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DENGUE PREVENTION AND CONTROL IN THE AMERICAS: INTEGRATED APPROACH AND LESSONS LEARNED

Background

Integrated Management Strategy for Dengue Prevention and Control in the Region of the Americas

1. At the 43rd Directing Council in September 2001, the Pan American Health Organization/World Health Organization (PAHO/WHO) approved Resolution CD43.R4 *(2)*,which calls for a new generation of programs for the prevention and control of dengue *(4)*. In September 2003, the 44th Directing Council of PAHO/WHO approved Resolution CD44.R9, which promoted the adoption of integrated management strategies for dengue prevention and control *(3)*,or IMS-Dengue, a working model developed by the countries with the participation of the Dengue International Technical Group *(1)* and top national experts in key areas such as epidemiology, entomology, patient care (EGI Dengue), laboratory techniques, mass communication, and the environment.

2. The adoption of the IMS-Dengue has been promoted in the Region and endorsed in a number of subregional technical and political forums, including the Council of Ministers of Health of Central America (COMISCA), the Meeting of the Health Sector of Central America and the Dominican Republic (RESSCAD), the Central American Network for the Prevention and Control of Emerging and Reemerging Diseases (RECACER), the Southern Common Market (MERCOSUR), and the Latin American Parliament (PARLATINO), all of which have advocated the use of an integrated management model for the prevention and control of dengue.

3. A Subregional Strategy for Central America and the Dominican Republic *(5)* (IMS-CA-DOR) was prepared in January 2004, and to date six Central American

countries (Costa Rica *(6)*, El Salvador *(7)*, Guatemala *(8)*, Honduras *(9)*, Nicaragua *(10)*, and Panama *(11)* and the Dominican Republic *(12)* have adapted the IMS at the national level. In South America, five countries have adopted this approach (Venezuela *(13)*, Colombia *(14)*, Paraguay *(15)*, Peru *(16)*, and Brazil *(17)*). It is expected that Argentina and Ecuador will be developing their national strategies during 2007. In addition, a Subregional Integrated Management Strategy for the MERCOSUR member states and associates will be being prepared during the same period. These strategic links and interprogram efforts are an important source of support for EGI-dengue. Annex I describes in detail some of the actions that are being carried out through these strategic links.

Dengue Epidemiological Situation in the Americas

4. The dengue epidemiological situation in the Region continues to be highly complex and is obliging us to redouble efforts toward implementation of the Integrated Management Strategy. During the period from 2001 through 2006 a total of 3,419,919 cases of dengue were reported in the Americas, including 79,664 cases of dengue hemorrhagic fever and 982 deaths, with a case-fatality rate of 1.2%. All 4 serotypes (DEN 1, 2, 3, and 4) *(35)* are in circulation, which increases the risk for appearance of the most serious forms of the disease – namely, dengue hemorrhagic fever and dengue shock syndrome. The Southern Cone countries account for 60% of all dengue cases in the Americas, and within this subregion, Brazil has the largest number. The Andean subregion is next, with 19%; here, Colombia and Venezuela have the most reports and the highest incidence rates. This subregion contributes more than 60% of all cases of dengue hemorrhagic fever. Some countries in the Caribbean and Central American subregions also had high incidence rates per 100,000 population during this period, including French Guiana, Martinique, Costa Rica, and Honduras.

5. In 2006, dengue outbreaks were reported in Cuba, the Dominican Republic, El Salvador, French Guiana, Martinique, and Paraguay. It is expected that 2007 will be an epidemic year, and in February PAHO/WHO issued an alert to the entire region calling for maximal prevention and control measures. Bolivia, Brazil, Mexico, and Paraguay have already reported dengue outbreaks during the first months of the year. In fact, for the first time in history, Paraguay reported cases of dengue hemorrhagic fever and also deaths.

6. In the 11 countries that are in the process of implementing IMS-Dengue, studies were undertaken in which the average numbers of cases reported between 1997 and 2003 were compared with corresponding numbers in the last three years (2004-2006), during which the strategy was prepared and began to be implemented (without eliminating the years with epidemic outbreaks). The result showed a 33% reduction in incidence and a 2% reduction in mortality. Even so, however, the countries were unable to stave off

epidemic outbreaks that affected Costa Rica in 2005 and the Dominican Republic, El Salvador, Panama, and Paraguay in 2006.

7. These data reveal the highly complex challenges of dengue control. Despite the efforts undertaken and the progress achieved, the countries have suffered an economic impact because of the effect that the disease has had on tourism, work and school productivity, and health services. The latter have experienced a breakdown because of the need for urgent care and the high demand for services in times of outbreaks and epidemics, with irreparable loss of human lives and high political and social cost.

Analysis

8. The countries that have implemented IMS-Dengue have kept up an ongoing exchange with the technical areas and those responsible for decision-making in the ministries and municipalities, which has made it possible to generalize and disseminate experiences and lessons learned in each of the different components. In addition, there has been greater openness on the part of health sector personnel—both professional and technical—to use interventions that go beyond exclusive reliance on vector control intervention, which has been the traditional response.

9. Currently, the countries that are in the process of implementing IMS-Dengue have achieved differing degrees of progress in such aspects as:

- Improved technical and managerial coordination within the ministries of health;
- Improved coordination with other sectors, municipalities, and organized community groups, and implementation of new local communication projects aimed at modifying habits and behaviors that have to do with dengue, such as the methodology advocated in the Communication for Behavioral Impact (COMBI) Plan;
- Increased capacity to mobilize resources (which are still insufficient) and greater adaptation of efforts to the logical framework that has been agreed upon, which forces those involved to consider the cost of activities and facilitates negotiation with possible donors, thus avoiding technical improvisation in the planning of responses;
- Development of new skills and abilities in the areas of community participation, education, and anthropological research;
- An increase in response capacity and in the incorporation of new tools for epidemiological surveillance, such as the rapid *Aedes* index survey (LIRA) developed in Brazil and the new trap for calculating adult indexes.

10. Although these and other steps toward progress *(18)* in combating dengue in the region are encouraging, they are still insufficient, and we are far from achieving the measures called for in the resolution adopted by the 44th Directing Council (CD44.R9). The process of implementing IMS-Dengue has, in itself, revealed weaknesses and serious threats that force to us to continue to analyze the subject of dengue in all its dimensions, magnitude, and complexity.

11. In order to make greater progress toward dengue prevention and control in the continent, it will be necessary to pay more attention to the health sector itself. Some of the most serious problems are:

- Technical and professional human resources are limited in the strategy's key areas, such as entomology and vector control. The availability of these trained human resources is unstable; they are often transferred to other agencies or go into the private sector. There is need for a policy in this area, as well as a strategy for assessing the situation and promoting the stability of trained staff.

- Technical field personnel who are highly experienced are near retirement and the new personnel coming in need training. This situation is slowing down the evaluation and sustainability of actions being carried out.

- Unplanned budget cuts or insufficient budgets, which sometimes only specify "vector control," with limited or no funds for such components as health promotion to encourage behavioral changes, interfere with the operation and sustainability of prevention and control programs.

- There is need for adequate budgets devoted specifically to the implementation of IMS-Dengue and the evaluation of actions taken at the different levels.

- Public health laws, regulations, and guidelines are often disregarded. Sometimes existing legislation is inadequate, or in other cases it fails to solve the problem for which it was created.

- There are not enough incentives to promote the active participation of communities in prevention activities. Training has been under way in COMBI 20-29 with very positive results in several countries, but generalizing it to other areas has been very slow, and only scant resources have been allocated for this component.

- Sustainability and continuity of prevention and control activities are constantly being compromised by the need to respond to competing health and political demands.

12. These are only a few examples of the problems that have been encountered by the countries in the implementation process. Each of the countries has developed a SWOT matrix that gives a more precise picture of their strengths, opportunities, weaknesses, and threats.

13. There are also factors outside the ministries of health, such as lack of or insufficient effective commitment on the part of other key actors to address the risk factors or determinants of dengue and to face the problem. Personnel responsible for providing technical cooperation need to improve their persuasiveness and negotiating skills. The earth's climate is undergoing radical, destabilizing changes *(30)* as a result of global warming *(31)*. The El Niño/La Niña/Southern Oscillation (ENSO) phenomenon *(31)* affects the intensity and duration of rain and hurricane seasons and can also cause droughts and damage to biodiversity. These changes, in turn, produce alterations in the ecosystems and ideal conditions for the spread of pathogens and their vectors.

- Unprecedented population growth, the presence of dengue in large urban centers and even major megacities (Rio de Janeiro, São Paulo, Caracas) poses new challenges and places new demands on prevention and control programs. The problem is aggravated even further by unplanned and uncontrolled population growth in urban areas *(32)*, which often generates critical conditions in terms of overcrowding and lack of basic services, including regular water supply and waste collection, thus facilitating proliferation and persistence of the vector.

- Increased migration, international traffic *(33)*, and tourism (the year 2006 saw a record 842 million tourists in the Region) *(34)* facilitates passage of the several dengue virus serotypes and the vector from one country to another. This situation cannot be avoided and is making it necessary to maximize efforts to integrate clinical, serological, epidemiological, and entomological surveillance.

- Other problems have been the rapid accumulation of abandoned tires with no place to put them and the sea of nonbiodegradable plastic containers across communities and in open dumps, which become potential breeding sites for the vector.

14. The recent epidemic outbreak of dengue in Paraguay, a country that is in the process of implementing IMS-Dengue, is a clear illustration of the severity of these problems. An emergency public health alert was promptly called by the Minister of Health, and soon afterwards a public health emergency was decreed by the President of the Republic, which guaranteed a comprehensive response and even the opportunity to mobilize funds from various international sources. In addition, the MERCOSUR countries provided rapid subregional support. It should be pointed out that the *Aedes aegypti* mosquito's principal breeding sites had been in abandoned tires. Thus, there is

need for directives to regulate their proper disposal, which would provide an immediate and definitive solution to the problem.

Proposal

15. During the current period, resources have been made available from the PAHO/WHO Regional Program on Dengue, as well as extrabudgetary funds from the Inter-American Development Bank (IDB), the Canadian International Development Agency (CIDA), the United States Centers for Disease Control and Prevention (CDC), and WHO, among other donors, often at the national level, which have supported the process of developing national strategies in the Region. However, financial resources are insufficient at this time to cover ongoing systematic implementation of scheduled activities in the national IMS-Dengue programs.

16. The inclusion of this topic on the agendas of the PAHO Governing Body meetings underscores the importance of systematically evaluating progress in the development and implementation of relevant strategies in all the countries. All the IMS-Dengue programs at the national level are committed to seeing that these strategies are incorporated into an extrasectoral framework, which will ensure that response to the dengue problem is global, not just from the health sector. This is an objective that we should strive for. It is hoped that the Member States will have the political will to mobilize basic resources for the implementation process and promote concrete actions that will both reduce the risk factors for dengue and secure progress on a sustainable basis.

17. It is also essential to promote the global research agenda agreed to at the October 6 meeting of the WHO Scientific Group on Dengue in Geneva, at which the Americas region was well represented. This research includes the investigation of new techniques, methods, and tools in the areas of mass communication, vector control, patient care, laboratory techniques, and epidemiological surveillance, as well as progress in the search for a preventive vaccine.

18. Furthermore, it is incumbent on the Secretariat to promote cooperation among the Member States, assist in the search for extrasectoral strategic links, aid in enlisting international financial donors to support the development and implementation of national strategies, and check the rising trend of dengue in the region, thereby reducing the social, economic, and political burden that the disease imposes.

19. It is well to remember that there is no one easy, low-cost solution for dengue, as the Minister of Health of Brazil recently said during the inauguration of vaccination week: “Dengue is a difficult disease to combat because the vector is inside our homes. It is a pathology that requires great mobilization on the part of the community. What is

needed is a lot of education and information. And most important, a strategy must be permanently in place over a long period of time in order for significant results to be seen."

Action by the Pan American Sanitary Conference

20. Taking into account the progress that has been made in implementing the IMS-Dengue, the problems and limitations that have been pointed out above, and the persistence of determinants and situations that act as conditioning factors in the transmission of dengue, the Conference is invited to analyze the present document and consider any special policy options that might be available to combat dengue in the Americas, such as those recommended by the 140th Session of the Executive Committee (see Resolution CE140.R17, Annex II).

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Annexes

PROGRESS WITH IMS-DENGUE AND OTHER REGIONAL INITIATIVES FOR DENGUE PREVENTION AND CONTROL

1. Strategic links and interprogram efforts have been identified as important sources of support for the Integrated Management Strategy for Dengue Prevention and Control. These have been key to the progress achieved in the Region and are described in detail below.

Multisectoral and Interprogram Effort

2. PAHO/WHO promotes and supports technical cooperation among the countries on an ongoing basis. This effort has included the improvement of health services for the management of patients with dengue and dengue hemorrhagic fever, vector control, training in laboratory techniques, and immediate technical and multisectoral support during recent dengue outbreaks. In this connection, there is close collaboration between the Regional Program on Dengue and other areas and units of PAHO/WHO, including: Sustainable Development and Environmental Health, Public Information, Health Technologies and Services Delivery, Emergency Preparedness and Disaster Relief, representatives and focal points in every country, and the Dengue International Working Group throughout the Region. The dengue laboratory network (*1)* of WHO Collaborating Centers on Dengue in the Region work together with the national reference laboratories on the diagnosis of dengue in the Americas, annual proficiency testing of laboratory personnel, the promotion of standardized laboratory techniques, joint research, and support for the dengue laboratories in the countries. In addition, the Regional Program on Dengue promotes ongoing epidemiological surveillance and has been reporting data to the dengue website since 1995, as well as to DengueNet, a component of the WHO Global Atlas of Infectious Disease *(2)* (the World Health Organization's central data management system on infectious diseases) for worldwide epidemiological and virological surveillance of dengue.

Communication for Behavioral Impact (COMBI)

3. This is a new approach, a methodology aimed at achieving synergy between marketing, education, communication, health promotion, and mobilization that helps to increase impact on behavior modification or encourage the adoption of specific behaviors and promotes the program-community relationship. To date, multidisciplinary teams in 22 countries throughout the Region have been trained in the COMBI methodology *(3-12)*. In some cases they are using it to promote behaviors that reduce the reproduction of vectors, while others the approach has been used to improve the diagnosis and clinical case management of dengue and dengue hemorrhagic fever. COMBI–Galápagos in Ecuador is a successful experience in application of this methodology. A pilot plan was

designed in 2005 specifically for Puerto Ayora on the Island of Santa Cruz—the largest human settlement in the Galápagos Archipelago, which has suffered classical epidemics of dengue since 2002. Under this plan, more than 15 health and educational institutions, political authorities, foundations, and communications media have joined together in a systematic multisectoral approach involving education and communication to promote proper management of the town's principal mosquito breeding sites. During the 2006-2007 academic year, high school students visited 1,527 families: 88% of them agreed to participate in the program, and 78% of them thoroughly washed and scrubbed their water tanks to prevent mosquitoes from breeding.

The Government-Industry-Community Connection

4. Intersectoral ties can be promoted by governments by promulgating and executing laws that provide the framework for dengue prevention and control activities for example, a number of countries have declared a "D-Day" (Dengue Day) featuring dengue prevention activities, introduced topics on dengue in the elementary and secondary school curricula, and enforced laws and imposed fines where mosquito breeding sites were being maintained. Barbados, Brazil, Costa Rica, Puerto Rico, and the United States of America have issued decrees or passed laws for the control and the proper management of used tires, one of the primary mosquito breeding sites throughout the world. Brazil is a good example: the Ministry of Health and the Environment and private industry have implemented a program for the recycling of tires. The country's 218 receiving centers for unusable tires have collected 650,000 tons or material, the equivalent of 129 million tires. The 62 companies engaged in collecting old tires employ 1,100 workers directly and create jobs for nearly 9,000 indirectly.

Integrated Vector Management (IVM)

5. In 2000, the WHO Global Strategic Framework for Integrated Vector Management (IVM) *(13)* set down the bases for the strengthening of vector control in ways that are compatible with national health systems. Within this framework, a Regional Strategic Plan for the Strengthening and Support of Medical Entomology and the Promotion of Integrated Vector Management *(14)* in the Americas has been prepared by the PAHO Communicable Diseases Unit in collaboration with WHO. This Regional Plan promotes a multi-disease approach and effective integration with other disease control measures as well as the application of a variety of interventions. Resources need to be mobilized for its implementation in the Americas.

Training Program on Healthy Housing and Vector Control

6. This course *(15)* was developed by PAHO's Sustainable Development and Environmental Health Area and the Communicable Diseases Unit of the Health

Surveillance and Disease Management Area in collaboration with the Cuban National Institute of Hygiene, Epidemiology, and Microbiology (INHEM) in Havana. Its curriculum is the joint effort of professors from Brazil, Cuba, Guatemala, and the United States. The approach focuses on the relationship between health, environment, housing conditions, and the circumstances in which people live, and it calls for prevention and sanitary control measures that involve community participation. Three virtual training courses have been offered (in 2002, 2004, and 2006) on the topic "vector control, reservoirs, and agents in and around dwellings" for over 1,267 participants from 20 countries in America and Europe. The instruction was offered in the form of undergraduate and graduate courses. The objective was to develop and share ways to strengthen local capacity and effectively address health problems in dwellings throughout the Region of Americas. The training course is being promoted in the countries of the Region by the Inter-American Healthy Housing Network *(16)*, the WHO Collaborating Center for Healthy Housing at INHEM, and the WHO Collaborating Center of Dengue at the Pedro Kourí Institute (IPK).

EcoClubs

7. EcoClubs are democratic organizations with more than 15,000 volunteers organized into 600 networks around the world, which together constitute the International Network of Eco Clubs (RIE) *(17)*. Since 2001, EcoClubs have been using strategic links to collaborate on dengue prevention and control. Some 6,000 young people in 300 EcoClubs have been mobilized and received training on dengue-related topics and other actions through this organization. The EcoClubs initiative is gaining momentum in Latin America: countries such as Argentina, Bolivia, Brazil, Chile, Costa Rica, the Dominican Republic, Ecuador, Guatemala, Haiti, Mexico, Nicaragua, Panama, Paraguay, and Peru have taken advantage of interinstitutional connections, prepared educational materials for prevention, and made technical visits to monitor and evaluate to dengue prevention and control activities.

Ecosystemic Approach to Human Health (EcoHealth)

8. This initiative (18), promoted by Canada's International Development Research Center (IDRC), contributes to the prevention of vector-borne diseases by linking up comprehensive environmental management strategies with a holistic and ecological approach to the promotion of human health. PAHO/WHO supports the implementation of research projects in this area. A number of countries, including Argentina, Brazil, Colombia, Cuba, Guatemala, Mexico, and Uruguay, have developed dengue prevention projects using an ecosystemic approach aimed at ensuring sustainable development. In 2006-2007, in response to a call put out by IDRC, proposals for research on dengue using an ecosystemic approach were submitted by candidates in Argentina, Bolivia, Brazil, Colombia, Cuba, Ecuador, Guatemala, Guyana, Mexico, Peru, Uruguay, and Trinidad and Tobago.

9. Finally, WHO's concern to achieve significant and tangible progress in dengue prevention and control has become a challenge for the international scientific community, which is committed to discovering/developing drugs and vaccines against dengue. Partners such as the Pediatric Dengue Vaccine Initiative (PDVI) and the Innovative Vector Control Consortium (IVCC), both financed by the Bill and Melinda Gates Foundation, and the DENCO and DENFRAME international consortia, funded by the European Commission, have been created to study the pathogenesis of dengue and its clinical management, including the search for new diagnostic media and means of controlling the vector. Several countries in the Americas Region are involved in this research, and the new scientific knowledge that they generate will enrich current integrated management strategies for dengue prevention in the Americas. Currently, the Program is collaborating with the WHO and the Scientific Working Group on Dengue to define and support the agenda for research on dengue and the preparation of a new edition of guidelines on the prevention and control of dengue and dengue hemorrhagic fever.

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PAN AMERICAN HEALTH ORGANIZATION
WORLD HEALTH ORGANIZATION

140th SESSION OF THE EXECUTIVE COMMITTEE

Washington, D.C., USA, 25 to 29 June 2007

CSP27/15 (Eng.)
Annex II

RESOLUTION

CE140.R17

DENGUE PREVENTION AND CONTROL IN THE AMERICAS

THE 140th SESSION OF THE EXECUTIVE COMMITTEE,

Having studied the document presented by the Director, *Dengue Prevention and Control in the Americas: Integrated Approach and Lessons Learned* (Document CE140/17);

Considering efforts by the countries of the Region in dengue prevention and control and pursuant to Resolutions CD43.R4 and CD44.R9 of the Directing Council of PAHO for the preparation and implementation of the Integrated Management Strategy (IMS-dengue), which it presents as a model for reducing the morbidity and mortality from dengue outbreaks and epidemics;

Recognizing that recent outbreaks of dengue and the complexity of the epidemiological situation have raised awareness about the macrodeterminants of transmission, such as climate change, migration, and uncontrolled or unplanned urbanization, with the consequent proliferation of breeding sites for the *Aedes aegypti* mosquito, the principal vector for transmission of the dengue virus; and

Bearing in mind that the encouraging progress and efforts of the countries to fight dengue in the Region are still not enough and that the very process of implementing the IMS-dengue has made it possible to identify weaknesses and threats that demand the continued study of dengue in all its dimensions, magnitude, and complexity,

RESOLVES:

To recommend that the 27th Pan American Sanitary Conference adopt a resolution along the following lines:

THE 27th PAN AMERICAN SANITARY CONFERENCE,

Having studied the document presented by the Director, *Dengue Prevention and Control in the Americas: Integrated Approach and Lessons Learned* (Document CSP27/15);

Considering efforts by the countries of the Region in dengue prevention and control and pursuant to resolutions CD43.R4 and CD44.R9 of the Directing Council of PAHO for the preparation and implementation of the Integrated Management Strategy (IMS-dengue), which it presents as a model for reducing the morbidity and mortality from dengue outbreaks and epidemics;

Recognizing that recent outbreaks of dengue and the complexity of the epidemiological situation have raised awareness about the macrodeterminants of transmission, such as poverty, climate change, migration, and uncontrolled or unplanned urbanization, with the consequent proliferation of breeding sites for the *Aedes aegypti* mosquito, the principal vector for transmission of the dengue virus; and

Bearing in mind that the encouraging progress and efforts of the countries to fight dengue in the Region are still not enough and that the very process of implementing the IMS-dengue has made it possible to identify weaknesses and threats that demand the continued study of dengue in all its dimensions, magnitude, and complexity,

RESOLVES:

1. To urge the Member States to:

(a) Work to address the weaknesses and threats identified by each country in the preparation of the IMS-dengue to achieve the results expected from the implementation of the national strategies;

(b) Identify and mobilize financial resources to further implementation of the national strategies;

(c) Prevent deaths from dengue by giving priority to strengthening the health services network to offer timely, adequate care to patients with serious cases of dengue hemorrhagic fever and dengue shock syndrome;

(d) Promote intersectoral public policies to control the macrodeterminants of dengue transmission, with particular attention to strengthening urban planning, poverty reduction, and environmental sanitation (water, refuse) to permit sustainable prevention of dengue and other vector-borne diseases;

(e) Pursue systematic monitoring and evaluation of national IMS-dengue implementation, which will make it possible to provide continuity for the activities and integrate new tools for dengue control;

(f) Evaluate evidence on the magnitude of the problem of waste tires and dumps filled with discarded plastic that might pose a growing threat as potential breeding sites for the dengue mosquito vector, and encourage partnerships between government and private industry in the search for solutions;

(g) Allocate greater financial resources where appropriate, specifically to improve the technical skills of human resources and their training in neglected fields such as entomology and social communication for development;

(h) Promote scientific research on new technical tools and ongoing evaluation of existing tools to ensure the greatest impact on dengue prevention and control;

(i) Take advantage of the implementation of the International Health Regulations (2005) for the timely detection of cases.

2. To request the Director to:

(a) Strengthen technical cooperation among the Member States to halt the spread of dengue in the Region and reduce the social, economic, and political burden that dengue represents;

(b) Support intersectoral strategic partnerships and the involvement of international financial partners to support implementation and evaluation of the Integrated Management Strategy for dengue prevention and control in all the countries and subregions of the Americas, with a view to reducing the determinants of transmission;

(c) Promote preparation of a regional plan for a timely response to the dengue outbreaks and epidemics that have increased over the years in the countries of the Americas.

(Ninth meeting, 29 June 2007)

PAN AMERICAN HEALTH ORGANIZATION
WORLD HEALTH ORGANIZATION

27th PAN AMERICAN SANITARY CONFERENCE
59th SESSION OF THE REGIONAL COMMITTEE

Washington, D.C., USA, 1-5 October 2007

CSP27/15 (Eng.)
Annex III

Report on the Financial and Administrative Implications for the Secretariat of the Resolutions Proposed for Adoption by the Pan American Sanitary Conference

1. Resolution: DENGUE PREVENTION AND CONTROL IN THE AMERICAS

2. Linkage to program budget

Strategic objective: Nº 1: To reduce the health, social, and economic burden of communicable diseases.

Area of work: HDM/CD **Expected result:** RER Nº 1.7

Efforts by the countries of the Region to deal with dengue through an Integrated Management Strategy for dengue prevention and control are a priority expressed in Resolution CD44.R9 of 2003.

For the period 2006-2007, 12 countries of the Region have prepared a national IMS-dengue (Brazil, Costa Rica, Dominican Rep., El Salvador, Guatemala, Honduras, Panama, Nicaragua, Paraguay, Colombia, Peru, and Venezuela) and two subregional strategies have been developed in Central America and MERCOSUR that serve as technical support for the national IMS-dengue's. It is expected that at the end the biennium 2008-2009, a total of 17 countries (which account for 97% of the dengue cases reported by the countries of the Region in the past 10 years) will be in the process of implementing their national IMS-dengue.

3. Financial implications

(a) **Total estimated cost for implementation over the lifecycle of the resolution (estimated to the nearest US$ 10,000; including staff and activities):** This proposed Resolution is very broad in that it requests each country to prepare its national IMS-dengue and mobilize resources to complement it with the results and technical activities contemplated in the strategy. It also asks that they promote policies and strategies to

address the determinants of dengue associated with poverty, population growth, and uncontrolled, unplanned housing developments, factors related to environmental management (water and solid and liquid waste), etc. The cost of these activities cannot be included in this strategy. It should be pointed out that calculations in 1997 for the Hemispheric Plan for intensification of the struggle against *Aedes aegypti* yielded a figure of $1,423,602,485 for vector control alone.

Today, based on the progress that we have made in promoting the IMS-dengue in Region, we have estimated that the cost of monitoring, evaluation, and technical assistance for implementation, strengthening, and capacity building in the countries in key areas such as entomology, mass communication, and patient care, as well as preparation of the national IMS-dengue in countries that still do not have one, will be around $9,700,000 over a 5-year period.

Budget costs: Year 1: $2,056,500, Year 2: $2,075,500, Year 3: $1,959,500, Year 4: $1,727,500, Year 5: $1, 845,000.

(b) **Estimated cost for the biennium 2008-2009 (estimated to the nearest US$ 10,000; including staff and activities):** In the biennium 2008-2009, a cost of $4,100,000 is estimated.

(c) **Of the estimated noted in *b),* what can be subsumed in the existing programmed activities?** Of the above costs, with the funds that are currently being allocated for dengue in PAHO/WHO through its regular funds, 3.8% ($160,000) of what is programmed for the biennium 2008-2009 in the aforementioned projection could be subsumed.

4. Administrative implications

(a) **Implementation locales (indicate the levels of the Organization at which the work will be undertaken and identify the specific regions, where relevant):** The implementation locale of the Resolution is the country and subregional level. Countries and subregions that have developed strategies are in the process of implementing them, and two subregions--the Andean and the Caribbean--will begin preparing the subregional IMS-dengue. It is anticipated that 17 countries, where 97% of the dengue cases in the Region have been concentrated in the past 10 years, will have prepared or be in the process of implementing their national IMS-dengue.

The Organization would be involved and take direct steps to guarantee the preparation of national and subregional strategies, and it would be coordinating and delivering technical cooperation through the Regional Dengue Program of PAHO/WHO with the integrated participation of the International Technical Group (international TG-dengue) (epidemiological surveillance, entomology, mass communication, laboratory, patient care, and the environment).

The PAHO/WHO Representative Offices, working directly in each country in

coordination with the regional program headquartered in Panama, will guarantee monitoring and evaluation during implementation and ongoing technical assistance.

(b) **Additional staffing requirements (indicate additional required staff full-time equivalents, noting necessary skills profile):** PAHO/WHO should strengthen the regional program headquartered in Panama with at least with one short-term consultant (STC) or national professional in order to maintain the greatest possible technical assistance coverage in the countries.

The profile should be a health professional with a master's degree in health sciences and local and international experience in any of the basic components of dengue.

(c) **Timeframe (indicate broad timeframes for implementation and evaluation)** For 2008-2009, a total of 17 countries should be in the process of implementing their national IMS-dengue, and two subregional IMS-dengue's should be prepared. At the end of 5 years (2013) a total of 19 countries should be implementing their national IMS-dengue.

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