM, Peter Olumese, WHO/CRSPC Co-Chair (for Corine Karema, Interim Executive Director)

Presentation: https://endmalaria.org/sites/default/files/u221/4_Corine%20Karema.pdf

Global Fund New Funding Mechanism 4 (NFM4) is coming in 2023. Countries are encouraged to request TA through the CSRPC for updating their national strategic plans (NSP) this year, as the number of consultants available is limited. Don't wait for next year and try to do both the NSP and the NFM4 application at the same time.

Updated application guidelines include a section on vaccines, but it does not address implementation (not the remit of guidelines). There is a group working on recommendations for implementation, especially given the very limited global supply.

Priorities for the next months

- CRSPC subregional malaria programmes and partners meetings.
- UN General Assembly (September 2022).
- Global Fund replenishment (September 2022).
- Support countries in GF Funding Request in 2023.
    - To ensure timely submission of high-quality funding proposals and to avoid gaps in implementation, the CRSPC will provide a comprehensive package of support to countries, based on a tried and tested country led approach.

- GF Funding Application Orientation meeting to inform countries on the differentiated application approach and prepare detailed TA plans. (December 2022).
- International consultants provide TA to support the development of the funding applications and background documents such as gap analysis, address TRP comments, MPR/NSP.
- Funds to countries to support in-country consultations, country dialogue and recruitment of local consultants.
- Mock TRP meetings will be held to facilitate country peer review of draft applications.
- Remote expert review of final draft funding applications will be provided by CRSPC members.
- Support is planned to assist countries to achieve timely grant signature (Grant making).

Question and Answer

WHO guidelines include a section on the RTS.S vaccine, but it does not include guidance on implementation. There is a group that is currently working on how best to deploy the vaccine given the limited supply.

With countries implementing multiple preventive strategies, e.g., SMC and IPTi, there is a risk that a child might be given multiple drug treatments. This is not addressed in WHO guidelines. Countries must develop policies and implementation plans to minimize this risk. WHO can assist countries in planning.

Groups working on Reproductive Health have been involved in the development of recommendations for implementation of cIPTp. We do not want to undermine ANC attendance and institutional deliveries. Community delivery platforms should be part of the continuum of care. It should not be seen as a rescue mechanism for a failing system. The recommended eight contacts for pregnant women don't necessarily have to all occur at ANC clinics.

Policy development happens at country level. WHO guidelines must be tailored based on the specific country context. WHO can work with countries to develop the right mix of policies for your country.

Countries don't need to change their NSP cycle to fit the global fund cycle or that of any other donor. Your NSP cycle is your starting point. Support can be provided to help you align these or to do an interim update to incorporate new/updated global guidelines.

An information note is not a guideline. Pyramax is still not in the Tx guidelines because there is a process by which WHO approves guidelines that is separate from the WHO Prequalification process. Prequalification tells you what to buy. Guidelines tell you when/how to use it. Guidelines focus on treatment classes, not specific products. WHO is looking for ways to harmonize guidelines and prequalification of products.

Drugs for chemoprevention have preferred characteristics. You want partner drugs to have a longer half-life. DHA Piperaquine is not optimal for chemoprevention as DHA is cleared from the body after 8 hours. There currently are very few options for chemoprevention.

The problems identified in the CARAMAL studies was not related to the efficacy of RAS, but with the health systems delivering RAS. Those systems will need strengthening to see the full effect of a program delivering RAS, particularly the referral system and hospital level care. The cost of hospital level care is a major barrier.

The SMC Field guide had clear guidelines on seasonality and level of transmission. This information fed into the analysis of cost-effectiveness of the intervention. Those guidelines will also be useful in guiding when you can stop SMC, particularly in areas moving towards elimination. SMC was never developed to reduce transmission, but rather to reduce severe malaria and death.

Reinstituting chloroquine is not recommended, as resistance will likely re-emerge rapidly after widespread use. The resistance development mechanism for chloroquine is very different from mefloquine, which was reintroduced successfully in the Mekong region.

Post-discharge malaria chemoprevention still requires further study.

Session 2: Severe Malaria, Chair, Dr. Elizabeth Juma

Dr. Phllis Awor, Makerere University: Understanding and Improving the Case Management of Children with Severe Malaria in DR Congo, Nigeria and Uganda: Results of the CARAMAL Study: Community Access to Rectal Artesunate for Malaria

Presentation: https://endmalaria.org/sites/default/files/u221/5_Phyllis%20Awor.pdf

Main conclusions

- In the CARAMAL countries, RAS, an efficacious medicine, was introduced in areas with weak health systems and impoverished communities; multiple severe system deficiencies were observed, leading to low cure rates and high case fatality rates.
- RAS is part of the continuum of care for severe malaria. Without considering the health system as a whole (including treatment seeking patterns, supplies of the multiple commodities, referrals and supervision) reducing case fatality from severe malaria and other major childhood diseases is unlikely to be achieved.

Dr. Stephan Duparc, Chief Medical Officer, Medicines for Malaria Venture, Debrief from Severe Malaria Global Stakeholder Meeting, 8-9 February 2022

Presentation: https://endmalaria.org/sites/default/files/u221/6_Stephen%20Duparc.pdf

Concluding messages from Severe Malaria Global Stakeholder Meeting

- RAS as a life-saving intervention should be made available to all children with severe malaria in accordance with the WHO guidelines.
- Strengthening of referral and post referral services should be prioritized and supported on a continuing basis.
- RAS must not be withheld from any child where no alternative is available.
- Complete treatment with at least 24 hours of injectable artesunate and a three-day ACTs.

Panel discussion on country experiences with severe malaria and Q&A- NMCP Representatives- Germaine Ekoyol (Cameroon), Ahmeddin Omar (Kenya), Emmanuel Shekarau (Nigeria), and Anitta Kamara (Sierra Leone)

Key points:

Emmanuel Shekarau, Nigeria NMEP: Severe malaria patients are treated at secondary and tertiary hospitals, which have revolving funds for medicine. ACT is not available for free, prescriptions are written, but these are poor patients who may not be able to buy medicine after a hospital stay.

Anitta Kamara, Sierra Leone NMCP: Primary Health Unit staff can administer RAS. Referral of cases to higher level facilities is good. Referral facilities, though, don't have capacity to manage severe malaria cases. At referral level, the staff have not been trained to handle severe malaria cases. Facilities don't have blood transfusion services, blood banks are not functional, and oxygen often is not available. CHWs are mostly men, which may contribute to community reluctance to accept suppositories at that level.

Germaine Ekoyol, Cameroon NMCP: RAS is just now being launched in the country. During refresher training, CHWs were advised that RAS is not the treatment for severe malaria, but just to buy time for the child to reach the hospital. We hope the CHWs will pass that message on. At hospital level, we trained staff to provide IV AS. Implementation has slowed down after CARAMAL results. We are just starting up now in 2 regions. Issued government decree that children under 5 years are supposed to be provided care for free. Only 45% of providers follow this decree because we have a shortage of IV AS.

They use artemether or quinine which are not subsidized. We hope to strengthen the procurement system, but there is overuse of injectable AS. In some facilities more than 70% of cases are classified as severe cases.

Ahmeddin Omar, Kenya NMCP: RAS was in the strategy as a pre-referral treatment, but availability was a big issue. It was, therefore, removed from our strategy in 2019. During our mid-term strategy review, RAS was reinstated. There are issues with the quality of care at referral level, including knowledge and skills with artesunate injection and triage of severe patients prior to admission. We have changed our capacity building approach. We now provide on-the-job training as much as possible. We try to ensure each district has master trainers, mentors, can train health workers in OPD, emergency departments, pediatric wards, to ensure health workers know what to do. Adhering to the national guidelines is complex, from testing to diagnosis, dosing, reconstitution of injectable AS, giving the right instructions, and follow up.

Phyllis Awor: CARAMAL was an observational study. We were not able to determine what may have been done if a child was not taken for referral after receiving RAS or whether referral was completed. There were many challenges to completing referral, including lack of transport. Even for those who completed referral, there were often stock outs of medicines. The main conclusion from these studies is that RAS did not reduce mortality because of the weakness of the health and referral systems in the study areas and was not related to the efficacy of RAS.

Stephan Duparc: We avoid using the phrase “rectal artesunate treatment”, it is not the treatment. In some areas, people can be given RAS but then not be referred anywhere so they need to keep taking RAS until they can take an ACT. We want to study this approach, looking at both efficacy and resistance.

Denis Rubahika, NMCP Uganda: More than 60% of patients are treated in private sector. In GF concept note, I was challenging to justify subsidizing injectable As for private sector facilities.

Peter Olumese, WHO: CARAMAL was an observational study. Limited conclusions can be drawn. Study did not investigate why people did not get ACTs after severe malaria treatment. Challenges not limited to RAS. National malaria program does not deliver case management services. That is the responsibility of the public health services in the country. When you say there are no syringes, that is not a malaria specific problem. In many countries, training of health workers has stopped or is very limited, in part because donors don’t like to fund repeated trainings.

Odell Kumeh, NMCP Liberia: Training is essential. We have a rapid turnover of staff. New staff need to be trained. Donors may not like to support training, but countries should take responsibility for training if donors will not.

Ahmeddin Omar, NMCP Kenya: In Kenya, 40% of patients go to private sector – more since COVID. We support the private sector with training, monitor whether they adhere to guidelines, and conduct private sector quality of care surveys every two years. We ensure no monotherapies are given, whether a small retail outlet or a tertiary hospital. Lots of donors are not keen to continue support for training, but health workers keep moving. In Kenya, we have tried to align pre-service training to guidelines. What they had been teaching is completely out of date with what is currently recommended. We have updated pre-service curricula, involving rectors and professors. We support 3 master trainers to visit facilities, identify which health workers need to be trained, and then provide on-the-job training. We also have an eLearning platform that offers CPD points, which reduces costs.

Emmanuel Shekarau, NMEP Nigeria: Non-adherence to treatment guidelines is worse in the private sector. When we reviewed the guidelines, we invited stakeholders to the table, including medical associations, private sector providers and reviewed pre-service training for doctors, nurses, and lab technicians. Because we know that the private sector accounts for a large percentage of all malaria treatments, we have started to promote more training on quality of care. We are training PPMVs (drug sellers) and community pharmacists on quality management for malaria. Some facilities have drug

revolving funds. The goal is to have pooled resources and make commodities available. We think it is a good idea because it means that the drugs are more likely to be available at the facilities.

Germaine Ekoyol, NMCP Cameroon: The private sector has an important role to play. Support to private sector facilities is included in our current Global Fund grant. We have for-profit and non-profit/confessional private sector providers. The non-profit ones are treated like public sector facilities, and they receive commodities and training. We are using a mentorship approach at hospitals that we call the Champions program. We are also providing pre-service training on the new national treatment guidelines in some medical schools.

Anitta Kamara, NMCP Sierra Leone: We support private hospitals with free commodities. They sign an MOU with the MOHS. They are being monitored to ensure they don't charge patients for the treatment. Also been working with private pharmacies for the last two years. We held a consultative meeting with the pharmacy association and told them about the policies and guidelines. We provide the RDTs free to the pharmacies that are registered. We ensure that they do the RDTs at no charge. Patients can either buy ACTs from the pharmacy or you go to the health facility and get it free. It has been working well. We aligned pre-service training with the guidelines. By the time they graduate they should have knowledge. Outreach Training and Supportive Supervision (OTSS+) is working well to improve the quality of facility health services, but we still need training for severe malaria.

Session 3: Drug resistance, Chair: Dr. Naomi Lucchi, PMI Rwanda/CDC

Dr. Pascal Ringwald, WHO GMP, Antimalarial drug resistance in Africa and Strategy to respond

Presentation: https://endmalaria.org/sites/default/files/u221/7_Pascal%20Ringwald.pdf

Key messages from Technical workstream on drug resistance.

Situation still under control, but measures should be implemented to avoid ACT treatment failure.

- Artemisinin partial resistance confirmed in Rwanda, Uganda Horn of Africa.
- Lack of geographical coverage of data.
- Fitness cost and parasite genetic background expected to play a key role in resistance's ability to spread.
- Spread potential likely to differ from the Greater Mekong Subregion.
- For partner drugs, scattered reports of treatment failure, but no resistance confirmed (*in vitro,* molecular markers, or blood levels).
- Potential risk of issue underestimation by local stakeholders (≠ GMS).
- Communication and advocacy will play a key role.

Way forward

- Need to define a strategy to respond to antimalarial drug resistance in Africa.
    1. Prevent the emergence of resistance.
    2. Tackle resistance once it has emerged.
- Strategy will rely on better use of existing tools, and development of new tools and strategies, with actions at global, regional and local level.

Four proposed areas of interventions to be prioritized and targeted through country assessment.

- Strengthen the surveillance of antimalarial drug efficacy and resistance.
- Optimize and better regulate the use of diagnostics and therapeutics to limit drug pressure.
- React to resistance by limiting the spread of antimalarial drug resistant parasites.
- Stimulate research and innovation to better leverage existing tools and to develop new ones against resistance.

Dr Aline Uwimana, MOPDD: Addressing drug resistance in Rwanda

Presentation: https://endmalaria.org/sites/default/files/u221/8_Aline%20Uwimana_updated.pdf

- Efficacy of AL remains high in Rwanda despite the presence of kelch13mutations and delayed parasite clearance, however, continued monitoring required.
    - Plans to test new ACTs: pyronaridine-artesunate (Pyramax).
    - Introduction of gametocide antimalarial drugs: single low-dose primaquine.
    - Consideration of multi-first line treatments is ongoing.

Panel discussion on country experiences with severe malaria and Q&A- NMCP Representatives- Rwanda, Denis Rubahika (Uganda), and Seynabou Gaye (Senegal)

Aline Uwimana, NMCP Rwanda: We're seeing increases in percentage of *P. malariae, P. ovale*, and mixed infections as the burden of *P. falciparum* decreases. We are monitoring this trend. Single, low dose primaquine will be deployed to lower burden areas, including those areas where partial artemisinin resistance has been identified. Using a different drug combination in areas where resistance has been identified may be an effective way to slow its spread.

Denis Rubahika, NMCP Uganda: We are examining why malaria cases are increasing. There are likely multiple factors contributing to this increase. In 2019-2020, TES was conducted in five geographically distinct sites tested. The efficacy of AL was 80-90% in those studies. The results of those studies are being re-examined and have not yet been disseminated. It does appear that the efficacy of AL has been reduced. Sometimes there is treatment failure that comes from improper use rather than resistance. There is also less impact from IRS, so they are changing the drug used.

Seynabou Gaye, NMCP Senegal: With the support of PMI, we regularly do TES and use WHO 2009 protocol. So far, it is apparent that antimalarials in Senegal remain effective. But there is some reports of resistance in Burkina Faso and we need to continue to do research to check for resistance.

Aline Uwimana, NMCP Rwanda: Now that partial resistance has been identified, we need to be vigilant, use evidence-based interventions, continue research, and monitor surveillance data to identify any issues. We also need to monitor and ensure the quality of the drugs distributed. Regular checks of drug quality must occur. As 90% of cases treated are done at community, health center, and health post level, monitoring must occur at that level.

Pascal Ringwald: We are developing a protocol for monitoring the efficacy of drugs used for chemoprevention, such as SP, and will be posting it online in the near future. There currently is no guidance on when to stop using chemoprevention drugs based on the presence of resistance.

Denis Rubahika, NMCP Uganda: We do not have guidelines on the use of herbal medicines. However, we know patients take herbal medicines at community malaria. Patients admitted with severe malaria often report that they took herbal medicine. But we need to research more if herbal medicine is effective.

Seynabou Gaye, NMCP Senegal: Many people use artemisia, as it is grown in our country. Studies are being done to see if there is an impact from its use. It is not in the guidelines, and we train CHWs to tell people not to use it.

Pascal Ringwald: For TES, it's better to do one armed study or do multiple arms sequentially. You can do multiple arms simultaneously, but TES studies cannot demonstrate superiority of one drug over another. That would take a large comparative trial.

Pascal Ringwald: In order to monitor the efficacy of injectable AS, we would need to administer 7 days of treatment, but that is not what is recommended. That is why it is important to provide a full course of treatment with ACTs after stopping injectable AS. There also can be issues when injectable AS it is not prepared properly and that can cause it to be ineffective.

Day 2

Session 4: Field Trip to observe Rwanda's national iCCM program

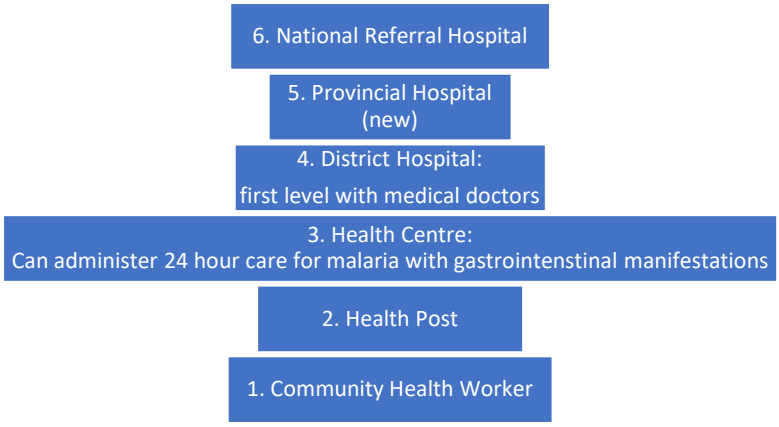
Features of the program

- CHWs selected via community election. The community fully supports the program. The CHW can leave the position at any time, at which point a new election will be held to replace them. Community also can choose a new one if they are unhappy with the current CHW.
- RDT costs 500 francs (US$ 0.50), 200 francs (US$ 0.20) if they have community insurance. If the test is negative, they are referred to the health center and they pay for the service there rather than to the CHW. The CHW collects the money, but it goes to the government. They do not receive any salary.
- The CHW is part of a pilot program where he was provided a smart phone and an allotment of cellular data each month to send in reports via a program called Chrome. For stockouts, they send a SMS using codes to request replenishment and to provide basic updates.
- On a busy day, a CHW may see as many as five clients. During slower times, a week can pass without seeing any patients.

Reflections on a visit to a Community Health Worker in Mareba, Eastern Province, Rwanda by Dr. Nekoye Otsyula, Novartis

Rwanda has a total of approximately 60,000 Community Health Workers (CHWs). This strategy started in 2007. The Eastern Province alone has ~2000 CHWs who are organized into villages, sectors and facilities. In the country, 65% of malaria patients are managed in the community. Of note, children <6 months and expectant mothers presenting with fever are referred to health facilities.

The health hierarchy in Rwanda is as follows:



The lowest three levels manage most of the uncomplicated malaria cases. The health center classifies malaria as uncomplicated, uncomplicated with gastrointestinal manifestations (vomiting and/or diarrhea which can affect retention of medicine) or severe. They administer parenteral artesunate and have the capacity to hold patients for 24 hours. Rwanda's malaria numbers for 2021 are as follows:

Incidence: 86/1,000. Total cases 1.1 million. Severe malaria: 2,500 cases. Deaths 69. They have had a 60% reduction from 2014/15.

To be a CHW is a voluntary position for which incentives are given to sectors that meet their KPIs (not on an individual level). CHWs are encouraged to be part of cooperatives- and when these cash incentives arrive, they are partly disbursed in cash and partly remitted to said cooperatives. These groups carry out income-generating activities including pig farming, and ownership of rental houses.

Each village has ~60 households and each household has ~5 members. CHWs are nominated by their neighbors in the village- so they are generally individuals of good standing in the community. They have at least primary school level of education (year 7/8) and are literate in Kinyarwanda as the job aids are in this language. They receive modular on-job training on basic care procedures and algorithms, inventory management, and record keeping. Each village currently has 4 CHW: a "binome" (1 male, 1 female) who provide malaria, diarrhea and pneumonia care, a third who is female and provides maternal & child health support and a fourth whose primary responsibility is health advocacy. All CHWs deliver health messages as part of their daily work.

We visited a CHW approximately 1 hour away from Kigali. He is a farmer and (mostly in the evenings) sees community members who are unwell. During high malaria season, he sees up to 5 malaria patients a day, and in the low season, 1 a week. People who are unwell visit the CHW at his house. For malaria treatment is supplied with malaria rapid diagnostic tests, and accompanying commodities (buffer, lancets, gloves, sharp boxes) and various AL SKUs- and there is a mobile-phone based system where he alerts the health system (alert goes to the Health Centre, District Hospital and National Medical Stores) when stocks are running low or when patients are referred.

CHWs use MUAC tapes to evaluate nutritional status in children aged <5 years, but otherwise do not take weight. Therefore patients who have positive RDTs receive AL as follows:

- 1 tab: 6 to 35 months
- 2 tabs: 3 to 8 years
- 3 tabs: 9 to 14 years
- 4: 15 years and above

The first dose administered to patients directly and water is used to disperse dispersible tablets. They then receive the rest of the medicine and instructions on how to complete the regimen.

This service is charged if the malaria test is positive. If negative, the patient is referred to the Health Centre for further evaluation. The patient/caregiver pays the CHW who remits the funds to the Health Centre at a regular basis. Cost of service is as follows and is irrespective of age:

- Stratum D&E who are the poor and the poorest of the poor receive free health services at all levels of the public sector.
- Stratum B&C who are eligible for social insurance, pay 200 Rwandan Francs (~ 0.2 USD).
- Stratum A who are considered wealthy, pay 500 Rwandan Francs (~0.5 USD).

Registers exist that list households in stratum D&E- these also receive monthly support from the government.

Convalescing patients are visited at home every three days to follow their progress. Those determined to be severely unwell or returning in poor health within less than a month of a malaria diagnosis are referred to the health facility. Ambulances are shared between Health Centres and can be hailed to the villages for patients too sick to go to hospital on their own.

Currently CHWs use their non-smart phone to send SMS. A smart phone platform is being piloted in a limited number of districts. As part of the pilot, CHWs are supplied with limited data bundles for this work- and the app works offline.

Many other African countries have a CHW strategy- the other thing I've learned in the last few days is that the implementation is not uniform. As an example, Malawi pays her CHWs a modest salary of 150 USD per month, and Ghana uses CHPS compounds and are considering rolling out this strategy in more remote areas.

Session 5: Abstract presentations, Chair: Elizabeth Juma, WHO, Co-Chair, CMWG

Dr. Mehul Dhorda, Mahidol-Oxford Research Unit, Triple Artemisinin-based Combination Therapies (TACTs) could reduce the spread or emergence of artemisinin resistant P. falciparum malaria

Presentation: https://endmalaria.org/sites/default/files/u221/1_Mehul%20Dhorda.pdf

Summary

AL+AQ, ASMQ+PPQ

- Well tolerated, no new safety signals.
- Efficacious even with artemisinin & partner drug resistance.
- Could delay emergence and spread of artemisinin & partner drug resistance (modelling results).

TRACII and TACT-CV (Cambodia Vietnam) studies already published.

Resistance markers don't necessarily mean poor efficacy. 2026-7 would be good to pre-emptively introduce triple ACTs. The earlier the better, don't wait for treatment failures of the partner drug when the resistance marker might have totally taken over in all parasites.

Q&A

Peter Olumese: The question is not if but when resistance will come. We need to get ahead of the game. Process to get TACTs into WHO guidelines when we get to that stage (of product development). What is the appetite for changing a working combination for something else which has a probability of delaying resistance while what you are using is still efficacious, and the new one may be more expensive? When you retool and bring together molecules already in use, you are reducing the combinations available.

Come up with a strategy for containing drug resistance in Africa.

- Triple Artemisinin-based Combination Therapies (TACTs) could reduce the spread or emergence of artemisinin-resistant Plasmodium falciparum malaria
    - What is the real incidence of DAPP resistance in African countries?
        - There is 90% effectiveness in some countries but it is unclear why that is. We should use these as early as possible since there is no big reason not to.
    - What is the timeline for TACT?
        - They've made an adult formulation. They are working in the dispersible version for kids. The goal is apply for prequalification. Hopefully 2025 but will take time to train and distribute.
    - When should NMEPs start to use the TACTs? Should we accelerate the timeline?
        - This is the big question. You may want to look for molecular markers of resistance. However, the gold standard is TES.

Shekarau Emmanuel, Nigeria National Malaria Elimination Program, The impact of the private sector co-payment mechanism (PSCM) on the private market for ACTs in Nigeria: results of the 2018 cross-sectional outlet and household market surveys.

Presentation: https://endmalaria.org/sites/default/files/u221/2_Emmanuel%20Shekarau.pdf

Conclusions:

- The Private Sector Co-payment Mechanism had clear impact on increasing the reach of subsidized QA brands and non-subsidized brands.
- Increased market competition led to innovation from unsubsidized brands and large reductions in costs to make them competitive with subsidized brands.
- Continued monitoring of the market is recommended, along with improved local capacity for QA-certification and monitoring

Q&A

AMFm 2010 transitioned to Private Sector Co-Payment Mechanism (PSCM) until 2017. What has happened since then? Used the results of the survey to develop an ACT sustainability plan.

PPMVs in Nigeria have 51% market share of febrile patients.

NB. Not all non-green leaf ACTs are poor quality. Just because it is not WHO quality assured does not necessarily mean that it is poor quality, maybe they have not submitted their dossier to WHO yet. NMCP is pushing non-qualified manufacturers to go for pre-qualification (national manufacturers).

Q&A

Were there any efforts to separate data on Fansidar used for IPTp and for treatment?

- We were just looking for market share, not use.

Following the stoppage of the funding of the program, we had to develop a new plan with the NMCP.

The goal of the AMFm was to crowd out poor quality malaria treatments with quality-assured ACTs. That does not seem to have been achieved. Were any steps taken to use enforcement powers to remove poor quality treatments from the market?

Dr. Stella Babalola, Breakthrough Action/Johns Hopkins CCP, Assessing the Influence of Psychosocial Factors on Provider Malaria Case Management in Health Facilities in Benin

Presentation: https://endmalaria.org/sites/default/files/u221/3_Stella%20Babalola.pdf

Recommendations:

- Psychosocial factors of providers should be taken into account to improve malaria case management in Benin.
- Improving provider adherence to case management guidelines could benefit from:
    - Strengthening technical knowledge of providers.
    - Using a norms-based approach to address negative beliefs of providers about the professional behaviors of their colleagues.
    - Promoting discussion among providers about case management guidelines.
    - Empowering providers to strengthen the capacity of patients to adhere to treatment and positioning patient adherence as the norm.
- Efforts to improve provider adherence to case management guidelines will also benefit from:
    - Paying special attention to private clinics.
    - Better understanding and addressing the reasons for the negative association between provider supervision and adherence. Could it be that poorly performing facilities are the ones targeted for supervision?
    - Emphasizing the importance of adherence to guidelines irrespective of patient's age.

Q&A

Regarding provider adherence. 57% didn't test but gave ACTs. Why?

- Some providers have said that their clinical judgement is more accurate than the test. We need to fix that.

Just 12% of private clinics were correctly diagnosing and treating malaria. Does the NMCP train them?

- Training is provided, but only a small percentage participate. Also, some are not certified or recognized by the government and wouldn't be included in trainings.

Was diagnosis done only with RDTs, or was microscopy also used?

- Mostly RDTs but can also be microscopy if they have it.

Sometime, when the test as positive, they did not offer antimalarial. Why was that?

- We don't have information on the reasons for not providing malaria treatment.

Some of NMCP's partners are targeting private sector. Some of them are not recognized or certified.

- When they are registered, they are not excluded from training, but the rate of training is much lower than in the public sector.

Dr. Roger Tine, PMI Insights Project, Identifying operational research and program evaluation priorities for malaria case management for the sub-Saharan Africa region

Presentation: https://endmalaria.org/sites/default/files/u221/4_Roger%20Tine.pdf

Case Management Priorities:

1. Test and evaluate approaches or interventions to reduce the frequency of stockouts of key commodities for malaria case management, especially at community level. Rank- 3.
2. Assess factors associated with volunteer CHW cadres' motivation and retention and evaluate different approaches or interventions to improve volunteer CHW motivation and retention. Rank-7.
3. Assess structural and behavioral factors associated with delayed care-seeking across different population groups and compare different strategies to decrease delays in care-seeking. Rank-15.
4. Assess predictors of adherence and non-adherence to case management treatment guidelines among health care providers and test/evaluate different strategies to improve adherence to guidelines. Rank-16.

5. Test and evaluate interventions to improve adherence to malaria treatment guidelines and reporting in private sector health facilities. Rank-20.
6. Evaluate different strategies to improve health care worker adherence to IMCI guidelines. Rank-27.
7. Test different approaches for working with/incentivizing participation and collaboration of the private sector in the referral, diagnosis, treatment, and reporting of malaria cases. Rank-32.

Key takeaways from prioritization

1. Research priorities reflect persistent challenges faced by NMPs in the implementation of core interventions; addressing the priorities can help support NMPs to reach high coverage and improve overall intervention effectiveness.
2. NMPs have insufficient evidence on effectiveness and cost-effectiveness of specific interventions and intervention packages, and how to tailor packages for maximum impact and resources efficiency.
3. Many of the research priorities speak to broader health systems issues that are contributing to gaps in malaria intervention coverage; these issues need to be addressed to improve effective coverage.

Q&A

Funding for different research questions is an issue. How does that get prioritized?

- The method for funding the priorities will depend on the country. We will look at proposals with Global Fund. One funder may not be able to fund all priorities.

Session 6: Monitoring global progress in malaria case management, Chair: Dr. Peter Olumese, WHO

Dr. Lawrence Barat, PMI Impact Malaria/Co-Chair CMWG, Global Indicators for Malaria Case Management

Presentation: https://endmalaria.org/sites/default/files/u221/5_Larry%20Barat.pdf

- Facility based performance indicators including quality of care indicators are available- same for CCM and iCCM, but:
  - Not uniformly collected or collated especially quality of care indicators.
  - Not standardized: there are disparities in how countries use "suspected case" some countries equate those tested with suspected cases, while others have different definitions.
- Indicators measuring access to case management and quality of care come from MIS/DHS surveys
  - These use fever in previous 14 days as proxy and are not so particularly as diagnostic testing is scaled up informative.
  - Challenges of Interpreting children with fever treated with an ACT or tested and treated with an ACT.
  - Best available indicator for WMR but the report on these are not actionable.
- In 2021 CMWG proposed that all stakeholders undertake a critical evaluation of the current and potential new indicators is needed, as is better guidance for countries on the collection and use of case management indicators for action.

Question to programs: How are you using your indicators? Are you able to make decisions with the indicators you have?

Panel discussion on global indicators for malaria case management, Noor Abdisalam, WHO GMP, Molly Robertson, Global Fund/SMERG, Patrick Kachur, Columbia University, Elizabeth Juma and Larry Barat, CMWG

Comments from country participants/panelists

- Many indicators are either not well-defined, not properly collected, or continue to be based on fever (rather than malaria) raising questions about their usefulness in program planning and monitoring at national and global levels.
- The usefulness of indicators for implementation over time will change. At national level, how much of case management is directly influenced by the program?
- We are still saying you should test before you treat? It is confusing, therefore, to continue to collect data on presumed cases.
- The terms "suspected" or "presumed" malaria case is very confusing. This terminology made sense when the policy was to treat all fever cases. Now, you must test all fever cases. We need to get rid of this indicator and it's not speaking to what we want to look for. We also need to bring in indicators of quality of care.
- Quality of care measures could include how many people were tested. RDT, competency in performing and RDT or microscopy and appropriate use of quality-assured ACTs.
- We have a clear guideline that all fevers should be tested. Also, what kind of test to use. All folks need to be highly trained. We also ensure that they have commodities, registers, and tools.
- Other quality indicators: How well are we triaging patients? We need to capture if injectable was used and for what duration. Quality of monitoring basic vital signs. Follow-up care. Quality of documentation.
- We should capture how often relapse occurs (for *P. vivax*).
- We also need to disaggregate case data by pregnancy status. How many cases of MIP are occurring? As we get closer to elimination, we'll see cases in pregnant women present in a more severe way.
- Regarding quality, we need to see if there is a physical exam. Are they being screened for severe malaria. Patient flow issues where people may get drugs before even their test comes back or have to wait in three lines.
- Glad we're going to revise difficult indicators. Maybe other countries don't have time to revise. Also, let's look at the systems. Do they talk to each other? Especially with systems for monitoring supplies.
- The issue in many countries is data quality. There are very big discrepancies at the ground level.
- Global indicators are intended to monitor progress toward coverage and impact targets. Many countries, though, do capture mountains of important data regarding quality of care. There are always issues with definitions as well. Countries often define indicators differently.
- The feedback from countries, including hearing some new perspectives that haven't been previously raised, drives home the need to better clarify existing indicators and the possible need for new indicators. It may be time to retire some indicators that no longer provide useful information.

Day 3

Session 7: Diagnostic Testing, Chair: Dr. Lawrence Barat, PMI Impact Malaria, Co-Chair, CMWG

Dr. Jane Cunningham, WHO GMP, Pfhrp2 deletions and other diagnostic challenges

Presentation: https://endmalaria.org/sites/default/files/u221/1_Jane%20Cunningham.pdf

Conclusions:

- Globally, there are hotspots for pfhrp2/3 deletions—South American and the Horn of Africa region, models predict other high-risk areas in SSA.
- Surveillance should be a high priority for all countries particularly where pfhrp2/3 deletions have been reported locally or in neighboring countries-- avoid crisis!

- With continued HRP2 RDT pressure, expect the problem is ongoing and getting worse; areas where malaria is being driven down to low levels may be at higher risk.
- Alternative tests that do not rely on HRP2 are available- in PQ pipeline and GF ERPD approved.
- Removing barriers to access diagnosis could have a much bigger impact than detecting low density infections, particularly in moderate and high transmission areas.
- Realizing the full potential of diagnostics requires that all links in the chain are strong and maintained.

Panel Discussion and Q&A on Challenges with Diagnostic Testing, Gudissa Assefa and Mebrahtom Haile Zeweli (NMCP Ethiopia), Samatar Kayad Guelleh (NMCP Djibouti), Busiku Hamainza (NMEC Zambia)

Gudissa Assefa and Mebrahtom Haile Zeweli, NMCP, Ethiopia

- 95% of cases are confirmed. We have about 16,000 HFs that use microscopy to confirm cases. We have many CHWs testing with RDTs.
- We conducted a survey of HRP2 deletions and found about 7.2% of those infected had hrp2 deletions. It's very heterogenous across the country.
- We developed a policy brief to address these issues.
- For quality assurance, we use standard slides to train technicians and we do supportive supervision. We are also conducting mentorship.

Samatar Kayad Guelleh, NMCP Djibouti

- We identified the problem of hrp2 deletion in 2019 and 2020. We had samples tested by WHO. We had 40% false-negative with RDT we were using.
- The country has already started to switch to a. Pf-LDH test. It is more costly, but it works for us. We held training sessions to build capacity to perform the new test. A quality improvement guide was developed. We informed the population that the test had been changed and that the new tests is being monitored closely.

Busiku Hamainza, NMEC Zambia

- They haven't yet had to deal with hrp2 deletion yet. A research group did surveys in two districts, but the findings were inconclusive.
- Zambia has a long history of implementing quality improvement program for microscopy and RDTs.
    - We have about 3000 HFs in the country. Our policy is that all suspected cases must be tested. RDTs are in all HFs, even ones with microscopy, so that they can still test if the lab tech is not there.
    - We conduct Outreach, Training, and Supportive Supervision (OTSS) visits to facilities on a quarterly basis using a standard checklist.
    - We developed a slide bank and we continue to build it and use it for training.
    - We have challenges too. Onsite OTSS visits have not been ramped up to full scale.

Q&A

- To Zambia – We went to a field visit for CHWs and in Zambia, they are doing 60% of malaria diagnostics and treatment in Rwanda. We have trouble ensuring quality assurance, however. What is a good experience to ensure quality of diagnosis at community level?
    - CHWs play an important role for malaria control. We have a target of about 36,000 CHWs. Right now, have about 15-16,000. Their role is to test and treat and refer. They are prioritized in hard-to-reach areas. CHWs have contributed to about 50% of patient load in catchment areas. They are really a valuable cadre of HW.
- For Jane Cunningham – Very often, you see that the hrp2-based RDTs are performing despite the hrp2 deletion due to mixed infections and residual antigenemia. By the time we get to replacing all tests, the problem may get out of control. Could there be surveillance at sentinel sites and look for

hidden parasites with those deletions. PCR would work but is very hard to implement. What can we do then?
    - The approach that we're taking is a practical one. We do recognize though that if resources are available, screening clinical samples for hrp2 and 3 deletions is warranted. The main focus should be on clinical samples, but it is still needed to understand if these deletions are in the population. It would be better if we had historical data, but we don't really have that. We're looking to update the survey protocol for monitoring for hrp2/3 deletions. We're modifying the methodology to support sentinel site monitoring. We have labs that can support this that have been for several years. We have a network and legal agreement that are set up for this.
- Given the false negative rate, at which level should we change test. We have 5-7%. Is that reasonable or should we shift now already?
    - The threshold is 5%, but the confidence interval may cross that and we need to use a large sample size in order to get a precise estimate.
- Not many countries do RDT and microscopy at the facility. If that's the case, how can we do surveillance when we hardly do the two together?
    - For most countries, you can just check the existing signals. You can conduct at the baseline survey and continue to monitor.
- Several countries are adding hrp2 deletions to the TES studies.
    - Like in Madagascar, most recent TES did include testing for hrp2/3 deletions. For TES, the sample sizes are not adequate to conclude that the deletions are not present. They also tend to focus on areas of high burden and those areas are where hrp2/3 deletions are least problematic. If there are deletions identified through TES, that would indicate the need for a larger survey. In terms of pressure, in South America, the data to support RDT pressure is more based on modelling.

Session 8: Closing

Brief Updates from MIP and SBC Working Groups

Dr. Katherine Wolf, PMI Impact Malaria/Jhpiego, Malaria in Pregnancy Working Group

Presentation: https://endmalaria.org/sites/default/files/u221/2_Katherine%20Wolf.pdf

Dr. Stella Babalola, Breakthrough Action/JHU CCP, Updates from the RBM SBC WG

Presentation: https://endmalaria.org/sites/default/files/u221/3_Stella%20Babalola_0.pdf

Q&A

To MIPWG – What messaging or advocacy is targeting the mothers and/or pregnant women. What is being done to promote advocacy to the pregnant women?

- Most of the women are coming to ANC at least once. That is a great touch point to talk to them about IPTp. Most come during the 2nd trimester, so they are eligible for IPTp during their first visit.
- The community SBC toolkit being developed by the SBC WG may be a pathway for them to reach these women to attend early and keep coming.

To MIPWG – It was interesting how little focus there was around CM. We put a lot of effort into promoting IPTp. We don't know enough about the CM part. How is it diagnosed? If a pregnant woman is diagnosed with malaria, they are referred for treatment, but do they follow up? Symptoms can be mild (e.g., headaches).

- SP is still effective. Trials do show that it is not inferior to any other drugs. SP is also helping with other pregnancy aspects that lead to low birth weight. It is still very effective and very cost

effective. It continually shows to be the drug of choice. I agree we don't do enough CM. We need include adults in our indicators, as well. Single screen and treat has shown in Rwanda to not be very effective.

There is data showing that community IPTp does not reduce ANC attendance and actually increases it.

Closing Remarks and Next Steps

Larry Barat

- Many thanks to all who helped organize this meeting.
- On a positive note, the issues we discussed at this meeting are a result of the work we have done to address the basics of case management. We can focus on severe malaria, HRP2 deletions, and drug resistance because we have had great success in scaling-up high-quality case management. That's a result of your hard work.
- Malaria control/elimination cannot be achieved in isolation. It needs a full systems approach, including public and private sectors, health service delivery at all levels, supply chain systems, etc.
- We very much appreciate the input of the participants on the M&E of malaria case management. We are energized to take the next step and launch a review of current case management indicators. We will be back in touch to get more detailed input from you on this.

Elizabeth Juma

- Many thanks for all who help organized and/or participated in this meeting.
- We need additional support for procurement aspects. Maybe the experts in PSM to address access based on availability. If commodities are not available, it doesn't matter how good our competencies are.
- We must also ensure we don't lose health workers. When you advocate for your work, do not just take no for an answer.
- Let's keep an eye on resistance and hrp2 deletions.

Larry Barat

- Elizabeth Juma is planning on stepping down as co-chair of CMWG. We will go through a process of nominations and elections. For those interested, please reach out to Larry and/or Elizabeth about what is all involved and please make good nominations as well.

Aline Uwimana

- Many thanks. We will take these conversations and use them to improve our peoples' lives. We are committed to eliminate malaria. We will continue to collaborate.