



Bringing Innovation to the Front Line: new tools to advance the global response to vector-borne diseases

The meeting 'Bringing Innovation to the Front Line: new tools to advance the global response to vector-borne diseases' took place in Madrid, Spain, on 11-12 May 2017. Organized by Unitaid, the World Health Organization (WHO) and Barcelona Institute for Global Health with the support of Fundación Ramón Areces, the meeting brought together more than 150 participants from diverse sectors, including industry, technical experts, policy makers, funders, national program managers, international organizations and public-private partnerships. Covering a wide range of topics, the meeting identified key challenges related to research and development (R&D) as well as promising tools, innovations and strategies to overcome these challenges, both for the near term (late stage development) and in the longer term, and to discuss how to better promote innovation in the vector field.

A significant part of the conference was devoted to sharing updates on the most innovative technologies for public health vector control (for malaria, Aedes, and beyond). Participants discussed the role of modelling in the development of novel tools, and the importance of entomological surveillance. Challenges in the regulatory processes and scaling up of new vector interventions into a seemingly crowded landscape were also addressed.

Participants highlighted the critical importance of focusing on the entire innovation pathway, moving from ideation, innovation, development, to regulatory approval and finally scale-up to achieve public health impact. This includes not only fostering research, but also searching for stimulating business models, facilitating the regulatory process to accelerate the introduction of new products and strengthening capacities in endemic countries in the field of entomology.

As reflected in the WHO report on Global Vector Control Response that was approved during the 70th World Health Assembly in 2017, there was unified support to address vector-borne diseases from an integrated approach, realigning the different vectors, diseases, sectors and partners. A focus on integration was considered as the optimal approach to have a real impact against diseases in the context of the Sustainable Development Goals.

One urgent theme discussed was the challenges faced by existing vector control tools, most importantly, growing resistance to pyrethroids, residual transmission, behavioral changes in the mosquito, interaction with other sectors, such as agriculture, that use pyrethroids, and the potential impact of global warming on the expansion of the geographical presence of vectors. Speakers also highlighted the need for specific responses to address Aedes-borne diseases in urban settings, as well as the needs of special populations such as migrant and refugees that live in camps where disease transmission is heterogeneous. Other critical barriers discussed included funding for late-stage R&D and the processes for new tools to be considered in national public health strategies.

Among the novel methods and approaches in vector control, participants highlighted biological control, baited traps, housing improvements, use of drugs in community programmes with ivermectin and other endectocides to reduce the mosquito population, gene drive technologies (aimed at replacement or suppression of vector populations), and other tools

with new modes of action such as the inhibition of attraction. The use of the wolbachia bacteria to block mosquito infection—principally targeted at Aedes transmission of dengue virus— was presented as an example of turning basic science into actual, sustainable interventions against vector-borne diseases.

Improvements in entomological surveillance were noted as critical for vector control, as well as methods to better evaluate new tools and produce the data that regulatory agencies and policy makers need for decision-making. A key point was the need for optimally designed studies that capture both entomological and epidemiological (human) endpoints to be conducted in late stage development of emerging products.

The discussion of the vector-control business models, and how this contrasted to other global health prevention such as vaccines, highlighted the fact that vector control for public health is not an attractive field for manufacturers and represents a very small percentage of the business market for involved companies compared to the agricultural market, which has led to the concentration of the development of novel active ingredients in very few players. In this context, industry representatives called for a less volatile market, a higher engagement of industry, and a clear regulatory and policy pathway that allows better forecasting by the industry, while harmonizing national rules to make it easy to expand the market. Finally, participants highlighted the importance of community engagement and the fact that ultimate success of any intervention depends on public acceptance and uptake of novel vector control methods, as well as the availability of funding.

Acknowledging the need to accelerate the availability of innovative tools, at the meeting, Unitaid announced a Call for Proposals for new vector control tools to prevent malaria and other vector-borne diseases (<https://unitaid.eu/call-proposals-new-tools-vector-control-malaria/>). The call aims to accelerate the availability of innovative vector control tools by funding late-stage product development -including field trials, market preparatory activities, establishment of regulatory pathways, or economic studies- for new vector control tools.

Unitaid, WHO and ISGlobal noted a sense of overall optimism after reviewing the pipeline of candidate tools and strategies, as well as the engagement of a variety of partners in the fight against vector-borne diseases. Regina Rabinovich of ISGlobal, summarized the key opportunities for bringing innovation in the vector field, including the need for immediate iterative improvements in existing technologies, transformative innovation, and innovative health system changes. Lelio Marmora of Unitaid called to transform the group that gathered in Madrid into a real community, and Pedro Alonso of WHO's Global Malaria Programme stated that it was an exciting time to be working in the fight against vector-borne diseases, which account for more than 17% of all infectious diseases and cause more than 1 million deaths each year.

Parallel event

On the sidelines of the vector control meeting, Unitaid and Jhpiego, an international nonprofit health organization and affiliate of the Johns Hopkins University, launched an ambitious effort to prevent malaria in pregnancy in communities in sub-Saharan Africa.

Unitaid is investing US \$50 million to ensure that pregnant women in malaria-affected countries in sub-Saharan Africa have access to a preventive therapy for malaria known as “intermittent preventive treatment in pregnancy” or IPTp. The five-year project, to be implemented by Jhpiego, will increase IPTp coverage and expand antenatal care attendance in

four African countries — the Democratic Republic of Congo, Madagascar, Mozambique and Nigeria.

The project — also known as “Transforming IPT for Optimal Pregnancy” (TIPTOP) — will increase IPTp coverage through community-level distribution of quality-assured sulfadoxine-pyrimethamine (the medicine used for IPT). Jhpiego has partnered with ISGlobal, which will lead the research and evaluation components of the Project.

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