Indonesia has set sequential goals for malaria elimination and aims to achieve national elimination by 2030.

Overview

Indonesia has made steady advances in malaria surveillance and control in the last decade and achieved a 17 percent decrease in malaria cases and an 87 percent decrease in malaria deaths between 2004 and 2014. All five species of Plasmodium parasites have been identified in the Indonesian archipelago: *P. falciparum, P. vivax, P. malariae, P. ovale* and *P. knowlesi*. *P. falciparum* and *P. vivax* mixed infections are very common, while *P. malariae, P. ovale*, and *P. knowlesi* infections are rare. Dominant malaria vectors include *Anopheles sundaicus, An. balabacensis, An. maculatus, An. farauti*, and *An. subpictus*, though over twenty anopheline vector species are responsible for malaria transmission in Indonesia. Malaria transmission occurs year-round due to the diversity of vectors, geographies, and environments.

Indonesia has made substantial progress towards malaria elimination. Most districts in Java and Bali, as well as some in Kalimantan and Sulawesi, fall under the WHO criteria of elimination. Java has significantly reduced its malaria burden in its urban centers and maintains low levels of transmission in its remote areas, while Bali has not reported an indigenous malaria case since 2012. Only 2.5 percent of the Indonesian population lives in high-endemic areas. The disease burden and parasite distribution in Indonesia is geographically asymmetrical: 80 percent of reported cases between 2005 and 2014 were found in the eastern part of the nation, particularly Papua, Western Papua, East Nusa Tenggara, Maluku, and North Maluku. Despite these encouraging trends, progress is easily reversible due to human migration from high-transmission areas to low-transmission areas within the country.

With support from its global partners and regional collaborators, Indonesia has revised its malaria control strategy and elimination goals and is currently aiming for national elimination by 2030. Strategies for malaria control include improving malaria diagnostics and surveillance, sustaining vector control activities, and strengthening community-based health efforts. Political support for malaria elimination is strengthened through Indonesia’s participation in the Asia Pacific Malaria Elimination Network (APMEN), a network composed of 18 Asia Pacific countries and other stakeholders working to eliminate malaria in the region, and the Asia Pacific Leaders Malaria Alliance (APLMA). The APLMA Elimination Roadmap emphasizes regional cooperation and cross-border collaboration to achieve malaria elimination by 2030.

At a Glance

- **252,027** Local cases of malaria (62% *P. falciparum*)
- **64** Deaths from malaria
- **26%** population living in areas of active transmission (total population: 254.5 million)
- **0.99** Annual parasite incidence (cases/1,000 population at risk/year)
- **19%** % slide positivity rate

Progress Toward Elimination

Dutch colonialists in Indonesia considered malaria to be a major public health challenge in the 1600s, though a national program for malaria control did not exist until the central malaria bureau was established in 1924. For the next few decades, environmental modification techniques—including new irrigation schemes, removal of algae from fishponds, and community education on local vector control, basic diagnosis, and transmission—were used to decrease vector breeding habitats.

Political turmoil during the Japanese invasion of Indonesia from 1942 to 1945 and the ensuing revolution for independence against the Dutch colonialists from 1945...
Eliminating malaria in INDONESIA

Malaria Transmission Limits

*Plasmodium falciparum*

- Water
- *P. falciparum* free
- Unstable transmission (API < 0.1)
- Low stable transmission (0.1 ≥ API < 1.0)
- Stable transmission (≥ 1.0 API)

*Plasmodium vivax*

- Water
- *P. vivax* free
- Unstable transmission (API < 0.1)
- Low stable transmission (0.1 ≥ API < 1.0)
- Stable transmission (≥ 1.0 API)

*P. falciparum/P. vivax* malaria risk is classified into no risk, unstable risk of <0.1 case per 1,000 population (API), low stable risk of 0.1 to <1.0 case per 1,000 population (API), and stable risk of ≥1.0 case per 1,000 population (API). Risk was defined using health management information system data and the transmission limits were further refined using temperature and aridity data. Data from the international travel and health guidelines (ITHG) were used to identify zero risk in certain cities, islands, and other administrative areas.

To 1949 undermined much of the country’s malaria control measures. After this period, control efforts such as indoor residual spraying (IRS) with DDT were scaled up. This led to a significant reduction in transmission and economic growth in highly endemic areas as workers’ health and productivity increased.4

In accordance with the World Health Assembly’s focus on eradication, Indonesia shifted its malaria control program to an elimination-focused program known as KOPEM (Komando Pembasian Malaria) in 1959.1 The national malaria eradication service aimed to eliminate malaria in Indonesia by 1970. Over 9,000 tons of DDT were used on the islands of Java and Bali from 1959 to 1963, but insecticide resistance developed.4 The feasibility of malaria elimination in Indonesia appeared less likely, and a combination of political and financial constraints along with an attempted violent coup d’état in 1965 weakened and eventually led to the discontinuation of the malaria elimination activities.4

As the malaria program gradually shifted its focus back to control, the islands were stratified into two groups with separate case detection strategies. The islands of Java and Bali, where most of the country’s population is concentrated, focused on active and passive case detection, mass fever surveys, contact surveys, and migration surveillance. In contrast,
the less populous outer islands used passive case detection and conducted malariometric surveys. During the Malaria Control Program from 1969 to 1999, the malaria burden was significantly reduced on Java and Bali, but the disease burden on the outer islands remained heavy due to the intrinsic challenges of treating a sparsely populated, vast geographical region with limited transportation and infrastructure.

The East Asian economic crisis of 1997 and subsequent fall of Indonesia’s authoritarian regime led to several years of political and economic instability exacerbated by a massive shift from a centralized to a decentralized government system. Accordingly, the Indonesian public healthcare system experienced major logistical and financial setbacks. With limited resources available, implementing and maintaining consistent and accurate malaria surveillance was a challenge.

The current malaria elimination program in Indonesia was stimulated in 2000 by the start of the Roll Back Malaria Initiative. The Indonesian Ministry of Health launched its initiative Gebrak Malaria, or “Crush Malaria,” in April 2000. Gebrak Malaria focused on malaria control in endemic areas through collaboration with government institutions, the private sector, and communities. In April 2009, the Indonesian Ministry of Health launched a formal set of elimination targets, implementing a spatially progressive approach to elimination across all islands from west to east with the national goal of elimination by 2030. Current malaria control strategies are dependent on malaria endemicity: high endemic areas require improved diagnosis and case management and mass bednet distribution; focus areas (i.e., mining, agriculture, etc.) require specialized interventions; and low-endemic areas require active case detection and strengthened migration surveillance.

**Goals:**
1. 300 districts are granted certification of elimination by the Minister of Health by 2019.
2. All districts are granted certification of elimination by the Minister of Health by 2025.
3. All provinces are granted certification of elimination by the Minister of Health by 2027.

**Reported Malaria Cases**

Despite the increase in reported malaria cases, presumably due to improved reporting and surveillance, the number of malaria deaths has decreased by 87 percent between 2004 and 2014.

Challenges to Eliminating Malaria

Quality Assurance of Diagnosis
Indonesia’s geography presents a challenge in developing and maintaining high-quality diagnosis.7 This is in part due to the uneven distribution of laboratory technicians, especially in remote areas. Rapid diagnostic tests (RDTs) are considered a viable alternative to microscopy in low-resource and remote settings, though they may not be as reliable as high-quality microscopy in low-transmission areas; in addition, maintaining the supply of RDTs is often challenging in remote areas. Frequent microscopy refresher trainings, maintenance of microscopes and other lab equipment, and supervision to ensure adherence to operating procedures may help to ensure early, accurate diagnosis and prompt treatment of malaria.

Information, education, and communication
Disparities in communication and education persist among various malaria-endemic provinces in Indonesia, often due to socio-cultural differences within and across districts and provinces. Although educational campaigns for mass insecticide-treated net distribution and IRS have been conducted with some success, many Indonesians living in endemic areas still do not consider malaria a serious disease and have little knowledge of its diagnosis, treatment, and prevention; those who are aware do not always adhere to preventative measures.24–26 Developing an appropriate strategy which considers the specific socio-cultural context is needed to diagnose and treat the disease at the community level.

Eligibility for External Funding19-21

<table>
<thead>
<tr>
<th>Program</th>
<th>Eligibility</th>
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<tbody>
<tr>
<td>The Global Fund to Fight AIDS, Tuberculosis and Malaria</td>
<td>Yes</td>
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<td>U.S. Government’s President’s Malaria Initiative</td>
<td>No</td>
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<tr>
<td>World Bank International Development Association</td>
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Economic Indicators22

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Value</th>
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<tr>
<td>GNI per capita (US$)</td>
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<td>Country income classification</td>
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<tr>
<td>Total health expenditure per capita (US$)</td>
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<td>Total expenditure on health as % of GDP</td>
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<tr>
<td>Private health expenditure as % total health expenditure</td>
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</table>

Conclusion
Despite the relatively small decline in reported malaria cases in the last decade, Indonesia has made significant progress towards malaria control, as evident by the sharp decrease in reported malaria deaths. Improved diagnostics and greater investment in health promotion activities should assist Indonesia in moving from control to pre-elimination and ultimately achieve its national goal of elimination by 2030.
Sources


Transmission Limits Maps Sources


About This Briefing

This Country Briefing was developed by the UCSF Global Health Group’s Malaria Elimination Initiative, in partnership with the National Malaria Control Program, Ministry of Health, Indonesia. To send comments or for additional information about this work, please email Kelly.Harvard@ucsf.edu.

The Global Health Group at the University of California, San Francisco is an ‘action tank’ dedicated to translating new approaches into large-scale action that improves the lives of millions of people. Launched in 2007, the UCSF Global Health Group’s Malaria Elimination Initiative (MEI) works at global, regional, and national levels to accelerate progress toward malaria elimination in countries and regions that are paving the way for global malaria eradication. The MEI believes that global eradication of malaria is possible within a generation. shrinkingthemalariamap.org

The Malaria Atlas Project (MAP) provided the malaria transmission maps. MAP is committed to disseminating information on malaria risk, in partnership with malaria endemic countries, to guide malaria control and elimination globally. Find MAP online at: www.map.ox.ac.uk