



Wilton Park



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Conference report

Malaria: integration of new tools for zero deaths and elimination

Monday 20 – Wednesday 22 February 2012 | WP1141

In association with:





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In co-operation with The Global Health Group at the University of California, San Francisco, GlaxoSmithKline, Medicines for Malaria Venture, Novartis, PATH Malaria Vaccine Initiative, and Vestergaard Frandsen

Summary

Wilton Park's second malaria-focused conference "Malaria: integration of new tools for zero deaths and elimination" followed on from the success of the first meeting held in 2009, "Malaria: getting to zero." The conference was an opportunity for a diverse group of experts to discuss the potential application of new technologies and strategies for achieving malaria elimination and zero deaths from malaria. The meeting attendees included a broad range of country leaders, malaria programme managers, international organisation representatives and private sector partners – all of whom engaged in a robust dialogue about the progress, opportunities and distinct challenges in the fight against malaria. This report provides an overview of presentations and discussions from the three-day meeting, with participants balancing the focus on current challenges for malaria control with the opportunities presented by new tools and technologies. Specific discussions focused on the use of new technologies such as the promise of a first malaria vaccine; a renewed focus on surveillance and response; addressing the increased prevalence of insecticide and drug resistance; expanding access to appropriate diagnostics; and, moving away from "one-size-fits-all" malaria programmes and toward more tailored approaches. Calls to action were made for topics including sustainable financing mechanisms for malaria control and elimination; increasing domestic contributions to malaria programmes; harmonising advocacy messages to increase support to malaria control and elimination programmes; and, balancing the use of old and new tools.

Setting the scene

1. Since the 2009 "Malaria: getting to zero" Wilton Park meeting, the world has witnessed great progress in the fight against malaria. In just three years, Turkmenistan and Armenia have been certified as malaria-free [1,2], Iraq has interrupted transmission [3], the Gambia and Rwanda have dramatically reduced their burden [4,5] and thirty-six countries around the world are pursuing malaria elimination [6]. The malaria map is progressively shrinking [7], as demonstrated in the World Health Organization's (WHO) 2011 World Malaria Report which showed that global malaria mortality rates have dropped by 26% and malaria cases have decreased by 17% since 2000 [8]. The massive scale-up of insecticide treated nets (ITNs) have contributed to these reductions, with 50% of households in Sub-Saharan Africa owning at least one ITN [8,9]. Several countries have expanded their indoor residual spraying (IRS) programmes, such as Namibia, while scores more launched or re-launched IRS campaigns. Worldwide, an ever-increasing number of countries have formally adopted artemisinin combination therapies (ACTs) as the first-line antimalarial treatment. The heightened availability of rapid diagnostic tests (RDTs) has enabled a range of health professionals – from doctors to community health workers – to make affordable and

accurate point-of-care malaria diagnoses. Countries like Swaziland are implementing proactive surveillance systems to geographically pinpoint confirmed malaria cases, screen for secondary cases, and launch effective response efforts to prevent onward transmission [10]. The world's current set of interventions has provided programme managers and donors with an affordable arsenal of effective weapons to bring malaria deaths and transmission close to zero in many places.

2. In spite of the impressive reductions in malaria deaths and cases worldwide, such progress remains fragile. Over the last few years, some countries have documented intervention failure, suggesting that the insecticides used for ITNs and IRS are losing efficacy. Artemisinin-resistant parasites have been reported in new areas of the Mekong region, refreshing concerns about losing artemisinin as the most effective first-line antimalarial drug [11]. As reflected by the suspension of Round 11 funding from the Global Fund to Fight AIDS, Tuberculosis and Malaria, the world's capacity to maintain high levels of development aid for malaria remains a serious concern. Donor institutions and private sector investors continue to face budget crises, and thus are demanding more programmatic activity for less funding, and/or have moved away from malaria-specific aid towards more generalised development projects. These funding uncertainties were mirrored by the 2012 World Malaria Day theme of "Sustain Gains, Save Lives: Invest in Malaria," in which partners like Roll Back Malaria (RBM) declared the present time as a "decisive juncture in the history of malaria control." Emphasised by the 2011 publication *Maintaining the Gains in Global Malaria Control*, continued investments in interventions and implementation of malaria control and elimination programmes are required [12]; otherwise the impressive gains in reducing the global malaria burden may be reversed [13].
3. The uncertainty around financing for malaria control and elimination combined with insecurity around the effectiveness of currently available tools has caused the malaria community to address critical questions about achieving efficiency gains. At this Wilton Park meeting, a diverse set of global partners sought to answer the following questions: in today's environment, how do we maximise the use of the tools that have helped countries achieve such dramatic progress? Should we plan to incorporate the new malaria tools from the development pipeline into present malaria programmes? And if so, how do we effectively roll them out, sustainably fund their use, and efficiently measure their impact? These questions are particularly relevant to the RTS,S malaria vaccine candidate, with its global licensure set for 2015, as well as malaria drugs and insecticides in development pipelines.

Key themes

New malaria tools

Malaria Vaccine candidate

4. Although initial findings for the RTS,S malaria vaccine candidate were published in 2011 [14], the Wilton Park conference offered attendees the opportunity to discuss results with key researchers involved in the multi-site trial. Across trial sites, researchers found a 55.1% protective efficacy against clinical malaria in young children over a 12-month period. Concerns arose about the initial findings' generalizability, especially as 75% ITN use was documented across trial sites and ITN ownership across Sub-Saharan African was about 50% during the same time period [8,9], the moderate efficacy, and the period of protection offered by the vaccine. Further, the vaccine is only licensable for young children based on current trial data, which excludes a majority of at-risk populations – older children, adults and pregnant women – from its benefits. The vaccine's use in low transmission areas has yet to be investigated, and as suggested by participants, the vaccine may assist with the interruption of parasite transmission and the achievement of elimination, though this is currently unproven.
5. With 2015 as the goal for the RTS,S malaria vaccine candidate licensure, conference attendees agreed that a vaccine is important to the long-term goal of malaria eradication. However, important logistical issues surfaced as participants discussed its

implementation. For instance, the optimal delivery mechanism for a malaria vaccine has yet to be determined; representatives considered the strengths and disadvantages of piggybacking the malaria vaccine onto existing Expanded Programme on Immunisation (EPI) platforms for childhood vaccinations. Participants also warned of the challenges of appropriately communicating the partial efficacy of RTS,S to health providers and mothers. The cost of the vaccine is essential information for programme managers, and unfortunately cost estimates could not be provided at the time of the conference. Nonetheless, industry representatives emphasised their dedication to making the vaccine as affordable as possible. Without more detailed information about the RTS,S vaccine's logistical characteristics and cost, country participants were hesitant to fully endorse the future use of this malaria vaccine in their programmes. Participants are eager for Phase 3 results and further information about the vaccine, which will be reported towards the end of 2012.

Antimalarial drug development

6. With 45 drugs in various stages along the development pipeline, the potential for more effective medicines against malaria appears high. Tafenoquine has been identified as a key drug candidate against *Plasmodium vivax*, and endoperoxide OZ439 that targets both *P. falciparum* and *P. vivax* are both in Phase 2 trials [15,16]. However, most of the 45 drug candidates remain in early development and many are unlikely to reach Phase 1 trials. Accelerating this pipeline and more efficiently identifying potential antimalarial drug compounds were emphasised as key areas for improvement. Participants suggested that working with stakeholders to augment time-saving processes, such as licensing approvals, may substantially reduce time lags between drug development and roll-out.

Discovery of new insecticides

7. As more countries document the emergence of pyrethroid-resistant mosquito populations [17-19], the need for new insecticides grows. Medical and agricultural entomologists are working together to identify new approaches for malaria vector control insecticides. Unfortunately, this pipeline remains relatively sparse, with experts projecting that new insecticides will not be available until 2020-2022 at the earliest [20]. Furthermore, experts expressed the need for improved insecticide surveillance systems in country programmes, which can detect – and promptly act upon – insecticide resistance.

Optimising the use of malaria interventions

Finding new uses for and increasing the benefits from existing tools

8. As the malaria community awaits new tools, their priority is making existing tools as effective and efficient as possible, as well as ascertaining more creative applications of their use. Using different combinations of existing malaria drugs and varied dosages – such as seasonal malaria chemoprevention (SMC) for children in areas with highly seasonal malaria transmission [21] - were discussed as potential approaches. In addition, international agencies and country managers alike discussed strategies on maximising the use of current interventions. More precise targeting of current interventions was proposed as an effective solution. One example that was discussed was around disrupting what has been termed “malaria hotspots” during transmission seasons for maximal effectiveness and efficiency [22, 23]. Similarly, “spatially targeting” insecticide-based interventions for these areas is likely to benefit – and potentially interrupt malaria transmission for - both individuals residing in malaria hotspots and their community at large. This approach, aptly described by a participant as supplying “intervention x, y, or z for particular groups of people in particular places at particular times,” also complements the need to increase programmatic efficiencies.

Improving data management, malaria surveillance and response

9. As programmes make progress in reducing their national malaria burden, the need to strengthen the overall surveillance and response system increases. Participants

recognised this need, agreeing that countries are unlikely to interrupt transmission without a timely and reliable understanding of where and when cases occur [24, 25]. A robust surveillance system is imperative, as it enables malaria programmes to stratify the country into different malaria risk categories and quickly respond to detected malaria cases and thus prevent outbreaks. Good data collection and management is also important; participants agreed that up-to-date data on malaria transmission patterns are essential for decision-making, especially pertaining to strategic resource allocation, as countries move their programmatic priorities from malaria control to elimination and then to preventing reintroduction.

Emerging challenges to malaria programmes in the wake of great progress

Spreading drug resistance

10. If – or when – it occurs, losing artemisinin as an effective first-line antimalarial will be a substantial blow to malaria control programmes worldwide. The importance of slowing and/or containing the spread of artemisinin-resistant malaria in South East Asia, and particularly preventing these parasite strains from reaching Sub-Saharan Africa, was emphasised throughout the three-day meeting.

Growing insecticide resistance

11. Attributing much of the progress against malaria to the pyrethroid insecticides used for ITNs and IRS, participants shared concern about pyrethroid-resistant mosquitos proliferating – especially as more countries report intervention failure for both pyrethroid-based ITNs and IRS [17-19]. Little funding exists to improve the monitoring of insecticide resistance, and the insecticide development pipeline is poorly populated. The effective reduction of indoor biting and resting *Anopheles* through the use of ITNs and IRS has led to the recognition of different vector behaviours, for example, *Anopheles* mosquitos biting outdoors and avoiding indoor-oriented vector control measures [26]. The malaria community must work to supplement ITNs and IRS by developing new insecticides and alternative approaches for vector control.

Maintaining malaria as a priority disease for investment

12. At the crux of discussions about maintaining the gains made in malaria control and elimination appeared a poignant question: how does the malaria community advocate for a disease as its burden is reduced and it is viewed as less pressing compared to other health issues? Further, with a \$9.7 USD billion funding gap for commodities over the next three years, the malaria community faces two challenges: (1) determining how to maintain and expand current programmes with fewer financial resources; and (2) proposing tangible ways to fill the funding deficits. The Global Fund's Round 11 grants are postponed indefinitely, threatening a delay in the distribution of essential malaria interventions. Participants mentioned the resurgence of malaria cases and parasitemia prevalence when Zambia experienced delays in ITN deliveries. According to a recent systematic review of malaria resurgence events in 61 countries [13], 91% of all malaria resurgence occurrences followed the weakening of national malaria programmes. Such findings, especially in combination with anecdotes from country representatives, highlighted the need for timely solutions to the current malaria funding crisis. Without effective resolutions to these challenges, recent progress in the control and elimination of malaria is unlikely to be sustained [12].

Spurring increased investments in malaria from the private sector

13. Private sector representatives explicitly requested more guidance from country health ministers and malaria programme managers on the ways they could optimally support their programme needs. Countries specifically asked for more technical assistance from the private sector, such as assistance in mapping and the use of cellular mobile phone technologies for reporting cases. Further, private sector partners emphasised the importance of “getting the right incentives in place” such that relevant markets, manufacturers, distribution agencies and consumers are motivated to spend their money on malaria control needs, activities and products. The implementation of

matching contributions by for-profit industries and donors was viewed as an approach that ought to be more widely adopted.

Heightening domestic financial contributions

14. Throughout the meeting, participants called for increased domestic contributions to national malaria programmes. Largely endorsed by country health ministers and programme managers, malaria endemic countries were encouraged to increase the percentage of their government expenditures dedicated to health financing and to ensure that malaria received a substantial budgetary line. Striving for the Abuja target of 15% of government expenditure for health was deemed to be a lofty, though attainable, goal. In addition, conference attendees pointed to in-country private sectors, especially those of emerging economies, as prime candidates for more sustained malaria investments consistent with their local business interests.

Creating innovative funding mechanisms

15. Looking beyond more traditional donors and financing structures, representatives deliberated alternative and innovative funding mechanisms for malaria control and elimination. Suggestions included enacting domestic taxes to generate more consistent streams of funding (for example airline taxes for funding ACTs) and a new financial product called “malaria bonds,” which provides pay-for-performance and efficiency incentives by tapping into private investor markets. Although no consensus was achieved on which innovative financing mechanism could yield the best results, participants acknowledged the importance of creative problem-solving to address the uncertain future of malaria funding.

Calls to action

Sustain malaria efforts and expand goals in spite of funding challenges

16. Participants lauded success in reducing malaria deaths and cases with current tools, but warned that many hard-to-reach communities in malaria endemic countries still lacked access to interventions. There was a call for the malaria community to invest more in demonstrating what works and what does not through conducting research and impact studies. With this information participants believed that efforts and investments could be further optimised, ultimately sustaining and increasing gains made against malaria deaths and transmission. Universal access to diagnostics emerged as a specific goal in this theme; without improved diagnostic capacity, it was asserted, malaria case management and reducing parasite prevalence will be undermined. Strengthening surveillance and response systems was identified as another specific priority, especially as the data generated from these systems are critical for identifying “malaria hotspots,” targeting intervention use, and driving malaria deaths and transmission closer to zero.

Address the funding gaps with new approaches

17. The era of consistent Global Fund monies is likely coming to a close, forcing countries and implementation organisations to prioritise effective interventions and find programmatic efficiencies. Streamlining costs at the programme-level will assist with achieving greater value-for-money, but greater innovation is needed. As a result malaria programmes also must seek complementary and/or alternative funding sources to augment their activities.

Balance the use of old and new tools

18. A quote from the meeting reminded participants of the malaria end-game for countries – elimination and prevention of reintroduction – and how the current malaria tools may not have the strength and durability to achieve those goals: “Two big interventions [ITNs and IRS] got us out of the starting gate, but they won’t get us to the finish line.” There was a warning that there were “no shortcuts” in malaria control and elimination,

such that new tools and innovations will help the malaria community get to zero transmission faster, but old tools will still play an important role. The need for more information about the utility and costs of new malaria interventions was reiterated.

Increase coordination in advocating for malaria

19. Echoing the 2009 Wilton Park call for improved malaria advocacy, partners stressed the need to synchronise communications about tools for malaria control and elimination. Harmonised messaging about new interventions, such as the RTS,S malaria vaccine, was viewed as vital. Partners recommended harnessing the power of African Leaders Malaria Alliance (ALMA), WHO and other key stakeholders to enhance malaria communications and advocacy. The malaria community was also encouraged to learn from other disease-based advocacy efforts and apply these communications strategies to malaria.

Conclusion

20. The malaria community was urged to keep all calls for action against malaria simple, positive and supported by evidence. Nonetheless, the phrase “urgent optimism” surfaced as the meeting’s central theme: while the new malaria tools emerging from development pipelines hold great promise for further reducing malaria deaths and transmission, a sustained focus on the field’s current problems - intervention accessibility gaps, spreading resistance to first-line tools, and significant funding deficits – must be maintained.
21. Today’s tools remain highly effective and must be used more widely and aggressively in programmes run as efficiently and effectively as possible.
22. Tomorrow’s tools, including new vaccines, drugs and insecticides, should be thoughtfully adopted as they become available, as this will accelerate the trend towards progressive malaria elimination and eventual eradication.
23. In reaffirming their commitment to eventually eradicate malaria, participants left Wilton Park reinvigorated with new perspectives, priorities and focus to achieve zero malaria deaths and cases worldwide.

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