

Malaria elimination strategies should adapt to changing patterns of infection

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According to Sir Richard Feachem, Director of the Global Health Group at the University of California, San Francisco, USA, and senior author of the study, "The malaria control strategies implemented over the last decade have been highly successful in reducing malaria worldwide. However, these strategies must evolve to respond effectively to the changing patterns of infection in low transmission areas. More sophisticated and targeted approaches to identifying those people who are infected, and responding promptly and effectively, must be put in place. The good news is that these new approaches are being pioneered with great success in countries such as China, Sri Lanka, and Swaziland."*

The authors present country examples showing that when malaria is reduced to low levels, it becomes increasingly concentrated in particular places or communities (hotspots) and in particular groups of people (hot-pops). In Sri Lanka, overall malaria incidence decreased by 99.9% between 1999 and 2011, but the proportion of infections in adult men increased from 54% to 93% over the same period.

Migrant workers appear to be at heightened risk, likely due to their participation in outdoor activities such as forestry, plantation work, and farming. Many low-transmission countries now find that the majority of their malaria cases are "imported", coming from international travellers, migrant workers, and other mobile populations who bring malaria from other high-transmission countries.

This new situation is compounded by the fact that many of these groups most exposed to [malaria infection](#) in low transmission settings are beyond the reach of current health services. "Hard-to-reach populations, including ethnic or political minority groups, are typically impoverished and mobile, often driven to more remote areas by marginalisation, safety concerns, and economic opportunities," say the authors. "They might avoid accessing the health systems because of fear of unwanted attention from government authorities, thus making monitoring and treatment of their malaria difficult."

One solution to this problem is to rethink the typical [malaria control](#) methods used to control infection, tailoring and targeting them to the groups most likely to contract malaria. Traditionally, malaria control has focused on home-based interventions such as bednets and indoor insecticides that protect women and children. However, the authors suggest that different, occupation-based control methods—such as insecticide treated clothing, or hammocks—could be used to protect these populations.

It is not just the demographics of malaria infection that are changing. Traditionally, the *Plasmodium falciparum* parasite has been considered responsible for the majority of the global malaria burden, and has therefore been the focus of control efforts. However, successful control of *P falciparum* in many countries has resulted in an increasing proportion of infections from another malarial parasite, *Plasmodium vivax*. While *P vivax* is less likely to lead to death than *P falciparum*, it is also harder to detect and treat, and therefore more difficult to control and eliminate. For example, in the Solomon Islands, malaria control efforts in the elimination provinces of Isabel and Temotu achieved a greater than 90% reduction in total malaria cases between 2001 and 2011, and the proportion of *P vivax* infections more than doubled over the same period.

According to Chris Cotter, lead author on the study, "Difficulties in detecting malaria infections in low transmission settings, particularly in these hot-pops who are infectious but might not have symptoms, is a major challenge faced by malaria programmes. Population movement across political boundaries and the resulting importation of malaria makes this challenge even greater. Without effective strategies to identify and target these individuals, malaria elimination may prove difficult in certain areas."*

Allocation of funding for malaria control in future years will play a critical role in addressing these challenges. According to the authors, "Despite the growing importance of imported malaria, the largest international funder for malaria control—the Global Fund to Fight AIDS, Tuberculosis and Malaria— allocates only a small proportion of its malaria funding to multicountry proposals...As countries reduce their [malaria](#) burdens, strategies that address the changing epidemiology...need to be developed, validated, and adopted."

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