156th SESSION OF THE EXECUTIVE COMMITTEE

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D. DENGUE PREVENTION AND CONTROL IN THE AMERICAS

Background

1.   In 2001, given the increase in dengue cases in the Americas and since national dengue control programs were predominantly vertical and based on pesticide use, a detailed action plan was prepared and presented to address the situation *(1)*. In 2003 the Integrated Management Strategy for Dengue Prevention and Control in the Americas (IMS-dengue) was implemented. In its early stages it included five components (patient care, epidemiological surveillance, laboratory, integrated vector management, and mass communication) and subsequently incorporated an environmental component *(2, 3)*. IMS-dengue was gradually implemented in each subregion and in 35 countries or territories, and was evaluated in 22 of them (two evaluations were conducted in Brazil and two in Mexico). A technical group of international experts on dengue (GT-Dengue International Task Force) was created to provide technical assistance to countries and territories on each component of IMS-dengue *(3)*. In 2007, Resolution CSP27.R15 was adopted, urging countries and territories to step up implementation of IMS-dengue and systematically evaluate it *(4)*.

2.   The epidemiological status of dengue remains extremely complex and unstable. Between 2000 and 2014, 14.2 million dengue cases were registered, with 7,000 deaths. Incidence has continued to rise, due in part to improvements in epidemiological surveillance systems and reporting by the countries of the Region. However, dengue incidence in 2014 (193.7 cases/100,000 population) was 31% lower than the average over the previous five years (282.4 cases/100,000 population) and 57% lower than 2013 (455.9 cases/100,000 population) *(5)*. Brazil, Colombia, and Mexico currently contribute 70% of the Region's dengue cases. The four serotypes of the dengue virus are circulating in the Americas, which increases the risk of severe cases (secondary immunological response) *(6-8)*. However, it should be noted that a reduction has been registered in the proportion of severe cases in the last five years, and particularly in the last two years, reflecting a clear downward trend *(5)*. There is a direct relationship between the reduction in severe cases and improvements in the quality and timeliness of primary medical care (warning signs). This has been confirmed in evaluations conducted in the countries.

Update on Progress Made

3.   Implementation of IMS-dengue has provided countries and territories with a sound methodological tool for dengue prevention and control.

4.   World Health Organization (WHO) clinical guidelines for the care of dengue patients has been reviewed, updated, adapted, and published for the Americas, accompanied by training given by GT-Dengue experts to physicians and paramedical workers at the different levels of health care in the countries *(9, 10)*.

5.   Since implementation of the new clinical guidelines, the dengue case-fatality rate has declined in the Americas; it is estimated that 3,300 deaths were prevented between 2011 and 2014.[1] The second edition (2015) of the clinical guidelines is in the publication process. It includes new information for the management of dengue cases in pregnant women, newborns, and older adults, and for the reorganization of health services during outbreaks, among other elements.

6.   A laboratory network was created for dengue diagnosis in the Americas (RELDA), through which technology and capacities are periodically transferred to countries and territories for the implementation of state-of-the-art molecular and serological methods for dengue diagnosis, with the support of the WHO collaborating centers (WHOCCs) for dengue.

7.   In the last five years, 50 countries and territories have successfully maintained periodic reporting of dengue data *(5)*. Work is in progress on the development of a generic system for integrated epidemiological surveillance, using standardized definitions and indicators, and integrating entomological and environmental components in the analysis. Surveillance in sentinel areas is also included to better characterize the history and course of the disease and its management in each country's service system. The generic system is in the validation phase in several countries and territories. Work is also underway to estimate the economic burden of dengue in several countries.

8.   In May 2014, a review was conducted of the state of knowledge about dengue in the last 10 years *(11)*, with the participation of academia, private industry, WHOCCs, countries, territories, and nongovernmental organizations. This review confirmed that IMS-dengue is the best available strategy and led to a strengthening of its operational model through the WHO Global Strategy for Dengue Prevention and Control 2012-2020 *(12)*.

Actions Needed to Improve the Situation

9.   Advance in the consolidation of the IMS-dengue model as a methodological tool for dengue prevention and control in countries and territories.

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[1] Estimate based on an annual increase of 0.018% in case fatality (increase in case fatality between 2009 and 2010).

10.   Guarantee political support and financial and human resources for the sustainable implementation of IMS-dengue.

11.   Involve other government sectors, ministries, academia, the private sector, communities, and families in an integrated response to the social and environmental determinants involved in transmission, since dengue is not exclusively a problem of the health sector. It has been shown that illiteracy, poor coverage of sanitation and piped drinking water, and poverty in general, are related to the high incidence and transmission of the disease.

12.   Continue to promote and foment public policies that act on the social and environmental determinants of dengue transmission in order to minimize the risk of infection by the disease.

13.   Improve and strengthen the capacity and quality of medical care in all the countries and territories, focusing on clinical case management at the primary care level in order to prevent the progression to severe cases, since difficulties persist in case management.

14.   Develop and implement new operational models for vector control.

15.   Accompany the development and evaluation of new technologies for disease control and prevention that can be put into practice, including a dengue vaccine, transgenic mosquitoes, bacteria of the *Wolbachia* genus, and new ovitraps, among others *(13-15)*.

Action by the Executive Committee

16.   The Committee is requested to take note of this report and formulate the recommendations it deems relevant.

References

1. Pan American Health Organization. Dengue Prevention and Control [Internet]. 43rd Directing Council of PAHO, 53rd session of the Regional Committee of WHO for the Americas; 20012 Sep 4-28; Washington (D.C.), United States. Washington (D.C.): PAHO; 2001 (Document CD43/12) [cited on 2015 Feb 25]. Available from:
    http://www1.paho.org/english/gov/cd/cd43_12-e.pdf.

2. Pan American Health Organization. Dengue [Internet]. 44th Directing Council of PAHO, 55th session of the Regional Committee of WHO for the Americas; 2003 Sept 22-26; Washington (D.C.), United States. Washington (D.C.): PAHO; 2003 (Document CD44/14) [cited on 2015 Feb 25]. Available from:
    http://www1.paho.org/english/gov/cd/cd44-14-e.pdf.

3. Pan American Health Organization. Dengue [Internet]. 44th Directing Council of PAHO, 55th session of the Regional Committee of WHO for the Americas; 2003 Sep 22-26; Washington (D.C.), United States. Washington (D.C.): PAHO; 2003 (Resolution CD44.R9) [cited on 2015 Feb 25]. Available from: http://www1.paho.org/english/gov/cd/cd44-r9-e.pdf.

4. Pan American Health Organization. Dengue Prevention and Control in the Americas [Internet]. 27th Pan American Sanitary Conference, 59th session of the Regional Committee of WHO for the Americas; 2007 Oct 1-5; Washington (D.C.), United States. Washington (D.C.): PAHO; 2007 (Resolution CSP27.R15) [cited on 2015 Feb 25]. Available from: http://www1.paho.org/english/gov/csp/csp27.r15-e.pdf

5. Pan American Health Organization. Regional dengue data: number of cases [Internet]. Washington (D.C.): PAHO; 2015 [cited on 2015 Feb 25]. Available from: www.paho.org/dengue.

6. Guzmán MG, Kourí G, Valdés L, Bravo J, Vázquez S, Halstead SB. Enhanced severity of secondary dengue-2 infections: death rates in 1981 and 1997 Cuban outbreaks. *Rev Panam Salud Pública/Pan Am J Public Health* [Internet]. 2002 [cited on 2015 Feb 25];11(4):223-7. Available from: http://www.scielosp.org/scielo.php?script=sci_arttext&pid=S1020-49892002000400003&lng=en&nrm=iso and at: http://dx.doi.org/10.1590/S1020-49892002000400003

7. Libraty DH, Endy TP, Houng H-SH, Green S, Kalayanarooj S, Suntayakorn S, et al. Differing influences of virus burden and immune activation on disease severity in secondary dengue-3 virus infections. *J Infect Diseases* [Internet]. 2002 [cited on 2015 Feb 25];185(9):1213-1221. Available from: http://jid.oxfordjournals.org/content/185/9/1213.full

8. Guzman MG, Alvarez M, Halstead SB. Secondary infection as a risk factor for dengue hemorrhagic fever/dengue shock syndrome: an historical perspective and role of antibody-dependent enhancement of infection. *Arch Virol* 2013; 158(7):1445-1459 [cited on 2015 Feb 25]. Available from: http://www.ncbi.nlm.nih.gov/pubmed/23471635

9. Pan American Health Organization; World Health Organization (Special Programme for Research and Training in Tropical Diseases). Dengue - Guidelines for diagnosis, treatment, prevention, and control. New edition. [Internet]. La Paz: PAHO/WHO; 2010 [cited on 2015 Feb 25]. Available from: http://www.who.int/entity/tdr/publications/documents/dengue-diagnosis.pdf

10. OPS. Dengue. Guías de atención para enfermos en la región de las Américas [Internet]. La Paz: OPS; 2010 [Cited on 2015 Feb 25]. Available only in Spanish at:
http://www.paho.org/hq/index.php?option=com_docman&task=doc_download&Itemid=270&gid=11239&lang=es

11. Pan American Health Organization. State of the art in the Prevention and Control of Dengue in the Americas. Meeting report [Internet]. Meeting: State of the art in the Prevention and Control of Dengue in the Americas; 28-29 May 2014, Washington, (D.C.), United States. Washington (D.C.): PAHO; 2014 [cited on 2015 Feb 25]. Available only in Spanish at:
http://www.paho.org/hq/index.php?option=com_docman&task=doc_download&Itemid=&gid=27234&lang=es

12. World Health Orgaization. Global strategy for dengue prevention and control 2012-2020 [Internet]. Geneva: WHO; 2012 [cited on 2015 Mar 24]. Available from:
http://apps.who.int/iris/bitstream/10665/75303/1/9789241504034_eng.pdf

13. Sabchareon A, Wallace D, Sirivichayakul C, Limkittikul K, Chanthavanich P, Suvannadabba S, et al. Protective efficacy of the recombinant, live-attenuated, CYD tetravalent dengue vaccine in Thai schoolchildren: a randomised, controlled phase 2b trial. *The Lancet*. 2012;380(9853):1559-1567.

14. Noor Afizah A, Lee H. Wolbachia-based strategy for dengue control–the way forward. Dengue. 2013;37:107.

15. Sim S, Cirimotich CM, Ramirez JL, Souza-Neto JA, Dimopoulos G. 22 Dengue virus—mosquito interactions and molecular methods of vector control. *Dengue and Dengue Hemorrhagic Fever*. 2014:425.

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