

A conversation with the Bill & Melinda Gates Foundation malaria team on December 9, 2013

Participants

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Note: This set of conversation notes was compiled by GiveWell and gives an overview of the major points made by the Bill & Melinda Gates Foundation malaria team.

Summary

GiveWell and Good Ventures spoke with members of the Bill & Melinda Gates Foundation (BMGF) malaria team about gaps in global malaria funding, BMGF's strategy and projected timeline for malaria eradication, and other BMGF malaria activities.

Gaps in global malaria funding

GiveWell and Good Ventures asked the Bill & Melinda Gates Foundation (BMGF) malaria team whether there is a need for funding of better data on bed net durability and bed net usage.

There is not as much knowledge and data about bed net usage and bed net durability as there should be. A potential source of variability in bed net durability is that, currently, there are no globally established criteria for measuring the durability of bed nets, so it is possible that net durability standards differ between producers.

The Results for Development Institute (R4D) is doing very good work on studying bed net durability. Susie Nazarro, of the BMGF malaria team, and Dr. Albert Killian are working with R4D.

Targeted vs. universal bed net coverage

Whether bed net distributions should be universal or targeted is currently a common topic of study in the malaria community.

In 2006-2008, the malaria community focused on getting as many bed nets into the field as possible. It encouraged moving away from social franchise models of net distribution toward free, universal distribution because social franchise models had not been successful in achieving universal coverage. Universal coverage was a simple intervention that communities embraced. The malaria community successfully distributed large numbers of nets and saved many lives. Universal net distributions had major impacts in many places, including Zanzibar, Rwanda, Zambia, and Eritrea.

There has not been much analysis re: how to sustain universal coverage and how to replace bed nets over the long term. Dr. Matthew Lynch at Johns Hopkins University is working on net replacement projects.

Universal coverage is a blunt tool, essential to get things going but smarter malaria control will be required if we want to achieve more with the available resources. A common insight is that to reduce death, the people at highest risk, such as children and pregnant women, should be targeted first. Adult males are less likely to die from malaria, though it is beneficial to the community when they sleep under bed nets because of “herd immunity” considerations. Data show that usage rates are higher among children and pregnant women and lower among adult males.

Targeted coverage represents an advocacy and communication problem; it may be difficult to explain who should use a bed net and why at both the individual and village levels.

Better information about malaria case rates, severity of malaria cases, risk from mosquito vector capacity, and net decay could lead to better-targeted distributions.

BMGF and malaria eradication

Malaria eradication is the BMGF malaria team’s primary goal because eradication would save lives now and save lives forever. BMGF’s malaria eradication strategy is called “accelerate to zero.” BMGF defines malaria eradication as eliminating the parasites that cause malaria in humans. To achieve eradication, the parasites must first be eliminated in humans using a “complete cure” strategy. Current drug treatments do not eliminate the parasite form (gametocyte) that is responsible for transmission (“incomplete cure”). In addition treatment is limited to only those who are symptomatic and seek treatment at a health care facility. Since most of the infected population is asymptomatic, we currently do not address the infectious reservoir. To accelerate getting parasites out of people, one needs to give a “complete cure”, that is, a drug regimen that targets all stages of the parasite in populations and includes the asymptomatic infections (“complete cure”).

BMGF has chosen to pursue a malaria eradication strategy because the goal is to save lives forever. Sustaining current levels of funding for the malaria control interventions is

unlikely to be maintained forever and the risk of resurgence when these interventions are no longer available is assured. In addition, concerns about emerging insecticide and drug resistance will limit future options unless we pursue a different paradigm.

BMGF is well positioned to pursue eradication. Most institutional funders, such as governments, prefer interventions that can demonstrate short-term impact on disease burden which facilitates a simple message for their constituents and donors. It is a more complex message to say that one is working on the longer term investments needed for malaria eradication.

Targeting sources of malaria infections

The malaria community needs better data on the major pockets of malaria infections in order to move toward eradication. The malaria community is now discussing and learning more about “sources” and “sinks” of malaria infections. Sources are geographic locations that tend to export parasites via infected people who travel to other areas. Sinks are geographic areas that tend to receive (net importer) parasites from sources, usually by people. (Most mosquito vectors fly only short distances and are seldom responsible for significant amounts of geographic spread.)

For example, Haiti is the only significant source of *P. falciparum* in the Caribbean. If malaria were eliminated in Haiti, malaria would be effectively eliminated from the Caribbean. Since Haiti is the source, focusing on eliminating *P. falciparum* in other “sink” countries is less effective and likely not even needed. Malaria should be eliminated at the source with targeted interventions.

BMGF plays a small role in preventing renewed outbreaks of malaria in areas where malaria control has been very effective. Preventing renewed outbreaks is essential to eventual eradication.

Developing a malaria vaccine

The traditional strategy to develop a malaria vaccine was to induce naturally acquired immunity earlier in life, essentially by making a 6-month-old’s immune system more similar to a 6-year-old’s immune system. However, natural immunity does not eliminate malaria infections, in fact normal immune responses, whether naturally acquired or vaccine induced, permit asymptomatic infections to persist.

BMGF is taking a different approach to its malaria vaccine strategy. BMGF is working to develop a vaccine that leads to “unnatural” immunity, that is immune responses that would not normally be seen in the course of infections but would prevent new infections or prevent transmission. BMGF believes that if sterile immunity is not natural, unnatural immunity and unnatural immune responses must be created to develop a vaccine that will eradicate malaria.

Timeline for eradication

BMGF believes that eradication is feasible within 20-30 years, with significant uncertainty on either side of that estimate. BMGF's projected timeline for malaria eradication is based on an internal analytical framework that it developed. The eradication strategy follows BMGF's broad principles to be impatiently optimistic and to be innovative.

"Accelerate to zero" utilizes current tools and new strategies, such as targeted coverage of the kind discussed above. Eventually, BMGF hopes to use new tools and new strategies. Its product development strategy is key to the success of its eradication strategy.

If all of BMGF's goals are met in 2014-2020, then it would feel confident in achieving elimination in some key geographies by 2020.

Other BMGF malaria activities

Treating malaria during pregnancy

BMGF is working on ways to screen for and treat malaria during pregnancy. The issue is not straightforward because, although intermittent presumptive treatment in pregnancy (IPTp) strategies have been developed, most treatment drugs for pregnant women have limitations for various reasons. BMGF has been experimenting with "household interventions" to target pregnant women: after a pregnant woman visits a natal clinic, her household receives bed nets, instructions for using bed nets properly, insect repellent, and malaria drug treatment.

Eliminating artemisinin resistance

Eliminating artemisinin resistance in the Greater Mekong Subregion before resistance spreads to other areas is one of the BMGF malaria team's highest priorities. This will require stopping the use of oral artemisinin monotherapies. There must also be a high-level push to prevent the distribution of fake and substandard malaria drugs. BMGF, Clinton Health Access Initiative (CHAI), and other partners could be helpful on this front; a focused effort could have a larger impact.

Incentivizing more efficient malaria spending

Mechanisms to improve financing could be extremely valuable. There is room for new ideas in this space.

Another option is to use a new funding model for malaria control, such as Cash on Delivery (COD) aid, which could improve the efficiency of malaria spending while ensuring that the savings are spent on other health initiatives. If COD aid were earmarked for health spending, it could be used on interventions that are important but less

recognized by the international aid community. For example, a health official in Zanzibar said that if he saved money by doing more efficient malaria control, he would fund work on leprosy.

BMGF's role in the international malaria community

BMGF is an active partner of the Roll Back Malaria (RBM) Partnership and plays many different roles in the partnership. It is leading the task force that will oversee the development of the second Global Malaria Action Plan. It invests heavily in product development because that is a significant comparative advantage.

BMGF played a major role in creating the advocacy community for malaria funding. Bill and Melinda Gates' advocacy has played a role in persuading donor governments to contribute to the Global Fund and to support other malaria-related interventions.

BMGF both uses its funds to fill large gaps in malaria spending and tries to help drive the global agenda in order to leverage funding toward the significant gaps.

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