

**REGIONAL COMMITTEE FOR THE
EASTERN MEDITERRANEAN
Seventy-first Session
Doha, Qatar, 14–17 October 2024**

October 2024

**INNOVATIVE APPROACHES FOR PREVENTING AND CONTROLLING DENGUE AND
OTHER MOSQUITO-BORNE DISEASES**

Objectives of the event

On 15 October 2024, a side event will be held on innovative vector control approaches for preventing and controlling mosquito-borne diseases.

The objectives of the event are to:

- update Member States on the situation of vector-borne diseases in the Region, with a focus on dengue, and highlight the challenges and key areas that require an integrated multisectoral approach;
- update Member States on available innovative tools, their potential uses and best practice for their adoption for preparedness to prevent and control mosquito-borne diseases, particularly dengue;
- explore mechanisms to develop integrated vector control strategies to respond to the increasing burden of dengue and other mosquito-borne diseases due to climate change;
- identify areas of collaboration and technical support between Member States and WHO to strengthen national and regional capacities;
- share the experience of Oman in using WHO's Early Warning and Response System (EWARS) supported by the presence of effective vector surveillance and epidemiological surveillance, integrated with climate and population data, to predict and prevent vector-borne disease outbreaks for early intervention and prevention.

Background

The burden of vector-borne diseases in the Eastern Mediterranean Region has increased significantly since 2015 due to various factors. These include climate change, expanding and poorly planned urbanization, international travel and population movement, weakening of health systems (especially in countries facing emergencies and other crises), chronic insufficient investment on vector control capacity in many countries and widespread resistance to insecticides.

In this context, the importance of EWARS has become increasingly evident. EWARS is crucial for predicting and managing outbreaks of vector-borne diseases by enabling early intervention and prevention. A critical component of EWARS is the availability of strong and effective vector surveillance systems. These systems play an essential role in monitoring vector populations, identifying potential risks and triggering timely responses to prevent the spread of diseases. The integration of vector surveillance with epidemiological data, climate data and population information enhances the ability to foresee outbreaks and implement appropriate control measures promptly.

Dengue is considered one of the most rapidly spreading mosquito-borne diseases and has increasing geographical expansion. The disease is reported to be endemic in more than 100 countries. The incidence of dengue has increased dramatically over the past two decades, from 500 000 in the year 2000 to 6.5 million in 2023. Since early 2023, the world has faced an upsurge of dengue transmission characterized by the increased number and size of outbreaks, the concurrence of multiple outbreaks and spread to areas previously free of dengue due to the expansion of the invasive dengue vectors, particularly the primary vector, *Aedes aegypti*. In the Eastern Mediterranean Region, the number of countries reporting dengue cases or outbreaks increased

from three in 2017 to 11 countries in 2024. In December 2023, WHO announced a multi-regional grade 3 emergency for dengue. The increasing cases of dengue, exacerbated by climate change and widespread resistance to commonly used insecticides with limited alternative options, emphasize the urgent need for innovative and effective vector control strategies as part of the integrated vector management approach.

The Global Vector Control Response 2017–2030, developed by WHO and endorsed by the World Health Assembly in May 2017, is a strategy that urges countries and development partners to strengthen vector control as a fundamental approach to preventing and eliminating vector-borne disease and responding to outbreaks. The Response builds on the principles of integrated vector management and calls for improved vector surveillance and control capacity and capability (human, infrastructural and institutional), a well-defined national research agenda, improved inter- and intrasectoral collaboration, community engagement and mobilization, and the use of novel tools with proven effectiveness. It seeks to reduce the global burden of vector-borne diseases through effective, locally adapted, sustainable vector control across diseases.

Furthermore, cooperation between Member States, WHO and other international organizations contributes to the exchange of experiences and resources, thus enhancing the effectiveness of integrated vector control efforts on a large scale.

New tools and approaches are a critical need for scaling up the response to increasing threats of vector-borne diseases. Novel interventions submitted for evaluation to the WHO Vector Control Advisory Group (VCAG) show promising approaches. These methods include the sterile insect technique (SIT), which involves sterilizing mass-reared male mosquitoes using traditional irradiation techniques and releasing them. These sterile males mate with the wild female mosquito population, leading to a reduction of the insect population over time. SIT studies are in progress.

The use of the bacteria *Wolbachia* for microbial control of human pathogens in adult vectors has been assessed by the VCAG and has been recommended as having a public health impact. *Aedes aegypti* that carry the *Wolbachia* strain are significantly less capable of transmitting arboviruses, including the dengue virus, following their infection. A WHO recommendation on the use of a *Wolbachia* strain is under development and will be published during 2024. In addition, two novel, easy-to-use tools – spatial repellent and vector trap with toxic bait – are currently at various stages of trial and are in the pipeline for a WHO review, recommendation and prequalification.

Genetically modified mosquitoes are mosquitoes that have had heritable traits introduced using genome modification technologies, leading to a reduction of the transmission of mosquito-borne diseases, such as dengue or malaria. These approaches include either population suppression to reduce or eliminate the specific mosquito populations or genetic modification of the mosquitoes so that they are no longer effective vectors of disease. WHO does not currently have a recommendation for the use or deployment of such mosquitos as evidence of impact against vector-borne diseases is not available or has not yet been presented for assessment by WHO.

Expected outcomes

- Provide support to Member States in developing their national integrated vector control plans tailored to the needs of the country situation based on a vector control needs assessment for the prevention and control of vector-borne diseases, in line with the Global Vector Control Response 2017–2030 and global arbovirus initiative.
- Support establishment of national vector control units in Member States with a cross-disease mandate for cost-effective and sustainable vector control services with the ability to adjust to changes in disease epidemiology and preparedness to respond to outbreaks.
- Strengthen capacities of Member States in entomology, basic laboratory infrastructure and guidance on introducing and adopting proven effective novel interventions, their scale-up, monitoring and impact assessment.

- Enhance the implementation of EWARS by ensuring the availability and integration of robust vector surveillance systems. These systems are crucial for the early detection of potential outbreaks and timely intervention to prevent the spread of vector-borne diseases.
- Strengthen collaboration with academic and research institutions for building national capacity on integrated vector surveillance and promoting operational research for informing evidence-based decisions on effective vector control.

Composition of the panel

The side event will be attended by: the Chief of the Entomology Branch of the National Center for Emerging and Zoonotic Infectious Diseases of the United States Centers for Disease Control; two representatives from Brazil and Singapore with experience in the management of dengue using novel tools; and one representative from Oman with experience of using Early Warning and Response Systems (EWARS). Discussion will be moderated by WHO's Head of Veterinary Public Health in the Vector Control and Environment Unit, Neglected Tropical Diseases.

Session information

The session will begin with a 30-minute presentation, followed by a 25-minute discussion during which time will be dedicated to questions from Member States. The session will end with a 10-minute conclusion.