

Can southern Africa eradicate malaria?



The number of people at risk of malaria who reside near dams and reservoirs in sub-Saharan Africa is set to double to 25 million by 2080

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Ten years on from the launch of the Africa Malaria Elimination Campaign, **Kirsty Tuxford** looks at the challenges facing the Southern African Development Community (SADC) in tackling malaria

In March 2009, eight SADC countries, which had formed the Elimination 8 Initiative (E8), held the first high-level ministerial meeting with the goal of stamping out malaria for good. The E8 is a unique regional approach that aims to end malaria transmission in the four low-transmission ‘frontline countries’ of Botswana, Namibia, South Africa, and Swaziland by 2020, and to then pave the way for elimination in the four middle- to high-transmission ‘second line countries’ of Angola, Mozambique, Zambia and Zimbabwe by 2030 (see map).

Through the E8 initiative, countries aim to work in harmony to monitor malaria outbreaks, track malaria transmission, gather and analyse data to ascertain where malaria is spreading across borders, ensure that treated mosquito nets are distributed and that indoor residual spraying takes place. Efforts are also made to diagnose and treat malaria in its early stages.

Between 2000 and 2012, there was a marked decline in malaria in southern Africa. In the E8 countries, malaria cases decreased by nearly 50 percent during a five-year period, from 14 million cases in 2007 to 8 million by 2012, according to the World Health Organization Global Malaria Programme, *World Malaria Report 2013*.

Then malaria bit back. “We had dramatically reduced malaria to the point where its elimination became tangible,” says Dr Richard Nchabi Kamwi, former Namibian Health Minister and now the E8 Ambassador for Malaria Elimination. “But in the recent 2016-2017 malaria

season, this completely changed—seven of the eight E8 countries recorded an increase in malaria cases. The worst part is that South Africa and Botswana saw a re-introduction of cases in previously unaffected areas. And outbreaks were declared in Swaziland. It is not good news at all.”

Through the E8, health ministries convened a meeting immediately to identify the causes behind the resurgence. One of the key drivers was found to be that the mosquitoes were becoming resistant to insecticides, and that countries were not reaching indoor spraying targets—indoor residual spraying is a highly effective for malaria control, and the WHO says that protection will be effective when at least 80 percent of houses in a targeted area are sprayed.

“Another issue was a lack of sufficient personnel for supervision and micro-planning,” says Dr Kamwi. “And the delayed procurement of malaria commodities. You would expect that during the winter, the ministries of health would be busy preparing themselves, but this was not the case. We also found a lack of identification of epidemics, and late responses to outbreaks—this was largely due to under-utilised surveillance systems.”

Following the E8 meeting, countries refined their action plans for the next malaria season 2017-2018 and have developed epidemic preparedness and response plans.

“I can honestly say that all eight ministers were determined to bring down this epidemic,” says Dr Kamwi. “E8 is based on collaboration, and now, countries are synchronising insecticide spraying schedules and staff training.” →



The four low-transmission countries of Botswana, Namibia, South Africa, and Swaziland are aiming to eradicate malaria by 2020

The need for local funding

Distributing treated nets and spraying insecticides is costly, says Dr Kamwi, and as countries’ case loads decline they should consider more targeted approaches in order to be cost efficient. This is where the effective use of data comes into play, and the need for strong surveillance teams to monitor the location of malaria outbreaks is key “(see map on page 20).

“The mainstay challenge is a lack of sufficient domestic funding from local governments for malaria programmes,” says Dr Kamwi. “In recent years, donor funding has reduced dramatically—especially in countries deemed economically sound such as South Africa, Botswana and Namibia.

“In my view, there is a need for more effective use of existing resources for maximum impact and strong quality control. And there is a need for investment in disease and entomological surveillance and early warning systems. If that is done, then we are talking,” he adds.

In his role as E8 Ambassador and as the African Union’s Centre for Disease Control and Prevention Champion, Dr Kamwi’s job is to encourage all member states to take ownership of the malaria eradication programme and provide sufficient funding. “There’s no way we can talk about malaria elimination when the resources are primarily from other countries’ taxpayers,” he says. “But we are seeing some positive signs—South

Africa is almost 100 percent taking care of its malaria programme, and Botswana and Namibia too. The others are doing their best to improve on their domestic funding.”

Other funding has come from the Global Health Group, the Bill & Melinda Gates Foundation, and a grant from the Global Fund of approximately US\$18 million, which is primarily going to be used to establish 35 malaria health posts at borders, with the aim of preventing cross-border transmission.

JC Flowers, who founded the Isdell:Flowers Cross Border Malaria Elimination Initiative, with former Coca-Cola CEO, Neville Isdell, also believes funding is too slow, and that the under-funding of malaria programmes is a missed opportunity.

“Malaria was receiving a lot of positive attention from a lot of people. It became fashionable and received a lot of support, but now it’s getting a little bit ‘tired’ in terms of how fashionable it is,” comments Flowers. “Yet it would appear from figures produced by the Gates Foundation, that with considerable sustained additional funding, the disease could actually be eradicated. It’s like spending US\$10 billion a year for the next hundred years, or US\$40 billion for five years and then you could actually get rid of it.”

The World Bank estimates that malaria costs Africa US\$12 billion a year in lost production and opportunity.

Migration

The Isdell:Flowers Cross-Border Malaria Initiative focuses specifically on supporting malaria eradication programmes in the cross-border communities of Angola, Namibia, Zimbabwe and Zambia. It is funded by the JC Flowers Foundation and Neville Isdell as well as by USAID’s President’s Malaria Initiative and

How is malaria transmitted?

Malaria is usually transmitted when a person is bitten by an infective female Anopheles mosquito, which is carrying the infection from a previous blood meal. When a mosquito bites an infected person, a small amount of blood is taken which contains microscopic malaria parasites. About one week later, when the mosquito takes its next blood meal, these parasites mix with the mosquito's saliva and are transferred to the next victim.

the Global Fund. Since the Cross-Border Initiative was founded in 2010, they have distributed around 90,000 nets annually (in partnership with NetsForLife), and taught people how they should be deployed. The nets are sourced in-country from the Global Fund/USAID Presidents Malaria Initiative.

Cases of malaria have declined dramatically in the areas that the Isdell:Flowers Initiative serves. “The reason for that is straightforward: these bed nets really work,” says Flowers. “But you can’t just leave the nets out there—you have to go back and change them after a couple of years.”

Flowers’ team also monitor incidences of malaria, do diagnostic tests and treat people who fall sick, as well as undertaking data analysis, recruitment and training of village health workers, village heads, clergy, and church leaders, in partnership with the government.

A major issue when it comes to stopping the spread of malaria, is tracking migratory populations—especially in hard-to-reach, rural areas. Malaria-infected people crossing borders is a huge factor in the spread of the disease in southern Africa. As Kamwi points out, a person needs a passport to cross a border, but a malaria parasite doesn't. To add to the challenge,



The Elimination 8 Initiative has brought together eight members of the Southern African Development Community to work together on malaria eradication

With border control being such a vital part of shrinking the malaria map, several neighbouring countries in SADC have signed cross-border agreements with the aim of working together

many migrants are unregistered, making tracking them even harder.

In Angola and Namibia people cross the border frequently. “You can’t work towards eliminating malaria without working on both sides of the border, which is bureaucratically not so easy, but that’s what has to be done and that’s a role we’re trying to fill,” says Flowers. “I think there’s goodwill and effort towards cooperation in these countries. But the bureaucratic

technicalities mean that you can’t just walk across the border with a bunch of malaria nets for example. The health post infrastructure, which is funded by the governments, is quite different on each side of the border. You can’t see the border, but you can feel the border.”

Border collaborations

With border control being such a vital part of shrinking the malaria map, several neighbouring countries →

First ever malaria vaccine

In April this year, the WHO announced that the world's first malaria vaccine would be trialled in Ghana, Kenya and Malawi, by injecting five- to 17-month old children. Vaccines will be delivered through the countries' existing vaccination programmes. GlaxoSmithKline has developed the vaccine, and the pilot is being funded by global vaccine alliance, GAVI, UNITAID, and the Global Fund to fight AIDS, TB and Malaria.

The challenge, should the vaccine work, will be future distribution. Solutions to distribution could come from private sector innovations already taking place. In Rwanda last year, medical supplies were delivered by drone thanks to a partnership with private company Zipline International and funding from GAVI and UPS. In Pakistan, mobile phone technology and satellite imagery systems have been used to identify areas where non-vaccinated children were living. In Kenya, DHL has been working with the ministry of health to identify gaps in the cold chain, which is one of the biggest challenges for the delivery of vaccines in developing countries.

in the SADC region have signed cross-border agreements with the aim of working together. The Lubombo Spatial Development Initiative (LSDI) is a semi-autonomous body formed in 1999 by Mozambique, South Africa and Swaziland to reduce malaria incidence, reduce new malaria infections, develop a small-scale risk map and develop GIS for monitoring and evaluation of the programme.

Funding comes from the three countries' governments and donors including Business Trust (BT) of SA, BHP, and the Global Fund. BT injected 5 million rand (US\$385,000) before Global Fund started injecting funds in 2003. The South African government has continued to pump in 5 million rand on an annual basis from 2003 until now.

Five administrative regions in Namibia and Angola share the border where malaria is prevalent between November and April every year. The region is called the Trans-Kunene, and a collaborative agreement named the Trans-Kuene Malaria Initiative (TKMI) is helping harmonise the fight against malaria.

The Trans-Zambezi region is a convergence of five countries (Angola, Botswana, Namibia, Zambia and Zimbabwe), which have also signed a collaborative agreement.

What's causing malaria increases?

New research is shedding light on the relationship between deforestation, dams and malaria increase. One study, led by Kelly Austin, and published in *AIMS Environmental Science*, found that deforested areas in developing countries increase sunlight and standing water—two key elements necessary for the *Anopheles malaria-transmitting mosquito*. As large pools of standing water, dams are another

contributory factor in the rise of the number of mosquitoes. Another paper published in the *Malaria Journal*, by UCI postdoctoral scholar in public health, Solomon Kibret, states that the number of people at risk of malaria who reside near dams and reservoirs in sub-Saharan Africa is set to double to 25 million by 2080.

"I'm still optimistic and looking at 2025-2030," says Dr Kamwi. "Swaziland, for example, is far ahead—for the past five years it did not record a single malaria death. Botswana unfortunately during the last season experienced some local deaths, but I was impressed with the aggressive way in which they responded to the epidemic and how they persevered with their plan. Now it's 2017, so maybe eradication by 2020 will not happen, but I am looking at 2025, with the final four countries following suit by 2030."

Flowers adds: "Some problems don't have solutions, but this one does—this can be eradicated. Once it's eradicated you're done." ■



Neville Isdell (right) and Chris Flowers together formed the Isdell:Flowers Initiative which has been a key actor in spreading distribution of mosquito nets