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STRATEGY FOR ARBOVIRAL DISEASE PREVENTION AND CONTROL

Introduction

1. Epidemic and potentially pandemic diseases pose a permanent threat to global and regional health security. In recent years, despite vector control efforts, the prevalence of viral infections transmitted by arthropods (arboviral diseases) has increased worldwide (1). While dengue remains the most prevalent arboviral disease in the Region (2,3), the Region of the Americas has been particularly affected by the emergence of other arboviruses, such as chikungunya, which has caused some 1.7 million confirmed or suspected cases since its introduction in December 2013 (4,5). In 2016 alone (as of 22 April), 54,213 cumulative (suspected and confirmed) cases have been reported in countries and territories in the Region (6). Furthermore, on 7 May 2015 the Pan American Health Organization (PAHO) issued an alert regarding the possible introduction of Zika virus into the Region. Local transmission of the disease was quickly confirmed in Brazil and by late January 2016, at least 28 countries and territories had confirmed autochthonous circulation of the virus (7,8); by 24 February, 31 countries and territories had confirmed transmission (9), and by 21 April, 35 countries and territories had confirmed autochthonous cases (10).

2. The emergence in the Region of new arboviruses, in addition to already endemic ones such as dengue, represents a challenge for clinical diagnosis, laboratory confirmation, and epidemiological surveillance. Furthermore, the reemergence of urban yellow fever poses a latent risk, as demonstrated during the outbreak in 2007-2008 in Paraguay, after almost 60 years of epidemiological silence in the country (11). The aspects related to each of these agents cannot be addressed as independent problems; this document, therefore, proposes to the Member States a strategy for comprehensive surveillance of arboviral diseases, based on the coordination and strengthening of epidemiological surveillance, integrated vector control, and laboratory diagnosis. The objective of this proposal is to serve as a reference for the countries of the Region to address the prevention and control of this group of diseases with an integrated clinical-epidemiological and laboratory approach, emphasizing vector control and active social participation.

Background

3. The emergence and spread of arboviruses depends on the presence and abundance of vectors, which in turn is related to various social, economic, and environmental factors on a regional and global scale. Despite the countries' commitment to progressive implementation of integrated vector management (12,13), control of disease-transmitting mosquitoes (*Aedes aegypti* and *Aedes albopictus*) remains a major challenge in the Region of the Americas (14).

4. In October 1947, the first Directing Council adopted Resolution CD1.R1 (15) which showed that the solution to the problem of urban yellow fever would be the eradication of *Aedes aegypti* in the Hemisphere. In 1962, that campaign proved successful when 18 countries of the Region and some Caribbean islands managed to eradicate this vector. Unfortunately, between 1962 and 1972 these efforts lost effectiveness due to the resistance of *Aedes aegypti* to DDT, which led to the reintroduction and rapid geographical spread of the mosquito and, in a short time, the emergence of epidemic dengue outbreaks (14). In the 1990s, as a vector control strategy, Resolutions CD38.R12 (1995) and CD39.R11 (1996) were adopted to prepare and implement a hemispheric plan for the eradication of *Aedes aegypti* (16,17).

5. In September 2001, the 43rd Directing Council of PAHO adopted Resolution CD43.R4 on the new generation of programs for dengue prevention and control (18), in order to strengthen the implementation of social communication measures in these programs, focusing more on behavioral change in the population than on dissemination of information and knowledge. This was the origin of the communication for behavioral impact strategy, or COMBI, as a methodology for social mobilization and communication with a behavioral approach focused on disease, including dengue. Adding the behavioral approach to the mobilization model ensures that these programs, which usually have very limited budgets and human resources, are able to optimize their resources in order to achieve the desired results in terms of individual behavior (19).

6. In accordance with the approach proposed in 2001 to address the situation (18), and in light of the sustained increase in cases in the Region, in 2003 PAHO passed Resolution CD44.R9 (2), which adopted a new prevention and control model: the Integrated Management Strategy for dengue prevention and control (IMS-dengue). This strategy included five basic components for the prevention and control of the disease: patient care, epidemiological surveillance, laboratory procedures, integrated vector control, and social communication (2,18). Subsequently, through the adoption of Resolution CSP27.R15 in 2007, the Member States were urged to strengthen the mechanisms for implementation and evaluation of the integrated strategy for dengue prevention and control (20).

7. However, despite these initiatives, the introduction and rapid spread of new arboviruses in the Region, such as the chikungunya and Zika viruses, underlines the need to broaden the scope of the integrated management strategy in order to make it a useful

tool in the comprehensive approach to arboviral diseases. The macrodeterminants that influence the onset of these diseases persist. They are compounded by the effects of climate change, which affects the intensity and duration of rainy seasons and hurricanes, gives rise to intense droughts, and reduces biodiversity (1,21-24).

8. Finally, since only a small group of vaccines—including the dengue vaccine, which is still under study—is available to control arboviral diseases (25), the emergence and reemergence of these diseases can be controlled only through rigorous and sustainable prevention and control measures aimed at preventing the proliferation of the transmitting mosquito, providing timely clinical diagnosis, strengthening epidemiological surveillance coordinated with solid laboratory support, and actively including society in the control of mosquito breeding sites. Furthermore, it is necessary to promote health research to identify critical aspects of research (basic, clinical, and services), health systems, and public health, and to set priorities and coordinate work around these priorities in order to generate scientific knowledge useful for decision-making and implement actions and programs for efficient prevention and control (26-29).

Situation Analysis

9. The epidemiological situation of arboviruses in the Region is extremely complex. Despite efforts to control dengue, its incidence is rising, with 14.2 million cases and 7,000 deaths recorded between 2000 and 2014 (30-32). Brazil, Colombia, and Mexico now report 70% of dengue cases in the Region and it has been demonstrated that the four viral serotypes are circulating. Furthermore, laboratory surveillance has been strengthened by the creation of the Arbovirus Diagnosis Laboratory Network in the Region of the Americas (RELDA, Spanish acronym) (formerly the Dengue Laboratory Network of the Americas).

10. In December 2013, PAHO issued an alert regarding the introduction and autochthonous transmission of the chikungunya virus in the Region of the Americas (33), after confirmation by the health authorities of Saint Martin (French territory). The virus spread rapidly from this focus in the Caribbean to the northern coast of South America and Central America. In 2015, transmission was documented in 44 countries and territories of the Region, with an average cumulative incidence of 302 cases per 100,000 population (34,35). Between 1 January 2016 and epidemiological week 16 of 2016 (17-23 April), 54,213 cumulative suspected cases were reported in the Region (6). Since 2010, PAHO has helped the countries prepare for the possible introduction of chikungunya in the Region (36). Thanks to the continuous technical support of the Centers for Disease Prevention and Control of the United States (CDC), it has been possible to strengthen the diagnostic capacity and clinical management of the disease. However, its impact on health systems and the (short- and medium-term) economic burden on countries has still not been evaluated.

11. In February 2014, the health authorities of Chile confirmed the first case of autochthonous transmission of Zika virus on Easter Island, and a number of other cases

were reported as of June that year (7). In May 2015, the health authorities of Brazil confirmed autochthonous circulation of the virus in the northeast of the country and by mid-November, at least 15 Brazilian states had confirmed the presence of the virus (7). On 16 October 2015, the Ministry of Health of Colombia also officially reported confirmation of cases of Zika virus infection in the north of the country (37) and by the end of 2015 had demonstrated its circulation in at least 33 of the country's 36 territorial entities (38). At the end of January 2016, local transmission had been confirmed in 28 countries and territories of the Region (39); by epidemiological week 7 (2016) (14-20 February), 134,460 cumulative cases had been reported (40) and by 24 February, 31 countries and territories had reported autochthonous transmission of Zika virus (9). By 21 April, 35 countries and territories had confirmed autochthonous transmission of the virus (10), with 227,929 cumulative suspected cases (41). As of 23 June, 40 countries and territories had confirmed autochthonous transmission of the virus (42) and as of epidemiological week 25 of 2016 (19-25 June), 419,964 cumulative suspected cases had been notified (43).

12. Since Zika virus is new to the Region and has not been closely studied at the global level, its clinical and epidemiological behavior should be studied attentively. In light of the increase in birth defects, cases of Guillain-Barré syndrome, and other autoimmune conditions in areas where Zika virus is circulating, PAHO and the World Health Organization (WHO) have recommended that their Member States establish and maintain the ability to: detect and confirm cases of this viral infection; prepare health services to respond to the greater need for specialized care and interdisciplinary work for the management of neurological syndromes (for example, rehabilitation for children with congenital anomalies and adults with neurological syndromes); and step up activities for consultations and prenatal check-ups (8,39). In addition, PAHO and WHO have urged the Member States to continue efforts to reduce the presence of the transmitting mosquito through effective vector control strategies and communication with the population (44,45).

13. In this same context, the first meeting of the Emergency Committee, convened by the Director-General of WHO in compliance with the International Health Regulations (2005) (46), was held on 1 February 2016 with regard to the clusters of microcephaly cases and other neurological disorders in certain areas affected by the Zika virus. After the report of the WHO Secretariat, and based on the committee's recommendations, the Director General declared a public health emergency of international concern (PHEIC) and also issued the committee's temporary recommendations (47).

14. Given this picture, the emergence and reemergence of arboviral diseases imply an impact and overload on health systems; these infections are also difficult to recognize clinically, making them a major challenge for health providers. Furthermore, the simultaneous circulation of closely related viruses poses a challenge for laboratory surveillance, which means that detection and confirmation should be based on protocols that permit proper differential diagnosis. Diagnostic tests should be accessible and have a sensitivity and specificity of no less than 90%. An algorithm is being developed for the

comprehensive diagnosis of arboviral diseases, including diagnostic tools for clinical suspicion and the confirmation or ruling out of cases. Training public and private health service providers is a priority aspect that should be taken into account.

Proposal

15. Recognizing that each country needs to establish its own action plans in accordance with its social, economic, political, historical, and cultural context, the objective of this proposal is, after adoption by the Member States, to implement it in collaboration with PAHO and other organizations and associate entities in order to guide and strengthen the processes of surveillance, diagnosis, and management of arboviral diseases. The following strategic lines of action are proposed, applicable at the corresponding national level, as appropriate.

Strategic Line of Action 1: Foster an integrated approach for arboviral disease prevention and control

16. Determine the critical aspects of epidemiological surveillance, laboratory work, and patient care already described in the integrated management strategy for dengue prevention and control (2,3,20), which should be adapted to the current context of circulation and co-circulation of various arboviruses and the potential risk of introduction of new viral agents. Together with integrated vector control and environmental management at the local and national level for the proper disposal of solid waste, an integrated arbovirus management strategy should be adopted to define the actions to be taken in order to ensure implementation of the strategy at the different levels in the country.

17. Establish and strengthen the planning, organization, management, implementation, evaluation, and monitoring mechanisms of the proposed strategy, ensuring multidisciplinary (interinstitutional and transectoral) participation with well-defined responsibilities and functions for each administrative level.

18. Maintain or encourage political will and financial commitment, in order to ensure the long-term sustainability and consolidation of the strategy.

19. Promote the identification of key issues in the broader framework of health research in order to efficiently develop and implement safe and cost-effective technologies and strategies to control or eliminate these diseases (26-28).

20. Strengthen coordination between the health sector and communities and families, by promoting their active participation and access, so that they can play an active role in measures for the prevention and control of arboviral diseases.

Strategic Line of Action 2: Strengthen health services capacity for the differential diagnosis and clinical management of arboviral diseases

21. Ensure timely clinical suspicion and proper differential diagnoses are fundamental for patient care and the management of symptoms in the absence of specific treatment.
22. Prepare clear guidelines for the diagnosis and clinical management of arboviral diseases, taking into account that all of them share characteristics and similarities that hinder precise and firm diagnosis, especially in areas or territories where local transmission of different arboviruses has been confirmed.
23. Standardize case definitions in order to facilitate diagnosis and early response to outbreaks. Training for front-line health workers and reorganization of the different levels of health services are key elements in the management of arboviral diseases. At the same time, communication strategies should be developed that focus on individuals, families, and communities, to enable them to detect clinical signs and seek timely care in the health services.
24. Ensure that all medical and health care workers, in both public and private health services, have access to information and mechanisms for dissemination of clinical management guidelines in order to ensure timely detection of cases and appropriate treatment and care for patients.

Strategic Line of Action 3: Evaluate and strengthen country capacity for surveillance and integrated vector control

25. Ensure that vector control programs focus on the protection of pregnant women, who constitute the most vulnerable at-risk population. It is necessary to focus on family self-care, including pregnant women, at home and in the workplace, if applicable, empowering the community to adopt measures of this type. Control programs should perform tasks not carried out by families, such as residual spraying, space spraying, and selective spraying with insecticides, special household spraying, and treatment of breeding sites with insecticides, in addition to monitoring and evaluation tasks (44,45).
26. Create mechanisms to effectively involve and empower the population as a fundamental and active participant in the process of controlling vector breeding sites, in coordination with the national programs responsible for establishing guidelines for specific activities, such as entomological surveillance, chemical control, and evaluation of resistance. With regard to entomological surveillance, it is important to develop the capacity to predict and characterize outbreaks through the surveillance of mosquitoes infected by arboviruses, using molecular techniques.
27. In accordance with the report of the WHO vector control advisory group (VCAG) (29), PAHO will continue to help the Member States with pilot testing of each new tool being operationally evaluated in the Region, such as the use of mosquitoes infected by *Wolbachia* bacteria or genetically modified strains of *Aedes aegypti*. The operational

evaluation of all new tools should include epidemiological data in estimates of the tool's impact.

Strategic Line of Action 4: Establish and strengthen the technical capacity of the Arbovirus Diagnosis Laboratory Network in the Region of the Americas (RELDA)

28. Give regional priority to strengthening national laboratories and quality management systems in order to ensure proper virological and laboratory surveillance of arboviral diseases, in addition to facilitating efficient coordination with epidemiological surveillance systems.

29. Strengthen and expand the laboratory capacity at the national level for timely identification both of already circulating arboviruses and emerging or re-emerging ones, based on harmonized and previously agreed-upon diagnostic algorithms. Strengthening implies ensuring access to modern methodologies and diagnostic platforms in accordance with scientific progress.

30. Establish clear mechanisms for the acquisition and timely distribution of critical reagents, and for the provision of appropriate training. Furthermore, it is important to encourage the political will and financial commitment to ensure sustainable laboratory processes, and to promote the development and appropriate use of scientific knowledge to meet the needs of policymakers, technical personnel, and communities that take action to respond to these diseases (26-28).

31. Guarantee the functionality and operation of the Arbovirus Diagnosis Laboratory Network in the Region of the Americas (RELDA), facilitating new membership and subregional and regional workshops, and ensuring its role as a technical reference point for activities and decision-making on laboratory surveillance of arboviral diseases.

Action by the Directing Council

32. The Directing Council is requested to review the components and lines of action of the proposed strategy and make any comments and recommendations it may deem relevant.

Annexes

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Pan American
Health
Organization



World Health
Organization
REGIONAL OFFICE FOR THE
Americas

55th DIRECTING COUNCIL

68th SESSION OF THE REGIONAL COMMITTEE OF WHO FOR THE AMERICAS

Washington, D.C., USA, 26-30 September 2016

CD55/16
Annex A
Original: Spanish

PROPOSED RESOLUTION

STRATEGY FOR ARBOVIRAL DISEASE PREVENTION AND CONTROL

THE 55th DIRECTING COUNCIL,

(PP1) Having examined the *Strategy for Arboviral Disease Prevention and Control* (Document CD55/16);

(PP2) Considering that the Constitution of the World Health Organization establishes that “the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition;”

(PP3) Considering the environmental, social, and biological factors that have facilitated the emergence and reemergence of different pathogens on a worldwide scale;

(PP4) Recognizing the difficulties that have hindered proper mosquito control, which has given rise to the emergence and rapid spread of arthropod-borne viruses (arboviruses) in the Region of the Americas;

(PP5) Aware of the social impact and economic burden of arboviral disease outbreaks and epidemics;

(PP6) Profoundly concerned about possible severe manifestations and chronic outcomes of new viral diseases in the Region;

(PP7) Recalling Resolution CD44.R9 (2003), in which a new model was adopted for dengue prevention and control through the integrated management strategy for dengue prevention and control (IMS-dengue);

(PP8) Recognizing that the current epidemiological context requires a strategy that comprehensively addresses arboviral diseases,

RESOLVES:

(OP)1. To adopt the *Strategy for Arboviral Disease Prevention and Control* (Document CD55/16) in the context of the specific conditions in each country.

(OP)2. To urge the Member States, taking into account the shared responsibilities in federated States, and as appropriate to their needs and priorities, to:

- a) strengthen surveillance systems for early detection of emerging and reemerging arboviruses, as well as outbreak and epidemic monitoring systems;
- b) prepare a strategy for the integrated control of arboviral diseases (IMS-arbovirus) which takes into account the critical components of IMS-dengue and introduces new tools for arbovirus surveillance in vectors and for prioritized prevention in high-risk populations;
- c) strengthen national public health laboratories in order to guarantee timeliness and quality in the processes of detection, diagnosis, and laboratory surveillance of arboviral diseases;
- d) strengthen the Arbovirus Diagnosis Laboratory Network of the Americas (RELDA) by establishing agreements among laboratories as well as effective channels for the exchange of scientific materials and output;
- e) prioritize and mobilize the necessary resources to implement the strategy and each of its components.

(OP)3. To request the Director to:

- a) support the implementation of the strategy to maintain and strengthen collaboration between the Pan American Sanitary Bureau and the countries and territories to address arboviral diseases;
- b) continue to strengthen PAHO and WHO activities to produce scientific evidence on the magnitude, trends, health consequences, risk factors, and protection against emerging, reemerging, new, and endemic diseases in the Region;
- c) continue to support countries and territories, at their request, by providing technical assistance to strengthen the capacity of health systems to address the surveillance of arboviral diseases in a coordinated manner;
- d) facilitate PAHO cooperation with committees, bodies, and human rights rapporteurs of the United Nations and Inter-American systems in order to guarantee implementation of the strategy in the countries and territories of the Region;
- e) prioritize arboviral disease surveillance and control and consider allocating the necessary resources to implement the strategy.

Report on the Financial and Administrative Implications of the Proposed Resolution for PASB

<p>1. Agenda item: 4.12 - Strategy for Arboviral Disease Prevention and Control</p>
<p>2. Linkage to PAHO Program and Budget 2016-2017:</p> <p>a) Categories: Category 5, Preparedness, surveillance, and response</p> <p>b) Program areas and outcomes:</p> <p>5.1. Alert and response capacities</p> <p>Outcome 5.1: All countries have the minimum core capacities required by the International Health Regulations (2005) for all-hazard alert and response</p> <p>5.2. Epidemic- and pandemic-prone diseases</p> <p>Outcome 5.2: All countries are able to build resilience and adequate preparedness to mount a rapid, predictable, and effective response to major epidemics and pandemics.</p>
<p>3. Financial implications:</p> <p>a) Total estimated cost for implementation over the lifecycle of the resolution (including staff and activities):</p> <p>The resolution covers the 2014-2019 period of the PAHO Strategic Plan; there are no additional costs beyond those already planned for the implementation of the Strategic Plan.</p> <p>b) Estimated cost for the 2016-2017 biennium (including staff and activities):</p> <p>The approved budget for “Preparedness, surveillance, and response” specifically allocated to “Alert and response capacity” is \$9,887,000, and the budget specifically allocated to “Epidemic and pandemic diseases” is \$14,565,000. The approved total budget will be \$24,452,000, which includes the financing from the regular budget and other sources.</p> <p>c) Of the estimated cost noted in b), what can be subsumed under existing programmed activities?</p> <p>The activities and technical cooperation necessary for implementation of the strategy should be integrated into the programmed activities. Criteria, objectives, and clear expected results should be included in order to prioritize resource allocation.</p>

4. Administrative implications:

a) Indicate the levels of the Organization at which the work will be undertaken:

All levels of the Organization need to carry out activities to implement the strategy, according to their defined responsibilities.

b) Additional staffing requirements (indicate additional required staff full-time equivalents, noting necessary skills profile):

No additional staffing needs are anticipated; however, it will be necessary to strengthen technical cooperation between PASB, collaborating centers, and ministries of health.

c) Time frames (indicate broad time frames for the implementation and evaluation):

The time frames for implementing this strategy are aligned with those established in the Organization's strategic and operational planning and with the PAHO Strategic Plan 2014-2019.

2016-2019: implementation.

2019: evaluation.

2020: presentation of report to the Governing Bodies.

ANALYTICAL FORM TO LINK AGENDA ITEM WITH ORGANIZATIONAL MANDATES

1. Agenda item: 4.12 - Strategy for Arboviral Disease Prevention and Control

2. Responsible unit: Department of Communicable Diseases and Health Analysis, Unit of IHR, Epidemic Alert and Response, and Water-borne Diseases

3. Preparing officers: Dr. Sylvain Aldighieri and Dr. Jairo Mendez Rico

4. Link between Agenda item and [Health Agenda for the Americas 2008-2017](#):

The Health Agenda for the Americas focuses on reducing the risks and burden of diseases. Its established priority is to strengthen health security and implement intersectoral measures to deal with disasters, pandemics, and diseases that affect national, regional, and global health security.

5. Link between Agenda item and the [PAHO Strategic Plan 2014-2019](#):

The purpose of the PAHO Strategic Plan 2014-2019 is to strengthen capacity-building in order to address specific risks related to a variety of diseases that can cause outbreaks, epidemics, or pandemics.

6. List of collaborating centers and national institutions linked to this Agenda item:

The strategy will require stronger collaboration between ministries of health and collaborating centers on dengue and other arboviral diseases. It will also require the collaboration of national vector control programs, ministries of the environment, and local government agencies.

7. Best practices in this area and examples from countries within the Region of the Americas:

Several countries and territories in the Region of the Americas have already made efforts in the integrated management strategy for dengue prevention and control, including Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Uruguay, and Venezuela.

8. Financial implications of this Agenda item:

No financial implications for PASB have been identified for this agenda item; however, Member States are called upon to set national goals for implementation of the Strategy for Arboviral Disease Prevention and Control, as well as plans of action that will have financial implications.