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Editorial

World Health Day 2014: an opportunity to promote research on vectors & vector-borne diseases

Every year there are more than one billion cases and over one million deaths from vector-borne diseases such as malaria, dengue, schistosomiasis, human African trypanosomiasis, leishmaniasis, Chagas disease, yellow fever, Japanese encephalitis and onchocerciasis, globally[1]. Malaria causes the most number of deaths among the vector-borne diseases; WHO estimated that there were 627,000 deaths and 207 million cases in 2012, mainly in sub-Saharan Africa followed by South East Asia[2]. Dengue is fast emerging pandemic-prone viral disease and up to 50-100 million infections are estimated to occur annually in over 100 endemic countries[3]. The economic costs of malaria and dengue are very high as reported in India[4] and in Puerto Rico[5]. In spite of the high burdens, five vector borne diseases (Chagas diseases, dengue/severe dengue, human African trypanosomiasis, leishmaniasis, lymphatic filariasis and schistosomiasis) are among the 17 neglected tropical diseases[6]. It is, therefore, fitting that World Health Day 2014 focuses on vector borne diseases[7].

World Health Day is celebrated on April 7 every year to mark the anniversary of the founding of WHO in 1948. Each year a theme is selected that highlights a priority area of public health. World Health Day 2014 focuses on vector-borne diseases with the following aims: *(i)* families living in areas where diseases are transmitted by vectors know how to protect themselves; *(ii)* travelers know how to protect themselves from vectors and vector-borne diseases when travelling to countries where these pose a health threat; *(iii)* in countries where vector-borne diseases are a public health problem, ministries of health put in place measures to improve the protection of their populations; and *(iv)* in countries where vector-borne diseases are an emerging threat, health authorities work with environmental and relevant authorities locally and in neighbouring countries to improve integrated surveillance of vectors and to take measures to prevent their proliferation[7].

As well, World Health Day 2014 is an opportunity to highlight the research on vectors and vector-borne diseases. Aside from research and development on new tools, it is necessary to invest in operations research, which is "any research producing practically-usable knowledge (evidence, findings, information, *etc.*) which can improve programme implementation (*e.g*. effectiveness, efficiency, quality, access, scale-up, sustainability) regardless of the type of research (design, methodology, approach)"[8], to contribute in effective control of vector-borne diseases and even eliminate some of these diseases.

Integrated vector management (IVM) is one area where operational research is very much needed. IVM is an approach that seeks to improve the efficacy, cost-effectiveness, ecological soundness and sustainability of disease-vector control. The ultimate goal is to prevent the transmission of vector-borne diseases such as malaria, dengue, Japanese encephalitis, leishmaniasis, schistosomiasis and Chagas disease. One of the five key elements for the successful implementation of IVM is "evidence-based decision making guided by operational research and entomological and epidemiological surveillance and evaluation"[9]. Research is also needed to understand the "epidemiology of elimination" of lymphatic filariasis[10].

Effective and large scale implementation of existing tools has markedly brought down the burden

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of malaria globally[2], including in Asia Pacific[11] and in Sri Lanka[12]. In recent years, four countries have been certified by the WHO as having eliminated malaria[13]. However, the gains achieved are fragile. Preserving the efficacy of key tools – insecticides and artemisinin-based combination treatments (ACT) – is critical. Otherwise, resurgence may occur as in the past wherein 32 per cent of malaria resurgence was attributed to vector or drug resistance[14]. Mosquito resistance to at least one insecticide has been detected in 64 countries[15] and *Plasmodium falciparum* resistance to artemisinin has been documented in Cambodia, Myanmar, Thailand and Vietnam[16-18]. Research plays crucial role in addressing these threats[15,19,20]. To reach the endgame of malaria elimination will require new tools as well as innovative mechanisms to deliver services to hard-to-reach populations in malaria-endemic areas as well as to inform policies and strategies for prevention of resurgence of transmission[21-23].

"Good science is the basis of good public health, but the challenge is to translate the best science into public policy"[24]. World Health Day 2014 is a good opportunity to help address this challenge by providing forum for researchers, policy makers and programme implementers to promote research on vectors and vector-borne diseases and to further improve the translation of evidence generated through research into policy and practice for better control and whenever feasible elimination of vector borne diseases.

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