

Vietnam Malaria Status Update and Potential Plan to Eliminate Emerging Incurable Malaria Strains



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Background

Malaria is a serious disease with over 200,000 cases reported annually in Southeast Asia, primarily in 11 endemic countries (Cambodia, China, the Lao People's Democratic Republic, Myanmar, Malaysia, Papua New Guinea, the Philippines, the Republic of Korea, Solomon Islands, Vanuatu and Vietnam). The National Malaria Control Plan (NMCP) for Vietnam has set a goal for malaria elimination by 2030. There is lasting value to eliminating malaria; nearly all countries (50 out of 54) that have achieved malaria elimination have been able to maintain this status despite the presence of competent vectors, imported cases and proximity to malaria endemic countries.

Malaria elimination is also a key strategy to combating artemisinin resistant malaria which is present in Southeast Asia including Vietnam. Significant reductions in malaria mortality (>99%) and morbidity (>97%) occurred in Vietnam between 1991 and 2013. As of 2013 the majority of Vietnam's provinces transitioned to (56.9%) or had eliminated (27.5%) malaria. However, malaria persists with an estimated 14.4 million people (approximately 16% of the population) residing in malaria endemic areas of the country.

Complicating elimination plans is the need to rapidly detect cases and the presence of Plasmodium falciparum parasites resistant to the current first-line treatments described in five provinces (Quang Nam, Gia Lai, Dak Nong, Ninh Thuan and Binh Phuoc). Malaria that is not sensitive to first line drugs recommended in the NMCP pose significant public health challenges due to the need for more varied and complicated control and elimination strategies. Here we present current malaria data collected for the NMCP and interventions under evaluation to address public health challenges.

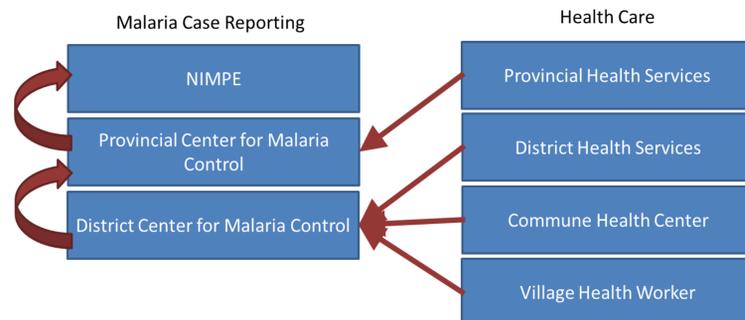


Figure 1: Vietnam malaria control system.

Methods

In Vietnam malaria case data is reported to National Institute of Malaria, Parasitology, and Entomology (NIMPE). Cases are confirmed by microscopy testing during the initial patient visit by World Health Organization Level I certified technicians. Results are reported from village, commune and district health centres via district and provincial centres (Figure 1).

In 2014 malaria data reported to NIMPE from 2009-2013 were collected from the commune level. Malaria risk was stratified into one of five zones: no malaria transmission, area at risk for reintroduction of malaria, low (>0-1/1000), medium (1-5/1000), or high (>5/1000). Malaria risk zone determination included historic malaria burden data as well as demographic, environmental, climatic and economic indicators.

Drug sensitivity data is generated from therapeutic efficacy study (TES) conducted in the region using 42-day follow-up with directly observed therapy. Specific study protocols varied by project, but include determination of parasite density in blood ≥ 12 hours with or without confirmation by polymerase chain reaction. Parasite clearance time and complete clearance during routine 3-day treatment were used to define clinical treatment failure. These data were used to provide information on parasite sensitivity to standard ACT to compliment epidemiology data generated from passive surveillance systems described above.

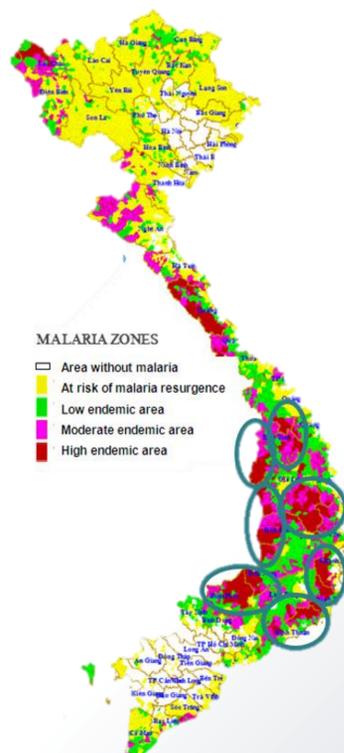


Figure 2. Vietnam's malaria restratification 2009-2013 also showing "forest islands of malaria" (blue circles).

Results

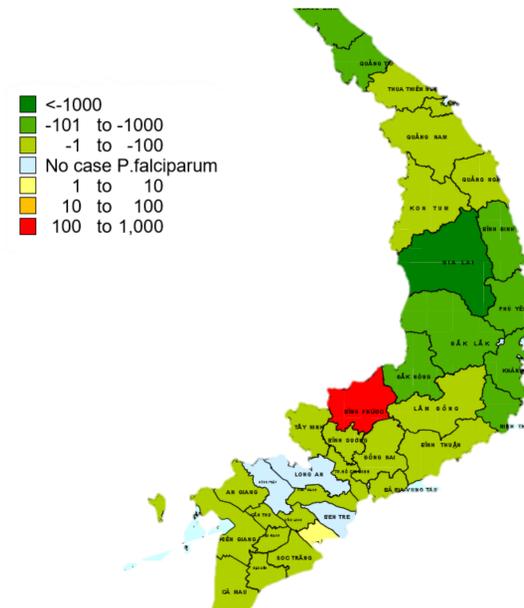


Figure 3. Changes in reported Pf cases from 2014 to 2015 in Vietnam. Confirmed cases decreased in 2015 with the exception of Binh Phuoc Province.

In 2014, restratification was conducted from the period of 2009-2013 (see figure 2). Between 2000 and 2015, confirmed *P. falciparum* (Pf) cases were reduced by 70% (15,936 to 4,756 cases). This restratification confirmed the longer term trend described for the period of 1991-2013. Areas of higher endemicity generally coincided with forested areas (denoted as blue circles in figure 2).

In 2015, Pf decreased by 47% nationwide; however in Binh Phuoc Province, where clinical ACT-resistance was observed (ref), there was an increase (32%) in reported Pf cases (Figure 3). A similar pattern of increasing malaria burden in areas with ACT and/or artemisinin resistance has been described in Western Cambodia.

Preliminary data from 2016 is not conclusive; Binh Phuoc Province has had a severe drought with malaria rates similar to 2014 (547 Pf cases from January – August).

Conclusions

The restratification of malaria data confirms a continued decrease in malaria morbidity and mortality with additional data suggesting a general reduction continued into 2015. Following the results of the restratification review case reporting criteria were revised to include greater detail, including detailed geo-spatial data reporting. These changes were made in 2015 and their full impact is being reviewed to inform local and national malaria policy.

Changes in parasite sensitivity to ACTs recommended in the NMCP pose a threat to the continued progress of malaria elimination in Vietnam. To immediately address ACT-treatment failures, a change to quinine-combination regimens was implemented in September 2016. Additionally, alternative drug combinations are currently being evaluated as a longer term solution.

While significant progress has been observed since 1991, the restratification data suggests that malaria transmission continues in forested areas in border and central highland regions of Vietnam. These areas present a challenge for control programs due to their more remote locations which will require more intense public health interventions for the rural and migrant populations that reside in these areas.

These challenges will require a novel drug combination therapies to combat resistant Pf parasites and evidence based approaches to eliminate malaria in remote and mobile populations. NIMPE continues to partner with national and international institutes to conduct enhanced surveillance and research to develop evidence to inform the NMCP.



Figure 4: NIMPE staff verifying malaria case report data during a site visit to a District Center for Malaria Control.



Figure 5: NIMPE staff visiting suspected forest transmission sites.

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