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PLAN OF ACTION ON ENTOMOLOGY AND VECTOR CONTROL 2018-2023

Introduction

1. The objective of the Plan of Action on Entomology and Vector Control 2018-2023 is to strengthen regional and national capacity for the prevention and control of key vectors and reduce the transmission of vector-borne diseases (VBDs). The plan of action is aligned with resolutions, strategies, reports, and disease-specific plans of action of the Pan American Health Organization (PAHO) and the World Health Organization (WHO), as well as with the PAHO Strategic Plan 2014-2019, Sustainable Health Agenda for the Americas 2018-2030, and the UN Sustainable Development Goals (1-3).

2. The Plan of Action is consistent with the structure and recommendations of the joint document on Global Vector Control Response 2017-2030, prepared by a steering committee consisting of WHO's Global Malaria Program, Department of Neglected Tropical Diseases, and Special Program for Research and Training in Tropical Diseases (4). The plan of action focuses on prevention, surveillance, and integrated vector control for arboviruses (e.g., chikungunya, dengue, yellow fever, and Zika), malaria, and selected neglected infectious diseases (Chagas disease, leishmaniasis, lymphatic filariasis, onchocerciasis, schistosomiasis, and others) through integrated and innovative strategies, using efficacious, sustainable, low-cost, evidence-informed interventions and best practices for vector control.

Background

3. Infectious diseases have a significant impact on public health in the Americas and the rest of the world. WHO notes that VBDs such as dengue, yellow fever, and other mosquito-borne viruses, malaria, schistosomiasis, leishmaniasis, Chagas disease, and plague account for more than 17% of all infectious diseases worldwide, causing more than 700,000 deaths annually (4). Since 2010, major outbreaks of the dengue, chikungunya, yellow fever, and Zika viruses and local outbreaks of malaria, leishmaniasis, Chagas

disease, leptospirosis, and plague have afflicted populations, claimed lives, and stressed health systems in the Region.

4. In 2008, PAHO adopted Resolution CD48.R8 on Integrated Vector Management (IVM) (5), which provided a comprehensive proposal to respond to VBDs. The resolution was aimed at strengthening country capacity in vector prevention and control based on the latest scientific evidence, cost-effective interventions, and sound environmental management. Additional response efforts included the establishment in March 2016 of the PAHO Technical Advisory Group (TAG) on Public Health Entomology and Vector Control, which formulates the PAHO recommendations to address scientific, technical, and operational needs for strengthening public health entomology and integrated vector control for the prevention and control of VBDs in the Americas, including the monitoring and management of insecticide resistance.

5. This plan of action consists of proven innovative strategies focused on the application of IVM, enhanced monitoring and evaluation of insecticide resistance and its management, and training and capacity-building to improve entomological practice. The plan of action is aligned with the WHO Global Strategic Framework for Integrated Vector Management and its global strategies for dengue control (2012-2020) and malaria control and elimination (2016-2030) (6-8), as well as the UN Sustainable Development Goals, the latter of which specifically targets malaria and neglected tropical diseases (including vector-borne diseases) for action by 2030. The plan of action is also aligned with PAHO's Integrated Management Strategy for Dengue Prevention and Control in the Region of the Americas (9), Plan of Action for the Elimination of Neglected Infectious Diseases and Post-elimination Actions 2016-2022, and Plan of Action for Malaria Elimination 2016-2020, which promote vector prevention and control (10, 11). The plan of action also reflects the conclusions and recommendations of the first and second meetings of the PAHO TAG on Public Health Entomology and Vector Control and the vector control components of the PAHO Strategy for Arboviral Disease Prevention and Control (12-14).

Situation Analysis

6. VBDs are infectious diseases spread by intermediate organisms, such as blood-sucking insects, ticks, mites, snails, and rodents, that transmit viruses, parasites, and bacteria to humans. These diseases are responsible for a high burden of illness and death, impacting individuals, their families, and their communities especially in countries and/or geographic regions with documented social, economic, and ecologic risk factors and population living in vulnerable conditions. They contribute to school absenteeism, worsening poverty, high health costs, and overburdened health systems, while reducing overall economic productivity. Malaria and Zika virus congenital and neurological syndromes are serious risks, especially for women of reproductive age, pregnant women, and the fetus/newborn; thus, protecting vulnerable women from mosquito bites must be an important part of vector control efforts.

7. Eliminating malaria transmission is a current goal in the Americas. PAHO estimates that 145 million people in 21 countries in the Americas are living in at-risk areas for malaria, with *Anopheles darlingi* being the primary vector in the Region (11). Argentina and Paraguay are in the process of obtaining certification of elimination, and Belize, Costa Rica, Ecuador, El Salvador, Mexico, and Suriname are close to eliminating the disease. Coordinated bilateral and international efforts are under way to end transmission of both malaria and lymphatic filariasis (LF) in the Dominican Republic and Haiti. Nevertheless, the expansion of gold mining unaccompanied by environmental management, vector control measures, or malaria prophylaxis and treatment have led to local malaria epidemics in the Guyana Shield, some Central America countries, and Venezuela (11). In 2017, an estimated 680,000 cases of malaria in the Americas were reported to PAHO.

8. In the past 30 years, dengue in the Americas has been characterized by recurrent cycles of epidemics every 3 to 5 years (15) and since 2000, dengue cases have been on the rise. In 2017, a total of 483,208 cases of dengue and 253 deaths in the Americas were reported to PAHO. There is evidence of the recent spread of dengue transmission to new geographic areas, such as parts of the southern United States, while the *Aedes aegypti* vector has been found at higher altitudes in some Andean cities and towns. *Aedes albopictus* is another potential dengue vector that is now widespread in the Region.

9. The chikungunya and Zika virus respectively appeared in the Region in 2013-2014 and 2015-2016. PAHO reported that in 2017, there were more than 180,000 chikungunya cases and that the cumulative number of suspected and confirmed Zika cases in the period 2015 to January 4, 2018 was 583,451 and 223,477 respectively, with 20 confirmed deaths and 3,720 confirmed cases of Zika Congenital Syndrome (ZCS) (16). Zika and chikungunya infections have been associated with cases of Guillain-Barré syndrome (17). As noted earlier, Zika infection is also a serious risk to pregnant women and their fetuses, highlighting the need for coordination between maternal and child health services and vector control programs.

10. Yellow fever (YF) is a reemerging mosquito-borne disease with epidemic potential. The foundations for its prevention and control are YF vaccination in populations at risk and rapid case detection and treatment. However, the sylvatic outbreaks of YF in Brazil since 2017 underscore the need to strengthen surveillance of zoonotic YF in non-human primates, monitor the virus in the *Haemagogus* and *Sabethes* mosquito species involved in its sylvatic transmission cycle, and suppress *Aedes aegypti* populations in cities at risk through effective vector control methods. Together, these measures can prevent urban transmission.

11. Vector-borne transmission of the parasite that causes Chagas disease remains the primary mechanism for spread of the infection. Close to 6 million people in the Americas, particularly families living in unprotected substandard housing and some indigenous communities, are still chronically affected by this disease. Congenital transmission also remains a big problem. Food and beverages contaminated by Chagas disease vectors

continue to cause local outbreaks of acute disease. Another increasing parasitic VBD, leishmaniasis, transmitted by *Lutzomyia spp*, is a major health problem in the Americas, with around 60,000 cutaneous and mucocutaneous cases, and 4,000 visceral cases of the disease reported annually (18). Leishmaniasis cases are more prevalent in vulnerable rural and peri-urban communities (18). Unplanned urbanization and the encroachment of agricultural, lumber, and migrant workers or settlers into forested habitats have been associated with local outbreaks of Chagas disease and leishmaniasis.

12. In the past 30 years, the elimination of three other parasitic VBDs—onchocerciasis, lymphatic filariasis, and schistosomiasis—has advanced in the Region through preventive chemotherapy with antiparasitic medicines and the occasional use of vector control techniques (19). Onchocerciasis is transmitted today only in the indigenous Yanomami area along the Brazil-Venezuela border, while lymphatic filariasis is nearly eliminated in Brazil and limited to a few foci in the Dominican Republic, Guyana, and Haiti. Similarly, active schistosomiasis transmission is limited to a few foci in Brazil, Suriname, and Venezuela.

13. Since the 1980s, public health entomology and VBD control have received low political priority, little visibility, and insufficient funding, with little investment in human resources. This situation has compromised the Region’s ability to respond rapidly and efficiently to the recent chikungunya and Zika epidemics (20). Populations living in conditions of vulnerability, especially those living in peri-urban settlements, rural areas, and many indigenous and Afro-descendant communities, remain underserved in terms of vector prevention and control services and access to any health services. 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 and climate change (15, 21, 22). The inability of many health agencies and the responsible government authorities to recognize and monitor the extent of the VBD problem—especially in populations living in vulnerable conditions, the causes behind it, and the need for IVM practices, interprogrammatic and intersectoral action, policies, and investments to tackle it—continue to be major challenges in the Americas.

14. The lack of regional and local capacity in public health entomology and the limited tools available further complicate vector control efforts. To address this, enhanced programmatic capacity, including the development of a regional pool of trained entomologists and technicians, improved infrastructure, and better policies and funding, are a component of this plan of action, along with the strengthening of adapted IVM practices.

Proposal

15. For the period 2018-2023, it is important that the countries of the Americas pledge to support this plan of action to reduce the burden and threat of VBD through effective, locally adapted, and sustainable vector control and best practices, including IVM.

With technical support from the Pan American Sanitary Bureau, the countries will implement the following five strategic lines of action.

- I. **Multilevel Integration Dimension.** Strengthen interprogrammatic (e.g., environment, infectious diseases, entomology), intrasectoral (e.g., social security, public health), and intersectoral (e.g., sanitation, health, tourism) action and collaboration in vector prevention and control.
- II. **Government and Community.** Engage and mobilize regional and local governments and communities, including local health services, for sustainable commitments to entomology and vector prevention and control.
- III. **Vector Control Programs and Systems.** Enhance entomological surveillance and vector control monitoring and evaluation, including insecticide resistance monitoring and management.
- IV. **Tools and Interventions.** Test, document, and integrate proven and/or novel tools and approaches (e.g. direct vector control tools, water and sanitation, housing improvements, and urban planning) and scale them up when possible and/or needed.
- V. **Workforce and Training.** Create and expand opportunities for entomologists, entomology technicians, and public health workers to receive regular training, continuing education, and career development.

16. The plan of action's activities to support the strategic lines of action are adopted and adapted principally from the goals, milestones, and targets of the Global Vector Control Response 2017-2030 (Table 1 of reference [4]) and are aligned with the key PAHO and WHO plans of action and reports discussed above.

Plan of Action 2018-2023

17. The purposes of the plan of action are: *a)* to accelerate regional progress toward enhanced prevention and control and, in some cases, the elimination of selected VBDs; *b)* to standardize IVM, tailor it to the Region's needs, and expand it to include the use of new technologies, when feasible; *c)* to improve insecticide resistance monitoring and management; and *d)* to strengthen human resource capacity in public health entomology through more and greater opportunities for entomology education and training.

18. The plan of action and its five strategic lines of action have a corresponding set of eight objectives (and 11 indicators).

19. For each indicator, the specific countries to be included in the baseline, milestone, and target will be listed in a technical note (prepared separately, and available upon request).

20. Building upon the strategic documents previously mentioned, regional consultations, and country experience with technical cooperation in entomology and IVM, the Region has thus outlined the strategic lines of action as key components of the Plan of Action on Entomology and Vector Control 2018-2023.

Strategic Lines of Action

Strategic line of action 1. Multilevel Integration Dimension – Strengthen interprogrammatic, intrasectoral, and intersectoral action and collaboration in vector prevention and control.

21. Countries and territories are encouraged to establish a functional and sustainable interministerial task force for multisectoral engagement in vector control (including vector control during emergencies/outbreaks) that should meet yearly. The task forces should engage the multiple sectors (health, social security, environment, water and sanitation and other infrastructure, agriculture and forestry, transportation, tourism, finance, etc.) needed to discuss, decide, and recommend the implementation of a successful and sustainable vector control work plan, ideally based on IVM. The task force is expected to develop a national vector control work plan. In the case that there already is a work plan, it will be reviewed and updated annually. For integrated decision-making, the ministry of health vector control program should use data and information from national water, sanitation, and housing programs and other sources. This will allow for proper allocation of available resources from the various sectors involved in the support of vector control activities.

Objective	Indicator	Baseline (2017)	Target (2020)	Target (2023)
1.1 Inter-ministerial task force for multisectoral engagement in vector control established and functioning	1.1.1 Number of countries and territories that have established a task force for multisectoral engagement in vector control (including vector control during emergencies/outbreaks) that has convened in the past 12 months and developed a national vector control work plan	3	10	20
1.2 Vector control programs using data and information from multiple sources for integrated decision-making	1.2.1 Number of countries and territories with vector control programs using data and information (e.g., temperature, rainfall, climate, environment, potable water, sanitation and waste management, infrastructure and housing) from various sources for integrated decision-making within the vector control programs	3	10	20

Strategic line of action 2. Government and Community – Engage and mobilize regional and local governments and communities, including local health services, for sustainable commitments to entomology and vector prevention and control.

22. People’s exposure to vectors and the diseases they transmit occurs at the local level and is often related to age group, gender, ethnicity, occupation, and inequalities, among others. In combatting both urban and rural VBDs, each local community is usually dependent upon resources and timely protective action by regional or municipal authorities, not solely action at the national level. With the recognition that national-level agencies cannot sustain successful vector control interventions and environmental management by themselves, national health and vector control authorities now consider it critical to plan for direct engagement and partnering with regional and local authorities, local health agencies or offices, and local community organizations. Thus, this line of action encourages national health authorities to develop plans or agreements for effective community engagement and mobilization in vector control at the national, regional, and local level that include a communications component and budget for implementation. Community organization should pay attention to social dynamics for the involvement of all affected populations, in particular women, ethnic communities, and volunteers.

Objective	Indicator	Baseline (2017)	Target (2020)	Target (2023)
2.1 Engage and mobilize regional and local government and communities, including local health services, to increase sustainable commitments to and action in vector control	2.1.1 Number of countries and territories in which national or territorial health authorities have developed plans or agreements for effective community participation, engagement, and mobilization at the national, regional, and local level (including local health services) with sustainable commitments in vector control	3	10	15

Strategic line of action 3. Vector Control Programs and Systems – Enhance entomological surveillance and vector control monitoring and evaluation, including insecticide resistance monitoring and management.

23. The recent establishment and rapid spread of chikungunya and Zika viruses highlight the inadequacy of the Region’s health surveillance systems to recognize and address new epidemic diseases. Moreover, the heavy health and economic burdens created by these diseases and other VBDs have led countries and territories to recognize the need to strengthen and integrate information systems to guide vector control activities. As part of the efforts to strengthen health information, the plan of action calls for each country and territory to conduct a national vector control needs assessment and to establish and maintain a national entomology database. PAHO/WHO guidelines are available both for

assessing entomological surveillance capacity, including integration of entomological surveillance systems with health information systems, and for monitoring and managing resistance to insecticides used in public health.

Objective	Indicator	Baseline (2017)	Target (2020)	Target (2023)
3.1 Entomological surveillance systems established or strengthened and integrated with health information to guide vector control programs and activities	3.1.1 Number of countries and territories that have established or strengthened their entomological surveillance system and database in accordance with PAHO/WHO guidelines and/or recommendations.	2	15	22
	3.1.2 Number of countries and territories that have established or strengthened a system for the monitoring and management of vector resistance to insecticides used in public health, in accordance with PAHO/WHO guidelines and/or recommendations	3	10	22
3.2 Vector control needs assessment conducted and/or updated	3.2.1 Number of countries and territories that have completed or updated their existing vector control needs assessment (workforce, entomology, and vector control capacity and structure) through a consultative process within the past 24 months, in accordance with PAHO/WHO guidelines and/or recommendations	5	15	35

Strategic line of action 4. Tools and Interventions – Test, document, and integrate proven and/or novel tools and approaches, and scale them up when possible or needed.

24. Particularly in the face of VBD epidemics and the spread of some endemic VBDs in the Region, countries and territories have recognized the critical importance of using proven vector control tools in more efficient and sustainable ways. Furthermore, the countries and territories of the Region have seen the need to try novel tools and approaches to prevent, control, and eliminate VBD transmission and geographic spread. Use of the proven tools available today needs to be scaled up, when feasible (in geographic areas covered, frequency or type of use, and/or number of vector species targeted), and integrated to tackle multiple VBDs at once, where epidemiologically viable. Novel tools, new insecticides or growth regulators (among other measures), and personal protective devices should be carefully evaluated in pilot studies, using standard methodologies and in

accordance with PAHO/WHO guidelines. These should be independently evaluated prior to their inclusion in the arsenal of prevention and control tools for IVM.

25. The efficiency and sustainability of vector control programs can be increased through the selective integration of certain vector control activities, as encouraged through this strategic line of action (23). Furthermore, for prevention and better control of urban VBDs, such as those transmitted by *Aedes aegypti* and *Culex quinquefasciatus* (which transmits LF), it is important for ministries of health to engage with urban planning authorities to reduce the habitats necessary for vector survival and to reduce human-vector contact through such actions as improved urban housing and drainage, a protected drinking water supply, and functional sanitation systems (including sewerage and solid waste management).

Objective	Indicator	Baseline (2017)	Target (2020)	Target (2023)
4.1. Ministries of health have tested and documented selected novel vector control tools, as recommended by PAHO/WHO, in operations or pilot studies	4.1.1 Number of ministries of health that have tested and documented vector control tools or measures to improve control of priority VBD	1	10	15
	4.1.2 Number of novel tools for vector control scaled up using standard methodologies, and independent evaluation initiated in selected countries and territories	3	5	8
4.2 Countries and territories have scaled up and/or integrated water and sanitation improvements, housing improvements, and/or urban planning in vector control operations	4.2.1 Number of countries and territories that have national or territorial plans or programs for water and sanitation improvement, housing improvement, and/or urban planning that include entomological risk as a factor for prioritizing actions and conducting assessments and studies	1	4	8

Strategic line of action 5. Workforce and Training – Create and expand opportunities for entomologists, entomology technicians, and public health workers to receive regular training, continuing education, and career development.

26. The lack of regional and local capacity in public health entomology is revealed by the shortage of trained public health entomologists and vector biologists in most of the Region. This is reflected by the lack of sufficient knowledge about safe and successful

vector prevention and control interventions and programs. Many countries need to build an adequate national public health entomology workforce and retain its members in the ministry of health to meet identified entomology and vector control needs. This strategic line of action aligns the plan with the priority lines of the PAHO Strategy on Human Resources for Access to Health and Universal Health Coverage (24). In order to meet the targets set here, national and/or regional institutions or networks must establish and support training (including in IVM) and education for both public health entomologists and vector control operations personnel at all levels, but prioritizing local levels of government through career-long training and educational opportunities (degree/diploma/certificate).

Objective	Indicator	Baseline (2017)	Target (2020)	Target (2023)
5.1 National public health entomology workforce strengthened and maintained to meet identified needs; and national and/or regional institutions or networks to support training and education in entomology and vector control established and functioning	5.1.1 Number of countries and territories with staff from national health authorities and/or their supporting institutions trained in entomology, vector control, and IVM, in alignment with the national vector control needs assessment	9	20	35
	5.1.2 Number of countries and territories that have used a national or regional institution or network to conduct a training or education program (degree/diploma/certificate) that included entomology, vector control, and IVM in the past 24 months	3	12	35

Monitoring and Evaluation

27. Monitoring and evaluation of this plan of action will be based on the measurement of indicators, accompanied by a technical note (available separately, upon request) explaining how each indicator will be measured.

28. The plan of action will contribute to both Outcome (OCM) 1.3 (“Increased country capacity to develop and implement comprehensive plans, programs, or strategies for the surveillance, prevention, control, and/or elimination of malaria and other vector-borne diseases”) and OCM 1.4 (“Increased country capacity to develop and implement comprehensive plans, programs, or strategies for the surveillance, prevention, control, and/or elimination of neglected, tropical, and zoonotic diseases”) of the PAHO Strategic Plan 2014-2019.

29. This plan of action will also contribute to:
- a) the achievement of impact goals 6 (Reduce mortality due to communicable diseases) and 8 (Eliminate priority communicable diseases in the Region) as defined in the PAHO Strategic Plan 2014-2019; and
 - b) the achievement of goal 10 (Reduce the burden of communicable diseases and eliminate neglected diseases); specifically, target 10.10 (Control the transmission of dengue, chikungunya, Zika, and yellow fever with an integrated and intersectoral approach) of the Sustainable Health Agenda for the Americas 2018-2030 (2).
30. Information for the indicators of the five strategic lines of action will require the Member States' commitment to providing that information. A mid-term report will be prepared for the PAHO Governing Bodies in 2021 and a final report, in 2024.

Financial Implications

31. The total estimated cost calculated for the Pan American Sanitary Bureau to implement the plan of action throughout its lifecycle from 2018 to 2023, including expenses for staff and activities, is US\$ 6,305,000.¹ The financing of country initiatives shall be covered by the Member States themselves. See Annex B for more detailed information regarding the financial implications of the plan of action.

Action by the Executive Committee

32. The Executive Committee is invited to review the plan of action and information provided in this document, offer any recommendations it deems pertinent, and consider recommending that the 56th Directing Council adopt the proposed resolution (presented in Annex A).

Annexes

References

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¹ Unless otherwise indicated, all monetary figures in this document are expressed in United States dollars.

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PROPOSED RESOLUTION

PLAN OF ACTION ON ENTOMOLOGY AND VECTOR CONTROL 2018-2023

THE 162nd SESSION OF THE EXECUTIVE COMMITTEE,

Having examined the *Plan of Action on Entomology and Vector Control 2018-2023* (Document CE162/17),

RESOLVES:

To recommend that the 56th Directing Council adopt a resolution in the following terms:

PLAN OF ACTION ON ENTOMOLOGY AND VECTOR CONTROL 2018-2023

THE 56th DIRECTING COUNCIL,

(PP1) Having reviewed the *Plan of Action on Entomology and Vector Control 2018-2023* (Document CD56/___), which proposes to accelerate regional prevention, control, and elimination of selected vector-borne diseases; expand integrated vector management; improve insecticide resistance surveillance and management; support opportunities in public health entomology education and training; and contribute to the achievement of the proposed targets for 2019 of the PAHO Strategic Plan 2014-2019 and the Sustainable Health Agenda for the Americas 2018-2030;

(PP2) Recognizing the Region's important achievements in the prevention, control, and elimination of vectors and vector-borne diseases, including mosquito-borne arboviruses and malaria; the elimination of onchocerciasis transmission in four countries;

local elimination of the principal vectors of Chagas disease in several countries; and the elimination or control of other selected vector-borne neglected infectious diseases or their vectors in various countries and territories since publication of the WHO Global Strategic Framework for Integrated Vector Management in 2004;

(PP3) Aware that despite these achievements, vector-borne diseases remain a serious threat to the health, well-being, and economy of peoples and nations in the Americas and, in some cases, have historically reemerged in areas where commitment and efforts against a disease have weakened; and furthermore, noting that accidental importation of new vectors to the Region has occurred in recent decades, as in the case of *Aedes albopictus*;

(PP4) Aware that efforts for the prevention, control, and/or elimination of selected vectors and vector-borne diseases will necessitate better coordination among all partners and stakeholders; review and updating of the education and training of vector control technicians and specialists, policies, and strategic frameworks; the use of new vector control tools and techniques; improved and sustained surveillance of vectors and vector-borne diseases at all levels of the health system; the sustained commitment of stakeholders; approaches tailored to local environmental and epidemiological conditions; and preparation to eliminate selected vectors and prevent the establishment of new vectors;

(PP5) Considering that the recent WHO document on Global Vector Control Response 2017-2030, which offers a global strategic approach, priority activities, and targets for strengthening country and local capacity to respond more effectively to the presence and threat of vectors and the diseases they transmit during the period up to 2030, has a bold vision of a world free of human suffering from vector-borne diseases and aims to reduce mortality from vector-borne diseases globally by at least 75% by 2030 relative to 2016, reduce case incidence from vector-borne diseases globally by at least 60% relative to 2016, and prevent epidemics of vector-borne disease in all countries by 2030;

(PP6) Recognizing that this Plan of Action is the platform for implementing the WHO Global Vector Control Response 2017-2030 and its strategic approach in the Region,

RESOLVES:

(OP)1. To approve the *Plan of Action on Entomology and Vector Control 2018-2023* (Document CD56/___).

(OP)2. To urge the Member States, considering their contexts, needs, vulnerabilities, and priorities, to:

- a) affirm the growing importance of entomology and vector control as a public health priority for the Member States of the Region;
- b) review and update national strategic and operational plans or establish new ones towards vector surveillance, prevention, control, and/or elimination, investing in

- appropriate human and capital resources and new tools and strategies; employ tailored approaches that address disease transmission by vectors in the context of the social determinants of health and existing health care systems; and provide for stepping up interprogrammatic collaboration and intersectoral action;
- c) heighten engagement in efforts to address vectors and vector-borne diseases, including coordination with other countries and relevant subregional initiatives in entomological and epidemiological surveillance, insecticide resistance surveillance and adequate measures to manage and prevent/reverse it, collaborative efforts in the monitoring and evaluation of new tools and technologies deployed in the Region, and dissemination of monitoring and evaluation results;
 - d) guarantee the availability of key vector control supplies, including WHO-recommended insecticides and other biocides and treated insecticidal nets, vector traps, and other control tools, through effective planning and forecasting of national needs, utilizing the PAHO Regional Strategic Fund for selected Public Health Supplies for joint procurement, as applicable;
 - e) strengthen entomological and appropriate epidemiological and public health services and align them with PAHO/WHO evidence-based guidelines and recommendations on vector surveillance, prevention, and control and insecticide resistance surveillance;
 - f) sustain the commitment of both endemic and non-endemic countries to combat targeted vector-borne diseases, including the sharing of vector surveillance information, where feasible; and strengthen appropriate sectors (e.g., agriculture, housing, infrastructure, environment) to help ministries of health combat vectors and the diseases they transmit, particularly in terms of collaborative planning and sustained or increased investments and provision of the necessary resources from those sectors;
 - g) establish integrated entomological, epidemiological, public health, and vector control strategies and develop capacities to surveil, prevent, and control the establishment or reestablishment of vectors and the diseases they transmit, with broad community participation so that the process helps to strengthen and sustain national health systems; surveillance, alert, and response systems; and disease control and elimination programs, with attention to factors related to gender, ethnicity, and social equity;
 - h) engage in regular dialogue on collaboration in vector control with subnational and municipal governments, local stakeholders and communities living in conditions that make them more vulnerable to the occurrence and transmission of vector-borne diseases; further intensify efforts to educate public health professionals and technicians about vector prevention and control and to educate and engage populations and occupational groups living in areas highly susceptible or vulnerable to vectors and the diseases they transmit;
 - i) support engagement in the testing, evaluation, and monitoring of new or expanded entomological and vector control tools and techniques in the context of an

organized operations research agenda that addresses important knowledge and operational, and technology gaps in vector surveillance and control in the various work contexts of the Region.

(OP)3. To request the Director to:

- a) support implementation of the *Plan of Action on Entomology and Vector Control 2018-2023* and provide technical cooperation, including capacity-building efforts in entomology and vector control needs for countries, to develop and implement national strategic or operational plans or establish new-ones towards vector surveillance, prevention, control, and/or elimination and insecticide resistance surveillance and management;
- b) coordinate regionwide efforts to eliminate selected vectors or the diseases they transmit and prevent the establishment of new vectors anywhere in the Region or the reestablishment of existing vectors in vector-free areas, in collaboration with countries, territories, and partners;
- c) advise on the implementation of national strategic vector control plans, insecticide resistance surveillance systems, and effective management plans;
- d) continue to advocate for the active allocation and mobilization of resources among countries, as well as globally, and encourage close collaboration to forge strategic partnerships that support the implementation of national, subregional, and regional efforts, including populations and occupational groups living in hard-to-reach locations and vulnerable conditions;
- e) employ entomologically and epidemiologically tailored approaches that address the social determinants of health that hinder vector control and elimination; improve interprogrammatic collaboration; and facilitate intersectoral action;
- f) report to the Governing Bodies on progress in the implementation of the Plan of Action and the achievement of its targets at mid-term (2021) and at the end of the implementation period (2024).

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

1. Agenda item: 4.7 - Plan of Action on Entomology and Vector Control 2018-2023

2. Linkage to [PAHO Program and Budget 2018-2019](#):

a) Categories:

1- Communicable diseases

b) Program areas and outcomes:

The plan of action will help to achieve Output Indicator 1.3.6 (Implementation of integrated vector management [IVM] with focus on improving or contributing to the achievement of global and regional targets for control, interruption, and elimination of vector-borne diseases) under:

- Outcome 1.3 (“Increased country capacity to develop and implement comprehensive plans, programs, or strategies for the surveillance, prevention, control, and/or elimination of malaria and other vector-borne diseases”), and
- Outcome 1.4 (“Increased country capacity to develop and implement comprehensive plans, programs, or strategies for the surveillance, prevention, control, and/or elimination of neglected, tropical, and zoonotic diseases”)

3. Financial implications:

a) Total estimated cost for implementation over the lifecycle of the resolution (including staff and activities):

Areas	Estimated cost (US\$)
Human resources	1,805,000
Training	1,125,000
Consultants/service contracts	1,235,000
Travel and meetings	987,500
Publications	162,500
Supplies and other expenses	990,000
Total	6,305,000

3. Financial implications: (cont.)

a) Total estimated cost for implementation over the lifecycle of the resolution (including staff and activities): (cont.)

The total estimated expenditure on staff and activities over the five-year duration of the regional Plan of Action on Entomology and Vector Control 2018-2023 is US\$ 6,305,000, of which \$1,805,000 is budgeted for staff and \$4,500,000 for activities. It is important to note that additional resources in the amount of \$3,783,000 will need to be mobilized for the biennium 2020-2021 to ensure full implementation of the Plan.

b) Estimated cost for the 2018-2019 biennium (including staff and activities):

The estimated cost for the 2018-2019 biennium is \$2,522,000, with an estimated \$722,000 budgeted for staff and \$ 1,800,000 for activities.

c) Of the estimated cost noted in b), what can be subsumed under existing programmed activities?

Funds have already been earmarked for activities in the biennium.

4. Administrative implications:

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

The work will be undertaken at the regional, subregional, central, intermediate, and local level within countries.

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

PAHO resources will be prioritized to maintain existing staff at Headquarters and at the subregional level.

Financing from the United States Agency for International Development (USAID) will help maintain additional staff until September 2018, including: one vector-borne disease advisor (P4); two subregional advisors for the Caribbean and Central America (P3); one specialist for vector-borne diseases and control (P2); one project manager (P1); and one administrative assistant I.

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

- Implementation: 2018-2023
- Midterm assessment: 2021
- Final evaluation to be presented to the Governing Bodies: 2024

ANALYTICAL FORM TO LINK AGENDA ITEM WITH ORGANIZATIONAL MANDATES

1. **Agenda item:** 4.7 - Plan of Action on Entomology and Vector Control 2018-2023
2. **Responsible unit:** Communicable Diseases and Environmental Determinants of Health/Neglected, Tropical, and Vector Borne Diseases (CDE/VT)
3. **Preparing officer:** Dr. Luis Gerardo Castellanos, Unit Chief, Neglected, Tropical and Vector Borne Diseases; and Dr. Haroldo Bezerra, Advisor Public Health Entomology
4. **Link between Agenda item and [Sustainable Health Agenda for the Americas 2018-2030](#):**

The Plan of Action for Entomology and Vector Control is closely aligned with the principles of the Sustainable Health Agenda for the Americas 2018-2030 and contributes to the achievement of the following goals:

 - Goal 2: Strengthen stewardship and governance of the national health authority, while promoting social participation
 - Goal 3: Strengthen the management and development of human resources for health (HRH) with skills that facilitate a comprehensive approach to health
 - Goal 6: Strengthen information systems for health to support the development of evidence-based policies and decision-making
 - Goal 7: Develop capacity for the generation, transfer, and use of evidence and knowledge in health, promoting research, innovation, and the use of technology
 - Goal 8: Strengthen national and regional capacities to prepare for, prevent, detect, monitor, and respond to disease outbreaks, and emergencies and disasters that affect the health of the population
 - Goal 10: Reduce the burden of communicable diseases and eliminate neglected diseases
5. **Link between Agenda item and the [Strategic Plan of the Pan American Health Organization 2014-2019 \(Amended\)](#):**

Entomology and Vector Control are an integral part of Category 1 (Communicable Diseases) and contribute to the achievement of impact goals 6 (Reduce mortality due to communicable diseases – 6.2, 6.4), 8 (Eliminate priority communicable diseases in the Region – 8.2, 8.3, 8.4), and 9 (Prevent death, illness, and disability arising from emergencies – 9.1) of PAHO's Strategic Plan. In addition, activities that address Entomology and Vector Control are linked to Categories 4, 5, and 6.

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

- National government agencies.
- Subregional initiatives: Andean Health Agency-Hipólito Unanue Agreement (ORAS-CONHU); Caribbean Public Health Agency (CARPHA); Council of Central American Health Ministers (COMISCA); Health Sector of Central America and the Dominican Republic (RESSCAD); Southern Common Market (MERCOSUR); Union of South American Nations (UNASUR); and Working Group on Health (SGT-11), among others.
- United Nations agencies: International Atomic Energy Agency (IAEA); United Nations Environment Program (UNEP); WHO Pesticide Evaluation Scheme (WHOPES); WHO Prequalification Team: Vector Control Products (PQT-VC); WHO Special Program for Research and Training in Tropical Diseases (TDR); WHO Vector Control Advisory Group (VCAG); and WHO Vector Ecology and Management and Global Malaria Program, among others.
- Multilateral and development partners: Global Affairs Canada; Mexican Agency for International Cooperation and Development (AMEXCID); and U.S. Agency for International Development, among others.
- Research and academic community: Center for Pest and Insecticide Research (CIPEIN - WHO Collaborating Centre for Insecticide Resistance and Insecticide Research on Chagas and Dengue Vectors); Earth Institute at Columbia University (WHO Collaborating Center for Early Warning Systems for Malaria and Other Climate-sensitive Diseases); Florida International University (FIU); Instituto Salud Global (ISGlobal); International Development Research Center (IDRC); International Research Institute for Climate & Society (IRI); National Institute of Public Health (INSP); Oswaldo Cruz Foundation (FIOCRUZ); U.S. Centers for Disease Control and Prevention (CDC); U.S. Navy Entomology Center of Excellence (NECE); and universities and national research institutes, among others.
- Nongovernmental organizations: Bill and Melinda Gates Foundation, CDC Foundation, Sabin Vaccine Institute, UN Foundation, country-based NGOs, other foundations, and the private sector, among others.

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

- Mosquito Awareness Week - The week has been observed since 2016, and its main objective is to strengthen existing initiatives and mobilize the public to take action to eliminate mosquito breeding sites in public and private areas (examples from Anguila, Argentina, Chile, Costa Rica, Jamaica, Nicaragua, Panama, and others).
- Malaria Champions of the Americas (examples from Brazil, the Dominican Republic, Guatemala, Honduras, and Paraguay).
- Integrated Management Strategy for Dengue Prevention and Control in the Americas (IMS-Dengue) – This strategy included six basic components for the prevention and control of the disease: integrated vector control, patient care, epidemiological surveillance, laboratory procedures, vaccines, and environmental management. IMS-Dengue was gradually implemented in each subregion in 35 countries or territories, 22 of which were evaluated.

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

- Of the 21 countries in which Chagas disease is endemic, 17 continued to maintain interruption of domiciliary transmission by vectors—insects of the *Triatominae* subfamily (reduviid bugs) carrying the *Trypanosoma cruzi* parasite—with a household infestation index of 1% or less in the country or its endemic areas (Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, El Salvador, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, and Uruguay).

8. Financial implications of this Agenda item:

Approximately US\$ 6,305,000, or an average of \$1,261,000 annually, needs to be invested in PAHO technical cooperation in entomology and vector control over the period 2018-2023. This level of investment is essential for the institution to respond effectively in its role of bridging gaps through technical cooperation and facilitating collaboration among countries and stakeholders.
