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PLAN OF ACTION FOR MALARIA ELIMINATION 2016-2020: FINAL REPORT

Background

1. This final report on the Plan of Action for Malaria Elimination 2016-2020 presents an analysis of the progress achieved by the Region of the Americas in the fight against malaria as mandated by Resolution CD55.R7, adopted in September 2016 (1). The Plan of Action for Malaria Elimination 2016-2020 (Document CD55/13) (2) provided the framework for Member States, the Pan American Sanitary Bureau (PASB), and other stakeholders to act and collaborate toward achieving the Region's malaria targets for the year 2020. It was strongly aligned with the Strategic Plan of the Pan American Health Organization 2014-2019 and 2020-2025 (3, 4); the Sustainable Health Agenda for the Americas 2018-2030 (5); the World Health Organization's Global Technical Strategy for Malaria 2016-2030 (6); the Roll Back Malaria Partnership's Action and Investment to Defeat Malaria 2016-2030 (7); and the United Nations 2030 Agenda for Sustainable Development (8).

2. The regional Plan of Action likewise contributes to the fulfillment of other important mandates from the Directing Council of PAHO, including, PAHO Disease Elimination Initiative: A Policy for an Integrated Sustainable Approach to Communicable Diseases in the Americas (Document CD57/7) (9); Strategy for Universal Access to Health and Universal Health Coverage (Document CD53/5, Rev. 2) (10); Plan of Action on Health in All Policies (Document CD53/10, Rev. 1) (11); and Policy on Research for Health (Document CD49/10) (12), among others.

Analysis of Progress Achieved

3. The principal reference for the preparation of the final report is the list of targets to which the Region committed for the period 2016-2020. These are: *a*) further reduction of malaria morbidity by 40% or more (based on 2015 official figures); *b*) further reduction of malaria-related deaths by 40% or more (based on 2015 official figures); *c*) implementation of efforts to eliminate malaria in 18 of the 21 (in 2015) endemic countries and attainment of malaria-free status in at least four countries; *d*) implementation of innovative approaches

to address challenges in countries where progress has been limited; and *e*) prevention of the reestablishment of malaria in countries that have been declared malaria-free.

4. Paralleling the global trend, progress on the achievement of regional targets for reductions in malaria burden has stalled since 2015. Between 2015 and 2019, malaria cases and deaths in the Region increased by 66% and 26% respectively. The increase in cases was driven primarily by the continuing epidemic in Venezuela, which in recent years has recorded the highest number of malaria cases in its history. Overall case increases of approximately 50% were also reported in Colombia, Dominican Republic, Ecuador, Guyana, Nicaragua, and Panama. On the other hand, during this period, additional countries in the Region effectively stopped local malaria transmission. Paraguay was certified as malaria-free in 2018, followed by Argentina in 2019. El Salvador completed three years without local transmission in 2019 and was certified as malaria-free in February 2021. This brought the number of malaria-endemic countries in the Region to 18, down from 21 in 2015. Belize also had no local transmission in 2019, putting it on track to be certified as malaria-free in 2022.

5. In 2019, the Region reported a total of approximately 723,000 confirmed cases of malaria and 197 deaths compared to 437,000 cases and 159 deaths respectively in 2015. Around 76% of infections are caused by *Plasmodium vivax* and 24% by *P. falciparum*. Between 2015 and 2019,¹ six of every 10 cases reported in the Americas occurred in men. During the same period, most cases were reported among those aged 15-19 and 20-24 years. For countries where information was available, 18% of cases in 2019 were in miners ($n = 102,000$), 15% were in indigenous populations ($n = 104,000$), and 8,580 were in pregnant women.

6. Preliminary information sourced from national epidemiological bulletins for 2020 suggests a 29% decline in malaria incidence regionally. That year saw declining incidence in all endemic countries except four (Haiti, Honduras, Nicaragua, and Panama). This general decrease could be partly due to a real decline in transmission in certain countries. At the same time, weakened patient demand for health care in general and especially for fever consultations in malaria-endemic areas during the COVID-19 pandemic may have led to a decline in reported cases in many areas, although its impact is not uniform.

7. During the five-year implementation of the Plan of Action, malaria-endemic countries made changes that helped reorient control programs toward malaria elimination in accordance with the World Health Organization (WHO) global elimination framework (13). In coordination with donors, partners, and stakeholders, the Pan American Sanitary Bureau (PASB) has promoted the Diagnosis-Treatment-Investigation and Response (DTI-R) strategy, which involves intensified action to improve the detection and timely treatment of cases. Other key elements of change are stratification based on receptivity and risk of importation, as well as an action aimed at identifying and eliminating the malaria foci in each country. Best practices in implementing the DTI-R approach have

¹ The information is being updated to 2019 with the data reported by the countries during 2020.

been demonstrated and documented in several countries, including through the Malaria Champions of the Americas (14).

8. By the end of 2020, most of the malaria-endemic countries had incorporated these elements into their national malaria plans. The Central American countries together with Colombia, Dominican Republic, and Mexico engaged in the Regional Malaria Elimination Initiative (RMEI),² which consolidated the efforts of new donors and partners with prior investments made by the countries themselves and by the Global Fund to Fight AIDS, Tuberculosis and Malaria. Since 2016, seven countries in the Region have become part of the WHO E-2020 initiative (15) and have received technical support to achieve their national elimination goals. By the end of 2020, four additional countries met the criteria established by WHO for countries with the potential to eliminate malaria by 2025. Moving forward, 10 countries and territories in the Region are considered to have the potential and feasibility for malaria elimination within the next five to ten years.

9. In Venezuela, which has seen a massive increase in cases since 2015, PASB has provided continuous support for the malaria response, resulting in prevention of drug shortages and improvements in prevention of mortality. These advances are expected to be sustained and consolidated with the approval of a Global Fund project for the period 2021-2023. Across the Region, countries are engaged in ongoing collaboration to reduce transmission in the highest-burden municipalities, with the help of regional and international partners (16). Data for the past three years indicate that 25 municipalities in the Region account for between 45% to 50% of all reported malaria cases in the Americas, while 25%-70% of all malaria cases at country level are usually concentrated within no more than three municipalities per country. By the end of 2019, some of these high-burden municipalities had already shown reduction in transmission.

Progress Achieved on the Indicators of the Plan of Action

Strategic Line of Action 1: Universal access to good-quality malaria prevention interventions, integrated vector management, and malaria diagnosis and treatment

10. Endemic countries increased the number of certified microscopists for malaria diagnosis over the period, while also incorporating improvements in quality assurance management systems for malaria diagnosis. The use of rapid tests increased as some countries put in place policies to allow community health workers to administer the tests. All endemic countries adopted the recommended PAHO/WHO treatment guidelines, and early access to treatment was prioritized in the DTI-R strategy. Since 2015, eight endemic countries have increased coverage with long-lasting insecticidal nets, and another six countries maintained their levels until 2020. Monitoring of insecticide resistance in malaria vectors was likewise strengthened.

² The RMEI, managed by the Inter-American Development Bank (IDB), is a subregional initiative that works toward an end to malaria in Central America, Colombia, Dominican Republic, and Mexico.

Objective 1.1: Reinforce country capacity in terms of access to and compliance with malaria prevention and case management interventions through effective supply chain management, information, education, and communication efforts, among others	
Indicator, baseline and target	Status
1.1.1 Number of Member States and territories implementing malaria prevention and case management efforts Baseline (2015): 33 Target (2020): 51 ³	<i>Partially achieved.</i> Thirty-four Member States are assessed to have achieved this indicator, including the 18 remaining endemic countries and territory, 3 that are recently certified as malaria-free and 13 that have ongoing efforts for prevention of malaria re-establishment.
Objective 1.2: Reinforce country capacity to address specific vector management problems, including monitoring of insecticide resistance	
Indicator, baseline and target	Status
1.2.1 Number of countries (both malaria-endemic and non-endemic) that are implementing integrated vector management based on PAHO/WHO guidelines (including insecticide resistance surveillance and vector behavior studies) Baseline (2015): 15 Target (2020): 18	<i>Exceeded.</i> Nineteen countries have reported that they implemented integrated vector management according to PAHO/WHO guidelines. All those countries are implementing systems for monitoring and managing resistance to insecticides used in public health and 8 of those countries have also reported having established or strengthened their databases and entomological surveillance systems.
Objective 1.3: Enhance institutional, network, and country readiness to perform and manage appropriate and adequate malaria diagnosis and treatment in various program contexts	
Indicator, baseline and target	Status
1.3.1 Number of malaria-endemic countries reporting malaria drug efficacy and drug resistance surveillance data to PAHO, as per PAHO/WHO guidelines Baseline (2015): 14 Target (2020): 17 ⁴	<i>Partially achieved.</i> Fifteen malaria-endemic countries are reporting malaria drug efficacy and/or drug resistance surveillance data to PAHO, as per PAHO/WHO guidelines.

³ In 37 of the 51 countries and territories, there is historical evidence that malaria transmission existed based on records available since 1949. Of the 37, eighteen remain with endemic malaria transmission by 2021, while 19 are currently non-endemic but must maintain efforts to prevent reintroduction given the continuing presence of malaria vectors. All other countries must ensure proper case management (this information also applies to the targets for indicators 1.3.2, 3.2.1, and 3.4.1).

⁴ The number of malaria-endemic countries decreased from 21 in 2015 to 18 as of 2021, given that three previously endemic countries were certified as malaria-free in 2018, 2019 and 2021.

Objective 1.3: Enhance institutional, network, and country readiness to perform and manage appropriate and adequate malaria diagnosis and treatment in various program contexts	
Indicator, baseline and target	Status
1.3.2 Number of countries implementing PAHO/WHO guidelines for quality malaria diagnosis and treatment Baseline (2015): 23 Target (2020): 51 ³	<i>Partially achieved.</i> Twenty-five countries are currently following PAHO/WHO guidelines for quality malaria diagnosis and treatment; 21 national reference laboratories in 20 countries are participating in the external quality assurance program (EQAP) for malaria diagnosis.

Strategic Line of Action 2: Reinforced malaria surveillance toward evidence-based decision making and response

11. At the end of 2020, several countries implemented the concept of surveillance as an intervention by promoting decision making at local level and centering the approach to malaria foci as the main element of their elimination plans. Individual case reporting is now the norm in all malaria-endemic countries, and local information analysis was strengthened with Excel-based dashboards, among other tools. Due to the COVID-19 pandemic, some countries could not report the annual malaria situation to WHO in 2020.

Objective 2.1: Further improve surveillance systems with early detection of cases and outbreaks and advocate collection of malaria data (by case, including information on age, sex, ethnicity, and other variables that facilitate appropriate analysis of disparities and inequalities between populations)	
Indicator, baseline and target	Status
2.1.1 Number of countries reporting malaria surveillance data annually to PAHO/WHO, by subnational level, sex, age, and other, by subnational level, sex, age, and other equity-related variables ⁵ Baseline (2015): 27 Target (2020): 51	<i>Partially achieved.</i> Thirty-five countries and territories are reporting malaria surveillance data annually to PAHO/WHO, by subnational level, sex, age, and other equity-related variables.

⁵ Place of residence, race/ethnicity/culture/language, occupation, religion, education, socioeconomic status, social capital, and other possible factors such as disease status or disability.

Objective 2.2: Strengthen and improve data-informed decision making through epidemiological information exchange at all levels: regional, between countries with common borders, and within the countries themselves	
Indicator, baseline and target	Status
<p>2.2.1 Number of malaria-endemic countries that are exhibiting strengthened data-informed decision making (based on the PAHO malaria data verification tool) and sharing epidemiological information</p> <p>Baseline (2015): 0 Target (2020): 21</p>	<p><i>Partially achieved.</i> Sixteen countries in the Region have used PAHO tools and shared epidemiological information and are exhibiting strengthened data-informed decision making.</p>

Strategic Line of Action 3: Strengthened health systems, strategic planning, monitoring and evaluation, operational research, and country-level capacity building

12. National malaria strategic plans have incorporated goals and strategies toward the elimination of malaria. Similarly, measures to maintain human resources and financing with the countries' own resources have been included, in most cases through integration of malaria interventions into the public health system. Financial and logistical gaps persist and are addressed through external financing, especially from the Global Fund and more recently from the Inter-American Development Bank (IDB). Donors such as the United States Agency for International Development (USAID), the Bill and Melinda Gates Foundation, and others also contribute to funding for technical cooperation. With the support of PASB, a regular supply of malaria drugs was maintained, mostly with the countries' own resources. The support of regional partners such as the United Nations Foundation allowed PASB to maintain an emergency stock that proactively addressed potential shortages, especially during the COVID-19 pandemic.

Objective 3.1: Improve recruitment, training, and retention of health personnel trained in malaria in country health systems and within PAHO/WHO to facilitate relevant technical cooperation at various levels of work (regional, inter-country, and intra-country) and program (particularly malaria elimination) contexts	
Indicator, baseline and target	Status
<p>3.1.1 Number of countries implementing plans for training health personnel on malaria</p> <p>Baseline (2015): 21 Target (2020): 33</p>	<p><i>Partially achieved.</i> Twenty-two countries have implemented plans or programmatic actions for training health personnel and community health workers on malaria</p>

Objective 3.2: Reinforce malaria policy development and strategic planning in collaboration with countries and stakeholders	
Indicator, baseline and target	Status
<p>3.2.1 Number of countries with national strategic plans (focusing on/including malaria) that align with WHO-recommended strategies and components of the PAHO Plan of Action for Malaria</p> <p>Baseline (2015): 31 Target (2020): 51³</p>	<p><i>Not achieved.</i> Twenty-one countries and territories have updated or are in the process of updating their respective national malaria plans. This include 18 that remain malaria-endemic and three countries that were newly certified as malaria-free, and are continuing to implement their plans for malaria elimination and prevention of reestablishment.</p>
Objective 3.3: Strengthen the capacity of national programs in the areas of management and logistics in collaboration with partners and stakeholders	
Indicator, baseline and target	Status
<p>3.3.1 Number of malaria-endemic countries with no stock-outs of key malaria supplies (including antimalarials) at the national level in a given year</p> <p>Baseline (2015): 19 Target (2020): 21</p>	<p><i>Partially achieved.</i> Twenty countries had no stock-outs of key malaria supplies in 2020, including the three recently certified malaria free countries.</p>
Objective 3.4: Develop financial strategies to sustain malaria prevention and elimination efforts at different levels in collaboration and synergy with partners and stakeholders	
Indicator, baseline and target	Status
<p>3.4.1 Number of countries with sustained domestic funding for malaria efforts</p> <p>Baseline (2015): 20 Target (2020): 51³</p>	<p><i>Partially achieved.</i> At least twenty-four countries have maintained domestic funding for malaria efforts, although financial gaps persist. Data was not available for most non-endemic countries.</p>
Objective 3.5: Reinforce operations research in program development and management	
Indicator, baseline and target	Status
<p>3.5.1 Number of countries conducting malaria operational research, including IVM topics</p> <p>Baseline (2015): 13 Target (2020): 21</p>	<p><i>Partially achieved.</i> Sixteen countries continue to engage in malaria operational research, including integrated vector management (IVM) topics.</p>

Strategic Line of Action 4: Strategic advocacy, communications, and partnerships and collaborations

13. During the Plan's implementation period, the Central American countries, in addition to Colombia, Dominican Republic, and Mexico, renewed their commitment to eliminate malaria as part of the Regional Malaria Elimination Initiative. The Municipalities for Zero Malaria Initiative (16) was also established to target municipalities with the

highest malaria burden in countries across the Region, supported by old and new partners who collaborate at various levels toward the elimination of malaria.

Objective 4.1: Support the development and strengthening of capacities through existing malaria networks, partnerships, and collaborations in the Region	
Indicator, baseline and target	Status
4.1.1 Number of countries participating in regional-level networks and collaborations Baseline (2015): 19 Target (2020): 42	<i>Partially achieved.</i> Twenty-one countries are currently participating in various networks and collaboration. Options are currently being explored for 10 non-endemic countries that have affirmed the importance of maintaining periodic contact among those that remain receptive and vulnerable to malaria, particularly in terms of preventing and managing outbreaks.
Objective 4.2: Optimize opportunities for coordination, synergy, and information sharing with other existing PAHO/WHO initiatives (e.g., integration of malaria efforts with maternal and child health in community and local health care programs, communications and social mobilization, health promotion and education interventions, programs on neglected diseases, and occupational health) and policies	
Indicator, baseline and target	Status
4.2.1 Number of countries engaged in inter-programmatic and/or synergistic actions advocated under PAHO/WHO initiatives and policies Baseline (2015): 18 Target (2020): 26	<i>Partially achieved.</i> Twenty-four countries are currently engaged in inter-programmatic and/or synergistic actions advocated under PAHO/WHO initiatives and policies. However, gaps and challenges continue to exist even among these countries.
Objective 4.3: Strengthen and support efforts to identify, document, and replicate best practices, including models of disease elimination and successful integration of cross-cutting issues	
Indicator, baseline and target	Status
4.3.1 Number of countries with identified best practices in their malaria activities Baseline (2015): 13 Target (2020): 15	<i>Achieved.</i> To date, 15 countries in the Region have generated, documented, and shared 38 best practices in malaria control and elimination.

Strategic Line of Action 5: Focused efforts and tailored approaches to facilitate malaria elimination and prevent reestablishment in malaria-free areas

14. Countries have made progress in reorienting their malaria programs from control to elimination, based on the WHO global framework for malaria elimination launched in 2017 (13). PASB has developed strategies and instruments and provided direct support to operationalize these changes in the countries. The DTI-R strategy (13), which was adopted by a majority of the countries, seeks to prioritize the timely detection and treatment of cases. The identification of malaria foci has made it possible to address vulnerable populations with measures specific to their realities. Countries at risk of malaria

reestablishment report the implementation of recommended surveillance actions. Three countries have been newly certified free of malaria since 2018, including El Salvador, which received certification in February 2021. Another country met the goal of eliminating transmission by 2020 but remains uncertified.

Objective 5.1: Resolve critical gaps in key target populations ⁶ in relation to the achievement of malaria elimination goals	
Indicator, baseline and target	Status
5.1.1 Number of countries implementing strategies to address malaria among populations in situations of vulnerability Baseline (2015): 10 Target (2020): 18	Achieved. All of the remaining 18 malaria-endemic countries are implementing approaches to improve malaria interventions at local level, seeking to address the populations in situations of vulnerability at the main malaria foci.
Objective 5.2: Address critical knowledge and technical gaps, including those pertaining to <i>P. vivax</i> and the preparation for end-game scenarios	
Indicator, baseline and target	Status
5.2.1 Number of countries implementing the 2015 WHO <i>P. vivax</i> recommendations (17) Baseline (2015): 0 Target (2020): 16	Partially achieved. Thirteen countries with endemic <i>P. vivax</i> transmission are currently implementing key <i>P. vivax</i> elimination recommendations, although operational and technical challenges continue.
Objective 5.3: Implement the process of malaria program reorientation toward malaria elimination and certification (as may be requested by Member States)	
Indicator, baseline and target	Status
5.3.1 Number of countries supported in terms of malaria program reorientation toward malaria elimination Baseline (2015): 10 Target (2020): 18	Achieved. All 18 countries where malaria remains endemic continue to receive direct technical support for malaria program reorientation.
Objective 5.4: Sustain key capacities in countries that have eliminated local malaria transmission	
Indicator, baseline and target	Status
5.4.1 Number of non-endemic countries supported in terms of maintaining key malaria capacities Baseline (2015): 9 Target (2020): 17	Partially achieved. Fifteen non-endemic countries and territories were supported in terms of maintaining key malaria capacities.

⁶ For example, pregnant women, children, persons living with HIV/AIDS, travelers, mobile populations, miners, loggers, banana and sugar cane plantation workers, indigenous groups, populations in areas of armed and/or social conflict, and people living in border areas or areas of common epidemiological interest.

Lessons Learned

15. While the elimination of malaria in several countries in the Region shows that this goal is achievable, the massive increase in cases within a few years due to the situation in Venezuela and the epidemic situations in other countries, highlights the epidemic potential of malaria and the fragility of achievements. Despite significant progress in implementing adjustments in interventions, epidemiological advances were achieved only in some countries. Certain geographic areas have experienced continuing increases in malaria cases and deaths, influenced primarily by underlying political and administrative problems in these countries.

16. Key lessons learned include:

- a) The importance of joint efforts between countries, donors, and external partners, as demonstrated by the rapid implementation of strategies and interventions in Central America through the RMEI initiative;
- b) The resilience of local teams and the potential for integrating malaria into routine health services, resulting in the maintenance of basic malaria interventions during the COVID-19 pandemic;
- c) The key role of high-quality implementation of basic interventions and operational improvements in reducing transmission, as exemplified in some countries;
- d) The feasibility of eliminating *P. falciparum* in the Region, as evidenced by the temporary or permanent interruption of its transmission at the national and subnational levels in several countries; and
- e) The central role of socioeconomic determinants, such as the increase in gold-mining activities, which heavily influence the dynamics of malaria transmission and the potential for elimination in the Region.

Actions Necessary to Improve the Situation

17. Countries are encouraged to orient their malaria activities toward a national and inter-programmatic effort aimed at elimination of the disease. They are further encouraged to continue active engagement in the process of updating and implementing the Region's Plan of Action for Malaria Elimination based on the evolving scientific and global context. Partners and stakeholders are likewise urged to engage with PAHO in boosting advocacy efforts to ensure that malaria remains high on the political and development agenda of affected countries, so that malaria programs receive appropriate support and can further decrease malaria toward elimination. Key provisions outlined in Resolution CD57.R7, PAHO Disease Elimination Initiative: A Policy for an Integrated Sustainable Approach to Communicable Diseases in the Americas (9), offer concrete guidance for actions by Member States and relevant stakeholders with respect to malaria.

Action by the Executive Committee

18. The Executive Committee is invited to take note of this report and to provide any comments it deems pertinent.

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