POLICY BRIEF

UNITED NATIONS FOUNDATION

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BEST PRACTICES FOR MALARIA ELIMINATION IN THE AMERICAS

>> SUMMARY

The experiences of malaria-free countries in the Americas demonstrate that malaria elimination is achievable and sustainable when strong political commitment is paired with targeted, context-appropriate action.

Best practices to accelerate and sustain malaria elimination include:

- Expand access to early diagnosis and treatment
- Strengthen surveillance for evidence-based decision making
- Foster multisectoral and cross-border collaboration
- Sustain political commitment and financing
- Leverage innovation to accelerate elimination

>> BACKGROUND

This policy brief outlines best practices to expand access to malaria diagnosis and treatment for all at-risk populations and advance targeted actions to achieve elimination and prevent the re-establishment of transmission. The paper draws on lessons from malaria elimination in the Americas to illustrate approaches countries have used to achieve and sustain elimination, informing efforts in settings with ongoing or low transmission.

The recommended practices are informed by case studies of recently certified malaria-free countries in the Americas (see Annex) and align with current guidance from the Pan American Health Organization (PAHO) *Plan of Action for Malaria Elimination in the Americas* (2026-2030) and World Health Organization (WHO) *Global Technical Strategy for Malaria 2016-2030 (updated in 2021)*.

These best practices, informed by PAHO and WHO guidance, have supported targeted efforts to address malaria transmission in hotspots and enabled programs to consolidate malaria-free territories despite heterogeneous malaria risk across populations.

A recurrent feature of successful malaria elimination efforts in the Americas has been a strong focus on local-level implementation, turning municipalities, districts, and communes into operational units, and tailoring interventions to strata and local contexts/ dynamics. It has required engaging different stakeholders at all levels of society, including authorities, multi-sectoral actors, and traditional leaders, empowering communities to play a leading role in the fight to end malaria. This approach has led to the consistent implementation of best practices to support elimination and prevent re-establishment, as explored in the sections that follow.

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>> MALARIA IN THE AMERICAS

Malaria is a life-threatening disease caused by parasites transmitted by mosquitoes, and although it can be prevented and treated, its symptoms and severity vary by parasite species. In the Americas, *Plasmodium. vivax* malaria is more prevalent than *P. falciparum*, accounting for over two-thirds of all reported cases[i].

Malaria transmission in the Americas varies across populations. Against this backdrop, indigenous peoples – many of whom live in remote, hard-to-reach areas with limited access to health services – are disproportionately affected by malaria; in 2023, they accounted for 31% of all malaria cases and 41% of all malaria-related deaths in the region[ii].

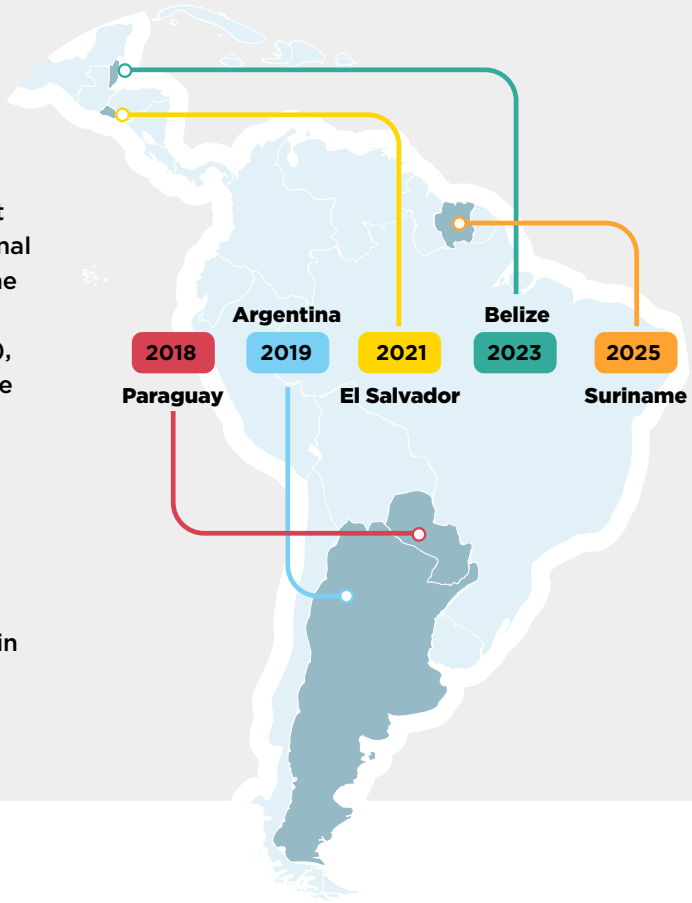
The Americas have not faced challenges reported in other regions, such as widespread artemisinin-based combination therapy (ACT) resistance or the establishment of invasive mosquito vectors such as *Anopheles stephensi*. However, malaria cases in the region have increased in recent years. In 2024, there were 537,000 malaria cases and 136 deaths reported in the region[iii]. Over 80% of these cases occurred in four countries: Colombia (26.8%), Brazil (24.4%), Venezuela (16.7%), and Haiti (13.8%)[iv]. This represents a 6% increase compared to 2023[v]. This trend indicates that progress toward malaria elimination has stalled in recent years, after significant advances between 2000 and 2014, when reported malaria cases declined by 67%, from 1,181,095 to 389,390[vi].

The upward trend in malaria cases in 2023 and 2024 has been attributed to a combination of interrelated factors, including high population mobility within and between countries, largely driven by economic activity, limited access to health care in remote areas, and disruptions to the commodity supply chain, which affected malaria response efforts in remote regions[vii].

Funding for malaria control and elimination also decreased in 2024, reaching USD 210.4 million, down from USD 233.3 million in 2015, with domestic contributions falling from 87.5% to 69.4%[viii].

Despite these challenges, 20 countries in the region have been certified malaria-free by the WHO, a designation granted when a country shows no local malaria transmission for at least three consecutive years and has a fully functional surveillance and response system to prevent the re-establishment of local transmission[ix]. In the last decade, Paraguay (2018), Argentina (2019), El Salvador (2021), Belize (2023), and Suriname (2025) were certified as malaria-free.

In countries where both *P. falciparum* and *P. vivax* were present, *P. falciparum* elimination was typically achieved first. As elimination progressed, most countries in the Americas shifted from stand-alone vertical malaria programs to integrating malaria activities within routine health services and integrated vector control programs.



>> BEST PRACTICES FOR MALARIA ELIMINATION

Countries that have successfully achieved and sustained zero local malaria transmission have implemented a range of coordinated actions, supported by strong government commitment and community engagement. These countries have consistently invested in malaria diagnosis, treatment, surveillance, and vector control, while strengthening the role of frontline health workers in rural and hard-to-reach communities to advance health for all.

Across malaria-free countries, these outcomes were underpinned by deliberate national planning and coordination. Ministries of Health (MOHs) have developed national malaria elimination plans that guide implementation efforts through the elimination and post-elimination phases, effectively coordinating actions along the way.

Within this enabling framework, countries have applied a consistent set of best practices to advance elimination and prevent the re-establishment of transmission. These include expanding access to early diagnosis and treatment through community-based and primary health care platforms; strengthening surveillance to support evidence-based decision-making; fostering multisectoral and cross-border collaboration to address population mobility and shared risks; sustaining political commitment and financing as the malaria burden declines; and leveraging innovation to accelerate elimination.

The sections below explore how these best practices have been applied in different country contexts across the Americas.

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EXPAND ACCESS TO EARLY DIAGNOSIS AND TREATMENT

For effective malaria prevention and treatment, accurate diagnosis of the most common malaria parasites, *P. vivax* and *P. falciparum*, is crucial, as differences in severity have direct implications for clinical management and transmission control.

Delays in malaria diagnosis and treatment of infected individuals not only increase the risk of severe disease and death but also contribute to ongoing transmission. Malaria-free countries have expanded access to prompt detection, diagnosis, and treatment for the entire population at risk of malaria, overcoming barriers by engaging local communities and networks.

In recent decades, countries that achieved malaria elimination shifted from controlling the disease through health centers in urban areas and focusing on populations with better access to health care services to intensifying efforts in remote areas where malaria still occurred, whether due to local transmission or importation.

For populations living in remote, hard-to-reach areas, such as Indigenous people, loggers, miners, and migrant workers, primary health care (PHC) and community health platforms serve as the main point of entry to health care, including malaria services. Integrating malaria detection, diagnosis, and treatment within PHC and community health platforms enables at-risk populations to benefit from key interventions and helps control and eliminate transmission in hotspots.

Malaria programs have trained and deployed mobile brigades, community health workers (CHWs) and other volunteer collaborators (ColVols) to raise awareness of malaria symptoms, encourage health-seeking behaviors, and promote uptake of prevention interventions. CHWs and ColVols are trusted community members, valued for their cultural knowledge and understanding of local dynamics, which can stimulate demand for care among at-risk populations.

Mobile brigades visit remote areas on a routine basis with malaria prevention campaigns, while CHWs and ColVols identify everyday fevers, conduct microscopy and rapid diagnostic tests (RDTs), administer anti-malarial treatment to positive cases, facilitate near-real-time reporting, refer severe cases to health facilities, and support routine monitoring of the supply chain.

These frontline health workers report the majority of malaria cases during the pre-elimination and

elimination phases and play a crucial role in expanding local capacity for detection, diagnosis, and treatment. In some cases, CHWs and ColVols have also been leveraged to perform malaria case contact tracing to prevent the re-establishment of transmission.

As malaria cases decline, there is a risk of losing valuable malaria knowledge and resources. With the integration of malaria services into PHC and community health platforms, not only do local populations feel empowered to take ownership of the malaria response, but malaria expertise and budgets can be protected and supported by domestic funding[x].

ARGENTINA

Argentina was certified malaria-free by the WHO in 2019. Political commitment was key to eliminating malaria, with the country investing in strengthening the roles of health workers in rural and hard-to-reach communities as well as microscopy capacity and vector control.

In 1966, the MOH established CHWs in rural and hard-to-reach communities who were trained to detect febrile patients, collect and analyze blood samples, and refer suspected malaria cases to health centers and vector control brigades. CHWs provided free malaria services, ensuring that diagnosis and treatment reached populations with limited access to health facilities.

During the elimination phase, CHWs were integrated into the PHC system. CHWs supported active case detection of malaria among populations considered to be at high risk, such as seasonal workers, migrants, and Indigenous communities. This community-level strategy helped fill data gaps in passive case detection and supported the timely interruption of disease transmission.

ZERO MALARIA | ARGENTINA

STRENGTHEN SURVEILLANCE FOR EVIDENCE-BASED DECISION-MAKING

Strong surveillance systems generate valuable information that enables health programs to make informed decisions to shape policies and interventions. Systematic qualitative and quantitative data collection, analysis, interpretation, and dissemination allow understanding of malaria transmission dynamics and trends, as well as the evaluation of the reach and effectiveness of prevention, control, and elimination interventions. Likewise, commodity supply data informs stock levels, guides forecasting, and helps prevent supply shortages.

Across malaria-free countries, surveillance data have guided risk stratification and tailoring of malaria interventions to local contexts. High-risk areas and hotspots, such as border communities or seasonal workers camps, have been prioritized for resource allocation to fund prevention and control interventions, including the deployment of frontline health workers and vector control to maximize impact.

During the elimination phase, these national malaria programs have intensified surveillance by strengthening laboratory networks, building local technical capacity, and leveraging digital tools and information systems, including mobile SMS, to collect real-time data and inform rapid-response efforts at the local, regional, and national levels. RDTs have also played a key role in this process, as trained CHWs and ColVols have used them to detect cases and support reactive case detection, including identifying, screening, and treating asymptomatic malaria infections among household members and neighbors of reported cases, and following up on every malaria case until local transmission was interrupted.

In the Americas, malaria surveillance is part of the national disease surveillance systems. A single report of a malaria case prompts an immediate response. Malaria programs conduct prompt investigation, detection, and treatment of all nearby cases, implement vector control, and raise awareness of malaria symptoms warranting health care-seeking, the importance of sleeping under a mosquito bed net, and the elimination of mosquito breeding sites.

The analysis of monitoring and surveillance data also helps evaluate the effectiveness of interventions and tailor strategies to better respond to local transmission risks. Malaria-free countries adapted their strategies to target specific groups at increased risk of infection that were not reached through routine services. For instance, they complemented facility-based surveillance with community-based passive, reactive, and active case-detection strategies to interrupt malaria transmission in border communities and mobile populations.

In the post-elimination phase, integrated malaria surveillance remains active nationwide, with particular attention to seasonal workers, migrants, and border communities near neighboring malaria-endemic countries. Every imported case triggers an immediate response and investigation to prevent the re-establishment of transmission. Frontline CHWs and ColVols continue to be engaged to promptly detect imported cases at testing and treatment sites at border points of entry, along migration routes, and at seasonal workers' camps, thereby preventing the reintroduction of the disease. Once a case is detected, investigation and response interventions are implemented and sustained for up to 6 months to prevent malaria transmission.

PARAGUAY

Paraguay was certified by the WHO in 2018. Paraguay's experience demonstrates that malaria elimination is achievable and durable when robust surveillance systems and meaningful community engagement are embedded within the broader health system.

In 1957, the MOH established a centralized malaria program and steadily strengthened frontline health worker capacity, access to free diagnosis and treatment, and surveillance. In 2012, the program adopted a testing, treating, and tracking approach, ensuring suspected cases were promptly detected, investigated, and responded to, with interventions tailored to local transmission risk.

Approximately 5,000 ColVols were trained to support active case detection, rapid follow-up of diagnosed cases, and health education in endemic and border communities, extending free health services to all, including migrants. After elimination was achieved, the MOH continued investing in diagnosis and treatment, data-driven surveillance, workforce training, and community engagement.

ZERO MALARIA | PARAGUAY

Photo: Estefania Bravo / UN Foundation

FOSTER MULTISECTORAL AND CROSS-BORDER COLLABORATION

Malaria is a community-wide challenge that requires coordinated, multi-sectoral action. The economic cost of malaria is substantial, with missed work and school days[xi, xii], as well as reduced tourism income[xiii], which in turn affects productivity, educational outcomes, and the growth of new industries. Strong country leadership and governance at all levels are essential for crafting effective policies and ensuring seamless coordination among malaria programs, health services, and non-health sectors. Without such integration, elimination efforts cannot reach their full potential.

Malaria-free countries have strategically involved public, private, and non-governmental organizations (NGOs) outside the health sector to reach populations at risk of malaria and eliminate the disease. Depending on the context, malaria programs have formed partnerships with stakeholders across education, tourism, agriculture, logging, and mining sectors, as well as with leaders of religious and indigenous groups. Malaria programs have engaged local stakeholders to set shared goals and priorities and to choose practical activities for collaboration. This approach encourages ownership and accountability, based on each sector's capabilities, resources, and assets, and it mobilizes action against malaria while reducing economic pressures on local communities.

In some countries, Malaria Elimination Committees, Councils, or Task Forces, made up of representatives from various sectors and affected communities, have been set up to bring together technical partners, donors, development agencies, academia, and NGOs to discuss and solve challenges, assess progress and setbacks, and offer technical advice to malaria programs for strategic decisions. In other countries, malaria programs have coordinated environmental cleaning campaigns with local representatives from the environment, agriculture, and education sectors to manage mosquito habitats and reduce disease transmission.

Collaboration between neighboring countries has become essential in the fight against malaria. Mosquitoes do not recognize borders. Furthermore, environmental and social challenges—such as natural disasters, conflict, and economic hardships—drive population movements that worsen malaria transmission across the region. Mobile populations can reintroduce malaria parasites into areas free of malaria, potentially leading to the re-establishment of transmission.

Binational agreements and subregional initiatives have promoted the exchange of surveillance data, advanced rapid diagnosis, treatment, and case investigation, and coordinated vector control deployment across border areas and among mobile populations. For instance, malaria-free countries have set up surveillance points at border crossings, including land checkpoints, airports, and ports, at sentinel sites near workplaces with seasonal and migrant workers, and within high-risk communities. These surveillance systems help monitor imported malaria cases, identify potential hotspots, and trigger reactive interventions to prevent the re-establishment of malaria.

BELIZE

Belize was certified malaria-free by the WHO in 2023. The MOH promoted cross-border collaboration among key industry stakeholders to facilitate the early detection of imported cases and coordinate targeted interventions in border communities and on farms in high-risk areas.

The MOH established collaboration agreements with Guatemala and Honduras to deploy and equip ColVols with RDTs near the borders to detect and treat cases and with Mexico to coordinate vector control interventions across border communities. In addition, in partnership with banana companies, it established sentinel sites on farms in high-risk areas and trained company personnel to test seasonal workers upon arrival, expanding the surveillance network.

Following certification, Belize has focused on preventing the re-establishment of local transmission by reinforcing surveillance in border areas, farms, and points of entry with high population movement from neighboring malaria-endemic countries.

ZERO MALARIA | BELIZE

SUSTAIN POLITICAL COMMITMENT AND FINANCING

Malaria-free countries demonstrate that strong leadership and political commitment, reflected in sustained domestic financing, are needed to sustain progress, reach elimination, and prevent re-establishment of transmission. Country leaders supported malaria elimination by prioritizing it on the political agenda, emphasizing that these efforts benefit the health system as a whole and boost local economies. These efforts have enabled sustained funding and resources for technical management positions and for integrated diagnosis, case management, surveillance, and vector control.

As countries approach elimination, domestic funding becomes more prominent, reflecting strong government commitment. In malaria-free countries, malaria financing is integrated within broader health system financing and supports the delivery of essential, integrated PHC services toward universal health coverage. Malaria resources have been integrated with those of other vector-borne diseases, enabling countries to protect most of the technical expertise and operational functions of malaria programs, even as malaria incidence declines. This approach unlocks efficiencies and augments spending on cross-cutting priorities such as maternal and child health and infectious disease elimination.

Some countries have leveraged innovative financing models that blend domestic and external financing to increase resources for malaria control and elimination. In Central America and the Caribbean, malaria-free countries El Salvador and Belize had participated, prior to malaria-free certification, in the Elimination of Malaria in Mesoamerica and the Island of Hispaniola (EMMIE; USD 10 million, 2014-2017) and the Regional Malaria Elimination Initiative (RMEI; USD 102 million, 2018-2022).

These initiatives implemented result-based financing models that combined domestic and external funds, including Inter-American Development Bank (IADB) loans and Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) grants, providing catalytic resources for malaria elimination efforts. Other countries, such as Suriname, have received financial contributions for malaria control from the formal mining sector and IADB, or benefited from Global Fund malaria grants, such as Paraguay.

EL SALVADOR

El Salvador was certified malaria-free by the WHO in 2021, becoming the first country in Central America to achieve this milestone. The MOH steadily invested in malaria control and leveraged catalytic and blended financing to boost key interventions and accelerate elimination.

Global Fund, EMMIE, and RMEI have supported case management and outbreak response, integrated vector management, and strengthened the surveillance system for epidemiological monitoring of malaria trends. In 2019, the Government of Germany forgave El Salvador USD 11.3 million in debt for the 2019-2021 period, to be used to upgrade the National Reference Laboratory under the "Debt2health" modality.

Today, El Salvador invests 6.8% of its GDP in the health sector, including health workforce training to maintain the capacity of vector control and laboratory staff, ColVols, and health care providers at large, as well as surveillance and diagnostic quality assurance.

ZERO MALARIA | EL SALVADOR

Photo: PAHO/WHO

LEVERAGE INNOVATION TO ACCELERATE ELIMINATION

While vector control is considered a key intervention against malaria globally, coverage of mosquito bed nets and indoor residual spraying (IRS) in the Americas remains low, reflecting cost and operational constraints associated with distributing mosquito bed nets and applying IRS. Malaria programs consider cost-effectiveness, community acceptance, and available technologies when designing vector control intervention strategies to optimize the use of limited resources. New tools, such as spatial emanators, could fill protection gaps in indoor environments, as they are easy to transport and use, require no daily maintenance once installed, and offer protection throughout the day and night.

Malaria elimination efforts benefited from innovative approaches and technologies that have been shown to reduce disease burden, halt transmission, and address the malaria parasite's human reservoir.

For instance, some malaria-free countries have strengthened their surveillance systems by leveraging technological upgrades and satellite internet connections to achieve near-real-time reporting of individual, geolocated cases within 24 hours of detection, enabling reactive strategies.

Likewise, recent strategies to eliminate *P. vivax* malaria emphasize that evidence-based innovations are essential for successful elimination and the post-elimination phase. These elements include improvements in radical cure, G6PD testing, targeted mass drug administration (tMDA), new service delivery models for mobile populations, and adherence support. Treating *P. vivax* is challenging. The full treatment course lasts 7 to 14 days, which can hinder compliance. Furthermore, the dormant liver stage of the disease, hypnozoites, cannot be detected by routine diagnostic tests. When hypnozoites reactivate, they cause relapses weeks or months later, requiring radical cure treatments to eliminate these dormant forms.

In specific situations, countries could consider innovative malaria interventions, such as targeted mass drug administration (tMDA) of antimalarial treatment to the whole population in a specific area at risk (with the exception of pregnant women and infants when primaquine is used), and health services delivery models that extend beyond traditional facility-based care, particularly those designed to reach highly mobile populations in remote, socially and geographically challenging areas.

SURINAME

Suriname became the first Amazonian country to be certified malaria-free by the WHO in 2025. The MOH has leveraged innovation to implement targeted strategies to control outbreaks and stop transmission among mobile populations living or working in highly remote areas.

In remote Indigenous communities, the MOH enhanced access to diagnostic and treatment, improved surveillance, and deployed tMDA to control sporadic outbreaks. To reach gold miners traveling to areas without access to malaria services, the MOH piloted a self-diagnosis-and-treatment kit. The malaria program trained gold miners in self-diagnosis using an RDT and self-treatment if the result was positive; if the test was negative, miners were instructed to take acetaminophen for headache and fever. The study pilot demonstrated increased treatment adherence, no serious adverse events, and a decline in malaria incidence in mining regions. In 2021, the MOH adopted this intervention to accelerate malaria elimination.

Currently, the MOH is testing radical cure treatment with G6PD screening for P. vivax among gold miners potentially exposed to this parasite, with no prior adverse drug reactions. This project aims to address challenges in treatment adherence by introducing tafenoquine, a new single-dose drug that significantly shortens the treatment course compared with the recommended 14-day primaquine regimen.

ZERO MALARIA | SURINAME

>> CONCLUSION

The experiences of malaria-free countries in the Americas demonstrate that malaria elimination is achievable and sustainable when strong political commitment is paired with targeted, context-appropriate action. There is no single pathway to elimination. Countries differ in malaria epidemiology, geography and climate, health system capacity, population mobility, and social and economic context. As a result, approaches to elimination must be adapted, timed, and coordinated to reflect national and subnational realities rather than applied uniformly.

As countries transition from control to elimination and into the post-elimination phase, the challenge shifts from scaling interventions to sustaining vigilance. Maintaining surveillance capacity, operational readiness, and political attention becomes increasingly important. Moreover, regional collaboration becomes critical to address cross-border transmission, particularly among mobile and displaced populations, to prevent the re-establishment of the disease.

Regular regional and subregional engagement among countries creates opportunities to share best practices, align strategies, and identify financing opportunities for cross-border and regional initiatives. Several regional initiatives illustrate these efforts. The Disease Elimination Initiative[xiv], led by PAHO, aims to accelerate progress toward eliminating more than 30 diseases by promoting integrated, evidence-based, and cost-effective action. The Malaria Champions of the Americas Initiative recognizes and amplifies the leadership driving malaria elimination across the region[xv]. Planned regional and national procurement of malaria commodities through the PAHO Strategic Fund further promotes sustainability by ensuring timely access to medicines and supplies[xvi].

Together, these national, regional, and cross-regional efforts provide a practical foundation for sustaining malaria elimination and advancing toward a malaria-free future.

Photo: Estefania Bravo / UN Foundation

>> ANNEX

CASE STUDY: ARGENTINA

Malaria transmission in Argentina was historically concentrated in the northern provinces bordering Bolivia, Paraguay, and Brazil, especially among seasonal workers, migrants, and Indigenous populations. Large outbreaks occurred in the mid-20th century, with widespread transmission across agricultural regions in the northwest and northeast. In the late 1940s, under the WHO's Global Malaria Eradication Program, Argentina implemented vector control measures, including IRS, which significantly reduced malaria cases and marked an early turning point in the country's malaria history, with the last locally transmitted case of *P. falciparum* reported in 1948.

Despite these advances, malaria continued to spread in border areas. Political commitment was key to eliminating malaria, with the country investing in strengthening the roles of health workers in rural and hard-to-reach communities as well as microscopy capacity and vector control. Over time, transmission became more localized, allowing the country to shift from broad control efforts to targeted elimination strategies focused on active case detection, rapid response, and cross-border cooperation in high-risk areas. Argentina reported its last local case of *P. vivax* in 2010 and was certified malaria-free by the WHO in 2019[xvii].

1. Expand access to early malaria diagnosis and treatment

In 1966, the MOH trained "Agentes Sanitarios" in rural and hard-to-reach communities to detect febrile patients, collect and analyze blood samples, and refer suspected malaria cases to health centers and vector control brigades. These CHWs provided free malaria services in the communities where people lived and worked, ensuring that diagnosis and treatment reached populations with limited access to health facilities.

During the elimination phase, CHWs were integrated into the PHC system. CHWs support active case detection of malaria among populations considered to be at high risk, such as seasonal workers, migrants, and Indigenous communities. This community-level strategy enabled the filling of data gaps in passive case detection and supported the timely interruption of disease transmission.

2. Strengthen surveillance systems for evidence-based decision-making

Since 2002, all information on malaria diagnosis and epidemiological research at the local, provincial, and national levels has been incorporated into the National Health Surveillance System (SNVS). The SNVS enables real-time monitoring, systematic data analysis, and effective communication between healthcare providers and management authorities[xviii].

Special focus is placed on the northern provinces, which face ongoing importation risks; in these areas, health teams and CHWs actively follow up on suspected cases, raise awareness, and coordinate with border health officials. The SNVS collaborates closely with clinical and laboratory surveillance teams, national control programs, and reference laboratories to ensure that all healthcare providers report malaria cases within 24 hours of detection.

3. Foster multisectoral and cross-border collaboration

A defining feature of Argentina's approach was early and continuous cross-border collaboration, particularly with Bolivia. Beginning in the late 1990s, the two countries coordinated malaria surveillance, case management, and vector control in border communities, where seasonal migration had sustained transmission. Through this collaboration, malaria prevalence along the border declined substantially, accelerating progress toward elimination and reducing transmission on both sides of the border.

Between 2000 and 2011, when malaria cases in Argentina fell from 440 to 0, the country collaborated closely with the Bolivian government to spray more than 22,000 homes with insecticides and collect more than 25,000 blood samples in border areas to test for malaria parasites[xix].

4. Sustain political commitment and financing

In 2010, MOH's Strategic Plan for the Elimination of Local Malaria Transmission (2011-2015) established strategic lines of action for epidemiological surveillance, early detection and appropriate treatment, entomological control, laboratory testing, social communication, and community participation. As a result of these actions, the country achieved and sustained zero malaria.

The MOH fully integrated its malaria program into the national health care system, thereby integrating malaria surveillance within febrile illness surveillance, enabling rapid identification and testing of suspected malaria cases. Between 2017 and 2018, Argentina developed the Action Plan for the Prevention of Malaria Reintroduction and the Malaria Re-establishment Prevention Plan, which focused on ensuring epidemiological surveillance, timely and appropriate diagnosis and treatment, and vector surveillance and control to address imported cases and prevent the re-establishment of transmission.

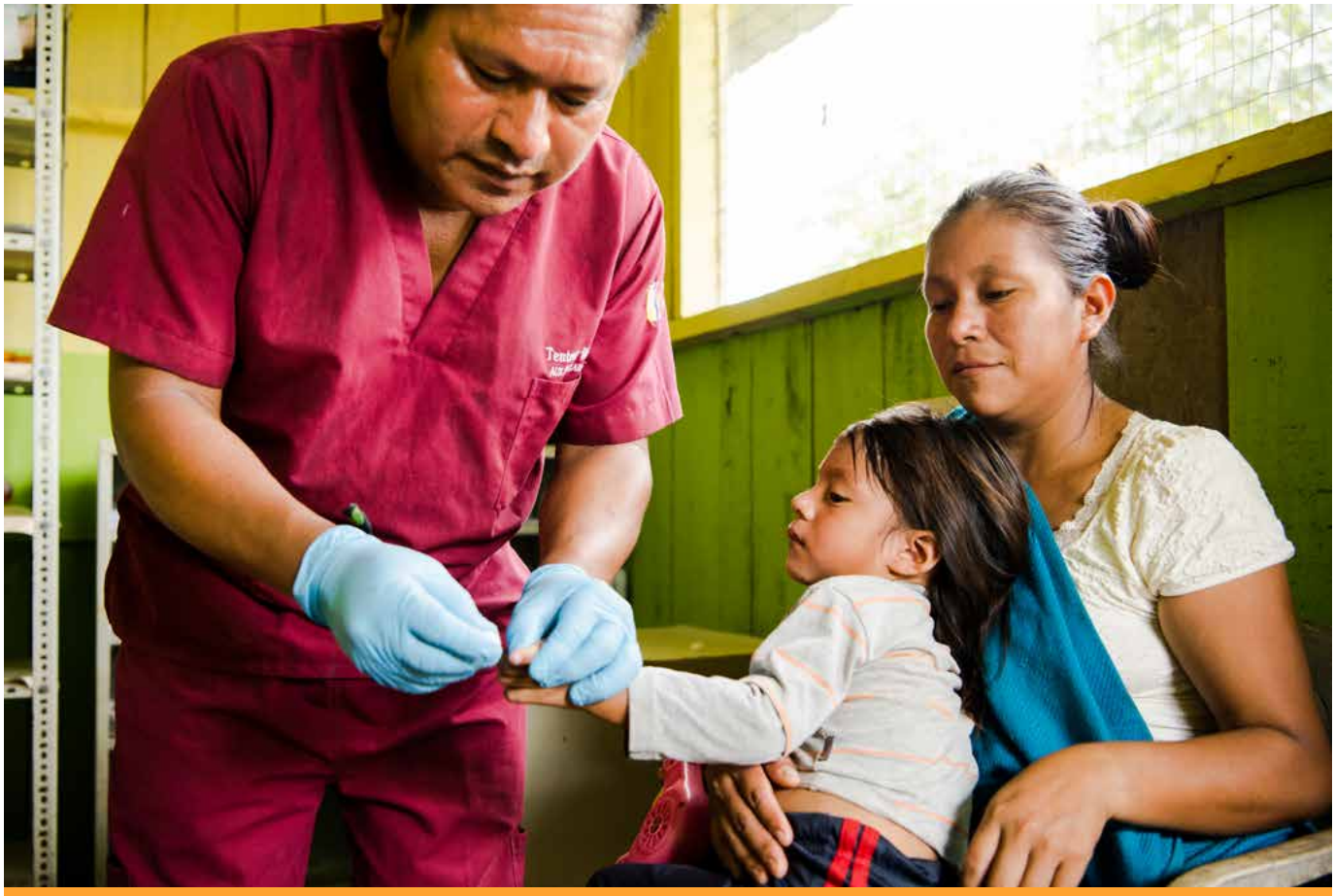

Photo: Estefania Bravo / UN Foundation

CASE STUDY: PARAGUAY

Malaria was widespread in Paraguay throughout much of the 20th century, with tens of thousands of cases reported in the 1940s and recurring outbreaks through the 1990s. Transmission was concentrated in rural and border regions, particularly among Indigenous communities, seasonal workers, and migrants. While economic growth and broader health system improvements contributed to a decline in transmission over time, malaria remained a public health threat into the early 2000s, requiring targeted interventions.

Sustained national commitment proved decisive. Paraguay invested early in a centralized malaria program, the National Malaria Eradication Service (SENEPA), and steadily strengthened surveillance, free diagnosis and treatment, and frontline health worker capacity at the local level. Following a major outbreak from 1999 to 2000, intensified control measures led to a rapid and sustained decline in cases, setting the stage for elimination. The last locally transmitted *P. falciparum* case was reported in 1995, and the last case of *P. vivax* in 2011[xx], marking a critical epidemiological milestone.

By the time Paraguay was certified malaria-free by the WHO in 2018, malaria incidence had fallen from thousands of cases annually in the early 2000s to zero local transmission. Paraguay's experience demonstrates that malaria elimination is achievable and sustainable when strong political commitment, robust surveillance systems, and meaningful community engagement are embedded within the broader health system, even in contexts where the risk of importation remains.

1. Expand access to early malaria diagnosis and treatment

The MOH provides health services to over 80% of the population, including free malaria diagnosis and treatment. To extend the reach of public health services, Paraguay trained ColVols to support active malaria case detection, rapid follow-up of positive cases, and health education, particularly in Indigenous communities and border areas. These ColVols, trusted members of the community, played a central role in sustaining progress over decades.

The National Health Policy (2015-2030) was designed to strengthen PHC and expand universal coverage. In 2016, the MOH launched a three-year initiative to build the skills of front-line health workers to achieve this goal.

2. Strengthen surveillance systems for evidence-based decision-making

SENEPA was established in 1957 and, in 1977, expanded to include other vector-borne diseases, including Chagas disease, dengue, yellow fever, leishmaniasis, and schistosomiasis. SENEPA conducted active case detection in endemic regions, border areas, and among migrant workers using thick blood smears and microscopy, and entomological surveillance around positive cases to assess mosquito presence and apply IRS.

As Paraguay approached elimination, SENEPA launched a strategic plan for malaria elimination that decentralized malaria prevention, control, and surveillance interventions. In 2012, SENEPA adopted a "Testing, Treating, and Tracking" approach[xxi], ensuring suspected cases were promptly detected, investigated, and responded to, with interventions tailored to local transmission risk. Central to this approach was rapid reporting and investigation of suspected cases within 24 hours, supported by timely treatment, awareness-raising campaigns, and targeted vector control in affected communities. Following elimination, refresher training and surveillance activities continue in high-risk areas to prevent the reintroduction of the malaria parasite.

3. Foster multisectoral and cross-border collaboration

Paraguay has established bilateral agreements with Argentina, Brazil, and Bolivia that guarantee access to free malaria services for populations living in border areas to control and eliminate malaria transmission[xxii]. Between 2012 and 2023, Paraguay reported 72 imported malaria cases, with 82% originating in African countries and 17% from the Americas, primarily Brazil[xxiii]; all cases were rapidly detected and controlled, preventing local transmission.

Since certification, efforts have focused on preventing re-establishment of transmission. Cross-border surveillance remains active nationwide, with particular attention to travelers, migrants, and border communities with links to malaria-endemic countries. Every imported case triggers immediate diagnosis, treatment, investigation, and response to prevent onward transmission.

4. Sustain political commitment and financing

Over several decades, strong domestic funding has played a key role in supporting malaria elimination efforts. From 2000 to 2014, the MOH provided most of the financial resources for malaria control and elimination, peaking at nearly USD 5.6 million in 2014. Between 2015 and 2019, with support from a Global Fund grant (USD 2,782,936), the country strengthened frontline health workers' skills and deployed 5,000 ColVols to conduct epidemiological surveillance nationwide[xxiv], consolidating elimination efforts and preventing the reintroduction of malaria.

Paraguay continues to invest in malaria education among front-line health workers, free malaria diagnosis and treatment regardless of nationality, and integrated vector control and surveillance to prevent the reintroduction of the malaria parasite.

Photo: Estefania Bravo / UN Foundation

CASE STUDY: BELIZE

Malaria control and elimination efforts in Belize have unfolded since the 1950s, with transmission linked to frequent population movement across neighboring countries and natural disasters. In the 1950s, the MOH established the National Malaria Eradication Service (NMES), which conducted IRS annually until achieving an 80% reduction in the malaria burden by 1957[xxv]. In subsequent decades, NMES increased efforts to detect and treat malaria cases nationwide, establishing a network of ColVols[xxvi] and a CHW program in 1982 to deliver basic health services to rural populations, including free malaria diagnosis and treatment. Despite these efforts, the country continued to report thousands of cases from the late 1980s until mid-1990s[xxvii, xxviii].

In the 2000s, the MOH decentralized the health system and adopted an integrated, multi-sectoral strategy, transforming the NMES into a Vector Control Program (VCP) within the Environmental Health Unit, with support from the Ministries of Agriculture, Natural Resources, and Education[xxix]. The MOH adopted electronic reporting, enabling real-time surveillance and the tailoring of malaria interventions for elimination. By the mid-2000s, *P. falciparum* transmission had declined steadily, and subsequent transmission was limited to *P. vivax*[xxx].

From 2011 to 2018, malaria cases continued to decline, achieving a 90% reduction. The last indigenous malaria case was reported in 2018, and Belize was certified malaria-free by the WHO in 2023[xxxi]. Following certification, Belize has focused on preventing the re-establishment of local transmission by reinforcing surveillance in border areas, farms, and points of entry with high population movement from neighboring malaria-endemic countries.

1. Expand access to early malaria diagnosis and treatment

Belize's health care system is based on an integrated PHC model that addresses the population's health priorities. In 1982, the MOH established a CHW program to deliver basic health services to rural populations, including free malaria diagnosis and treatment. CHWs and ColVols were trained to detect fevers and to obtain blood smears for malaria testing at national reference laboratories[xxxii, xxxiii].

In 2001, the MOH decentralized primary and secondary care services to 6 regional hospitals and 37 PHC centers, each with a corresponding catchment area[xxxiv]. Mobile clinics and approximately 300 CHWs and ColVols supported health education, environmental cleanup to remove mosquito breeding sites, and bed net distribution campaigns in all localities[xxxv, xxxvi]. With technical guidance and support from vector control personnel, this frontline network reached high-risk populations, including seasonal workers and migrants[xxxvii]. By 2021, CHWs had been trained to use RDTs and were equipped with phones to report malaria cases in real time. CHWs and ColVols continue to support malaria prevention interventions, prioritizing pregnant women, children under five years of age, and mobile populations.

2. Strengthen surveillance systems for evidence-based decision-making

In the 1990s, the country was stratified by malaria-transmission risk, which enabled improved epidemiological surveillance and targeted collaboration with health services in key areas[xxxviii]. Since the late 2000s, the Belize Health Information System (BHIS) has been operational across all health facilities, including private sector facilities, and has provided every citizen with an electronic health record for patient management[xxxix]. BHIS collects real-time data on communicable diseases, including malaria, as well as on laboratory and supply chain management[xl]. This allows the surveillance system to detect outbreaks quickly and trigger the malaria response.

Vector control personnel conduct surveillance activities at the health facility and high-risk communities, in collaboration with CHWs and ColVols[xli]. A single case of malaria triggers an investigation within 24 hours, including screening all household members and co-workers, regardless of symptoms, and, until 2018-2019, prophylactic treatment. Vector control personnel continue to track fevers weekly until four weeks have elapsed without a new case. Entomological surveillance, IRS, and bed net distribution complement the malaria response.

3. Foster multisectoral and cross-border collaboration

Population movement into Belize is driven by socio-political instability in neighboring countries and by Belize's economic prospects, primarily from El Salvador, Guatemala, Honduras, and Mexico[xlii]. Sectors such as agriculture, construction, and tourism attract seasonal workers, with agriculture serving as the primary employer of semi-skilled labor[xliii]. Collaboration across borders and among key industry stakeholders, such as the banana farmers association, has been crucial for the early detection of imported cases and for coordinating responses in border communities and on farms. This approach helps contain transmission, improves the quality of life for workers and surrounding communities, and boosts productivity.

Belize established collaboration agreements with Guatemala and Honduras to deploy and equip ColVols with RDTs near the borders to detect and treat cases[xliv, xlv] and with Mexico to coordinate vector control interventions across border communities. The VCP, in partnership with banana companies, established sentinel sites on farms in high-risk areas and trained company personnel to test seasonal workers upon arrival, expanding the surveillance network[xlvi]. Likewise, health inspectors test travelers and migrants with fevers at airports and major land border crossings using RDTs.

4. Sustain political commitment and financing

While Belize has worked to control malaria transmission through many decades, its inclusion in the EMMIE project[xlvii] and the RMEI[xlviii] served as catalysts for the elimination agenda. These regional initiatives strengthened political commitment at the highest level, enabled the development of the National Strategic Plan for Malaria Elimination and the Prevention of Transmission Re-establishment (2018-2022), and provided additional funding for cross-border surveillance activities.

In 2021, the MOH budget accounted for 14.3% of the total government budget and 3.1% of GDP, and included domestic funds for malaria surveillance, case management, and vector control[xlix]. The 2023-2027 strategic plan for the prevention of transmission re-establishment continues to prioritize domestic investments in surveillance in border areas and farms, community-level case management, and vector control, demonstrating significant attention to importation risk.

Photo: Rafael Jantz / UN Foundation

CASE STUDY: EL SALVADOR

In El Salvador, malaria transmission was historically widespread, particularly in rural areas, with periodic resurgences linked to seasonal workers, migrants, and natural disasters. Early and sustained investment in surveillance, case management, and vector control laid the foundation for malaria elimination.

In the 1950s, the National Malaria Program (NMP) drained swamps, conducted IRS, and applied larvicide to mosquito breeding sites in high-risk areas, resulting in a rapid decline in malaria cases. Although malaria resurged in the 1960s and 1970s due to agricultural expansion, population movement, and insecticide resistance, the MOH responded by establishing a nationwide network of trained ColVols, who played a central role in delivering prompt malaria diagnosis and treatment to remote communities and by strengthening surveillance to enable rapid, local-level responses[i].

The last case of *P. falciparum* malaria was reported in 1995. By 2000, El Salvador had reduced malaria cases by 98.9%. In the 2010s, elimination efforts focused on intensified surveillance and cross-border coordination, particularly with Guatemala, where seasonal workers continued to pose a risk. By 2017, local *P. vivax* malaria transmission had been interrupted nationwide. El Salvador was certified malaria-free by the WHO in 2021, becoming the first country in Central America to achieve this milestone.

1. Expand access to early malaria diagnosis and treatment

In 1955, El Salvador launched its first antimalarial national campaign, followed in 1956 by the *Defense Against Malaria* law published by the MOH, which included the establishment of a network of trained ColVols to support malaria diagnosis and treatment throughout the country[ii]. This approach contributed to a reduction in malaria cases during the 1980s and 1990s, and by 1992, ColVols detected 90% of all malaria cases[iii].

By 1999, the NMP had been integrated into the larger National Vector Control Program (NVCP), increasing the workforce engaged in malaria-related field activities to more than 5,000[iii]. By 2011, ColVols identified 47% of all malaria cases despite collecting only 20% of blood samples[iv].

In 2009, the MOH decentralized public health services into networks organized into 5 regions, 13 departments, and 68 municipal and inter-municipal micro-networks to provide universal health care to every community in the country. This system reform expanded the role of ColVols into PHC while preserving the functions they previously served in the NVCP. By 2013, ColVols were acknowledged to have contributed to a halving of the mortality rate among children under five years old[v].

2. Strengthen surveillance systems for evidence-based decision-making

To promote the integrated management of all malaria activities in high-burden areas, the MOH decentralized the NMP and the laboratory network in 1980[vi]. A decade later, the MOH established an electronic national epidemiological surveillance system, VIGEPES, which enabled real-time reporting, analysis of epidemiological trends, and targeted responses[vii]. This policy change ensured that all malaria cases were confirmed and investigated. By 2009, the private health sector was required to report every case through VIGEPES, and by 2010, every malaria case was investigated within 72 hours of confirmation.

As transmission declined, El Salvador shifted from control to elimination. Vector control staff tested the family members and neighbors of each positive case to identify additional potential infections and eliminate local mosquito-breeding sites. In 2015, the MOH launched the Multisectoral National Strategic Plan for Malaria Elimination (2016-2020), which aimed to achieve 48-hour diagnosis, same-day treatment, case investigation within three days, and a response within the first 7 days. Following elimination, the MOH continues to invest in health workers' training and surveillance capacity to quickly detect and respond to imported cases and prevent the re-establishment of transmission.

3. Foster multisectoral and cross-border collaboration

El Salvador has collaborated closely with neighboring countries, Guatemala and Honduras, to address malaria transmission among mobile populations. Between 2010 and 2014, a third of the country's malaria cases were imported from Guatemala, often among seasonal workers returning from farms and plantations in the Escuintla department.

The country's participation in regional malaria elimination initiatives, such as EMMIE (2014-2017) and RMEI (2018-2026)[lviii], has strengthened relationships with neighboring countries and facilitated information exchange. Cross-border collaboration focuses on sustaining malaria surveillance; providing prophylaxis with antimalarials to seasonal workers in farm camps or factories; and implementing targeted vector control with IRS in at-risk areas.

4. Sustain political commitment and financing

Political commitment, domestic financing, and community engagement have been the backbone of the fight against malaria. The MOH has continued to invest in malaria control despite persistent social and economic challenges and ongoing importation risks[lix]. During malaria resurgence in the 1970s and 1980s, the MOH allocated 10% of the health budget to malaria interventions[lx]. During the civil war (1979-1992), strong community engagement enabled the NMP to operate and carry out its activities[lxi].

As cases began to decline, the country leveraged catalytic and blended financing to boost key interventions and accelerate elimination. For instance, Global Fund grants (USD 2 million) have supported outbreak response, integrated vector management, and strengthened the surveillance system for epidemiological monitoring of malaria trends. In 2019, the Government of Germany, through the German Development Bank, forgave El Salvador USD 11.3 million in debt for the 2019-2021 period, to be used to upgrade the National Reference Laboratory under the "Debt2Health" modality[lxii]. Today, El Salvador invests 6.8% of its GDP in the health sector, including malaria surveillance, diagnostic quality assurance, and health workforce training to maintain the capacity of vector control and laboratory staff, ColVols, and health care providers at large.

Photo: PAHO/WHO

CASE STUDY: SURINAME

Throughout much of the late 20th century, high levels of population movement associated with gold mining, logging, and cross-border travel by Indigenous communities significantly influenced malaria transmission in Suriname[lxiii]. Between the 1950s and 1960s, the MOH carried out an anti-malaria campaign that included IRS, diagnosis, and treatment in coastal cities, and by the late 1960s, malaria transmission was under control in these areas, although it persisted in the Amazonian hinterlands.

In 1995, the National Malaria Board was established as a multi-sectoral advisory body with executive authority to monitor the implementation of the malaria program. Following the Malaria Board's advice, a shift toward community-based, free diagnosis and treatment, along with culturally adapted health services, marked an important turning point, leading to a 90% reduction in malaria incidence among stable communities by the late 1990s[lxiv]. However, malaria incidence remained high among mobile populations, prompting the MOH to intensify efforts to understand transmission dynamics, tailor interventions, and adopt and scale-up innovations such as RDTs, ACTs plus a single dose of primaquine to treat malaria by *P. falciparum*, and mosquito bed nets to further reduce malaria incidence and ultimately eliminate it.

Since 2010, the MOH and the Malaria Elimination Task Force (formerly the Malaria Board) have developed strategic plans to reach these mobile populations, including the piloting of self-diagnosis and self-treatment, as well as radical cure[lxv]. Between 2006 and 2016, cases declined to fewer than 100 per year; the last case of *P. falciparum* was reported in 2018, and the last case of *P. vivax* in 2021[lxvi]. In 2025, Suriname became the first country in the Amazon region to be certified malaria-free by the WHO, reflecting decades of adapting and tailoring strategies to account for geography, population mobility, and cultural context.

1. Expand access to early malaria diagnosis and treatment

In Suriname, populations at risk of malaria, including Maroon and Amerindian communities and seasonal workers, live in and frequently travel between remote, hard-to-reach areas of the Amazon rainforest, accessible only by small planes or boats. Since 2005, the MOH has focused on removing barriers to malaria diagnosis and treatment in populations with limited access to health services by implementing approaches that go beyond traditional facility-based care, relying on innovative service-delivery models designed to reach highly mobile populations.

The malaria program partners with community-based health providers in remote areas, such as Medical Mission, a faith-based NGO that trains CHWs from Maroon and Amerindian communities to deliver free malaria services through its health center network[lxvii]. These CHWs speak local languages, engage directly with community leadership, and ensure that surveillance and response are integrated into daily village life, substantially reducing malaria transmission in these communities.

The malaria program has also developed targeted strategies to reach high-risk groups, including recruiting and training members of affected communities to reach seasonal workers at border crossings, mining camps, and resting sites[lxviii]. The "Malaria Service Deliverers" can navigate local dynamics more effectively. Under the supervision of the malaria program, these ColVols provide malaria education, distribute mosquito bed nets, detect and diagnose fevers using RDTs, provide treatment, report positive cases, and support investigation and response efforts. The MOH provides ongoing training for frontline health workers, who detect all imported cases from neighboring malaria-endemic countries.

2. Strengthen surveillance systems for evidence-based decision-making

In 1955, Suriname established a malaria information system that recorded weekly case reports from health service providers[lxix]. This system evolved into the Bureau of Public Health's centralized malaria information system, which captures data from public- and private-sector providers. Every positive malaria case triggers a prompt investigation and response, which includes proactively seeking potential cases in places of residence and work to contain outbreaks.

The malaria program has used epidemiological data to stratify the territory by malaria risk and plan local-level responses strategically[lxx]. For example, case data enables the distribution of ColVols in high-risk areas to diagnose, treat, and report cases, thereby supporting surveillance efforts. ColVols use mobile phones connected via satellite-based internet services to alert the malaria program about cases in more remote mining areas.

Following certification, Suriname continues to monitor imported cases in border regions, with continued emphasis on mobile populations and cross-border coordination. In addition, private-sector laboratories receive capacity-building training in malaria diagnostic control, while academic institutions support drug-efficacy surveillance to combat antimalarial resistance[lxxi].

3. Foster multisectoral and cross-border collaboration

Increased population movement due to the expansion of mining and logging activities threatened elimination, with over 80% of malaria cases reported between 2015 and 2019 being imported[lxxii]. Multisectoral partnerships with key industry stakeholders and cross-border collaboration with neighboring countries, Brazil, French Guiana, and Guyana, have contributed to reaching mobile populations, achieving elimination, and preventing the re-establishment of transmission.

The malaria program has partnered with mining and logging companies operating in the Amazon rainforest to provide malaria services for company employees and to train company staff to diagnose and treat malaria among their co-workers. The program also received private-sector support for the construction of the malaria laboratory and the distribution of mosquito bed nets. The program also collaborates with tour operators that partner with Indigenous communities to help control malaria outbreaks.

Suriname has also collaborated with Brazil to identify and recruit Brazilian gold miners working and residing in Suriname to join the Malaria Service Deliverers network[lxxiii]. This strategy enabled the program to reach its primary target population: Brazilian miners. The country has also promoted information exchange with Guyana and French Guiana to monitor the therapeutic efficacy of ACTs among mobile populations and prevent antimalarial resistance.

4. Sustain political commitment and financing

Over the past 35 years, Suriname has sustained its political commitment to end malaria. The MOH has involved various sectors of society, including academia, NGOs, the Ministry of Regional Affairs, the Ministry of Defense, and affected communities, in national efforts to eliminate malaria. The Malaria Elimination Taskforce advocated for the establishment of the Malaria Elimination Fund to allocate domestic and catalytic resources for elimination[lxxiv].

Suriname also leveraged technical support, grants, and loans from international development agencies to expand access to malaria services and scale up innovations in remote, hard-to-reach areas of the Amazon rainforest. Technical assistance from PAHO has improved AMR surveillance and vector control[lxxv]; Global Fund grants facilitated the introduction of RDTs and ACTs and the mass distribution of mosquito bed nets[lxxvi]; and an IADB loan supported malaria efforts in mining areas[lxxvii].

5. Leverage innovation to accelerate malaria elimination

The MOH has leveraged innovation to implement targeted strategies to control outbreaks and stop transmission among mobile populations living or working in highly remote areas with limited access to health services. In remote Indigenous communities, the MOH enhanced access to diagnostic and treatment, improved surveillance, and deployed tMDA to control sporadic outbreaks. In 2019, tMDA was implemented to control malaria outbreaks following the disease's reintroduction by travelers from Brazil[lxxviii]. As pregnant women and infants were not administered tMDA, other malaria interventions were reinforced to eliminate transmission. Following this outbreak, visitors and returning community members are required to undergo malaria testing to prevent the re-establishment of transmission.

To reach gold miners traveling to areas without access to malaria services, the MOH piloted a self-diagnosis-and-treatment kit (MALAKIT) in collaboration with Brazil and French Guiana[lxxix]. The MALAKIT includes an illustrated guide and 2 packages: One containing 3 RDTs and another containing an ACT combination with a single dose of primaquine and acetaminophen. Between 2018 and 2020, the malaria program trained gold miners in self-diagnosis using an RDT and self-treatment if the result was positive; if the test was negative, miners were instructed to take acetaminophen for headache and fever. The study pilot demonstrated increased treatment adherence, no serious adverse events, and a decline in malaria incidence in mining regions. In 2021, the MOH adopted this intervention to accelerate malaria elimination.

In 2023, the malaria program, in collaboration with Brazil, piloted radical cure treatment with G6PD screening for *P. vivax* (CUREMA) among gold miners potentially exposed to this parasite with no prior adverse drug reactions[lxxx]. Following G6PD testing, radical cure treatment with 3 days of chloroquine, with either 7 days of primaquine or a single dose of tafenoquine, is provided to eliminate both the blood-stage and the dormant liver-stage parasites that cause relapses and onward transmission in individuals with *P. vivax*. CUREMA aims to address treatment adherence challenges by introducing tafenoquine, a new single-dose drug that significantly shortens the treatment course compared with the recommended 14-day primaquine regimen. In addition, all participants are required to commit to a 14-day follow-up, which can occur through ColVol in-person visits, phone calls, or a mobile application.

Following elimination, Suriname continues to conduct studies to evaluate innovative strategies to prevent the reintroduction of malaria parasites, including radical cure with tafenoquine and G6PD testing[lxxxi].

Photo: Estefania Bravo / UN Foundation

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