The Solomon Islands aims to progressively eliminate malaria to achieve its national elimination goal of 2035.

Overview
The Solomon Islands has experienced a 73 percent decrease in reported malaria cases between 2000 and 2014, from 68,107 cases to 18,404 cases. \(^1\) Deaths due to malaria have decreased by 68 percent since 2003 from 71 deaths to 23 deaths. \(^1\) Ninety-nine percent of the population is at risk for malaria. \(^1\) Infections occur primarily from *Plasmodium falciparum* and *P. vivax*, with *P. falciparum* accounting for about 54 percent of cases. \(^1\) The main malaria vector is *Anopheles farauti* and secondary vectors include *An. punctulatus* and *An. kolienensis*. \(^2\) The malaria eradication program of the 1970s nearly eliminated the vectors *An. punctulatus* and *An. kolienensis*, and these vectors are uncommon with a patchy distribution across the island nation. \(^3\) However, *An. farauti* has maintained effective transmission by changing its biting behavior to early evening, outdoor biting in response to earlier control methods employed in Solomon Islands. \(^3,4\) Transmission occurs throughout the year with two transmission peaks in February/March and September/October. \(^5\)

Malaria is endemic throughout the Solomon Islands, however, there is marked variation among the 10 provinces. \(^3\) Over the last decade the country has scaled up its malaria control activities and cases have continued to decline. \(^1,6\) Since 2007, the Solomon Islands has been pursuing aggressive malaria control and progressive elimination. \(^7\) Solomon Islands has set a 2035 goal for national malaria elimination. \(^5\) The Solomon Islands is a country partner of 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. \(^8,9\)

Progress Toward Elimination
In 1954, 96 percent of the population of the Solomon Islands was living in malarious regions. \(^11\) In the 1960s, as part of the Global Malaria Eradication Program (1955–1970), the Solomon Islands developed a malaria elimination plan that centered on the wide-spread implementation of indoor residual spraying (IRS) using dichlorodiphenyltrichloroethane (DDT). \(^11,12\) Vector control reduced malaria to only 3,500 reported cases in 1975. \(^13\) The following year malaria operations were decentralized, further exacerbating the program’s technical and financial limitations. By the year 1981 there were 60,000 malaria cases recorded. \(^3,7,13\) The strategic aim of the national malaria program was changed from elimination to control. \(^3,13,14\) Throughout the 1980s, improved case detection and reporting artificially elevated the number of malaria cases. \(^15\) In 1992, malaria cases reached 141,400 and there were 46 deaths. \(^16\) That same year, in response to such high levels of malaria morbidity and mortality, the Ministry of Health and Medical Services reoriented its malaria control objectives to: (1) reduce mortality and morbidity through early detection and treatment, and (2) reduce human-vector contact, primarily through the use of insecticide-treated bed nets (ITNs). \(^15\) ITNs became a major component of the malaria control strategy as a result of the effectiveness demonstrated in the region. \(^15,14\) Nationally, the malaria incidence fell by 67 percent between 1992 and 1999. Honiara, the country’s highly endemic capital, reported a 92 percent reduction in cases between 1995 and 1999. \(^12,17\) However, progress in malaria...
Eliminating malaria in the SOLOMON ISLANDS

Malaria Transmission Limits

*Plasmodium falciparum*

*Plasmodium vivax*

control was hindered at the turn of the century. Increasing civil unrest, a political coup in June 2000 and subsequent financial crisis, led to a significant disruption of malaria control activities and health services in the Solomon Islands. During this time, malaria cases rose from 68,107 in 2000 to 92,227 in just three years. IRS with DDT coverage gradually increased from 2001 to 2004, but as a result of the Stockholm Convention on Persistent Organic Pollutants, restrictions were put in place on the importation of DDT, and the insecticide was eventually phased out of national program activities. With the restriction on DDT, the Vector Borne Disease Control Program (VBDCP) introduced pyrethroid insecticides and placed a greater emphasis on quality coverage and safe spraying techniques. In 2003, the Solomon Islands (and neighboring country Vanuatu) received a Round 2 malaria grant from the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) to help the VBDCP reduce malaria morbidity by 50 percent and mortality by 80 percent. The major strategies utilized in this plan included: (1) strengthening and expanding malaria diagnostic services by involving community health volunteers; (2) developing social marketing strategies to increase ITN coverage; and (3) working with church and village leaders to strengthen community education on malaria prevention. As a result of increased financial support and the reestablishment of core malaria interventions, malaria cases in the Solomon Islands fell from 92,227 in 2003 to 75,337 cases in 2006.
In 2006, the Solomon Islands received additional funding from the Global Fund to further scale-up malaria interventions with the ultimate aim of achieving 100 percent long-lasting insecticide-treated bed net (LLIN) coverage by 2010 and increasing rapid diagnostic test (RDTs) coverage. In 2008, the government shifted the strategic approach of its national malaria program from control to elimination, and began implementing a strategy of intensified control and spatially progressive elimination, targeting the provinces of Isabel and Temotu for elimination. In 2008, the Solomon Islands changed its national treatment guidelines for malaria from sulfadoxine-pyrimethamine (SP) to artemisinin-based combination therapy (ACTs). Currently, artemether-lumifantrine (AL) is the first line drug used to treat uncomplicated \textit{P. falciparum} and \textit{P. vivax} infections. The addition of primaquine (PQ) + AL is recommended for treatment of \textit{P. vivax} but is rarely prescribed due to concerns about glucose-6-phosphate-dehydrogenase (G6PD) deficiency.

G6PD deficiency is estimated at 14 percent of the total population but variation between provincial populations and in the severity of the deficiency is unconfirmed. Diagnosis and treatment of malaria are provide for free for all ages in the public sector. Currently there is no evidence of artemisinin resistance in the Solomon Islands. However, there is moderate resistance in \textit{An. farauti} to pyrethroid-based insecticides in Malaita, Guadalcanal, and Central provinces. Continued monitoring for insecticide resistance is planned.

In 2013, a national survey showed that 91 percent of households in Solomon Islands owned at least one LLIN compared to 49 percent in 2007. Additionally, 33 percent of households were targeted for IRS, showing improvement on past years. The National Malaria Control Program (NMCP) also reported that 95 percent of health facilities were equipped with RDTs or microscopy. However, presumed diagnosis remains the norm in Solomon Islands; only 48 percent of all treated cases were confirmed. There was an 86 percent adherence rate to the national treatment guidelines among all treated cases.

External funding for the malaria program is provided by the Global Fund, the Australian Department of Foreign Aid and

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**GOALS:**

1. Reduce the annual parasite incidence (API) to less than 25 per 1,000 in 2020
2. Eliminate malaria in Temotu and Isabel Provinces by 2020, and Western Province by 2025
3. National elimination by 2035

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After a peak in cases in 2003, largely attributed to civil unrest in the country, malaria cases have consistently declined in the Solomon Islands. *Solomon Islands does not distinguish between local and imported when reporting case numbers.

Challenges to Eliminating Malaria

Case Management

The shortage of trained health workers affects the quality of malaria case management in the Solomon Islands.\textsuperscript{5} Presumptive treatment is still common practice and supervision of program activities is not sufficient.\textsuperscript{5} Professional development and staff training are needed to improve technical understanding, management skills and administrative capacity.\textsuperscript{5,6} Funding for the malaria staff workers is also limited, which creates difficulties in maintaining field operations.\textsuperscript{6} In recognition of this gap, improvements to the quality of case management and staff training is planned under the 2015–2020 National Malaria Strategic Plan and the 2015–2017 Global Fund grant.\textsuperscript{5}

Plasmodium vivax malaria

In the two elimination provinces of Isabel and Temotu, a challenge is the elimination of \textit{P. vivax}.\textsuperscript{27} Current program data indicate that \textit{P. falciparum} has nearly been eliminated in these areas.\textsuperscript{27} The current trends in transmission of predominantly \textit{P. vivax} infections, the prevalence of G6PD deficiency in the population, and the lack of a sensitive and easy-to-use diagnostic tool for field-based screening of G6PD deficiency, create challenges for malaria elimination in these provinces.\textsuperscript{27,28}

Asymptomatic plasmodium infections

The prevalence of asymptomatic plasmodium infections among populations living in areas of low malaria transmission in the Solomon Islands has been documented.\textsuperscript{29,30} This presents a challenge in elimination settings as asymptomatic cases may seed further transmission but evade standard case detection methods.\textsuperscript{29} To achieve progressive elimination, screen and treat campaigns will need to take asymptomatic malaria cases into account.\textsuperscript{29}

Conclusion

The Solomon Islands is implementing a spatially progressive approach to malaria elimination. With sustained technical assistance and political and financial support, the Solomon Islands will achieve its national goals of reduced API, subnational malaria elimination in three provinces by 2025, and national malaria elimination by 2035 all while maintaining intensive malaria control throughout the country.
Sources

Transmission Limits Maps Sources


About This Briefing

This Country Briefing was developed by the UCSF Global Health Group’s Malaria Elimination Initiative, in collaboration with the National Vector Borne Disease Control Program in the Solomon Islands. Malaria transmission risk maps were provided by the Malaria Atlas Project. This document was produced by Kelly Harvard; 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 (UCSF) 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 works at global, regional and national levels to accelerate progress towards eradication by conducting operational research to improve surveillance and response, strengthening political and financial commitment for malaria elimination, and collaborating with country partners to shrink the malaria map.

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.