South Africa reported a 78 percent decrease in malaria cases from 2000 to 2014 and is working to achieve national elimination by 2018.

**Overview**

South Africa has experienced a substantial drop in malaria cases, from 64,624 in 2000 to 13,988 in 2014. During the same period, malaria-related deaths decreased from 424 to 174. Despite this large overall decline in the malaria burden, cases and deaths actually increased between 2013 and 2014, by 58 percent and 66 percent respectively. Heavy rainfall and a subsequent rise in imported cases from Mozambique across South Africa’s northeastern border fueled this increase. All malaria cases reported in 2014 were due to *Plasmodium falciparum*. *Anopheles arabiensis* is the primary vector of transmission, with *An. funestus* contributing as a secondary vector to an extremely limited degree.

Due to a long history of successful malaria control efforts, malaria transmission in South Africa is now confined to three provinces in the north and northeastern parts of the country: KwaZulu-Natal, Limpopo, and Mpumalanga. Population movement across the northeastern border with Mozambique and the northern borders with Botswana and Zimbabwe, in large part related to occupation, contribute to sustained transmission in the three provinces. Malaria transmission in South Africa is seasonal, with the majority of cases occurring during the rainy summer months of September through May, peaking in January and April.

**Malaria Transmission Limits**

*Plasmodium falciparum*

<table>
<thead>
<tr>
<th>At a Glance¹</th>
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</thead>
<tbody>
<tr>
<td>Reported cases of malaria (100% <em>P. falciparum</em>)</td>
<td>13,988</td>
</tr>
<tr>
<td>Deaths from malaria</td>
<td>174</td>
</tr>
<tr>
<td>% of population at risk (total population: 54.0 million)</td>
<td>10</td>
</tr>
<tr>
<td>Annual parasite incidence (cases/1,000 total population/year)</td>
<td>0.26</td>
</tr>
<tr>
<td>% slide positivity rate</td>
<td>2.59</td>
</tr>
</tbody>
</table>

*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.

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¹ South Africa's Ministry of Health.
Although malaria interventions vary somewhat by province due to South Africa’s decentralized health system and different eco-epidemiological settings, the mainstay activities include active and passive case detection, surveillance, case management, vector control, including indoor residual spraying (IRS), and cross-border collaborations with neighboring countries. Funding for malaria program activities comes entirely from the South African government. The National Department of Health (NDOH) is currently implementing an overarching malaria elimination strategy that aims to strengthen key interventions, particularly targeted vector control and active surveillance, with the goal of achieving malaria elimination by 2018.7 South Africa is also a member of the Elimination Eight (E8), a regional initiative composed of eight countries wherein the four “front-line” countries embarking on elimination—Botswana, Namibia, South Africa, and Swaziland—coordinate their efforts with the four “second-line” countries—Angola, Mozambique, Zambia, and Zimbabwe.8

**Goal:** Achieve zero local malaria transmission nationwide by 2018.

### Progress Toward Elimination

South Africa has a long history of malaria control. In 1905, malaria was first identified in what was then Natal Province (modern-day KwaZulu-Natal). Epidemics were frequent in both Natal and Transvaal Province (which encompassed the modern-day provinces of Limpopo and Mpumalanga) from the 1900s through the 1930s. In Transvaal, the malaria situation got progressively worse during the 1920s after a large influx of settlers developed the land for farming.3,9 Anti-larval measures in malarious areas were launched in 1924, and by 1927, a national surveillance system with annual reporting had been established. The first malaria research centers were created in 1931 after an intense outbreak in Transvaal that killed more than 2,000 people; community education on prevention and treatment, identification and reduction of mosquito breeding sites, and quinine distribution were all coordinated through these centers. Throughout the 1930s, localized control efforts consisting of IRS with pyrethrin,

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*South Africa does not distinguish between local and imported when reporting case numbers.

larviciding with Paris Green or oil waste, and distribution of quinine for prophylaxis and treatment were highly effective in reducing malaria but could not be implemented on a provincial or national scale due to financial and logistical barriers.\(^3,10\) South Africa replaced pyrethrin with DDT in 1945, and focal elimination projects using IRS with DDT, larviciding, and quinine distribution were expanded during the 1940s and 1950s. As a result, the malaria burden dropped, vector density of *An. arabiensis* was significantly reduced, and *An. funestus* was reportedly eliminated, contributing to a 75 percent geographical reduction in malaria transmission.\(^3,10\) In Natal, malaria control efforts were so effective that IRS was discontinued after only 36 cases were reported in 1965. By 1971, only 230 cases were reported nationwide and South Africa came very close to achieving malaria elimination.\(^3,11\)

Despite the great success in reducing cases, annual IRS and active case detection continued in Transvaal. Unfortunately, the gains made in the previous decade were not sustained, and regular epidemics of about 650 cases per year as a result of irregular rainfall patterns occurred throughout the 1970s in both Natal and Transvaal. Malaria cases then rose drastically to more than 3,800 annually between 1988 and 1992, finally peaking at 64,624 cases in 2000.\(^3,13\) Contributing to this upward trend were: the rise in *P. falciparum* resistance to chloroquine and sulfadoxine-pyrimethamine (SP), the reintroduction of pyrethroid-resistant *An. funestus* vectors from Mozambique, and the withdrawal of DDT in 1995 due to environmental concerns.\(^3,12\) In addition, political upheaval in Zimbabwe and Mozambique, where the malaria burden was significantly greater, led to a surge of border crossings into South Africa, increasing the number of imported cases. Only after DDT was reintroduced and an artemisinin-based combination therapy (ACT), artemether-lumefantrine (AL), was rolled out as a first-line therapy for *P. falciparum* infections in 2000 did malaria cases finally begin to decline.\(^10,12\)

South Africa continued to see declines in malaria morbidity and mortality between 2000 and 2010. In particular, KwaZulu-Natal, which historically had been the most malaria-prone province, experienced a 99 percent decrease in malaria cases and a 97 percent decrease in malaria mortality. Success was due in large part to active case detection, IRS, and the cross-border collaboration with Mozambique and Swaziland facilitated by the Lubombo Spatial Development Initiative (LSDI).\(^13\) LSDI was launched by the three governments in 1999 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 ACTs in place of chloroquine and SP as first-line treatment.\(^3\) Beginning in 2003, LSDI was largely funded by the Global Fund through regional grants until its termination in 2010.\(^14,15\)

As of 2010, the malaria burden in South Africa had shifted, with 62 percent of the country's cases occurring in Limpopo Province, 32 percent occurring in Mpumalanga Province, and only six percent occurring in KwaZulu Natal—down from 66 percent in 2000.\(^16\) In 2011, in light of South Africa’s overall 88 percent decline in cases over the previous decade and based on the findings of the Malaria Program Review conducted in 2009, the NDOH developed its first strategic plan for malaria elimination, targeting 2018 as the goal for nationwide interruption of transmission. Key objectives outlined in the Malaria Elimination Strategy 2012–2018 include: 1) strengthening passive and active surveillance systems to ensure prompt and routine reporting on key malaria indicators in 100 percent of districts; 2) ensuring sufficient capacity at all levels of the program; 3) using appropriate social mobilization and advocacy to ensure 100 percent of population has adequate knowledge of malaria; and 4) effectively preventing new malaria infections and eliminating all parasite reservoirs. The interventions outlined in the national strategy are being implemented by provincial malaria programs to account for regional differences in transmission patterns, risk groups, and key challenges.\(^7\)

### Eligibility for External Funding\(^17–19\)

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

*South Africa is eligible for regional Global Fund malaria grants only; it is not eligible for national grants*
Economic Indicators

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<tbody>
<tr>
<td>GNI per capita (US$)</td>
<td>$6,800</td>
</tr>
<tr>
<td>Country income classification</td>
<td>Upper middle</td>
</tr>
<tr>
<td>Total health expenditure per capita (US$)</td>
<td>$593</td>
</tr>
<tr>
<td>Total expenditure on health as % of GDP</td>
<td>9</td>
</tr>
<tr>
<td>Private health expenditure as % of total health expenditure</td>
<td>52</td>
</tr>
</tbody>
</table>

Challenges to Eliminating Malaria

Prioritizing malaria in the face of other challenges

An estimated 6.4 million South Africans are living with HIV/AIDS and over 60 percent are co-infected with tuberculosis, yet the annual malaria parasite incidence is 0.21 percent.2,21 Thus, maintaining focus and adequate resources for malaria elimination is a serious challenge. Historical malaria rates in South Africa strongly suggest that once attention and funding for control efforts are diverted, the disease will resurge.22 Therefore, it is critical to maintain malaria control and surveillance efforts to reach elimination and prevent reintroduction.

Cross-border coordination

South Africa’s malaria burden is now confined to nine districts in the three provinces that border Botswana, Mozambique, and Zimbabwe, and the majority of its annual cases are thought to be imported from southern Mozambique. However, increased population movement across these borders in recent years has made it very difficult to distinguish imported cases from those acquired within South Africa’s borders.2,10 LSDI was successful in reducing malaria incidence along the Mozambique border, but it is no longer being funded. Other cross-border collaborations such as the Trans-Limpopo Spatial Development Initiative and MOZIZA, a regional initiative between Mozambique, Zimbabwe, and South Africa, have been slow to start but could help improve surveillance and response in border areas. Regional cooperation facilitated through E8 membership will also help to strengthen cross-border coordination of malaria activities.7,8

Conclusion

South Africa has made great progress in reducing its malaria burden over the past decade and has been diligently working toward national elimination since 2011. Maintaining adequate funding for its malaria program and improving the coordination of control activities in border areas through regional collaboration are the key challenges the country must overcome in order to meet its national goal of malaria elimination by 2018.

Sources

Eliminating malaria in SOUTH AFRICA


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 South Africa National Department of Health. 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.

shrinkthemalariamap.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.