

Raising the red flag for malaria elimination and integrated fever surveillance in the Brazilian Amazon



In the past decade, Brazil has achieved considerable progress in malaria control, with 140 000 cases reported in 2015, the lowest numbers since 1980.¹ Part of this success has been attributed to the establishment of a large network of around 3000 diagnostic and treatment units for malaria.¹ A remarkable feature is that these services are provided for free as part of the public universal health-care system (Sistema Único de Saúde [SUS]) and cover rural and riverine areas in the Amazon region—where more than 83% of malaria transmission occurs. Populations in these areas have a low density and reduced level of mobility, and in spite of the high coverage for malaria-associated diagnosis and treatment by the SUS, scarce access to health care and other public services, characterising the precarious social conditions and relative neglect of malaria in this region,² a situation unfortunately shared with other Latin American countries.

In the absence of a consistent presence of the state, a creative and original acute fever surveillance system based on the use of a red flag has been put in place (figure). This consists of hoisting a red flag (or piece of red cloth) in front of a household if an inhabitant presents fever or other malaria-associated symptoms. Whenever a community health-care worker roaming their catchment area observes a red flag, they stop at that household, fill the notification form with the data from the febrile person, and collect a blood sample for malaria diagnosis through either microscopy (done at that location's health post) or rapid diagnostic test. If the test is positive, the species-specific treatment is provided following the national guidelines. Such a system has contributed to partly overcome the problem of large distances to health facilities, which impairs efficiency of case detection in the region,^{3,4} and enabled more than 60% of malaria cases to be treated within 48 h of fever onset.¹

While acknowledging this system's efficacy at improving case detection, it is important to recognise its limitations, especially considering the more ambitious goals the country should incorporate: to decisively aim for malaria elimination and to provide comprehensive health care and disease surveillance in the Amazon.

The renewed commitment and impetus from the international community towards malaria elimination requires a shift and re-orientation of control programmes. Besides diagnosing and treating symptomatic malaria cases, it is imperative to identify and manage the infectious reservoir, including asymptomatic and low parasite density infections not detected with routinely used tools and strategies,⁵ but which are critical for maintaining transmission in a given community. Therefore, to achieve elimination, surveillance needs to incorporate innovative and efficient strategies.^{5,6}

From another perspective, decreasing incidence of malaria results in lower proportions of malaria-attributable fever,^{7,8} which has fallen from around 25% to 10% in the past decade in Brazil.⁹ This suggests that 75–90% of acute febrile illness in the Amazon do not receive an aetiological diagnosis, exposing a major failure in both surveillance of endemic and emerging infectious agents and in case-management of febrile individuals. Surveillance is complex owing to the variety of agents causing undifferentiated fever (eg, dengue, chikungunya, Zika, bacteria, and trypanosome) and the unavailability of point-of-care tests, and thus efficient syndromic surveillance becomes paramount to inform specific actions.^{8,10} Concerning case-management,



Red flag in front of a household in the rural Amazon signalling the presence of febrile individual

non-malarial fevers might need either specific treatments or referral to better equipped hospitals for appropriate care.⁸ Additionally, the low proportion of malaria-attributable fever results in lower sensitivity to detect positive cases, because neither users nor health workers prioritise it as a diagnostic hypothesis, leading to delay in diagnosis, higher rates of complications, and slower response to malaria outbreaks.⁶

Although Brazil made substantial efforts to expand primary health care throughout the country with initiatives such as recruiting international physicians to work in remote areas (Programa mais Médicos),¹¹ hard to reach small rural and riverine areas suffering the largest burden of malaria did not benefit equally. Furthermore, to maintain a malaria-specific parallel health-care system in low-transmission settings is probably not cost-effective and, amid scarce resources, threatens the sustainability of reducing malaria incidence.

Malaria control success in Brazil shows that the country has the capacity to commit to eliminate malaria, establish ambitious and realistic mid-term and long-term targets, and help steer the continent towards elimination. Concomitantly, Brazil should implement more integral health-care strategies addressing the specificities of Amazonian populations. This will require a re-orientation of the health system in the region, combining integrated management of acute febrile illness, provided in a timely fashion by the closest health facility and professionals (eg, community health workers, nurses), with malaria-specialised surveillance and control teams able to carry out the required activities to reduce and prevent malaria transmission.

A public health red flag is raised, calling for the bold commitment of civil society, politicians, academia, and others partners, to advance towards the attainable goal of eliminating malaria and providing integral health care in the Amazon, an important step to reduce the neglect suffered by its populations.

*Andre M Siqueira, Quique Bassat, Sheila Rodovalho, Marcus V G Lacerda

Instituto Nacional de Infectologia Evandro Chagas, Fiocruz, Rio de Janeiro 21040-360, Brazil (AMS); Programa de Pós-Graduação em Medicina Tropical UEA/FMT-HVD, Manaus, Brazil (AMS, MVGL); ISGlobal, Barcelona Institute for Global Health, Barcelona, Spain (QB); Centro de Investigação em Saúde de Manhiça (CISM), Maputo, Mozambique (QB); ICREA, Pg. Lluís Companys 23, Barcelona, Spain (QB); Coordenação Geral do Programa de Malária, Ministério da Saúde, Brasília, Brazil (SR); Fundação de Medicina Tropical Dr Heitor Vieira Dourado, Manaus, Brazil (MVGL); and Instituto Leônidas e Maria Deane, Fiocruz, Manaus, Brazil (MVGL)

andre.siqueira@ini.fiocruz.br

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