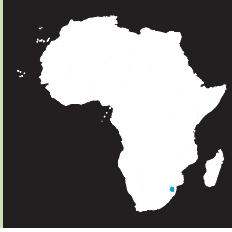
COUNTRY BRIEFING



Eliminating malaria in SWAZILAND

Swaziland has achieved a 98 percent decrease in reported malaria cases between 2000 and 2011 and is aiming to eliminate malaria by 2015.

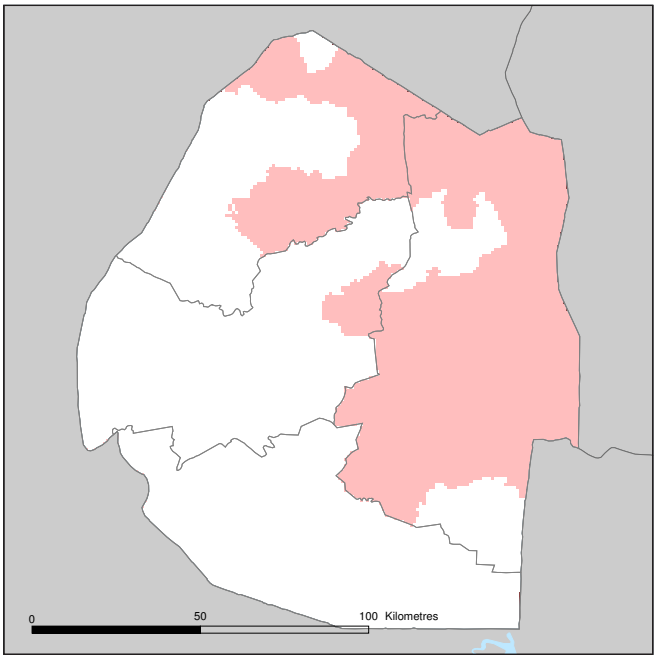
At a Glance[1]

797	Reported cases of malaria (*P. falciparum* only)
8	Deaths from malaria
28	% of population at risk (total population: 1.2 million)
0.66	Annual parasite incidence (cases/1,000 total population/year)
N/A	% Slide positivity rate

Source: World Health Organization, World Malaria Report 2012
N/A: Data not available

Malaria Transmission Limits

Plasmodium falciparum



Overview

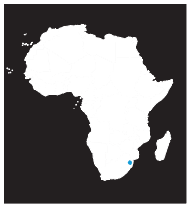
Swaziland is located on the southern endemic margin of malaria transmission in sub-Saharan Africa. Swaziland has dramatically decreased its malaria burden in the last 15 years, moving from a high of nearly 39,000 cases in 1996 to only 797 cases in 2011.[1] In 2011, 100 percent of malaria cases in Swaziland were due to *Plasmodium falciparum*.[1] *Anopheles arabiensis* and *An. funestus* are the vectors primarily responsible for malaria transmission, with *An. merus* and *An. nili* serving as secondary vectors.[2] Approximately 28 percent of Swaziland's population is at risk for malaria, particularly residents living near the country's eastern border, which is shared with Mozambique and South Africa.

Most cases occur in the Lubombo district and during Swaziland's rainy season, which is between November and May and peaks in February and March.[3] 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.[3]

In 2008, with the support of a Global Fund grant, Swaziland began transitioning from malaria control to elimination; the country's Malaria Elimination Strategic Plan centers on robust surveillance and response and strong case management. Swaziland is a member of the Elimination Eight (E8),

- Water
- *P. falciparum* 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.



a regional initiative composed of eight countries wherein the four "front-line" countries—Botswana, Namibia, South Africa, and Swaziland—embarking on malaria elimination coordinate their efforts with the four "second-line" countries—Angola, Mozambique, Zambia, and Zimbabwe.[4] With continued financial and political commitment, improved surveillance techniques, and cross-border collaboration with Mozambique, Swaziland may become the first mainland sub-Saharan African country to eliminate malaria by 2015.[5]

Progress Toward Elimination

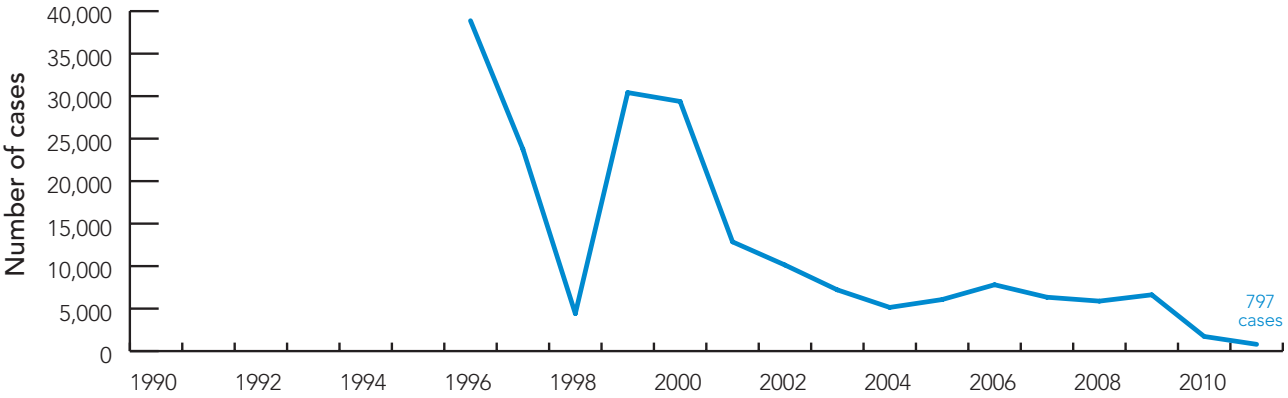
Swaziland's National Malaria Control Program (NMCP) was created in 1946 and was largely funded by the World Health Organization (WHO). In that year, the country experienced about 45,000 clinical cases after a particularly heavy wet season, infecting more than 60 percent of children between the ages of 1 and 12.[3] 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, and parasite prevalence plummeted from 24 percent to 0.4 percent,[3] prompting Swaziland to be recognized as a leading African country for malaria control at the second African Malaria Conference in 1955.

With the implementation of a robust surveillance system that could detect malaria importation risk, malaria incidence in 1969 reached its lowest recorded level with only 46 reported cases, 36 of which were non-indigenous.[3] The next year, WHO decreased funding for the country's malaria program, perceiving the disease as a minimal public health issue for Swaziland. At the same time, the extensive use of agricultural laborers from Mozambique to fill employment demands at Swaziland's growing sugar estates brought more imported malaria, and malaria was soon reestablished.[6] By 1977 a nationwide malaria epidemic occurred, leaving 87 dead and 1,473 sick with confirmed malaria.[3]

Control efforts reduced confirmed malaria to 350 cases by 1981 and 230 cases in 1982.[3] However, the country's capacity to maintain low malaria transmission was challenged by program funding cuts, the emergence of chloroquine

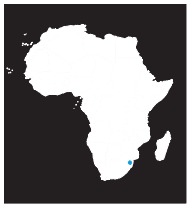
GOAL: Achieve national malaria elimination by 2015.[5]

Reported Malaria Cases



Cases have decreased dramatically between 1999 and 2011, from more than 30,000 cases to 797 cases. This impressive reduction has been largely attributed to focal vector control, improved case management, and expanded malaria surveillance activities.

Source: World Health Organization, World Malaria Report 2012



resistance and a civil war in Mozambique which increased migration into Swaziland.[3] Malaria surged to 5,450 cases in 1988, prompting assistance from the South African Trade Commission and the United States Agency for International Aid (USAID) to enable the malaria control unit to expand IRS coverage with DDT.[3] These efforts helped reduce malaria incidence by 56 percent over the following two years, reducing cases in 1990 to 2,400. However, South Africa reduced malaria control funding to Swaziland in 1991 and, in conjunction with intense rainfall, drug resistance to chloroquine, and a health system struggling with the emerging HIV epidemic, the country experienced over 38,000 probable and 9,700 confirmed malaria cases in 1996.[3]

In 1999, the Lubombo Spatial Development Initiative (LSDI) was established and regionally coordinated IRS was administered in the shared border areas of Mozambique, South Africa and Swaziland.[7] Often heralded as a model regional economic initiative that effectively controlled cross-border malaria transmission,[3] LSDI has helped to achieve malaria reductions in all three countries; for example in Swaziland, between 1998 and 2008, a 98 percent reduction in the annual incidence of malaria was achieved.[3]

Upon receiving a Global Fund Round 2 grant in 2003, Swaziland improved its vector control activities and dramatically reduced malaria incidence from 49 per 1,000 population at risk in 2002 to nine in 2009. In 2005, Swaziland achieved Roll Back Malaria's Abuja target and Millennium Development Goal on malaria—to halve malaria deaths by 2010— five years prior to the prescribed deadline, and then commenced its malaria elimination campaign in 2007.[7] Beginning in 2005, Swaziland 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.[3]

By 2008, Swaziland developed a seven-year malaria elimination strategic plan and received a Round 8 Global Fund grant for pre-elimination, which would strengthen four key interventions and program areas:[8] (1) case management with confirmation of diagnosis and artemisinin-based combination therapies (ACTs) as treatment; (2) integrated vector management through joint IRS and long-lasting insecticide-treated net (LLIN) distribution campaigns for at-risk areas; (3) expanding active disease surveillance and epidemic response systems in all confirmed cases; and (4) establishing an information, education, and communication (IEC) campaign for elimination.

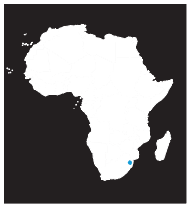
Starting in 2010, all public health and private sector facilities received the ACT artemether-lumefantrine (AL), as a first-line therapy for malaria, in accordance with case management guidelines. In 2010, the National Malaria Control Program rolled out its campaign to provide rapid diagnostic tests (RDTs) to all health centers and developed a policy that all suspected cases receive confirmation by RDT or microscopy; subsequently, confirmed malaria cases increased by 65 percent, and overall reported malaria cases declined by 77 percent.[3] Compliance to case management standards was further strengthened by the passage of Swaziland's national malaria elimination policy in 2011[9] and the development of the national advisory body, the Swaziland Malaria Elimination Advisory Group, which regularly reviews the elimination strategy and policy.

Eligibility for External Funding[19–21]

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

Economic Indicators[22]

GNI per capita (US$)	$7,470
Country income classification	Upper middle
Total health expenditure per capita (US$)	$432
Total expenditure on health as % of GDP	5.1
Private health expenditure as % total health expenditure	39.2



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,[14] with the majority originating from Mozambique. The border between these two countries is porous, and as Mozambique has a higher burden of malaria, this poses a significant threat to Swaziland's progress. Greater efforts are needed to synchronize case investigation, 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, but the initiative's uncertain future threatens progress toward elimination.[9]

Surveillance system precision and responsiveness

Malaria elimination in Swaziland hinges on the country's malaria surveillance system and its ability to efficiently pinpoint cases, investigate secondary cases, differentiate local cases from imported ones, and respond promptly. Swaziland features a robust surveillance system, but the country faces unique obstacles due to its increasingly low transmission. Given that RDTs frequently produce false-positives or fail to detect sub-patent infections under such epidemiological conditions, the National Malaria Control Program has struggled to determine which diagnostic tools will provide the most accurate results in a cost-effective, scalable manner. Logistics related to secondary case investigation, such as designating the optimal investigation radius around an index case, could be further examined to increase programmatic efficiency and targeting of resources.

Sustained financial commitment

In 2008, Swaziland was the first country in sub-Saharan Africa awarded a Global Fund grant specifically earmarked for malaria elimination;[3] however, as donor budgets continue to shrink and the Global Fund completes its restructuring process to assess country eligibility for funding, Swaziland's malaria elimination activities may receive lower priority. As malaria becomes a less pressing public health issue, Swaziland 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 will 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 to maintain its National Malaria Control Program, Swaziland is on track to achieve its malaria elimination goal by 2015.

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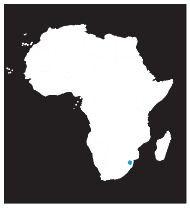

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About This Briefing

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The Malaria Elimination Initiative at the **Global Health Group** of the University of California, San Francisco (www.globalhealthsciences.ucsf.edu/global-health-group) convenes the Malaria Elimination Group (www.malariaeliminationgroup.org), and supports countries actively pursuing elimination at the endemic margins of the disease. Funding for the Malaria Elimination Initiative is provided by the Bill & Melinda Gates Foundation and Exxon Mobil Corporation.

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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.

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