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Editorial Article

SMALL BITE, BIG THREAT: GLOBAL WAR AGAINST VECTORS

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ABSTRACT

Vector-borne diseases cause more than one million deaths each year. Diseases spread by vectors kill a million people every year and more than half of the world's population is at risk. Malaria is the biggest killer among vector-borne diseases. Each year, around half a million patients with severe dengue require hospitalization. Japanese encephalitis can permanently damage the central nervous system. Around 120 million people are currently infected with lymphatic filariasis, and about 40 million of them are disfigured and disabled. Another concern is that these vectors in several countries are developing resistance to highly effective class of insecticides. Hence all the countries must appreciate the urgent need to act before an alarming situation deteriorates any further. Vector control programmes need to adapt to match the changing epidemiological patterns of new emerging threats. The emergence of vector-borne diseases in new parts of the world – clearly highlight the increasing threat of these diseases to global public health.

Keywords: WHO Day, Vector Borne Diseases, Malaria, Dengue, Epidemiological, Integrated control.

INTRODUCTION

Vector borne diseases are a major public-health concern throughout tropical and sub-tropical regions of the world. They pose a serious threat to development as well as health, affecting the most economically vulnerable populations. Worldwide social, behavioral and environmental factors are key aspects affecting both the transmission and control of such diseases. More than half of the world's population is at risk from vector-borne diseases such as malaria and dengue. Vectors may be a threat to your health – and that of your family - at home and when travelling. This is the message of this year's World Health Day, 7 April, which highlights actions we can all take to protect ourselves from the serious diseases that these "vectors" can cause. The topic for 2014 is vector-borne diseases and the goal is better protection from vector-borne diseases¹. The theme is "small bite, big threat". Hence WHO has declared a global war on vectors to combat the diseases caused by them.

Every year more than one billion people are infected and more than one million people die from vector-borne diseases including malaria, dengue, schistosomiasis, leishmaniasis, Chagas disease, yellow fever, lymphatic filariasis and onchocerciasis. Mosquitoes are one of the best known disease vector. Others include certain species of ticks, flies, sandflies, fleas, bugs and freshwater snails. One sixth of the illness and disability suffered worldwide is due to vector-borne diseases. Also more than half the world's population currently

estimated to be at risk of these diseases with poorest communities and least developed countries². Similarly the important vector-borne diseases for the WHO South-East Asia Region include lymphatic filariasis, malaria, chikungunya, dengue, Japanese encephalitis, kala-azar, and schistosomiasis.

Burden of vector-borne diseases:

Vector-borne diseases (VBDs) account for more than 17% of all infectious diseases, causing more than 1 million deaths annually³. More than 1.3 billion people in this Region are at risk of malaria, as over 75% of the population live in malaria-prone areas. Dengue is one of the fastest spreading infectious diseases of the twenty-first century moving from urban to rural areas and to new geographical regions due to climate change⁴. The population in South East Asia at risk for malaria, dengue and kala-azar is 1.4 billion, 2.24 million and 147 million respectively. An estimated 1.3 million new cases of leishmaniasis occur annually. Every year there are around 200 000 cases of illness and 30 000 deaths from yellow fever⁵. The number of yellow fever cases has increased over the past two decades due to declining population immunity to infection, deforestation, urbanization, population movements and climate change. Japanese encephalitis causes an estimated 50 000 cases and 10 000 deaths every year, mostly of children aged less than five⁵. More than 120 million people are currently infected with lymphatic filariasis, about 40 million of whom are disfigured and incapacitated by the disease⁵. Lymphatic filariasis afflicts more than 25 million men with

genital disease and more than 15 million people with lymphoedema⁵. Approximately 65% of those infected live in the South-East Asia Region, 30% in the African Region, and the remainder in other tropical areas. Onchocerciasis is the world's second leading infectious cause of blindness, after trachoma. A total of 37 million people are infected worldwide⁵.

Distribution of these diseases is determined by a complex dynamic of environmental and social factors. Many of these diseases are preventable through informed protective measures. The recrudescence of malaria in epidemic form in Member countries of the South East Asia Region was primarily due to the inadequate and delayed supply of insecticides, particularly DDT, which, in turn, is due to inadequate manufacturing capacity within the Region and also to the prohibitive cost and limited supply from developed countries. These diseases constitutes a major factor of morbidity and mortality in this region and that unless effective steps are taken in time to control the epidemic effectively, there will be serious repercussions on the socio-economic development of the countries in the Region. A significant step undertaken by India was to undertake a Joint Monitoring mission (JMM) recently from 1 – 10 March 2014 by Ministry of Health & Family Welfare, Government of India and WHO Country office for India to review the country's progress towards vector-borne disease targets of the National Health Policy (2002), malaria related Millennium Development Goals, and challenges and plans for vector control efforts⁶. The outcome of the JMM aims to provide high-level advice to the Government of India and partners on strategic issues and for improving integration of vector-borne diseases with the general health system in the country. JMM participants included various stake holders like national and international experts from technical agencies, development agencies, national research institutes, civil society, medical colleges and non-governmental organizations.

Increasing threat of VBDs:

Many of these diseases were confined to distinct geographical areas, but this situation has changed. The reasons are many that include climate change, intensive farming, dams, irrigation, deforestation, population movements, rapid unplanned urbanization, and phenomenal increases in international travel and trade. These changes create opportunities for vectors and the diseases they spread to take up residence in new areas. Environmental changes are causing an increase in the number and spread of many vectors worldwide. Dengue in particular is emerging as a serious public health concern. These diseases affect urban, peri-urban and rural communities but thrive predominantly among communities with poor living conditions like lack of access to adequate housing, safe drinking water and sanitation. These diseases also exacerbate poverty. The underlying causes for the worsening of the epidemiological situation of vector borne diseases can be grouped broadly as-

1. Change in determinants
2. Demographic trends and urbanization
3. Transportation and trade
4. Climate change
5. Capacity building and Inter-sectoral coordination

These diseases impose a substantial economic burden on families and governments, both in medical costs and in work days lost due to illness. According to some studies,^{7, 8} an average dengue episode represents 14.8 lost days for ambulatory patients at an average cost of US\$ 514 and 18.9 days for non-fatal hospitalized patients at an average cost of US\$ 1491.

Vector control

WHO promotes integrated vector management as the best approach to strengthen vector control in a way that is compatible with national health systems⁹. When designing and applying vector control strategies it would be essential to have a good knowledge of the vector behavioral traits particularly those relevant to the chosen control method. Vector control programmes need to adapt to match the changing epidemiological patterns of new emerging threats. New paradigms for controlling and/or interrupting malaria transmission should then be explored for their protective efficacy and adapted to the local context for a good efficiency. Research will continue to play an important role in reversing the trend in dengue and other vector borne diseases by improving methods and systems for surveillance, prevention and control. The need of the hour is to formulate evidence-based strategies and policies; develop new tools, including insecticide products and application technologies. The emergence of vector-borne diseases in new parts of the world – clearly highlight the increasing threat of these diseases to global public health.

CONCLUSION

Vector-borne diseases are one of the greatest contributors to human mortality and morbidity in tropical settings and beyond. Some of them have been brought under control, some continue to spread. The gains made so far in controlling them are at stake due to the geographic expansion of vectors and their development of resistance to insecticides. Vector control programmes need to be tailored to match the changing epidemiological patterns of these new emerging threats. A number of proven cost effective interventions exist to control and prevent vector-borne diseases. Globally it's the right time to utilize the full potential for vector control in the large-scale reduction of vector-borne diseases.

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