

## FIRST MEETING OF THE TECHNICAL ADVISORY GROUP ON PUBLIC HEALTH ENTOMOLOGY

### PAN AMERICAN HEALTH ORGANIZATION

#### SUMMARY

The first meeting of the Technical Advisory Group on Public Health Entomology (TAG PHE), was held from 8 to 10 March 2016 at the PAHO headquarters in Washington, DC. The topics discussed covered two scenarios: 1) vector control and prevention actions in regards to the current public health emergency of international concern (PHEIC) declared by WHO on the epidemic of Zika virus infections in the Americas, and 2) review and analysis of the actions that can be implemented in the medium and long term for the prevention and control of vectors responsible for vector-borne diseases (VBD) in the Americas.

The main recommendations made by the TAG PHE are described as follows:

#### 1. VECTOR CONTROL AND PHEIC OF ZIKA VIRUS INFECTIONS

- **Strengthen and enhance** existing measures of entomological surveillance and vector control for their current effective use in order to help reduce the risk of transmission of VBDs including Zika virus infection, and to ensure the achievements of the various existing elimination efforts in the Americas.
- Strengthen and enhance existing entomological surveillance and vector control measures, emphasizing the **protection of pregnant women** in order to avoid contact with the culpable vector.
- **Target vector control actions** so that vector control programs prioritize activities in the homes and workplaces of pregnant women.
- **Assess the feasibility** of a proposed regional plan to control *Aedes* in the context of the emergency of the Zika virus using an integrated vector management (IVM) framework. The plan should be developed as soon as possible by the PAHO Regional Public Health Entomology Program in consultation with key stakeholders and partners outside of PAHO.
- **Encourage** the rapid, robust and accelerated evaluation of new and supplemental tools for *Aedes* control, such as *Wolbachia* infections and genetically modified insect technology to ensure adequate technical cooperation and funding for this purpose.

#### 2. ACTIONS AT MID AND LONG TERM

##### SURVEILLANCE

- **Conduct surveillance of insecticide resistance**, as immediate entomological surveillance. **Analyze** the information generated on insecticide resistance for public health purposes at the national level. **Develop and implement** plans to manage resistance in each country based on subsequent analysis.
- **Define** a single integrated surveillance system, that would be practical and could provide necessary routine entomological information in a sustainable way to support the decision-making process, including monitoring of vectors and their behavior change. This would require

reviewing existing systems already developed in the Region and then **determining mechanisms to update them**. **Transfer** of knowledge and technology to those countries in need or that demonstrate interest in receiving or exchanging this information.

- **Evaluate and improve entomological indices**, adopting or creating new ones reflecting current public health challenges making them more useful for measuring prevention and prediction of occurrence of cases and outbreaks.

#### TRAINING IN ENTOMOLOGY AND PREVENTION AND CONTROL OF VECTORS

- **Investment** in human resources for vector control in the short, mid and long-term (career pathways) is urgently needed. Programs cannot operate to protect the public health without adequate personnel. Various types of certification programs are needed to accompany training and refresher courses.
- **Determine** country capacity, identify needs, and assess the necessary levels of training required. **Identify** potential training centers and opportunities to collaborate on human resource development including South-South cooperation.
- **Strengthen** human resources of the entomology program at PAHO so that the recommended activities of the TAG can be developed, and technical support to countries can be delivered in a timely manner.

#### MONITORING AND EVALUATION

- **Evaluate** the actions of vector control, field operational teams, and procedures used in prevention and control activities. Focus on these actions in terms of impact (including that of disease transmission) and cost-effectiveness.
- **Identify published case studies** (model examples) or develop successful IVM programs that target *Aedes* mosquitoes including those that describe effective public-private partnerships.

#### OPERATIONAL RESEARCH

- **Propose, support and develop** operational research projects on entomology as well as projects regarding interaction between the vector and the environment, society and urban development (infrastructure and sanitation), among others.

#### SOCIAL MOBILIZATION AND ALLIANCES

- **Establish, promote, seek and support** partnerships with communities. Identify community leaders that represent the families of those communities; and contact all heads of household to develop and implement sustainable actions of surveillance and vector control in order to reduce the entomological risk of vector-borne diseases in the Americas.
- **Establish, promote and support** partnerships with different local and central governments to improve the quality and access to basic services (water supply and water security, solid waste disposal, etc.); that can impact reduction of entomological risk for vector-borne diseases. Encourage the full involvement of local governments (mayor, city councils and advisors) to support the improvement and access to basic sanitary services.

The detailed description of the recommendations made by the TAG PHE is summarized below.

## BACKGROUND

The first meeting of the Technical Advisory Group on Public Health Entomology (TAG PHE) took place from March 8 to 10, 2016, at the Pan American Health Organization (PAHO/WHO) headquarters in Washington, DC. During the first two days, in addition to members of the TAG, there were representatives of various organizations in attendance including the World Health Organization, the Oswaldo Cruz Foundation of Brazil, the Centers for Disease Control and Prevention of the United States, the Monash University of Australia, the US Agency for International Development, the Bill and Melinda Gates Foundation, and the US White House Office of Science and Technology Policy. Following the meeting agenda, the topics covered two scenarios: 1) actions towards the current public health emergency situation related to the epidemic of Zika virus infections in the Americas, and 2) review and analysis of the actions in the medium and long term for prevention and control of vectors responsible for vector-borne diseases (VBD) in the Americas.

The main topics discussed were needs and capacity assessment of public health entomology and vector control, strengthening the monitoring of vectors that transmit the main VBD (particularly arboviruses) monitoring and management of insecticide resistance, analysis of the responsibility for the development of a regional plan to intensify the control of *Aedes* mosquitoes in the Americas using the framework of integrated vector management (IVM), intersectoral and community collaboration, review and evaluation of new tools to control *Aedes*, and improvement of monitoring and evaluation for future interventions. Knowledge gaps were also discussed as well as the need to implement operational research in basic aspects of entomology to reduce these gaps.

Regarding the emergency of Zika virus, an outline of priority prevention actions for pregnant women was presented, which the TAG PHE recommended to be incorporated as part of existing prenatal care services offered, as well as increasing vector control actions in homes, neighboring houses, workplaces and around where these women live.

Additionally, during the third day of the meeting, the TAG PHE convened in private to review the information and deliberations of the two previous days of discussion. Final considerations and issue recommendations are described below:

## VECTOR CONTROL AND PREVENTION OF ZIKA VIRUS INFECTIONS

- Countries should **strengthen and enhance** existing measures of entomological surveillance and vector control to help reduce the risk of transmission, and ensure the achievements in eliminating vector-borne diseases in the Americas. Countries should immediately consider adapting the IMS-Dengue model to both Chikungunya and Zika disease prevention and control.
- In addition to the need for immediate strengthening and enhancing of existing entomological surveillance and vector control measures, emphasis should be focused on **the protection of pregnant women**. Vector control programs should **target actions** in and around the homes and workplaces of pregnant women.
- It is important that PAHO, together with the countries of the Region, **assess the feasibility** of a proposed regional plan to intensify the control of *Aedes* mosquitoes in the context of the emergency of the Zika virus.

- The TAG endorses the three objectives of the PAHO regional program for public health entomology, i.e., monitoring and evaluation for resistance and its management; implementation of IVM; and training to strengthen entomological practice.

## SURVEILLANCE

- **Define** a practical single integrated surveillance system that can provide the necessary information to conduct entomological surveillance in a routine and sustainable way, in order to support the decision-making process. This requires reviewing existing systems already developed in the Region and **determining mechanisms of transfer** of knowledge and technology to countries interested in receiving or exchanging them.
- **Link** surveillance to prevention and vector control activities (before and after intervention activities). Plan activities according to the type of monitoring that is done, including monitoring of vector behavior change.
- It is important to **conduct monitoring of insecticide resistance** as part of entomological surveillance. **Analyze** the information generated on insecticides resistance used in countries for public health purposes. Based on this analysis, **develop** plans to manage resistance in each country. Develop PAHO regional guidelines for insecticides resistance and regional plan on insecticide resistance, both disaggregated by the life stages of each vector.
- **Monitoring of the risk of transmission of disease is a priority in urgent situations and health emergencies.**
- **Consider the feasibility** of surveillance systems in sentinel points or sentinel sites, and develop stratification of risk.

## TRAINING IN ENTOMOLOGY AND CONTROL AND PREVENTION OF VECTORS

- **Determine** country capacity and identify needs including the necessary levels of training required. **Identify** potential training centers and opportunities for collaboration on human resource development, including activities of South-South cooperation.
- **Review** existing curricula of academic training, technical and operational manuals, and training modules in different areas of Entomology and Vector Control in countries; and **develop** new curricula as necessary, specifically for the operating level of programs, which must include a multi-disease approach and IVM. It is considered important to **provide a certification** or recognition for trainees in all these processes of human resource training and periodic retraining and recertification.
- **Establish** a fund to support training activities and training of human resources in Entomology and Vector Control within PAHO, as well as identify donors.
- **Develop** short-term training courses for emergency situations, with standard guidelines and operating procedures.
- **Strengthen** the human resources of the entomology program of PAHO, so that the recommended activities can be developed, and provide support and technical assistance to countries.

- Evaluate and improve entomological indices or create new ones that would enhance measurements of prevention and prediction of cases and outbreaks. Adequate indices are needed not only to evaluate impact of control measure, but also to measure disease transmission, entomological population surveillance and weekly epidemiological surveillance.

## MONITORING AND EVALUATION

- **Develop and provide** a protocol for penetration testing of insecticides, and testing of biological efficacy, especially in countries where the situation of insecticide resistance is unknown.
- **Evaluate** the actions of vector control, field operations, work equipment and operational procedures used in prevention and control activities; in terms of impact of actions and cost-effectiveness, and the measured impact on disease transmission and incidence. The method and evaluation of most-productive mosquito larval containers should be included.
- **The countries should support the evaluation of new tools, without losing focus on the emergency and its corresponding response to their level of scale, feasibility, cost effectiveness and acceptability by the community.**

## OPERATIONAL RESEARCH

- Develop research projects not only in entomology, but also projects regarding the interaction between the vector and the environment, society and the level of development of cities (infrastructure, urbanization and sanitation).
- Support pilot studies for the development of new entomological indicators, for example those based on entomo-virological surveillance.
- Encourage rapid and robust evaluation of new and supplemental tools for *Aedes* control, such as Wolbachia infections, novel traps, and genetically modified and/or sterile insect technologies, and ensure adequate funding for this purpose.

## SOCIAL MOBILIZATION AND ALLIANCES

- It is necessary to **establish, promote and support** partnerships with communities, and identify community leaders to develop and implement sustainable actions of surveillance and vector control in order to reduce the entomological risk of vector-borne diseases in the Americas.
- **Identify** social networks at the community level and in high-risk neighborhoods to establish partnerships that can promote and support the dissemination of information relating to surveillance and vector control, with the goal of sustainable community action to control mosquito breeding sites.
- **Establish, promote, seek and support** partnerships with communities. Identify community leaders that represent the families of those communities; and contact all heads of household to develop and implement sustainable actions of surveillance and vector control in order to reduce the entomological risk of vector-borne diseases in the Americas.
- It is necessary to **establish, promote and support** partnerships with productive sectors and industries that are involved (e.g. tire shops, water storage tank manufacturers) with the generation of the entomological risks (mosquito breeding and resting sites) to develop sustainable and economically viable actions to collaborate and decrease these risks. Involve communication experts to send the appropriate message.



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- Develop and conduct the communication of appropriate messages, perhaps using the Communication for behavioral impact (COMBI) framework. Consider the creation of a regional *Aedes* Control Day, similar to the Association of Southeast Asian Nations (ASEAN) Dengue Day.