

Accelerating malaria elimination in Guyana

An intensified and coordinated regional approach to malaria elimination in the Guyana Shield is projected to eliminate *Plasmodium falciparum* malaria in Guyana by 2025 and yield dramatic health and economic benefits, including an annual economic savings of USD 11 million -- a 285% return on investment -- and over 240,000 clinical cases averted by 2025.

Overview

- **Despite a recent surge in malaria, elimination in Guyana is within reach.** Guyana has made significant progress in shrinking its burden of malaria from a peak of nearly 60,000 cases in 1995 to a low of 13,200 cases in 2015. However, in recent years there has been a reversal in this trend: Guyana experienced a 46% increase in annual malaria cases from 2015 to 2019 — a surge that jeopardizes the country's ability to reach elimination by the Americas' regional target date of 2030.
- **A coordinated, regional approach to malaria elimination is projected to be more impactful than control or elimination efforts made by any one country alone.** Due to cross-border movement of migrants and associated imported malaria cases, Guyana's malaria elimination prospects are inextricably linked to the country's endemic neighbors in the Guyana Shield region. Guyana is unlikely to achieve elimination in the next decade unless the entire region — including Suriname, French Guiana, Venezuela, and the Amazonian states of Brazil — mounts a coordinated, scaled-up malaria response.
- **Regional scale-up is projected to result in significant elimination achievements and economic benefits for Guyana.** Intensifying malaria interventions regionally is projected to result in elimination of *Plasmodium falciparum* (*Pf*) malaria in Guyana by 2025 — achieving the national species elimination target — and to avert over 240,000 clinical cases over the next four years alone, as compared to a business as usual approach. This accelerated approach would require Guyana to invest an additional USD 7.5 million in its national malaria response from 2021 to 2024 (USD 1.9 million per year) but is expected to generate economic savings of USD 11 million annually and a 285% return on investment by 2025.
- **Guyana has the opportunity to double down on malaria investments and bend the national and regional malaria elimination curve.** Guyana's economy is anticipated to transform in coming years due to major offshore oil discoveries that have the potential to triple the country's gross domestic product by the end of this decade. As a byproduct of oil revenues, the Government of Guyana expects to double its annual spending on malaria over the next four years from approximately USD 5 million in 2020 to nearly USD 10 million in 2024.
- **Left unchecked, artemisinin resistance could derail malaria efforts in Guyana and across the region, further underscoring the urgency of elimination.** The potential spread of artemisinin resistance to first-line malaria treatments in Guyana requires continued and enhanced vigilance. If not adequately addressed, this threat could result in an additional estimated 33,000 clinical cases from 2021 to 2030, to the detriment of surveillance and response efforts and negative impact beyond Guyana's borders.

Regional Scale-Up* Projections

Pf malaria in 2025 Pv malaria after 2030	Projected year of malaria elimination** in Guyana
240,200	Clinical cases averted in Guyana (2021 to 2024)
1.9 million	Annual additional investment in Guyana (2021 to 2024), USD
11 million	Annual economic savings in Guyana by 2025, USD
285%	Return on investment in Guyana

*Regional scale-up includes simultaneous intensification of interventions in Guyana, Suriname, and French Guiana as well as a decrease in cases imported into these countries from Brazil and Venezuela.

**Projected elimination is considered to have been achieved when the number of projected indigenous cases is less than 0.1 per 1,000 population at risk.

Guyana faces malaria elimination challenges and is tied to its endemic neighbors

Despite progress over the past few decades, Guyana has seen a surge of cases in recent years driven by increased human activity in the malaria-endemic hinterland coupled with challenges in service delivery to these remote, hard-to-reach areas.

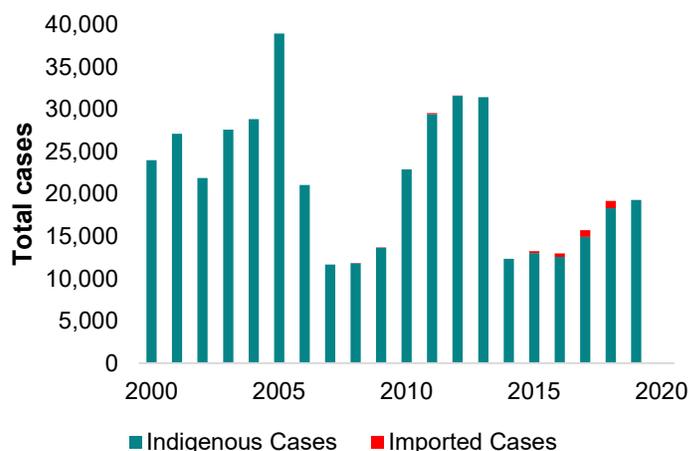
The lush rainforest climate of Guyana's interior border areas — where the highest malaria burden is predominantly concentrated — creates a favorable environment for malaria transmission. The abundance of available natural resources, including gems and metals, attracts many migrants to participate in mining and logging, with nearly 20,000 miners estimated to have worked in Guyana in 2020. The influx of Venezuelan migrants in particular has been accompanied by a marked rise in malaria incidence among this group, with cases among Venezuelans in Guyana's mining regions increasing from 18 cases in 2014 to 2,056 in 2018.

Malaria prevention, diagnosis, and treatment services are provided free of charge to all populations in Guyana, including foreign migrants. The steady rise in population in Guyana's malaria-endemic border regions have necessitated increased deployment of malaria supplies to the border areas. Due to the difficult terrain and remote nature of these areas, the distribution of malaria commodities and services requires an increased investment of time and financial resources by Guyana's

national malaria program to adequately serve the mobile populations. Ongoing efforts to stratify malaria risk at the foci level, along with improvements to imported case data, could enable further tailoring of response to mobile populations.

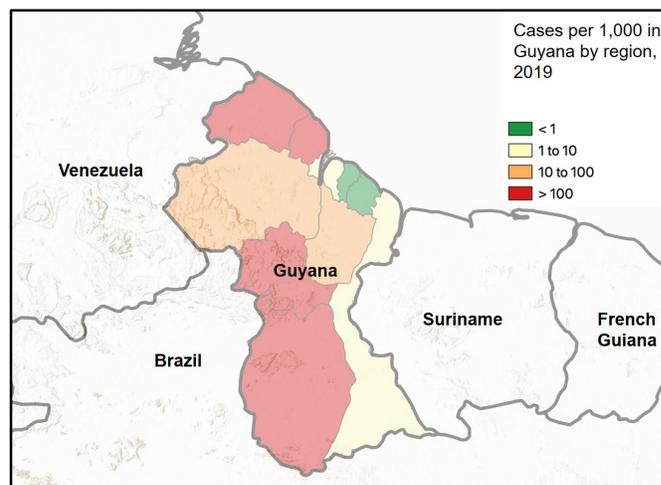
Given the technical, geographic, and cross-border challenges, Guyana is unlikely to achieve malaria elimination by the Americas' 2030 goal unless Guyana significantly increases domestic investment in malaria response and scale-up is jointly undertaken by all countries in the Guyana Shield region.

Figure 1. Total malaria cases in Guyana, 2000 to 2019.



Source: World Health Organization. World Malaria Report 2013 and 2020.

Figure 2. Indigenous malaria cases per 1,000 population in Guyana by region, 2019.



Source: Data provided by Vector Control Services, Ministry of Health, Guyana. 2020.

Regional scale-up could bring significant health and economic benefits to Guyana

If Guyana and its malaria-endemic neighbor Suriname both intensified their national malaria prevention and response interventions, Guyana could decrease its malaria morbidity, averting 194,200 clinical cases over the next four years. This scale-up would require Guyana to spend an additional USD 8.8 million over the next four years (USD 2.2 million annually) but could result in economic savings of USD 8 million annually by 2025 with a return on investment of 265%.

However, due to the interconnectedness of the region by way of cross-border migrant populations, the achievement and maintenance of malaria elimination in Guyana will remain dependent on progress made by the region as a whole. A coordinated, regional approach to malaria elimination is projected to be more impactful than isolated control or elimination efforts made by any one country. While regional scale-up is considered optimistic, it demonstrates the value of coordinated efforts to decrease malaria throughout the region.

If the entire region – including Guyana, French Guiana, Venezuela, and the Amazonian states of Brazil – mounted a scaled-up malaria response then further benefits will be gained across the region, including in Guyana. A regional approach is projected to enable Guyana to eliminate *Pf* malaria by 2025, achieving the national species elimination target and averting 240,200 clinical cases. To unlock these benefits, additional investment of USD 7.5 million is required between 2021 and 2024 (USD 1.9 million annually) but will yield an economic savings of USD 11 million annually by 2025 with a return on investment of 285%.

Guyana is poised to double down on commitment to malaria elimination with new domestic resources

Doubling down on Guyana's domestic investment in malaria response is critical as donor funding is anticipated to steadily decrease in coming years as Guyana's economy continues to rapidly strengthen and expand. As such, Guyana anticipates domestic resources for malaria will double over the next four years — from approximately USD 5 million in 2020 to nearly USD 10 million in 2024 — to cover the majority of the resulting financing gap, ensuring a sustainable malaria response. An estimated USD 1.9 to 2.2 million in additional financing over the next four years will be required for scale-up of key interventions, including passive case detection, vector control, new treatment

options, as well as increased uptake of these interventions and treatment seeking through behavior change efforts. Oil revenues are expected to bring significant windfall to Guyana's national health system and malaria program, as evidenced by the Government of Guyana's anticipated doubling of domestic annual spending on malaria over the next four years.

The threat of artemisinin resistance requires proactive risk mitigation and underscores the urgency to eliminate

While malaria parasite resistance to artemisinin-based drugs has not yet been established in Guyana, there is cause to closely monitor the potential for drug-resistant malaria to take hold in the country. Recent evidence indicates the presence of parasitic mutations (markers of artemisinin resistance) as well as of treatment failure to current antimalarial drugs. The appearance of resistant parasites is expected to result in a substantial increase in cases, with an additional 33,000 clinical cases projected over the next decade if resistance appeared in 2021 and steadily increased through 2025. In light of the risk of artemisinin resistance, surveillance and response efforts must increase and adapt or face diminished efficacy as existing treatment options become less effective. Such efforts require corresponding increases in resources. The spread of drug resistance can more broadly jeopardize regional health security and economic growth in addition to putting decades of effort and investment at risk. Close monitoring of parasites in Guyana will be critical for assessing potential resistance and considering mitigation options should resistance occur. Mitigation could include ensuring availability of second-line treatments and updating clinical guidance to promptly identify and manage suspected treatment failure.

Recommendations for Guyana

- **An increased investment of USD 1.9 million annually in Guyana's national malaria response over the next four years - alongside simultaneous investment across the region - is projected to enable the country to achieve *Pf* elimination by 2025 and to accelerate pace towards *Pv* elimination.** Advocacy for domestic financing for malaria and multisectoral engagement, particularly with the growing oil sector, could strengthen the sustainability of the malaria response. Additional financing for scale-up of key malaria interventions has the potential to benefit from the anticipated increases in national oil revenue which stand to bring significant windfall to Guyana's national health system and malaria program.

- **Regional coordination will be essential to reaching malaria elimination in Guyana.** Increased focus on high-risk populations along the malaria-endemic border areas as well as strengthening technical and financial coordination with neighboring countries, particularly Venezuela, will enable Guyana to leverage and align efforts for a more efficient response. Donors such as the Global Fund to Fight AIDS, Tuberculosis and Malaria are supporting efforts to bolster malaria response efforts in Venezuela, presenting opportunity for Guyana to strengthen collaboration on cross-border malaria efforts.
- **Proactive measures to monitor and respond to potential drug resistant malaria must continue in order to mitigate a surge of cases and ensure effectiveness of interventions.** Close monitoring of the resistance profile of malaria parasites in Guyana will help to identify potential drug resistance at an early stage. National guidelines for switching to a second-line treatment could help to mitigate consequences in the event that resistance is established.
- **Strengthening risk stratification (at the foci level) and imported case data (*Pf* and *Pv* speciation at the foci level) will improve Guyana's ability to target and tailor interventions,** thereby allowing more efficient use of existing resources in expanding access to services and interventions where they are most needed. Guyana is committed to providing malaria services to the most vulnerable high-risk communities, including migrants, and strengthened subnational data would enable enhanced targeting of resources to ensure equitable distribution and highest impact.

The methodology, data, and evidence referenced in this summary brief, as well as additional country and regional results projected under different investment scenarios, are included in the full-length investment case report. The report is accessible through shrinkingthemalariamap.org.

The Malaria Elimination Initiative (MEI) at the University of California, San Francisco (UCSF) believes a malaria-free world is possible within a generation. As a forward-thinking partner to malaria eliminating countries and regions, the MEI generates evidence, develops new tools and approaches, disseminates experiences, and builds consensus to shrink the malaria map. With support from the MEI's highly skilled team, countries around the world are actively working to eliminate malaria. shrinkingthemalariamap.org

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