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DENGUE: PROGRESS REPORT

1. Dengue is currently one of the major vector-borne viral diseases in the Region. In October 2007, the countries of the Hemisphere represented at the 27th Pan American Sanitary Conference recognized that the growing dengue outbreaks and the complexity of the epidemiological situation had alerted them to the presence of the macrodeterminants of transmission, such as poverty, unprecedented population growth, uncontrolled or planned urbanization, migration, environmental degradation, the lack of a reliable water supply, improper solid waste disposal, and the growing presence of dumps filled with discarded junk, tires, and plastic containers.

2. In 2007, the Member States adopted Resolution CSP27.R15¹ urging that dengue be considered a problem that reaches beyond the health sector. Furthermore, implementation of the International Health Regulations (IHR), a matter addressed in the resolution, adds a new approach for managing dengue outbreaks and epidemics. Based on these considerations, PAHO/WHO is promoting implementation of the Integrated Management Strategy for Dengue Prevention and Control (IMS-dengue) with the countries, focusing on the conditioning factors associated with the macrodeterminants that have a bearing on these problems. This document is a progress report describing the successes in dengue prevention and control in the Region and the challenges that are still pending.

3. Dengue has been on the rise for 25 years in the Region of the Americas, with cyclical epidemic outbreaks every three to five years, the last major one occurring in 2002, with more than 1 million cases reported.

¹ Pan American Health Organization/World Health Organization. 27th Pan American Sanitary Conference. 59th Session of the Regional Committee. Resolution CSP27.R15 "Dengue Prevention and Control in the Americas," Washington, D.C., USA, 5 October 2007.

4. The epidemiologic behavior of dengue in 2007 was influenced by the El Niño phenomenon, with outbreaks occurring in Bolivia, Brazil, Costa Rica, Guyana, French Guiana, Honduras, Martinique, México, Paraguay, Peru and Puerto Rico.² It was an epidemic year, with 900,782 cases reported, the second highest figure in the history of this disease. Of these cases, 26,413 were dengue hemorrhagic fever, signaling an increase in the most serious forms of the disease, linked to circulation of the four serotypes of dengue in several countries of the Region. In addition, 317 deaths from dengue were reported. However, despite the outbreaks and the increase in the number of serious cases of dengue hemorrhagic fever, case-fatality in 2007 was lower than in 2006 (1.26% in 2006 vs. 1.2% in 2007).

5. Although conditions in 2007 were very favorable for transmission, and over the past 22 years each outbreak has been more extensive than the last, on this occasion the trend was interrupted, with the incidence remaining below that of the previous outbreak in 2002.

6. To date in 2008 (epidemiological week 20), 290,478 cases have been reported, with 7,567 cases of dengue hemorrhagic fever and 139 deaths, Rio de Janeiro, Brazil, being the most affected city (megacity).

7. It is important to mention that in some countries of our Region, increased morbidity and mortality from dengue in children has been observed. Historically, classical dengue has predominated over dengue hemorrhagic fever in the Americas, with the highest number of cases for all forms of dengue occurring in adults, in contrast to the situation in Southeast Asia, where dengue hemorrhagic fever predominates and children are the most affected group.³ In Brazil, for example, the proportion of hospitalizations for dengue hemorrhagic fever in children under 15 soared from 9.5% in 1998 to 46.2% in 2007,⁴ and in the initial months of 2008, during the epidemic outbreak in Rio de Janeiro State, 88% of the deaths from severe dengue occurred in children under 15.⁵ In 2007, 50% of the deaths from dengue hemorrhagic fever and dengue shock syndrome in Costa

² Pan American Health Organization/World Health Organization. EER Noticias: Enfermedades Infecciosas Emergentes y Reemergentes, Región de las Américas. Boletines. See <http://www.paho.org/spanish/ad/dpc/dengue.htm>. Accessed on 11 April 2008

³ Roses, M; Guzmán, MF. Dengue y dengue hemorrágico en las Américas. Rev. Panam Salud Pública 32(4),2007.

⁴ Teixeira, MG; Costa, MC; Coelho, GE; Barreto, ML. Alteração no padrão de ocorrência de Dengue Hemorrágico no Brasil: Tendência de deslocamento de faixa etária. Article to be sent for publication. 2008

⁵ National Dengue Program, Brazil. Informe Epidemiológico da dengue. January-April 2008

Rica occurred in children under 3⁶ (four cases). Similar situations have been observed in other countries such as Nicaragua⁷ and El Salvador.

8. In light of this new situation, it is recommended that more in-depth investigations of pediatric illness be conducted, along with greater efforts to train personnel and equip the health services to provide care for dengue hemorrhagic fever and its severest forms in children.

9. In 2007, the Member States adopted Resolution CSP27.R15, which encourages intersectoral public policies for the control of macrodeterminants, strengthening the preparation, implementation, and systematic evaluation of IMS-dengue, promoting scientific research, and taking advantage of the implementation of the International Health Regulations in the Member States. It also recognizes the need for the countries to allocate more resources for implementation of these strategies.

10. To date, 14 countries in the Hemisphere have prepared their national IMS-dengue: the six Central American countries (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama), one Caribbean country (the Dominican Republic), and seven South American countries (Argentina, Brazil, Colombia, Ecuador, Paraguay, Peru and Venezuela). Two subregional IMS-dengue have also been prepared, one for Central America and the other for the Member and Associated States of MERCOSUR. The national IMS-dengue are in different phases of implementation, depending on the progress that the countries have made. In the biennium 2008-2009, the strategies for Belize, Chile, Cuba, Guyana, Mexico and Uruguay, and the subregional strategies for the Caribbean and the Andean subregion will be prepared.

11. Since 2003, the TG-dengue has collaborated with the countries of the Region in the preparation and implementation of the IMS-dengue, provided technical assistance in outbreaks and epidemics, and trained health professionals.⁸ During implementation of the IMS-dengue, new challenges have been identified (greater frequency of atypical forms of dengue, vector resistance to pesticides, etc.). The Dengue International Technical Group (International TG-dengue) is expected to meet this year (2008) in Santa Cruz de la Sierra, Bolivia, to discuss these challenges and adopt the new tools available for controlling this disease.

⁶ Ministry of Health, Costa Rica. Boletín epidemiológico de Costa Rica. Week 52. 2007.

⁷ Hammond SN, Balmaseda A, Pérez L, Tellez Y, Saborío, SI, Mercado JC, Videá E, Rodríguez Y, Pérez MA, Cuadra R, Solano S, Rocha J, Idiaquez W, González A, Harris E. Differences in dengue severity in infants, children, and adults in a 3-year hospital-based study in Nicaragua. *Am J Trop Med Hyg.* 2005 Dec; 73(6):1063-70.

⁸ Pan American Health Organization. 44th Directing Council, 55th Session of the Regional Committee Provisional Agenda Item 4.11. CD44/14 (Eng.) Washington, D.C., USA 22-26 September 2003 . International TG-dengue. See <http://www.paho.org/english/gov/cd/cd44-14-e.pdf> Accessed 11 April 2008.

12. Pursuant to the new resolution, evaluation of the IMS-dengue has begun, starting with the International Seminar to Evaluate the Dengue Control Program in Brazil in July 2007. Given the highly complex nature of the country, this process will continue through 2008; an external group from PAHO/WHO will participate and issue recommendations for necessary changes in the national strategy. In March 2008, a multidisciplinary team from the international TG-dengue, accompanied by the national authorities, evaluated Mexico's dengue program at the national level and in seven states. The primary objective of this evaluation was learn how all program components (epidemiological surveillance, laboratory techniques, health promotion, mass communication, patient care, case definitions, and vector control) were managed at the national level. The program's new algorithms and indicators were reviewed.

13. Based on the experiences with this evaluation process and the interprogrammatic efforts of the International TG-dengue, a reliable evaluation instrument has been developed that includes the WHO criteria for evaluating dengue programs⁹ and the indicators for the national IMS-dengue.

14. During the biennium 2008-2009, evaluation of the IMS-dengue will continue with Central America (Costa Rica, Guatemala, Honduras, Nicaragua, Panama, and El Salvador), and South America (Brazil, Colombia, Paraguay, Peru and Venezuela). This will help promote implementation of the IMS-dengue and permit the necessary technical adjustments in the general health care system, with emphasis on primary environmental care. Moreover, the epidemiological situation of dengue will be analyzed, recommending key actions and practices for improving national strategies.

15. In 2007, outbreaks were officially reported in 11 countries of the Region. The El Niño phenomenon, with its extremes of heavy rain or severe drought, combined with the presence of the aforementioned macrodeterminants, was a factor in these outbreaks. In each outbreak, there was a clear lack of explicit guidelines offering a rapid, effective, coordinated, and integrated technical response for managing epidemics in the countries. The inclusion of contingency plans in the IMS-dengue for dengue outbreaks and epidemics since 2007 marks the launch of a new component. The design of this plan guarantees a rapid, effective response by the different actors involved in the strategy, but places particular emphasis on an intersectoral response and community involvement. The objective of the contingency plan is to reduce both case numbers in risk areas and mortality, limiting the socioeconomic impact in the Region. The strategies of Argentina, Ecuador, Peru, and MERCOSUR currently have a contingency plan, and changes are being made in the other countries.

⁹ World Health Organization. WHO/CDS/CPE/PVC/2005.13 Guidelines for conducting a review of a National Dengue Prevention and Control Programme. 57 pages, 2005.

16. These plans include action to be taken at the start of an outbreak, promoting the declaration of a health alert or emergency and immediate communication of the announcement. Other specific actions are to form a multisectoral committee that will identify and invite representatives of the health, environment, education, justice, civil defense, and other sectors to respond to the outbreaks; activate and maintain the situation room; organize the intervention and the mobilization and redistribution of supplies, organize patient care services, intensify vector control measures, and support strategies for risk communication and community participation.

17. The entry into force of the IHR (2005)¹⁰ represents the first multilateral initiative to develop an effective framework for preventing the international spread of disease and explicitly require immediate reporting of several diseases of particular national or regional concern, among them dengue. It is therefore urgent to prepare a regional contingency plan that contains the new guidelines set forth in the IHR (2005).

18. Resolution CSP27.R15 recognizes the impact of the macrodeterminants associated with dengue. Thus, not only is this consensus conducive to boosting technical capacity in the six components of the IMS-dengue (patient care, entomology, laboratory techniques, epidemiological surveillance, mass communication, and environment), it is imperative to improve intersectoral activities at the governmental and nongovernmental level.

19. A meeting of mayors' associations is currently being programmed to discuss successful prevention and control experiences in the Region that can be generalized. Immediate steps will also be proposed that can lead to better prevention and control of dengue transmission in their communities. The objective is to encourage greater attention to developing activities with a greater impact in terms of prevention and control--activities that this level of government is perfectly capable carrying out: proposing more robust legislation; considering the vector's habitat in city planning; ensuring proper management of solid waste; developing strategies for eliminating abandoned tires and plastic containers; improving the water supply and environmental sanitation, etc. It is hoped that working directly with the mayors' associations will lead to a change in current models that consider dengue a matter only for the health sector—models that have proven ineffective. This approach is essential to implementation of the IMS-dengue.

20. Strategic alliances and interprogrammatic efforts have been identified as a significant source of support for the IMS-dengue and key to the Region's progress in this area. Extrasectoral initiatives continue to be important. One such initiative is the Ecoclubs, which is signing a new macroagreement with the International Development Research Center of Canada (IDRC) that addresses the issues of water and youth,

¹⁰ World Health Organization. 58th World Health Assembly. International Health Regulations (2005). 60 pages.

application of the Communication for Behavioral Impact (COMBI) methodology, and the Ecosalud Approach.

21. These lines of action will be complemented and reinforced with Integrated Vector Management (IVM) (CE142/24), whose multidisease approach will make it possible to strengthen areas common to the vector-borne disease prevention and control programs, among them: epidemiological and entomological surveillance, the rational use of pesticides, the mobilization of society, and proper environmental management.^{11,12}

22. The international scientific community committed to discovering and/or developing a dengue vaccine continues to forge ahead with initiatives such as the Pediatric Dengue Vaccine Initiative (PDVI) and the Innovative Vector Control Consortium (IVCC), both financed by the Bill & Melinda Gates Foundation. DENCO and DENFRAME, international consortia supported by the European Commission, have been created to study the pathogenesis of dengue and its clinical management, including the discovery of new diagnostic tests and vector control measures. In November 2007, an international symposium on new technologies for dengue control was held in Fortaleza, Brazil, attended by national and international scientists and PAHO and WHO advisers from over 10 countries of the Region. Any new dengue prevention and control measures will have a sound evidence-based scientific and technical foundation.

23. It should be noted that for 2008, PAHO/WHO has funds from the Government of Spain totaling US\$ 550,000.00 to improve dengue management, prevention, and control, especially in the MERCOSUR countries. CIDA-Canada has also provided funding for dengue management in the Southern Cone.

24. This progress report emphasizes the fact that there are serious complex challenges to achieving dengue prevention and control in the Hemisphere that must be addressed if more impressive results in the reduction of this disease are to be obtained. As the countries have mentioned, they still lack strict laws to address the serious environmental sanitation problems that are directly responsible for foci of the *Aedes aegypti* mosquito, the transmitter of dengue. Improper disposal of abandoned tires and accumulated junk, the lack of a water supply, and the systematic failure to collect solid waste are problems that must be faced head on and solved; otherwise, it will be impossible to improve dengue control and make the current strategies sustainable; the vector will be a permanent fixture in our communities, because such areas are its breeding sites. These challenges are compounded by external factors such as climate change and global

¹¹ WHO. Global Strategic Framework for Integrated Vector Management. Geneva, 2004. 15 pages. <http://www.emro.who.int/RBM/PDF/GlobalStratFrameIVM.pdf> Accessed in April 2007

¹² Strategic Plan for Integrated Vector Management in the Americas. Proposal to Support Implementation of IVM as a Regional Strategy in the Americas. Draft 6.0. Unpublished.

warming, which also promote the life cycle of the mosquito and further complicate these problems.

25. Given the complexity of dengue transmission, it is very clear that we must engage the highest political-administrative levels in our countries in solving these problems, which today are the direct causes of the disease.

Action by the Executive Committee

26. The Executive Committee is invited to consider this report and offer comments, additional information, and guidance in order to move forward with technical cooperation for dengue prevention and control.

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