



# Planning meeting for operational research on malaria elimination

17–18 October 2013, Geneva, Switzerland  
Meeting Report | Global Malaria Programme



**World Health  
Organization**



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WHO/HTM/GMP/2014.5

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## Background

In the past decade, large-scale funding and the development of improved technologies and strategies have resulted in impressive improvements in malaria control and this in turn has led to renewed attempts at malaria elimination in a number of countries. The Global Malaria Action Plan (GMAP, 2008) reflects this ambition: “at least 8–10 countries ... will have achieved zero incidence of locally transmitted infection by 2015.”

Moving forward with elimination requires adjustments to the way national malaria programmes operate. For example, the strategies for case detection and surveillance are radically different in control and elimination programmes. Countries may face constraints or bottlenecks as they make the transition from control to elimination, and operational research can help to remove these bottlenecks, thereby enabling countries to make the transition from control to elimination phases more rapidly.

As part of WHO's work on accelerating countries' transition from malaria control to malaria elimination, and supported by the Bill & Melinda Gates Foundation, WHO/GMP organized a planning meeting for operational research on malaria elimination on 17–18 October 2013. The meeting was held in Geneva, Switzerland, and was attended by 40 participants, including representatives from selected malaria-endemic countries, WHO regional offices, research institutes and funding partners.

The main objectives of the meeting were to:

- review the malaria operational research landscape;
- identify operational challenges, bottlenecks and priority research questions in the transition from malaria control towards elimination; and
- reach agreement among the meeting participants on the next steps, roles and responsibilities.

## The WHO/GMP operational research landscaping exercise

Operational research (OR) has been defined as “the search for knowledge on interventions, strategies, or tools that can enhance the quality, effectiveness, or coverage of programmes in which the research is being done”.

To prioritize areas for future OR related to malaria elimination, WHO/GMP presented a review of published and ongoing OR for discussion at the meeting. This OR landscaping exercise included (1) a literature review of 515 malaria projects that met the definition of OR and had been published in the five years from January 2008 to June 2013; and (2) a partial summary of ongoing OR based on information gathered from research institutes and funding partners, including the Bill & Melinda Gates Foundation (B&MGF), the President's Malaria Initiative (PMI), the Global Health Group/ Malaria Elimination Initiative (GHG/MEI), the Asia Pacific Malaria Elimination Network (APMEN), the Malaria Eradication Scientific Alliance (MESA), and the Malaria Control and Evaluation Partnership in Africa (MACEPA).

The OR landscaping exercise revealed an extensive and active involvement of funding partners and research institutes in malaria OR. The activities were related to various programmatic areas including diagnosis, treatment, prevention, vector control, surveillance, epidemiology and transmission, health systems and cost-effectiveness.

The OR landscaping exercise also identified the following constraints:

1. OR made up only a small number of all articles on malaria research published in the past five years. This implies that OR needs to be enhanced and researchers should be encouraged to publish their findings.
2. Few of the OR projects were led by the national malaria programmes which are responsible for the implementation of control and elimination activities and have intimate knowledge of the real situation and the bottlenecks in their own programmes. This might indicate a need to further involve national malaria programmes in the implementation of OR and to strengthen OR capacity in malaria-endemic countries.
3. Although a number of OR studies are now looking at issues such as so-called hot spots, reactive case detection and asymptomatic parasite carriers, not many of them are being conducted in countries that are engaged in malaria elimination. In the past five years, very few published OR projects focused on topics and activities relevant to malaria elimination. This may suggest that more OR is needed on such topics.
4. Low-transmission settings pose challenges for research studies that require large numbers of cases. OR in low-transmission settings will need to employ methods that work well with small numbers of cases, e.g. case-control studies.

Limitations to the methodology used to conduct the literature search were also identified, and suggestions were put forward to improve the OR landscape:

1. There was probably bias due to the search strategy. The literature review was limited to research cited in PubMed, which is normally undertaken by research institutes, while OR undertaken by national malaria programmes for improving programme management may not have been published.
2. Only English-language publications were reviewed; as OR projects may have been preferentially published in local languages, it is also necessary to search non-English publications.
3. Information on ongoing projects was only partial as it was only collected from some partners; more information about such projects should be collected from malaria-endemic countries.

A full report of the OR landscaping exercise will be made available in due course.

## OR priorities of partners

The partner agencies and research consortia that participated in the meeting were invited to present their OR priorities and activities focused on malaria elimination. Most presented only their current OR activities, as the research priorities for the future are still under consideration and will take this meeting's results into account.

### **Bill & Melinda Gates Foundation (B&MGF)**

B&MGF aims to accelerate malaria elimination efforts ("Accelerate to zero") by fostering coordination and collaboration among grant recipients and other partners on the following priority topics:

- diagnostic tests and infection mapping to enable elimination campaigns;

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- drugs and delivery strategies for complete cure at individual and population levels;
- drugs, vaccines and vector control to reduce and block infection transmission;
- proof that we can accelerate the path towards and achievement of malaria elimination with existing tools;
- policy and practice change to move more countries towards elimination;
- mobilizing sufficient resources;
- preparing for the endgame.

B&MGF has supported partners such as MACEPA, the Clinton Health Access Initiative (CHAI), GHG/MEI and malaria-endemic countries in OR related to vector control and treatment strategies, among others. It is also developing a new OR agenda with priorities focusing on malaria elimination issues.

#### **Clinton Health Access Initiative (CHAI)**

CHAI primarily supports national malaria control programmes (NMCPs) to make evidence-based decisions and optimize the impact of limited resources, focusing on:

- forecasting and modelling for decision-making;
- cost efficiencies and resource allocation;
- how best to scale up laboratory-confirmed diagnosis;
- managing parasite movement; and
- asymptomatic infections.

CHAI is actively involved in OR activities that answer programmatic questions in selected endemic countries. Examples include:

- mapping and modelling to suggest feasible operational plans to achieve elimination in the short term;
- identifying optimal delivery channels for seasonal chemoprevention (mass drug delivery) in Nigeria;
- improving passive surveillance for maximum impact in Zimbabwe;
- combining routine surveillance data with mobile phone collected data to improve targeting of interventions in Namibia;
- testing reactive infection detection strategies and identifying asymptomatic infections in Swaziland, jointly with GHG/MEI.

#### **Global Health Group/Malaria Elimination Initiative (GHG/MEI)**

GHG/MEI presented its research priorities in:

- reactive case detection;
- primaquine roll-out;
- identification of risk factors; and
- response to hotspots and hot-pops.

GHG/MEI's current and future projects include:

- production of a set of background papers on selected key challenges in malaria elimination: importation, surveillance, management, mass drug administration (MDA) and financing;



- continuation of the primaquine work;
- implementing network studies to examine imported malaria;
- trialling targeted parasite elimination; and
- identifying strategies to incorporate private sector reporting into surveillance.

### **Global Fund to Fight AIDS, Tuberculosis and Malaria (The Global Fund)**

The Global Fund does not set research agendas, but funds OR mostly through its monitoring and evaluation (M&E) budgets for country malaria programmes. Its priorities for funding are: OR that alleviates bottlenecks that impede successful programme implementation, with clear translation into action, and short time-frames. The programme must plan for the capacity to design, implement, analyse and interpret the findings of the OR studies.

In addition, The Global Fund will continue to ensure that funding is available for routine surveillance, including therapeutic efficacy studies and insecticide-resistance monitoring.

### **Malaria Control and Evaluation Partnership in Africa (MACEPA)**

MACEPA primarily supports African countries to scale up existing proven interventions and to document progress and impact, but also pays attention to malaria elimination in countries that aspire to this goal. Priorities for OR in the latter include, but are not limited to:

- malaria in mobile and remote populations;
- public and private sector actions;
- community engagement, participation, ownership;
- measuring intervention outcomes; and
- documenting progress towards zero local transmission.

### **Malaria Eradication Scientific Alliance (MESA)**

MESA seeks to advance the science of malaria eradication, and supported its first round of grants to OR on health systems' readiness and measurement of transmission last year. The second round of grants will focus on OR priorities as determined at this meeting. A call for proposals was planned for the end of October 2013.

### **Special Programme for Research and Training in Tropical Diseases (TDR)**

TDR currently collaborates with WHO/GMP and the WHO/Regional Office for Africa inter-country support team in Southern Africa (IST) on OR capacity building for malaria elimination. A first workshop was held in Harare, Zimbabwe in October 2013 to identify priority areas for OR around malaria elimination activities, including research studies that could be conducted immediately using routinely-collected (or previously-collected) data. Studies using available data will be the basis of a Structured Operational Research and Training Initiative (SORT IT) programme. SORT IT programmes take participants through the entire OR process from the formulation of a research question to writing a paper for peer-reviewed publication and preparation of an evidence brief for consideration by policy-makers. Programmes consist of three one-week workshops, held over a 10-month period. Workshop facilitators continue to provide mentorship to participants between workshops.

Each workshop addresses different stages of the research process:

1. research questions, protocol development and ethics;
2. data management and data analysis;
3. paper writing, peer review and policy implications.

This SORT IT programme is scheduled to start in August/September 2014 in four southern African countries: Botswana, Namibia, South Africa and Swaziland. The report of the 2013 Harare meeting is being prepared for publication in a relevant peer-reviewed journal.

## Discussion on operational challenges for malaria elimination

Following the presentation of the OR landscape and presentations from the partners, the meeting participants had an intensive discussion on operational challenges and bottlenecks in the transition from malaria control to elimination. The discussion centred on the following observations:

- Major epidemiological shifts are being observed as countries progress towards malaria elimination. Imported malaria is gaining more prominence and cases are increasingly reported in adult men, clustered geographically, and among migrants and other hard-to-reach groups.
- Essential surveillance data to guide policy-makers in moving from control to elimination is inadequate and incomplete in countries with poor health systems. There are difficulties in integrating the malaria information from private-sector health providers into the health information system.
- Sustainability and phase-out of vector control interventions in low-transmission settings where financial support from donors is waning, need to be addressed.
- Innovative approaches are necessary to address potential changes in vector behaviour, including selection for outdoor biting and increased biting during crepuscular periods, which will limit the effectiveness of long-lasting insecticidal nets (LLINs) and indoor residual spraying (IRS).
- There is an increasing need for accurate detection of asymptomatic infections and micro-parasitaemic infections as transmission is being reduced.
- Low compliance with the 14-day primaquine course for radical cure of *Plasmodium vivax* infections and the safety of single dose primaquine for *P. falciparum* in patients with glucose-6-phosphate dehydrogenase (G6PD) deficiency need to be addressed.
- Insufficient OR capacity of malaria control programmes needs to be addressed.

The meeting participants noted that funding and collaboration for OR will be pivotal to sustain current progress towards malaria elimination.

## Identification of priority OR questions

The process for identification of priority OR questions adopted at this meeting included three steps based on group discussion and individual voting. Participants were assigned to one of three groups (classified as Group-Pf, Group-Pv and Group-island) according to the different malaria profiles of the countries assigned to the particular group. Each group con-

sisted of country representatives, research institutes and partners. At least 10 specific research questions were identified from each group discussion in step 1. These questions were then consolidated with those identified before the meeting and 17 out of 43 research questions were finally prioritized by group discussions in step 2. Ranking based on individual voting was conducted to obtain consensus on a list of priority questions in step 3, ranging from high to lower priority, as shown in Box 1.

**Box 1. Priority research questions for accelerating programme transition towards malaria elimination, ranked from high (1) to lower (17) priority**

1. What is the optimal vector control strategy for elimination? a. full coverage or focal coverage? b. both IRS and insecticide-treated nets/LLIN or one or the other alone, and what is the optimal combination? c. when will vector control interventions be phased out?
2. What are the optimal strategies for identifying and providing services in support of elimination among a range of mobile and remote groups?
3. How can malaria foci be identified and responded to?
4. What are effective and feasible strategies for ensuring quality case-management and engagement in case reporting in the private sector?
5. What diagnostic technologies should be used for detecting submicroscopic infections?
6. How can community engagement for malaria elimination be improved?
7. What is the optimal MDA strategy (i.e. timing, combinations of drugs, number of rounds, duration, geographically and demographically defined at-risk population, adverse events monitoring, and population acceptability)?
8. What strategies should be used to differentiate indigenous and imported cases?
9. How can primaquine be effectively deployed for interrupting transmission of *P. falciparum* in pre-elimination and elimination settings?
10. What are the main barriers to data reporting and what strategies could be used to improve the speed and quality of reporting?
11. What is the optimal intervention where outdoor biting is prevalent?
12. How can primaquine safety be monitored in the absence of G6PD testing?
13. How can receptivity and vulnerability of border areas be evaluated?
14. Where and when is environmental management appropriate?
15. What is the most efficient radius for reactive case detection and intervention around the home of the passively detected case?
16. How can microscopy skills and quality assurance be sustained in low-transmission settings?
17. When and where are larviciding measures appropriate and what is the impact of larviciding on malaria transmission?.

## Recommendations from the meeting to WHO

1. WHO/GMP will develop an *OR agenda* in discussion with partners such as B&MGF, the Global Fund and TDR. The agenda will specify target countries, financial resources, and desired linkages between NMCPs, research institutes and partners. All of the 17 priority research questions should be included on the agenda for selective adoption by different countries, research institutes and partners. Attention will be paid to identification of OR priorities specific to particular countries.
2. WHO/GMP will develop an *OR work plan* for targeting countries with specific research questions, to accelerate countries' transition from malaria control to elimination.
3. WHO/GMP and TDR will expand the *SORT IT* approach, developed in Southern Africa, to other groups of countries, assuming availability of funds.
4. WHO regional offices will collect information on published and ongoing OR projects from relevant countries for continually improving the *OR landscape*.

## For further information please contact

Strategy, Economics and Elimination Team (SEE)  
Global Malaria Programme  
World Health Organization  
Email: [infogmp@who.int](mailto:infogmp@who.int)  
[www.who.int](http://www.who.int)

## List of participants

### African Region

Dr L. Mazhani  
University of Botswana School of Medicine  
Private Bag 0022  
Gaborone, Botswana

Mr J. Alcantara  
National Malaria Control Programme (NMCP)  
Ministerio da Saúde  
BP 23  
São Tome et Principe

Dr M. Santos  
National Malaria Control Programme (NMCP)  
Ministerio da Saúde  
BP 23  
São Tome et Principe

Mr M. Msellem  
Medical Laboratory Scientist  
Ministry of Health  
P O Box 503  
Zanzibar, United Republic of Tanzania

Mr S. Ame  
Public Health Laboratory  
Ivode Carneri  
P O Box 122  
Chake-Chake, Pemba,  
United Republic of Tanzania

### Region of the Americas

Ms M. Eersel  
Ministry of Health  
Paramaribo, Suriname

Mr S. Vreden  
Foundation for Scientific Research  
Paramaribo, Suriname

### South-East Asia Region

Dr W. Satamai  
Bureau of Vector Borne Diseases  
Department of Disease Control  
Ministry of Public Health  
Nonthaburi 11000, Thailand

Professor P. Singhasivanon  
Mahidol University  
Faculty of Tropical Medicine  
Mahidol University  
420/6 Rajvithee Road  
Bangkok, 10400, Thailand

Dr K. Mendis  
Colombo, Sri Lanka (unable to attend)

### Western Pacific Region

Mr X. Zhuigui  
National Institute of Parasitic Diseases  
207 Rui Jin Er Road  
Shanghai 200025, People's Republic of China  
(unable to attend)

Mr G. Taleo  
National Malaria Control Programme (NMCP)  
Health Department  
PMB 9009  
Port Vila, Vanuatu (unable to attend)

Dr L. Dysoley  
National Center for Parasitology  
Entomology and Malaria Control St 322 and  
Monivong  
Phnom Penh, Cambodia

### European Region

Professor V.P. Sergiev  
Director, Martsinovskiy Institute of Medical  
Parasitology and Tropical Medicine  
Malaya Pirogovskaya Street 20  
119435 Moscow G.435, Russian Federation

Dr A. Velibekov  
Deputy Minister of Health, Ministry of Health  
1 M. Mirgasimov Street  
AZ 1022, Azerbaijan

### Eastern Mediterranean Region

Dr F. Ali  
National Malaria Coordinator  
Khartoum, Sudan

Dr A. Ghouth  
Hadramout University  
Department of Community Medicine  
Yemen

### International Institutes

Dr P. Alonso  
Institute for Global Health Barcelona  
(ISGLOBAL)  
Barcelona, Spain (unable to attend)

Dr M. Colenar  
University of Liverpool  
Liverpool, England (unable to attend)

Dr J. Cox  
DrPH Course Director  
Faculty of Infectious and Tropical Diseases  
London School of Hygiene and Tropical  
Medicine  
London, England

Dr M.A. Chang  
US Centres for Disease Control and Prevention  
Atlanta, Georgia  
United States of America (unable to attend)

Dr H. Sturrock  
Global Health Group  
University of California  
San Francisco  
United States of America

Dr M. Tanner  
The Swiss Tropical Research Institute  
Basel, Switzerland (unable to attend)

Dr J. Utzinger  
The Swiss Tropical Research Institute  
Basel, Switzerland (unable to attend)

Dr R. Dhiman  
National Institute of Malaria Research  
New Delhi, India

Dr K. Whitfield  
Malaria Eradication Scientific Alliance  
(MESA) – Barcelona Centre for International  
Health Research  
Barcelona, Spain

### **Partners**

Dr D. Measham  
Bill & Melinda Gates Foundation (B&MGF)  
United States of America

Dr T. Kanyok  
Bill & Melinda Gates Foundation (B&MGF)  
United States of America

Dr J. Cohen  
Clinton Health Access Initiative (CHAI)  
United States of America

Dr A.L. Menach  
Clinton Health Access Initiative (CHAI)  
United States of America

Dr A. Ramsay  
Special Programme for Research and  
Training in Tropical Diseases (TDR)  
Geneva, Switzerland

Dr S. Filler  
The Global Fund  
Geneva, Switzerland

Dr R. Steketee  
Malaria Control Program and Malaria Control  
and Evaluation Partnership in Africa (MACEPA)  
PATH/USA

### **WHO Regional Offices**

Dr A. Kalu  
Regional Office for Africa (unable to attend)

Dr I. Sanou  
Regional Office for Africa

Dr R. Escalada  
Regional Office for the Americas

Dr G. Zamani  
Regional Office for the Eastern Mediterranean

Dr E. Gasimov  
Regional Office for Europe

Dr A. Valibayov  
Regional Office for Europe

Dr L. Ortega  
Regional Office for South-East Asia

Dr L. Vestergaard  
Regional Office for the Western Pacific

### **WHO Headquarters Secretariat**

Dr R. Newman  
WHO/Global Malaria Programme (GMP)

Dr R. Cibulskis  
WHO/Global Malaria Programme (GMP)

Dr P. Ringwald  
WHO/Global Malaria Programme (GMP)

Dr A. Rietveld  
WHO/Global Malaria Programme (GMP)

Dr S. Zhou  
WHO/Global Malaria Programme (GMP)  
(Meeting organizer)

Dr M. Velarde  
WHO/Global Malaria Programme (GMP)

Ms S. Tabengwa  
WHO/Global Malaria Programme (GMP)  
Administrative Assistant



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World Health Organization  
20 avenue Appia  
1211 Geneva 27  
Switzerland