



Eliminating malaria in SWAZILAND

Swaziland achieved a 72 percent decrease in reported malaria cases between 2000 and 2014 and is poised to eliminate malaria by 2017.

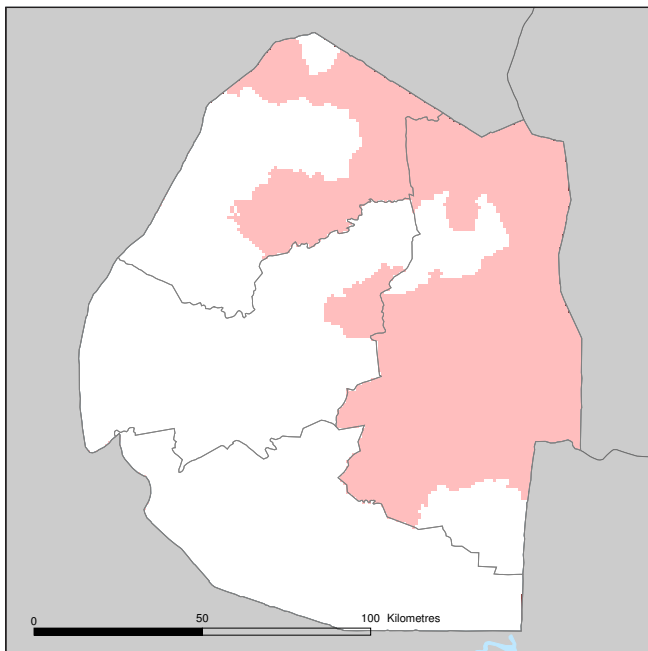
At a Glance^{1,2}

389	Local cases of malaria (100% <i>falciparum</i>)
4	Deaths from malaria
28	% population at risk (total population: 1.2 million)
0.31	Annual parasite incidence (cases/1,000 total population/year)
N/A	% slide positivity rate

N/A: Data not available

Malaria Transmission Limits

Plasmodium falciparum







Overview

Swaziland is located on the southern endemic margin of malaria transmission in sub-Saharan Africa, and is working to become the first mainland country in the region to eliminate malaria. Swaziland has dramatically decreased its malaria burden, moving from 1,395 cases in 2000 to only 389 cases in 2014.¹ In 2014, 100 percent of malaria cases in Swaziland were due to *Plasmodium falciparum*.² *Anopheles arabiensis* is the primary vector responsible for malaria transmission; *An. gambiae*, *An. merus* and *An. funestus* served as secondary vectors in the past, but have not been implicated in recent years.^{3,4}

Most malaria transmission in Swaziland occurs in the lowlands of the Lubombo region during the rainy season, which is between November and May, with a peak in March or April.^{4,5} Historically, Swaziland has experienced several nationwide epidemics following heavy wet seasons, with as many as 50,000 cases recorded in 1946 after a particularly intense rainy season.⁵

In 2008, with the support of a Global Fund grant, Swaziland began transitioning from malaria control to elimination with a strategic plan centered on robust surveillance and response

	Water
	<i>P. falciparum</i> free
	Unstable transmission (API < 0.1)
	Stable transmission (≥ 0.1 API)

P. falciparum malaria risk is classified into no risk, unstable risk of < 0.1 case per 1,000 population (API) and stable risk of ≥ 0.1 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.



and strengthened case management.⁶ The Ministry of Health (MOH) recently released its National Malaria Elimination Strategic Plan 2015–2020 with the goal of accelerating progress toward elimination by the end of 2015.⁴ Further support for Swaziland’s elimination goal is generated through the country’s participation in the Elimination Eight (E8), a regional initiative composed of eight countries wherein the four “front-line” countries embarking on malaria elimination—Botswana, Namibia, South Africa, and Swaziland—coordinate their efforts with the four “second-line” countries—Angola, Mozambique, Zambia, and Zimbabwe.⁷

Progress Toward Elimination

Swaziland’s National Malaria Control Program (NMCP) was created in 1946, largely funded by the World Health Organization (WHO). In that year, the country experienced about 45,000 clinical cases after a particularly heavy wet season, with more than 60 percent of children between the ages of 1 and 12 afflicted.⁵ Most cases occurred in the hyperendemic lowlands, while at higher altitudes, malaria

was unstable with epidemics occurring after excessive rainfall or extended droughts.³ *An. gambiae* was the main malaria vector during this period, and *P. vivax* accounted for 5–10 percent of all cases.⁸ Indoor residual spraying (IRS) with DDT commenced in 1949 and was scaled up to cover all malarious areas by 1955. Between 1952 and 1957, IRS effectively drove down vector capacity in the country and parasite prevalence plummeted from 24 percent to 0.4 percent, prompting Swaziland to be recognized as a leader in malaria control at the second African Malaria Conference in 1955.^{3,5}

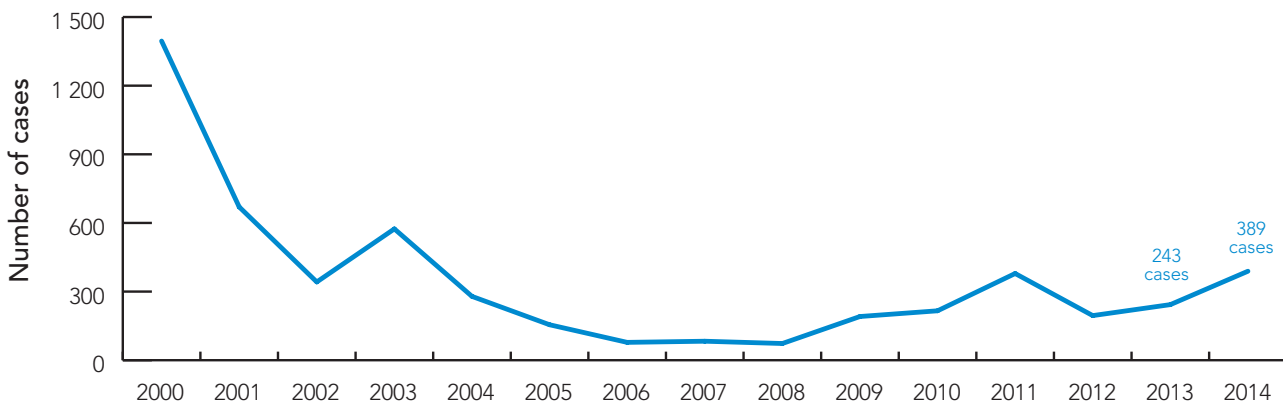
In 1969, with the implementation of a robust surveillance system that could quickly identify new malaria cases and help quantify importation risk, malaria incidence reached its lowest recorded level of just 46 cases, only 10 of which were indigenous.⁵ The next year, WHO decreased funding for Swaziland’s malaria program, deeming the disease a low public health priority for the country. At the same time, increasing employment opportunities on Swaziland’s growing sugar estates drove an influx of agricultural laborers from Mozambique. This led to increased incidence of imported

Goals:⁴

1. Eliminate malaria by the end of 2015
2. Achieve World Health Organization certification of elimination by 2018

Swaziland has not officially updated these goals but is continuing to make progress toward elimination.

Reported Malaria Cases*



The slight increase in cases between 2012 and 2013 has been attributed to improved case reporting as well as a heavier than usual rainy season.

*As of 2010, only local cases are shown.

Source: World Health Organization, World Malaria Report 2015



malaria, and local transmission was soon reestablished.⁹ In 1977, a nationwide malaria epidemic occurred, leaving 87 dead and 1,473 sick with confirmed malaria.⁵

Control efforts reduced the malaria burden to 350 cases in 1981 and 230 cases in 1982. However, the NMCP’s capacity to further reduce malaria transmission was limited by program funding cuts and subsequent disruption of malaria services in 1986, the emergence of chloroquine resistance in *P. falciparum* (the cause of all malaria cases in the country by this period) and a civil war in Mozambique which increased migration into Swaziland.^{5,10} Malaria cases surged to 5,450 in 1988, prompting assistance from the South African Trade Commission and the United States Agency for International Development (USAID) to enable the malaria control unit to expand IRS coverage with DDT. These efforts helped reduce malaria incidence by 56 percent over the next two years to just 2,400 cases in 1990.⁵ However, South Africa reduced malaria control funding to Swaziland in 1991 and, in conjunction with intense rainfall, further spread of chloroquine resistance, and a health system struggling with an emerging HIV epidemic, the country experienced over 38,000 probable and 9,700 confirmed malaria cases in 1995.⁵

In 1999, the Lubombo Spatial Development Initiative (LSDI) was launched by the governments of Mozambique, South Africa, and Swaziland with a goal of establishing an international coordination mechanism to build capacity for regional malaria control data-sharing, ultimately leading to the reduction of transmission and subsequent economic development across all three countries. The malaria control component of the initiative included regionally-coordinated IRS in the shared border areas and the adoption of artemisinin-based combination therapy (ACT) in place of chloroquine as first-line treatment.¹¹ Beginning in 2003, LSDI was largely funded by the Global Fund through regional grants until its termination in 2010.^{12,13}

Upon receiving a country-level Global Fund Round 2 grant in 2003, Swaziland’s malaria situation improved dramatically, with incidence declining from 49 to just 9 per 1,000 population at risk between 2002 and 2009. The funding supported the expansion of vector control activities and strengthening of epidemic detection and response capacity, with the goal of reducing malaria morbidity and mortality by 2007.¹⁴ Beginning in 2005, the NMCP provided consistent IRS application for 90,000 to 100,000 structures in at-risk areas each year and supplemented spraying with insecticide-treated net (ITN) distribution.⁵ By this time, the country had already

achieved Roll Back Malaria’s Abuja target as well as the Millennium Development Goal to halve malaria deaths by 2010, prompting a reorientation of the malaria program from control to elimination in 2007.¹⁵

In 2008, Swaziland developed a seven-year malaria elimination strategic plan and received a Round 8 Global Fund grant for pre-elimination, strengthening four key programmatic areas: (1) case management with confirmation of diagnosis and ACTs as treatment; (2) integrated vector management through joint IRS and long-lasting insecticide-treated net (LLIN) distribution campaigns for at-risk areas; (3) active disease surveillance and epidemic response systems; and (4) information, education, and communication (IEC) campaign for elimination.⁶ Starting in 2010, all public health and private sector facilities received the ACT artemether-lumefantrine as a first-line therapy for malaria, in accordance with case management guidelines. Also in 2010, the NMCP rolled out a campaign to provide rapid diagnostic tests (RDTs) to all health centers and developed a policy for all suspected cases to receive confirmation by RDT or microscopy. Subsequently, confirmed malaria cases increased by 65 percent, and overall reported malaria cases declined by 77 percent.⁵ Compliance with case management standards

Eligibility for External Funding^{18–20}

The Global Fund to Fight AIDS, Tuberculosis and Malaria	Yes
U.S. Government’s President’s Malaria Initiative	No
World Bank International Development Association	No

Economic Indicators²¹

GNI per capita (US\$)	\$2,700
Country income classification	Lower middle
Total health expenditure per capita (US\$)	\$256
Total expenditure on health as % of GDP	8
Private health expenditure as % of total health expenditure	25



was further strengthened through the passage of Swaziland's national malaria elimination policy in 2011 and the development of the national advisory body, the Swaziland Malaria Elimination Advisory Group, which regularly reviews elimination strategies and policies.¹⁶ As a result of these efforts, case confirmation rate for the 2013–2014 malaria transmission season was a strong 83 percent.¹

In January 2015, Swaziland was awarded a three-year, US\$ 4 million grant by the Global Fund to support the goals of malaria elimination by the end of 2015 and attainment of WHO malaria-free certification by 2018, as outlined in the NMCP's National Malaria Elimination Strategic Plan 2015–2020. The new funding will support the four objectives laid out in the strategic plan: 1) all infections are identified by parasitological-based diagnostic tests and immediately reported; 2) all confirmed infections are treated according to national guidelines; 3) all active foci are identified and eliminated through intensified surveillance, targeted vector control, environmental management, and human parasite reservoir interventions; and 4) all surveillance systems are in place to achieve WHO's certification of elimination by 2018, with subsequent transition to a prevention of reintroduction program.^{4,17}

Challenges to Eliminating Malaria

Cross-border coordination with Mozambique

According to a 2012 malaria survey, about two-thirds of confirmed malaria cases in Swaziland are not locally acquired, with the majority originating from Mozambique.²² The border between these two countries is porous, and because Mozambique has a higher burden of malaria, this poses a significant threat to Swaziland's progress toward elimination. Greater efforts are needed to synchronize case investigation activities, integrated vector control measures, and treatment standards along border regions. The accomplishments of LSDI demonstrate that Swaziland and Mozambique, along with South Africa, can effectively work together to support regional malaria goals. Regional cooperation facilitated through E8 membership will help to strengthen cross-border coordination of malaria activities.

Diagnostic sensitivity and surveillance

Malaria elimination in Swaziland hinges on the country's surveillance system and its ability to efficiently identify new cases, investigate secondary cases, differentiate local cases from imported ones, and respond to each case promptly. Swaziland has developed a robust surveillance system, but the country faces unique obstacles due to its increasingly low transmission. A decreasing malaria burden often leads to waning microscopy skills and increased sub-patent infections that are not detected using RDTs. The NMCP has struggled to determine which diagnostic tools will enable the most accurate secondary infection detection in a cost-effective, scalable manner.

Sustained financial commitment

In 2008, Swaziland was the first country in sub-Saharan Africa awarded a Global Fund grant specifically earmarked for malaria elimination, and in 2014, the malaria program secured additional funding for elimination from the Global Fund for three years. However, as donor budgets continue to shrink, Swaziland's malaria elimination activities may receive lower priority in the near future, particularly at the crucial moment when the program is seeking WHO certification of elimination. As malaria becomes a less pressing public health issue, the national program must identify ways to maintain the financial and political resources that have brought the country to the brink of eliminating malaria today; otherwise, the malaria resurgences of the past may become Swaziland's future once again.

Conclusion

Through increased cooperation with Mozambique to reduce imported malaria, further strengthening of its surveillance and response efforts, and continued support from the Global Fund and domestic financing sources, Swaziland is poised to achieve malaria elimination by 2017.



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Transmission Limits Maps Sources

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About This Briefing

This Country Briefing was developed by the UCSF Global Health Group's Malaria Elimination Initiative, in collaboration with Swaziland's National Malaria Control Program. To send comments or for additional information about this work, please email Anne.Bulchis@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.

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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.