

Malaria elimination in Indonesia: halfway there



Indonesia marked a major milestone in 2017, with more than half of districts officially declared malaria free. This is an important accomplishment for an equatorial country with 25 species of malaria-receptive *Anopheles* mosquitoes; a dual *Plasmodium falciparum* and *Plasmodium vivax* caseload in almost equal proportions; a large, dispersed population (>260 million and >5000 inhabited islands); high internal migration; socioeconomic inequality; and decentralised governance.¹

Indonesia's achievement was largely the result of accelerated progress in the past decade. Between 2007 and 2017, annual parasite incidence fell by three times,

from 2·89 per 1000 to 0·9 per 1000 population. This decline corresponded to a 50% reduction in confirmed cases and a 66% reduction in deaths from malaria.² Although 450 districts reported suspected malaria cases in 2010, 266 have become malaria free, 93 have been downgraded from high or moderate to moderate or low transmission, and 38 have witnessed a reduction in annual parasite incidence of three times or greater (figure). Today, 72% of Indonesia's population lives in areas free from malaria transmission.

Although Indonesia's National Malaria Eradication Unit was first established in 1952, initial control efforts

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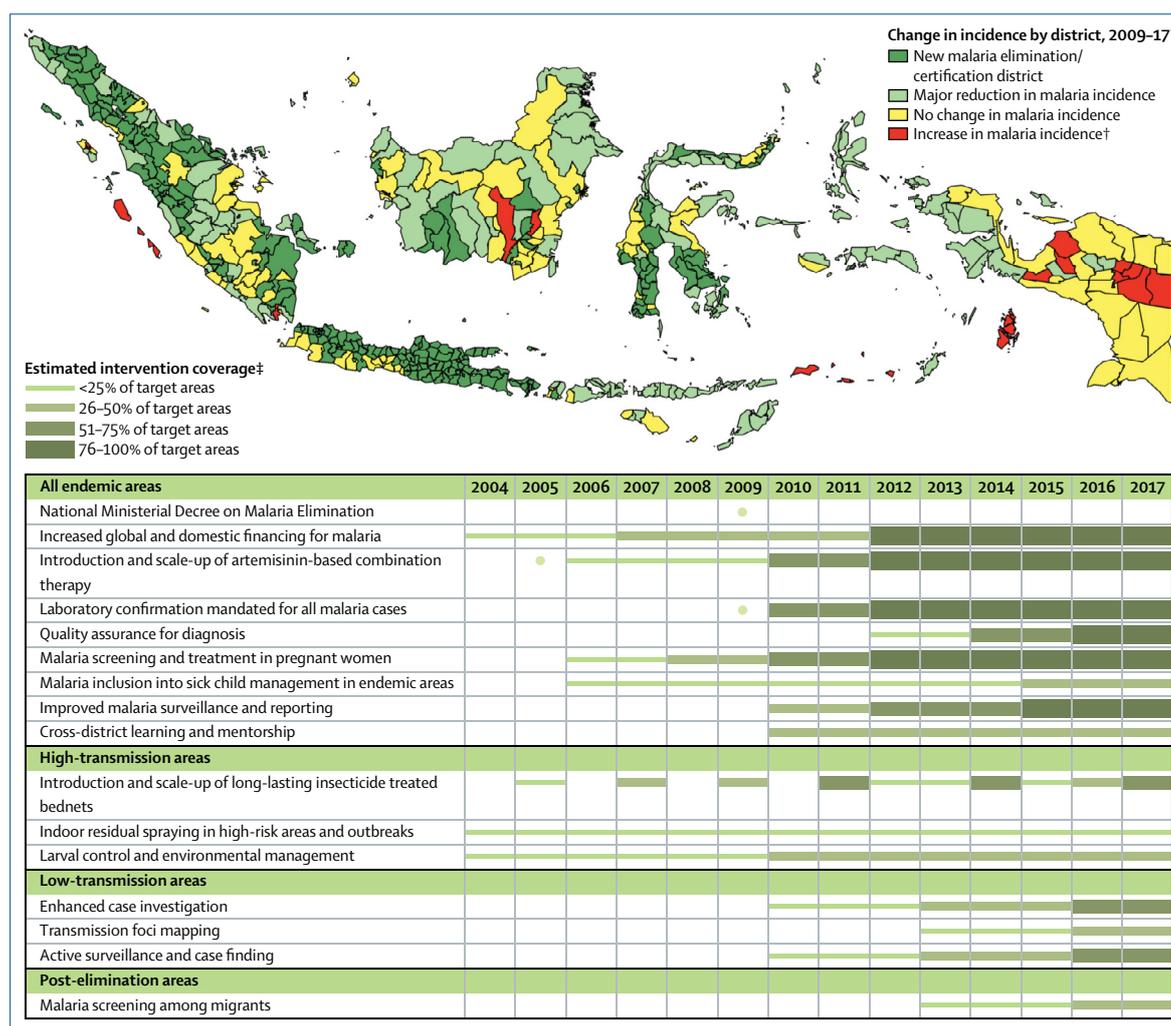


Figure: Changes in malaria incidence and intervention coverage, Indonesia 2004-17

*Baseline annual parasite incidence data available in 2009-10 for 90% of districts. Major reduction represents downshift in transmission strata or three-times reduction in annual parasite incidence; no change represents same strata and less than three-times reduction in annual parasite incidence. Increase represents an upshift in transmission strata. †Increase might reflect improved malaria surveillance. ‡Estimates based on expert consultation with the Indonesian Ministry of Health and partners.

were limited to Java island and focused on indoor residual spraying with dichlorodiphenyltrichloroethane (DDT) and chloroquine-based treatment. It was not until 2004 that the unit began to intensify its malaria control efforts. Artemisinin combination therapy was introduced as first-line treatment because of widespread chloroquine resistance. Procurement and distribution of the drug was tightly controlled; regular therapeutic studies have shown no resistance.³ Laboratory confirmation, including rapid diagnostic tests to complement microscopy, was mandated shortly thereafter, resulting in improved reporting and surveillance. Control efforts extended to sparsely populated and remote areas of eastern Indonesia with high transmission and more efficient vectors. Long-lasting insecticide-treated bednets were introduced through subnational campaigns to eastern Indonesia and parts of Sumatra in 2005, to all of Sumatra in 2007, to Kalimantan and Sulawesi in 2009, and subsequently nearly every 2 years in highly endemic districts and villages, where continuous distribution of long-lasting insecticide-treated bednets was integrated with routine immunisation and antenatal care services (with malaria screening during pregnancy). In the past decade, 20 million long-lasting insecticide-treated bednets were distributed. Indoor residual spraying was done in high-risk villages (annual parasite incidence >20 per 1000 population) and in response to outbreaks. In high-transmission areas, malaria screening for sick children was introduced into clinical management protocols. Finally, capacity development efforts buoyed case management, vector control, surveillance, and case investigation. Case investigation included adoption of the 1-2-5 surveillance and response protocol: case management and notification on day 1; case classification and foci investigation on day 2; and foci response and elimination by day 5.

An important driver of success has been subnational action supported by evidence-based policy and advocacy across all levels of government. In 2009, a National Ministerial Decree on Malaria Elimination was passed, which spurred political commitment from provincial governors, district regents, and municipal mayors. Given the high levels of decentralised authority, locally tailored responses have been essential. In South Halmahera, a community empowerment programme led to substantial reductions in transmission through

environmental management and larval control. In Bintuni District, private sector engagement supported aggressive case finding. In Wonosobo District, active surveillance of migrant workers has maintained malaria elimination, as has active surveillance among migratory fisherman. In Sabang District, case reporting from hospitals and private practitioners to health centres was combined with active case finding and treatment compliance monitoring by village volunteers to underpin successful malaria elimination. In Karangasem District, village-based larval control and active case detection provided the basis for malaria elimination. Models from these pioneering districts have been adopted or adapted elsewhere, resulting in competition to eliminate malaria and public acknowledgment of district leaders who eliminate malaria each year.

Coordination of the malaria response was led by the Ministry of Health with support from UNICEF, WHO, community organisations, and the private sector. Additional financing was crucial. The Global Fund to Fight AIDS, Tuberculosis and Malaria invested US\$238 million between 2003 and 2017, complementing an estimated US\$110 million in domestic spending.⁴ The government supported human resource costs, capacity development, and procurement and distribution of malaria drugs, with partners providing assistance both with staff costs and with purchasing commodities such as long-lasting insecticide-treated bednets and rapid diagnostic tests.

No middle-income country in southeast Asia has successfully eliminated malaria.⁵ As Indonesia approaches its elimination goal, this is no time for complacency. Surveillance systems need to be strengthened. Scaling of diagnostic and treatment interventions alongside vector control in high-transmission districts should be coupled with tailored approaches in low-transmission areas. This redoubling of efforts will be essential for Indonesia to achieve its 2030 target and national vision to be malaria free.

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