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The new research agenda for malaria elimination and global eradication stresses the need for innovation and integrated approaches

malERA Refresh is the result of a consultative process with over 180 experts and seeks to accelerate progress to a world free from malaria

Barcelona-Basel-Boston, 28 November, 2017. More than 180 scientists, malaria programme leaders and policy makers from around the world have come together through a consultative process to update the research agenda for malaria elimination and eradication, first published in 2011. The outcome is a series of seven **‘malERA Refresh’ (malaria eradication research agenda) papers** that have been published as a special collection in *PLOS Medicine*. The aim of this exercise, coordinated by the Malaria Eradication Scientific Alliance (MESA) with headquarters at the Barcelona Institute for Global Health (ISGlobal), was to define a forward-looking research and development agenda that will accelerate progress towards malaria elimination and global eradication.

The WHO vision is a world free of malaria. Achieving this would present enormous benefits in terms of health, equity and economy. The WHO has set ambitious goals for reducing the burden of malaria, and 21 countries have been identified as having the potential to eliminate local transmission of malaria by 2020. However, there is no easy path to achieving a malaria-free world and there is a **real need for innovation**. The malERA Refresh sets out a research agenda to meet the challenges, achieve these goals and, in the long-term eradicate it globally.

“The value of malERA Refresh is that it focuses on problems that need to be solved, not only the technologies that could be developed” states MESA chair Dr. **Regina Rabinovich** (ISGlobal and Harvard T.H. Chan School of Public Health). “Transforming the mindset from implementation to problem solving is an essential task for the next generation of scientists and program implementers,” she adds.

The **key messages** highlighted in the introductory paper of the malERA Refresh collection can be summarized as follows:

- Since 2011 significant **progress** has been made in R&D, including support for large-scale testing of the first approved vaccine (RTS,S), non-pyrethroid insecticides in the

pipeline, new genetic technologies to block parasite transmission by mosquitoes, and identification of markers of drug resistant parasites.

- This progress however has been matched with significant **challenges**, such as the expansion of insecticide and drug resistance, knowledge gaps particularly when working in low disease transmission settings, and tools to prevent disease reintroduction. Concerning *Plasmodium vivax* malaria, the most common malaria outside Africa, more is known about its transmission biology and epidemiology but we still lack tools to tackle it. In addition, the continuous evolution of malaria parasites and vectors brings new challenges. An example is the reported rise of *Plasmodium knowlesi* infections in South-East Asia, as well as changes in mosquito biting and resting habits.
- **Solutions** to these problems require **three types of innovation**: 1) iterative innovation (for example, new medicines); 2) transformative innovation of tools and strategies to reduce or halt parasite transmission (for example, gene drive technologies); and 3) integrated approaches tailored to local contexts and local variations in disease transmission dynamics.

To update the agenda, six panels with over 180 experts from different disciplines and countries engaged in a collaborative process to address progress made and main challenges in the following areas: basic science and technologies; insecticide and drug resistance; characterising the reservoir and measuring transmission; diagnostics, drugs, vaccines and vector control; combination interventions and modelling; and health systems and policy research.

“A critical recognition of the malERA Refresh is that eradication efforts perturb the ecological balance of disease transmission. This changing landscape requires ongoing research to understand the impact of this perturbation, and the resulting need to change tactics. This iterative process is the core of the malERA Refresh effort,” says Professor **Dyann Wirth** (Harvard T.H. Chan School of Public Health).

Each panel was guided by a chair and co-chair(s) who are renowned experts in their respective fields. The whole process was overseen by a Leadership Group composed of Drs. Regina Rabinovich (ISGlobal and Harvard T.H. Chan School of Public Health), Pedro Alonso (WHO Global Malaria Programme), Marcel Tanner (Swiss Tropical and Public Health Institute) and Dyann Wirth (Harvard T.H. Chan School of Public Health).

Dr. **Rabinovich** warns that in order to pursue the opportunities proposed in the agenda, a diverse landscape of funders is needed, as well as “a continuous monitoring of research, its impact and the emergence of new challenges to keep the malaria community on course.”

For Professor **Marcel Tanner** (Swiss TPH), “MalERA-refresh will give new momentum to science in the public and private sectors and particularly the key R&D efforts that will make elimination possible.”

The malERA Refresh collection is considered a complement to the WHO ‘Global Technical Strategy for Malaria’ (GTS) and the Roll Back Malaria ‘Action and Investment to defeat Malaria’ (AIM). **Pedro Alonso**, Director of the WHO Global Malaria Programme, underlined the importance of the updated agenda as a key pathfinder for the Global Observatory on Health R&D and added: "Robust research is critical for the WHO to build evidence-based policies and guidelines.”

For access to the publications, please visit collections.plos.org/malera-refresh

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About MESA

The Malaria Eradication Scientific Alliance (MESA) is an inclusive and collaborative consortium of malaria research, policy, and implementation partners dedicated to advancing the science of malaria eradication. First launched in 2012 with the support of the Bill & Melinda Gates Foundation (BMGF grant OPP1034591), MESA is based on the concept that an optimized, funded, and evolving malaria elimination and eradication research agenda is critical for global eradication. MESA works in three main areas: i) management and sharing of information and emerging evidence; ii) collaboration and coordination of the research agenda; and iii) effective and timely translation of learning into policy and practice. The MESA Secretariat is based at the Barcelona Institute for Global Health (ISGlobal)

About malERA

The first Malaria Eradication Research Agenda (malERA) initiative took place between 2008 and 2011. The outputs were published in 2011 in a special collection in PLOS Medicine. It was as a rigorous scientific consultative process based on the understanding that the academic and research community play a crucial role in the fight against malaria and its eradication worldwide, and that such a goal will be unachievable without the development of a new tools and strategies. MalERA was supported by a grant from the Bill & Melinda Gates Foundation and was facilitated by a Secretariat based at the Barcelona Centre for International Health Research (CRESIB), now ISGlobal.

About ISGlobal

ISGlobal is a consolidated hub of excellence in research that has grown out of work first started in the world of health care by the Hospital Clínic and the Parc de Salut MAR and in the academic sphere by the University of Barcelona and Pompeu Fabra University. The pivotal mechanism of its work model is the transfer of knowledge generated by scientific research to practice, a task undertaken by the institute's Education and Policy and Global Development departments. ISGlobal is member of the CERCA programme of the Generalitat de Catalunya.