Vector-borne diseases in South-East Asia: burdens and key challenges to be addressed

WORLD HEALTH DAY AND ITS SIGNIFICANCE

World Health Day is celebrated on 7 April every year to mark the anniversary of the founding of the World Health Organization (WHO) in 1948. Each year a theme is selected that highlights a priority area of public health. It provides an opportunity for individuals in every community to get involved in activities that can lead to better health. World Health Day 2014 focuses on vector-borne disease with the following aims: (a) families living in areas where diseases are transmitted by vectors know how to protect themselves; (b) travellers know how to protect themselves from vectors and vector-borne diseases; (c) 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 (d) in countries where vector-borne diseases are an emerging threat, health authorities work with environmental and other authorities locally and in neighbouring countries to improve integrated surveillance of vectors and to take measures to prevent their proliferation.

This special issue of the *WHO South-East Asia Journal of Public Health* focusing on vector-borne diseases is one of the highlights of World Health Day 2014 activities in the WHO Regional Office for South-East Asia.

VECTOR-BORNE DISEASES

Vectors are living organisms that can transmit infectious diseases between humans or from animals to humans. Mosquitoes are the best known disease vector. Others include ticks, flies, sandflies, fleas, triatomine bugs and some freshwater aquatic snails.

Vector-borne diseases account for more than 17% of all infectious diseases, causing more than 1 million deaths annually. Yet, five vector-borne diseases – Chagas disease, dengue/severe dengue, human African trypanosomiasis, leishmaniasis, lymphatic filariasis and schistosomiasis – are among the 17 neglected tropical diseases. The incidence of dengue has increased 30-fold over the last 50 years. Up to 50–100 million infections are now estimated to occur annually in over 100 endemic countries, putting almost half of the world’s population at risk. In 2012, there were an estimated 207 million cases and an estimated 627 000 deaths due to malaria, mostly (90%) in sub-Saharan Africa. It is therefore fitting that the theme of World Health Day 2014 focuses on vector-borne diseases.

Many vector-borne diseases are prevalent in the South-East Asia Region. These include, among others, mosquito-borne diseases (e.g. malaria, dengue, chikungunya, Japanese encephalitis, lymphatic filariasis), sandfly-borne disease (kala-azar) and snail-transmitted disease (e.g. schistosomiasis). The highly infectious and fatal tick borne viral diseases, Kyasanur forest disease and Crimean Congo hemorrhagic fever are present in India but not much is known about these in the Region probably due to poor surveillance and very limited diagnostic facilities to detect it.

Malaria is endemic in all countries in the Region except Maldives, which has been malaria-free since 1984. WHO estimated that there were 27 million cases and 42 000 deaths due to malaria in 2012 in the Region, where around 1.4 billion people are at risk. In India, the total economic burden from malaria could be around $1940 million, mainly from lost earnings (75%) while 24 percent comes from treatment costs.

Of the 1.3 billion people globally at risk of lymphatic filariasis, 871 million reside in the South-East Asia Region, of whom 297 million (34%) are children. Of the 120 million infected people globally, 60 million are in the Region. The Region thus accounts for about 65% of the global population at risk and 50% of the infected people. About 147 million people in three countries (Bangladesh, India and Nepal) are at risk of kala-azar, mainly the poor and marginalized populations. Recently, a small focus of kala-azar has been identified in Bhutan. Estimates indicate about 100 000 cases of kala-azar per year in this Region.

Schistosomiasis in the Region is limited to small areas in two districts in Indonesia where the number of school-age children requiring preventive chemotherapy in 2012 was only 2998 compared with 114 348 387 globally, mainly in Africa.

The South-East Asia Region has become hyperendemic with regular reporting of dengue cases since 2000. The maximum number of cases (355 525) and deaths (1982) were recorded during 2010. In 2012, a total of 257 204 cases and 1229 deaths were reported from the Region. Chikungunya occurs in Africa, Asia and the Indian subcontinent. Human infections in Africa have been at relatively low levels for a number of years. A major outbreak occurred in the islands of the Indian Ocean in 2005 and since then, India, Indonesia, Maldives,
Myanmar and Thailand have reported over 1.9 million cases.\textsuperscript{13} Japanese encephalitis is endemic in 24 countries in the WHO South-East Asia and Western Pacific regions. It is the main cause of viral encephalitis in many countries of Asia with nearly 68 000 clinical cases every year. The case-fatality rate among those with encephalitis can be as high as 30%. Permanent neurological or psychiatric sequelae can occur in 30–50% of those with encephalitis. Safe and effective vaccines are available to prevent the disease. Treatment is focused on relieving severe clinical signs and supporting the patient to overcome the infection.\textsuperscript{14}

**ADDRESSING KEY CHALLENGES**

Most vector-borne diseases have unique epidemiological features as described in some of the articles in this special issue of the *WHO South-East Asia Journal of Public Health*\textsuperscript{6,15–18}. However, most of these diseases share common socioeconomic determinants. These include difficult access to health services; poverty; and poor housing, sanitation and water supplies. Efficient, effective and sustainable prevention and control of vector-borne diseases requires not only the application of biomedical tools but also interventions to address those factors that are beyond the domain of the health sector.

Outbreaks of dengue, chikungunya and Japanese encephalitis are becoming common, possibly related to increasing population movement, globalization of trade and urbanization without adequate measures to prevent vector breeding. In addition to effective systems for surveillance and rapid response, multisectoral collaboration and community participation are needed to prevent and control outbreaks of these diseases.

The parasitic vector-borne diseases – kala-azar, lymphatic filariasis, schistosomiasis and malaria – are being targeted for elimination at least in some countries. Some key challenges to be addressed to accelerate progress towards elimination are common to these diseases. Among them is the need to scale-up further the use of existing strategies, including integrated vector management,\textsuperscript{19} and put in place innovative delivery mechanisms to help ensure that everyone at risk or with the disease can easily access evidence-based interventions. Strong political will, sustainable financing and community participation are essential. Investments are needed to generate strategic information for decision-making, improve procurement and supply chain management and develop and maintain the right mix of expertise at different levels of the health system to reach the goal of elimination.

While success in malaria control is noted globally,\textsuperscript{5} including in Asia Pacific,\textsuperscript{20} and in Sri Lanka,\textsuperscript{21} the pathway to accelerate malaria control towards elimination is being seriously threatened by vector resistance to insecticides and parasite resistance to drugs. Insecticide resistance is widespread; globally it is now reported in nearly two thirds of 97 countries with ongoing malaria transmission. It affects all major vector species and all classes of insecticides.\textsuperscript{22} The emergence of artemisinin resistance in some areas in the Greater Mekong subregion is a major threat to the progress in malaria control and elimination.\textsuperscript{23–25} Recently a molecular marker associated with delayed parasite clearance in patients treated with artemisinin has been identified, which could help improve global surveillance of artemisinin resistance.\textsuperscript{26} There is an urgent need for all stakeholders to work together to address insecticide resistance and drug resistance in accordance with WHO-recommended strategies.\textsuperscript{22, 27} In the Greater Mekong Subregion, WHO is coordinating the emergency response to artemisinin resistance\textsuperscript{28} that is being implemented by ministries of health and nongovernmental organizations, with support from development partners. A recent report from Myanmar,\textsuperscript{29} indicates several challenges should be addressed to improve further the achievements in containing artemisinin resistance.

**CONCLUSION**

Vector-borne diseases are major public-health problems in the South-East Asia Region. While progress is notable, much more needs to be done to eliminate lymphatic filariasis, kala-azar, schistosomiasis and malaria and to prevent reintroduction of transmission in areas freed from these diseases. Well-coordinated multisectoral actions as well as active participation of individuals, families and the communities at risk are necessary to eliminate these diseases and to contain the spread of dengue, chikungunya and Japanese encephalitis. Additional tools, innovative delivery mechanisms, political will and sustainable financing are essential to achieve universal coverage to control and, whenever feasible, eliminate vector-borne diseases. World Health Day 2014 is another opportunity to call for action against vector-borne diseases.

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**REFERENCES**


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