Global malaria efforts: Progress made, but challenges loom ahead

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‘Invest in the future. Defeat malaria,’ the theme of World Malaria Day 2013, still struck a chord with the outgoing WHO Global Malaria Program Director, Dr Robert Newman, during the release of the latest World Malaria Report on 11 December 2013 in Washington D.C. Dr Newman stated that ‘the greatest threat to continued success in malaria efforts is financial,’ as the community had less than half of the US$5.1 billion needed annually to ensure universal access to life-saving malaria interventions, including long-lasting insecticidal nets (LLINs), indoor residual spraying of households with insecticide (IRS), intermittent preventive chemotherapy for pregnant women (IPTp), rapid diagnostic tests (RDTs) and artemisinin combination therapies (ACTs). Fellow panelists at the release of the report concurred that while tremendous gains have been made in the past decade in reducing malaria morbidity and mortality, these gains, if the experience of the weakening of national malaria control programs following the abandonment of the Global Malaria Eradication Program in the 1980s is to go by, could be easily reversed if the investment to buy the main malaria commodities did not materialize.

With the advent of the Global Fund to Fight AIDS, Tuberculosis and Malaria in 2002; the U.S. President’s Malaria Initiative in 2006; the many contributions of international, bilateral, non-governmental and philanthropic organizations; the private sector; as well as governments of malaria-endemic countries, the disease’s global morbidity and mortality rate fell by 29% and 45% between 2000 and 2012, respectively, saving an estimated 3.3 million lives. Undoubtedly, as shown by endemic countries’ program impact evaluations, such achievements can be largely attributed to the scale-up of the main malaria interventions in that period. Thus, the cumulative number of insecticide-treated nets delivered by manufacturers in sub-Saharan Africa since 2004 now exceeds 700 million, with net ownership increasing from 3% in 2000 to 56% in 2012. In 2012 alone, 135 million people, representing 4% of the global population at risk, were protected from malaria infection by IRS. Between 2010 and 2012, the weighted average of all pregnant women who received one, two and three doses of IPTp during pregnancy was 37%, 23% and 8%, respectively. In 2012, 205 million RDTs were supplied by manufacturers to national programs, and between 2005 and 2012 the number of ACT treatment courses delivered to the public and private sector in malaria-endemic countries rose from 11 to 331 million globally.

These are staggering numbers. While the continuation of global malaria efforts hinges on fully covering the financial needs and gaps to ensure that commodities for implemented interventions are available, efforts could, however, be derailed by current and looming programmatic challenges. First, Plasmodium falciparum, the major human malarial parasite species, has developed resistance to artemisinin, the mainstay of current anti-malarial therapy. A strategy and plan to contain and prevent an expansion of resistance beyond the Greater Mekong subregion has been developed, and funding to support its implementation is being mobilized.

Second, the scale-up of IRS and LLINs throughout endemic areas has led to widespread insecticide resistance. Mosquito populations are fully resistant to organochlorines (e.g. DDT) and pyrethroids (e.g. deltamethrin) in several countries across the African continent, which has resulted in a cost explosion for IRS programs as the other two classes of insecticides, carbamates (e.g. bendiocarb) and organophosphates (e.g. pirimiphos methyl), are more expensive and may require more frequent application. Also, it is yet unknown how pyrethroid resistance will affect the efficacy of the hundreds of millions of distributed LLINs, given that most of these LLINs are pyrethroid-based. Third, country programs’ impact is affected by a cascade of decreasing efficacies and effectiveness, whereby the interventions’ impact is undermined by health systems (e.g. commodity supply chains) and sociological limitations (e.g. behavior change). Thus, while countries globally have massively increased LLIN ownership, sub-national studies and assessments, as well as national household surveys, repeatedly show that LLIN use is much lower than the 85% Abuja Declaration target figure.
Similarly, while the recommendation is to test, treat (and track) every suspected case, commodity stock outs at facility level mean that presumptive treatment persists, cases get treated with the wrong drug or cases go untreated altogether. Fourth, while scale-up of malaria interventions occurred successfully and almost seamlessly in many countries, sustaining control and possibly embarking on elimination requires a departure from a ‘one-size-fits-all approach,’ using sub-national data for improved targeting of interventions, procurement and distribution of commodities, detection of epidemics, as well as shifts in scope or expanse of interventions (e.g. low prevalence or incidence of malaria in an area may require increased case management and surveillance efforts rather than continuation of LLIN or IRS efforts). Infusing such flexibility in national malaria control programs would, however, require strong and nimble health systems, including supply chain management; health personnel capacity; monitoring and evaluation; as well as surveillance.

Additionally, the endgame to malaria elimination will not happen without a renewed push for research and development for new drugs and insecticides to overcome parasite and mosquito resistance to existing products (see above), respectively; improved diagnostic tools capable of detecting low parasitemias; novel programmatic approaches (e.g. seasonal malaria chemoprophylaxis); as well as the development of an effective and a durable vaccine.

A wave of countries (e.g. Argentina, Bhutan, Cape Verde, El Salvador, Malaysia, Mexico) are contemplating malaria elimination and other countries will soon reach pre-elimination status, with economic benefits of global malaria elimination shown to exceed US$200 billion. As demonstrated in the World Malaria Report 2013, the achievements to prevent and control malaria in the past decade have been tremendous. There is little time for the malaria community to rest on its laurels: each year the disease still infects 207 million people and causes 627,000 deaths, highlighting the need and urgency to overcome the financial gap to ensure continued supply of main malaria commodities, and address the programmatic challenges in order to build on the current efforts to defeat this devastating disease.

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References