

# Investing in Malaria Elimination in Indonesia

Malaria elimination in Indonesia can result in more than USD 18 billion in economic benefits over 15 years.

## Overview

- Indonesia has committed to eliminate malaria by 2030—a goal that can be reached only if aggressive interventions are implemented and the required resources are mobilized.
- To sustain current malaria interventions in Indonesia, an estimated USD 0.85 per population at risk, per year is required.
- Malaria elimination in Indonesia is estimated to cost USD 2 billion for 2016–2030—an average of USD 145 million per year.
- Malaria elimination in Indonesia is a public health best buy. Successful elimination by 2030 can generate economic and financial benefits of approximately USD 18 billion by reducing malaria deaths, cases, household and healthcare spending, and increasing productivity.

Eliminating malaria in Indonesia by 2030 can lead to:

- **Over 41,000 lives saved**
- **25 million cases averted**
- **10:1 return on investment**



Indonesia has committed to eliminating malaria by 2030 and is making steady progress towards achieving that goal. By employing a subnational elimination strategy, cases have declined by over 50% since 2010 (Figure 1) and more than 70% of Indonesia's population now lives in areas that have eliminated malaria. However, successful elimination of the disease in the remaining endemic areas by 2030 will require a redoubling of efforts and investment.

## Building on the Momentum

Aligning with the Asia Pacific Leaders Malaria Alliance's goal of a malaria-free region by 2030, Indonesia aims to eliminate the disease to save lives and benefit from associated economic gains and healthcare savings. To

maintain progress and accelerate toward national elimination, Indonesia will require adequate financial resources and unwavering political commitment from country leaders and donors.

Political and financial commitment from the Indonesian government, as well as significant financial contribution from donors—particularly the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund)—has played a significant role in Indonesia's progress against malaria. Total funding for malaria has increased in the last five years; however, this upward trend is not projected to continue. In Indonesia, a significant funding gap is expected in the coming years as government financing plateaus and donor financing declines, at which point financing requirements for elimination will outpace available resources for malaria.

## Indonesia At a Glance\*

<b>217,025</b>	<b>Total cases of malaria<sup>a</sup></b> (55% <i>Plasmodium falciparum</i> )
<b>157</b>	<b>Deaths from malaria<sup>a</sup></b>
<b>71,371,466</b>	<b>Population at risk<sup>b</sup></b> (30% of population)
<b>861.9 billion</b>	<b>Gross domestic product<sup>c</sup></b> (current USD)
<b>Lower-middle -income</b>	<b>Country income classification<sup>c</sup></b>
<b>11.3</b>	<b>Population living in poverty<sup>c</sup></b> (%)
<b>99.41</b>	<b>Total health expenditure per capita<sup>c</sup></b> (current USD)

a World Health Organization  
b Indonesia Sub-directorate for Malaria  
c The World Bank  
\*Data are from 2015

Past studies have suggested that inadequate financial investments and a lack of political will can derail progress and lead to resurgence of malaria. Largely due to decentralization, local governments with relatively low resource bases for revenue generation and a high burden of disease are particularly at risk in Indonesia. The fractured financing and health systems in Indonesia require strong leadership from provincial and district health offices in managing and financing critical malaria elimination efforts.

## Developing an Investment Case

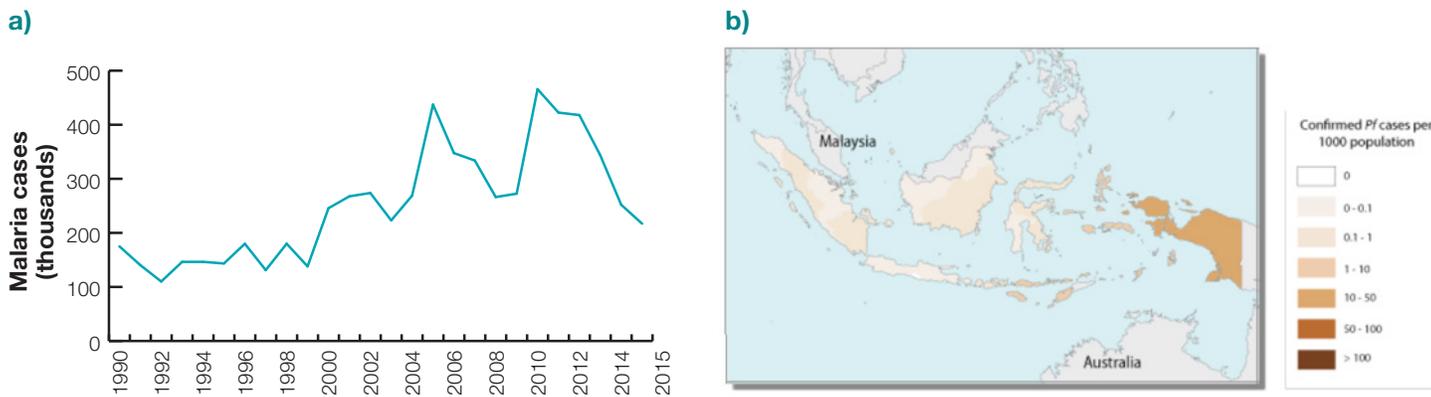
To support Indonesia's resource mobilization and advocacy efforts, the Malaria Elimination Initiative at the University of California, San Francisco Global Health Group, in collaboration with the Center for Health Research of the University of Indonesia and the Sub-directorate of Malaria of the Ministry of Health, developed an investment case for malaria elimination. The investment case estimates the costs and economic and financial returns of malaria elimination through 2030 and explores feasible and sustainable financing options for malaria efforts in Indonesia. This study has a number of limitations. The transmission model was designed with a single homogeneous patch for the whole of each country. Thus, spatial heterogeneity within each country was not modeled including malaria transmission and intervention. The full-length report, including detailed results and methodology, is accessible through [shrinkingthemalariamap.org](http://shrinkingthemalariamap.org).

## Costing Current Malaria Efforts

Using data from Indonesia's Sub-directorate of Malaria and a diverse sample set of seven provinces and 14 districts, the direct economic cost of the current malaria program was estimated to be approximately USD 147 million per year or USD 0.79 per capita (ranging from USD 0.27 per capita in malaria-free areas to USD 3.49 per capita in high-burden areas).

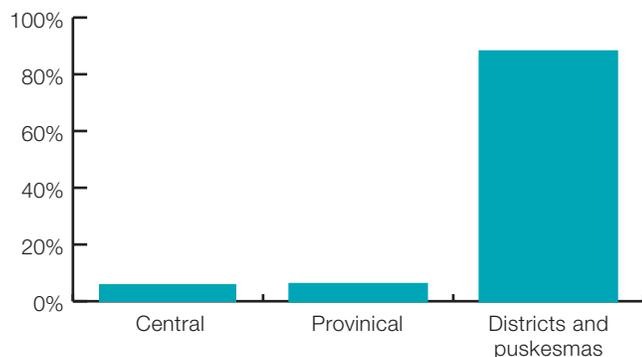
If indirect costs, such as productivity losses, are included, the total economic burden jumps to a staggering USD 205 million for 2015.

**Figure 1. a) Reported malaria cases,\* 1990–2015; b) *Plasmodium falciparum* endemicity map of Indonesia,† 2015**



\*Data and map from the World Health Organization's World Malaria Report (2016)

**Figure 2. Economic cost share by level of health facility, 2015**



Puskesmas = village level health facility

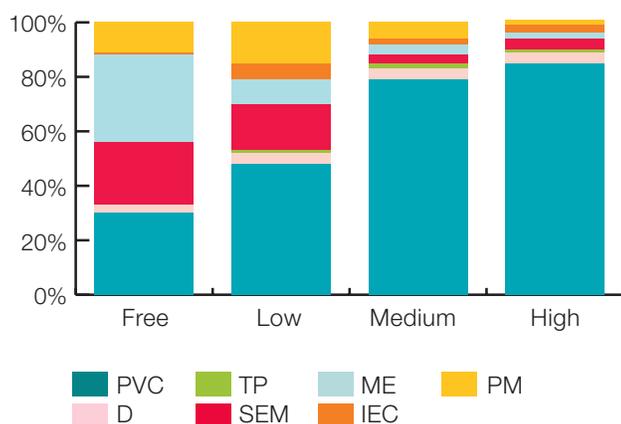
The financial cost, defined as the cost of the program's recurrent budget line items (i.e., excluding non-recurrent expenses such as capital or non-malaria personnel, as well in-kind donations), for 2015 was estimated at USD 60.9 million, which translates to USD 0.85 per population at risk (PAR).

Figure 2 shows that the majority of costs (89%) for malaria are shouldered by local levels of government, mainly districts and puskesmas (village health facilities).

Across sample districts, consumables (such as diagnostics, treatments, and bed nets) constituted the largest share of input costs (57%), followed by services (24%) and human resources (13%). Capital costs, such as vehicles and other durable supplies, constituted only about 6% of total malaria expenditures.

As shown in Figure 3, the majority of vector control activities are conducted in medium- to high-burden districts; however, even in malaria-free districts, vector control activities still comprise 30% of total costs.

**Figure 3. Distribution of economic cost by activities across levels of endemicity, 2015**



PVC – prevention and vector control; D – diagnosis; TP – treatment and prophylaxis; SEM – surveillance and epidemic management; ME – monitoring and evaluation; IEC – information, education, and communication; PM – program management

Vector control activities are still conducted in malaria-free districts such as Bali, mainly in the form of larviciding in order to prevent outbreaks from occurring. Malaria-free and low-endemic areas spend more as a share of total costs on monitoring and evaluation (32% and 9%, respectively) and surveillance and epidemic management (20% and 15%, respectively).

## Costing Malaria Elimination by 2030

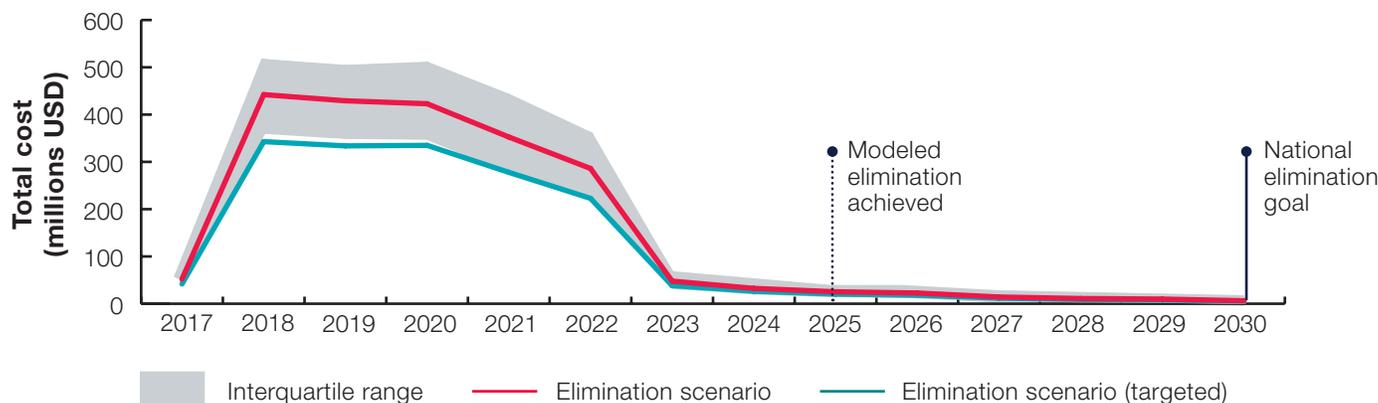
To estimate the costs of malaria elimination, a dynamic transmission model was used to determine the minimum interventions required to interrupt malaria transmission in Indonesia.

The modeled elimination scenario, which reflects national malaria interventions and targets, includes (1) 30% protective effectiveness of long-lasting insecticidal nets (LLINs); (2) 80% health system treatment rates by 2025; (3) increased surveillance; (4) switching from quinine to injectable artesunate for treatment of severe malaria in 2017; (5) 2% of PAR covered by indoor residual spraying; and (6) 13% of PAR covered by LLINs. The modeled elimination scenario also requires five annual rounds of mass drug administration (MDA) beginning in 2018 in order to successfully achieve elimination – an aggressive and costly intervention not currently employed by the malaria program. The elimination scenario projects elimination can be achieved in Indonesia by 2025 – five years before the national goal of 2030 – at an estimated cost of USD 2 billion over 15 years or an average of USD 145 million per year (Figure 4).

The costs remaining after 2025 are mainly for prevention of reintroduction (POR). The transmission model does not account for the cost of the additional POR activities beyond 2030, but until global eradication is achieved a minimal level of costs will remain necessary to prevent reintroduction.

The price tag of USD 2 billion for malaria elimination by 2030 could be decreased by 21% through improved targeting of interventions (approximated in the model by reductions in PAR covered by interventions).

The difference between the current economic and financial costs of the malaria program and the modeled cost of elimination are due to differences in methodology – the model assumes fully implemented interventions (as described in the scenarios) with 100% efficiency and does not include broader program costs (i.e., including capital and non-essential malaria personnel). Hence, modeled elimination costs before MDA is implemented (2016–2017) are much lower than the estimated economic and financial costs for 2015.

**Figure 4. Malaria elimination scenario costs in Indonesia, 2017–2030****Table 1. Projected malaria elimination financial gap in Indonesia, 2016–2020 (millions USD)\***

	2016	2017	2018	2019	2020	Average
Domestic financing**	20.4	16.2	21	21.5	22.1	20.3
Global Fund Funding**	17.4	30.3	17.8	17.9	17.8	20.2
Projected modeled cost for elimination	30.2	52.2	444.2	429.1	422.9	275.3
<b>Financial gap (available - total cost)</b>	<b>-7.6</b>	<b>5.6</b>	<b>403.2</b>	<b>389.7</b>	<b>382.9</b>	<b>234.8</b>

\* The latest WHO World Malaria Report (2016) provides available financing for malaria up to 2015; therefore, the financing gap for 2016 is included in this table as a projection.

\*\*Estimated available funding projections obtained from the Sub-directorate of Malaria, Indonesia

## Eliminating Malaria: What Are the Benefits?

By investing in malaria elimination between 2016 and 2030, Indonesia can expect to see a return on investment of 10 to 1, over 25 million clinical cases averted, over 41,000 lives saved, and over USD 18 billion in net economic benefits. If investment decreases below current levels and intervention coverage ceases or decreases, Indonesia could face 35 million new clinical cases and 74,000 additional deaths between 2016 and 2030.

## Estimating Current and Future Financial Gaps

Current donor and government funding for malaria do not meet the amount of financing required to eliminate malaria in Indonesia. Given the projected available financing for malaria in Indonesia for 2016–2020 (USD 203 million), the estimated funding gap for this period needed to achieve malaria elimination is USD 1.3 billion

or an average of USD 234 million per year (Table 1). Implementing MDA is by far the main driver of the financial gap, causing costs to soar between 2018 and 2022 as multiple annual rounds are administered. The apparent surplus in 2016 is due to a combination of the modeled elimination intervention costs at 100% efficiency and an underestimation of domestic resources available from the subnational levels.

## Securing Adequate Resources

To meet the financial requirements of malaria elimination and achieve national elimination by 2030, Indonesia must significantly increase domestic financing for malaria and improve the economic and operational efficiency of its current malaria program.

Despite healthy economic growth, government spending on health as a percent of gross domestic product over the last 10 years has also been low – ranging from 0.8% in 2005 to 1% in 2014 – and ranks lower than many comparable countries. In 2015, government funding for malaria in Indonesia comprised only 0.06% of its total domestic health expenditure.

Indonesia may reduce the financial gap for malaria by increasing central government contributions. Further, increased subnational advocacy will be needed to augment local funding streams and garner more local-level political support for elimination.

While the private sector mining industry has been engaged in malaria efforts, there are opportunities to expand to other large industries that could benefit from malaria elimination such as agriculture, forestry, and tourism. Engaging these sectors and making a business case for why Indonesia's malaria-free status could be beneficial to their industry (i.e., by increasing worker productivity or increasing tourism), could lead to increased and diversified investments for malaria programming.

Implementing innovative financing mechanisms could also unlock untapped resources that could fill Indonesia's large funding gaps. One such method is a "Sin tax," or a tax on tobacco or alcohol. In Indonesia, taxes on cigarettes amount to 46% of the price, yet the maximum excise rate under Indonesian law is 57%. As taxes gradually rise to 57%, the government is expected to see an increase revenue by 20–34% and a portion could be earmarked for health and malaria.

Without significant tax reform and health prioritization, it will be difficult for the government of Indonesia to capture sustained revenue to support health programs. Allocating a portion of tax revenue to malaria could provide a sustainable source of funding to help Indonesia fight malaria and achieve elimination.

The evidence generated by this study can be used by the Sub-directorate for Malaria and its partners to advocate for increased resources to overcome the significant financial gaps to achieving malaria elimination in Indonesia.

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The **Malaria Elimination Initiative (MEI)** at the University of California San Francisco (UCSF) Global Health Group believes a malaria-free world is possible within a generation. As a forward-thinking partner to malaria-eliminating countries and regions, the MEI generates evidence, develops new tools and approaches, documents and disseminates elimination experiences, and builds consensus to shrink the malaria map. With support from the MEI's highly-skilled team, countries around the world are actively working to eliminate malaria – a goal that nearly 30 countries will achieve by 2020.

[shrinkingthemalariamap.org](http://shrinkingthemalariamap.org)

