Eliminating malaria from the margins of transmission in Southern Africa through the Elimination 8 Initiative

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Abstract

Four southern Africa countries, namely, Botswana, Eswatini, Namibia and South Africa, were identified by the World Health Organization as having the potential to eliminate malaria in the near future. However, the extreme interconnectedness of southern African countries facilitates the constant movement of malaria parasites across country-borders, predominately from higher-burden “source” countries to lower-burden “sink” countries, reinforcing the notion that malaria elimination in any southern African country would not be possible without regional cooperation and collaboration. The Elimination 8 initiative (E8) was therefore, created by Health Ministers from eight countries (Angola, Botswana, Eswatini, Mozambique, Namibia, South Africa, Zambia and Zimbabwe) to coordinate the implementation of a regional malaria elimination strategy. The E8 supported the implementation of five cross-border malaria control initiatives and the deployment of malaria health units at strategic points along shared borders. These units have contributed to a 30% and 46% reduction in malaria incidence and mortality, respectively, in the E8 border regions. The Situation Room, a novel data sharing platform developed and supported by the E8, has allowed for the early detection of and prompt response to malaria outbreaks. This platform played a vital role in identifying resources gaps due to the COVID-19 pandemic. Despite advancing the elimination agenda, the E8 region faces challenges which include, significant increases in malaria in certain member states, limited domestic funding and health system bottlenecks. These must be urgently addressed if the gains made through the E8 are to be sustained and malaria elimination is to be achieved across southern Africa.

Keywords: malaria, elimination, E8, southern Africa, regional control, surveillance, border posts, imported malaria, capacity building, policy harmonisation, impact assessment

INTRODUCTION

Countries in the southern African region, particularly the four countries (Botswana, Eswatini, Namibia and South Africa) identified by the World Health Organization as having the potential to elimination malaria by 2023 (WHO, 2018a) and their immediate, higher malaria-burdened neighbours (Angola, Mozambique, Zambia and Zimbabwe), exhibit a high degree of interconnectedness (Figure 1). This, well-established interconnectivity, which has been

very clearly demonstrated using mobile-phone (Ruktanonchai, 2014) and molecular (Tessema *et al*., 2019) technologies, facilitates the sustained movement of malaria parasites between countries in the region. Highly mobile and migrant populations, who frequently traverse country borders, are largely responsible for this sustained parasite movement which poses a significant challenge to individual country-led malaria elimination efforts (Cosner *et al*., 2009; Acevedo *et al*., 2015; WHO, 2018b). In highly connected regions such as southern Africa, events in one country generally have a knock-on ripple effect in neighbouring countries, highlighting the value of and need for a well-co-ordinated, well-resourced regional responses (Maharaj *et al*., 2019; E8, 2018a).

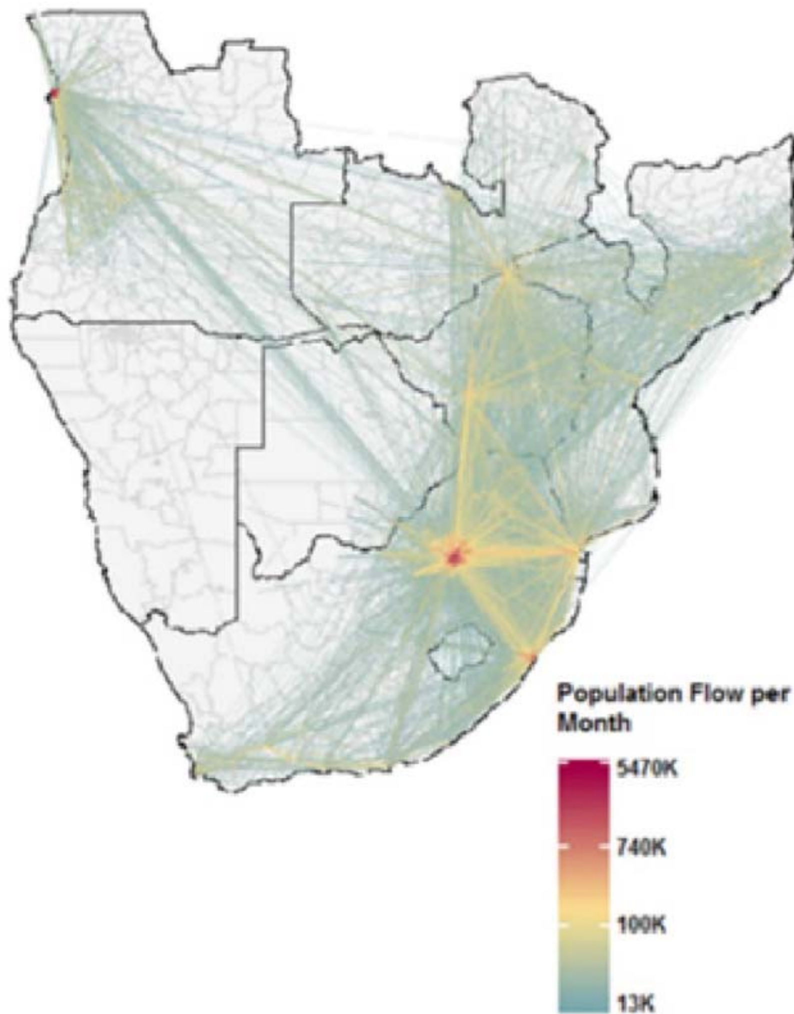


Figure 1. Population movement within the Elimination 8 (E8) countries tracked using mobile-phone technology, which emphasised the high degree of connectivity and high volumes of people movement within the Elimination 8 region (source: Ruktanonchai, 2014).

Regional malaria elimination efforts allow for the collective development of harmonised policy frameworks and strategies, where the respective interventions, investments, and policies can be channelled synergistically towards the collective goal, reinforcing and optimising each for one purpose – regional malaria elimination (Lover *et al*., 2017). Malaria elimination in southern Africa is therefore, only be possible with the support of and collaboration between all the countries in the region (Gueye *et al*., 2012; Wangdi *et al*., 2015). Cognisant of this, and the positive impact the multi-country collaboration between Mozambique, Eswatini and South Africa has had on reducing malaria in these three

countries (Sharp *et al*., 2007; Maharaj et al., 2016), Health Ministers from eight southern Africa countries (Angola, Botswana, Eswatini, Mozambique, Namibia, South Africa, Zambia and Zimbabwe) endorsed the creation of a regional malarial elimination initiative, known as the Elimination 8 (E8) malaria initiative in 2009 (SADC, 2009a, 2009b).

This paper, the first in a series on the E8 initiative, serves to provide a high level overview of the E8 initiative, by describing the structure and core functions of the E8 Initiative, briefly discussing the impact of and challenges faced by the initiative in the first ten years of its existence and ending with recommendations for further enhancing the impact of the E8 in advancing malaria elimination in southern Africa.

STRUCTURE OF THE E8 INTITIATIVE

Constituted as subsidiary agency of the regional socio-economic development organisation, the Southern African Development Community (SADC), the E8 was mandated to drive the SADC malaria elimination agenda in the eight E8 countries (SADC, 2009a; E8, 2017a; E8, 2018a). The E8 ministerial sub-committee, comprising the Health Ministers from the eight participating countries, is the ultimate decision-making body of the E8 and is responsible for strategic leadership and diplomatic dialogue aimed at addressing obstacles and challenges to the regional malaria elimination agenda. The ministerial sub-committee reports upwards on a bi-annual basis, to the SADC Joint Council of Health Ministers and Ministers responsible for HIV/AIDs from all 16 SADC countries. on the progress made and challenges faced by the E8 in achieving its mandate. An E8 Technical Committee comprising national malaria control managers from the eight E8 countries and select members from partner organisations (Figure 2) support the E8 ministerial sub-committee.

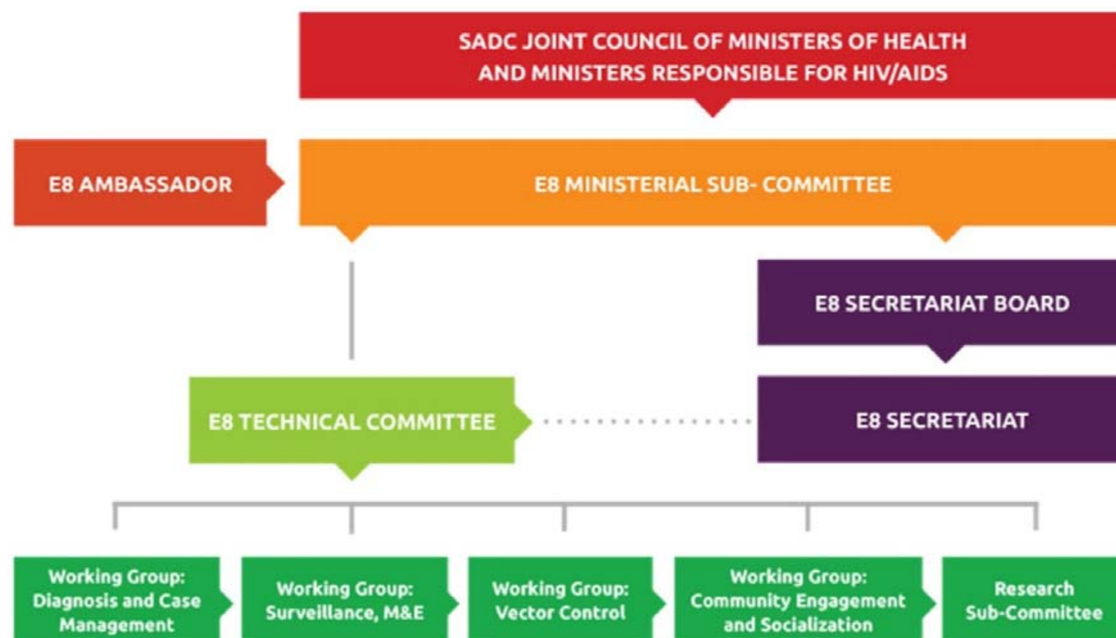


Figure 2. Organisational structure of the Elimination 8 (E8) Initiative (Source: Elimination 8 Initiative Secretariat).

While the E8 ministerial sub-committee is responsible for strategic leadership oversight, the E8 technical committee is responsible for technical oversight of the E8 initiative. The technical committee critically evaluates the technical guidance and recommendations from five technical working groups (Figure 2) and selects those strategies/interventions which have the potential to be most impactful and cost-effective for submission to the E8 ministerial

sub-committee for approval to implement. Once ministerial approval is obtained, the technical committee oversees intervention implementation, monitoring and evaluation processes and progress reporting across the E8 region. All challenges/obstacles that the E8 technical committee fails to adequately address are referred to the E8 ministerial sub-committee for resolution through international diplomacy.

The technical working groups have been constituted to provide evidence-based technical guidance on strategies/interventions in five areas deemed critical for accelerating the E8 region towards elimination. Each technical working group consists of one country-nominated technical expert from each member state and other key stakeholders from development and technical support agencies, academic and research institutions, non-governmental organisations, the private sector and funding organisations (Table 1). Besides providing technical guidance, the country-nominated technical experts are also mandated to represent and defend the interests of their respective countries by ensuring any decision taken is of benefit to all eight participating countries, or at the very least, does not negatively impact malaria elimination efforts in their country.

The E8 Secretariat is responsible for the coordination, liaison, monitoring and information sharing on behalf of the E8 Ministerial sub-committee. The E8 Secretariat also provides administrative and secretarial support for activities conducted through and by the relevant partners of the E8 (Table 1). Oversight of the Secretariat's activities and of the initiative as a whole is provided by an independent board. On a bi-annual basis the board reviews the progress made by the initiative against annual targets and the programme's financial statement prepared by an external auditor. Based on their finding, the board makes recommendations aimed at improving the performance and impact of the initiative as well as correcting underperforming and non-compliant activities.

Table 1. Key partners of the elimination 8 (E8) initiative.

Stakeholder type	Stakeholder name
Development and Technical Support Agencies	World Health Organization (WHO) International Organization for Migration (IOM)
Academic/Research Institutions	University of Eswatini University of Botswana University of Namibia South African Medical Research Council (SAMRC) Institute for Communicable Diseases- South Africa (NICD) Centro de Investigacado em Saude de Manhica – Mozambique (CISM) Ifakara Health Institute – Tanzania (IHI)
Non-governmental Organisations	Clinton Health Access Initiative (CHIA) Isdell Flowers Foundation PATH Malaria Control and Elimination Partnership in Africa (MACEPA) African Leaders Malaria Alliance (ALMA) The RBM Partnership to End Malaria
Funders	The Global Fund to Fight HIV, Tuberculosis and Malaria (GFATM) The Bill and Melinda Gates Foundation The University of California-San Francisco Global Health Group Isdell Flowers Foundation Southern African Development Community (SADC)

CORE E8 FUNCTIONS

To fulfil its goal of driving the SADC malaria elimination agenda, the E8 performs a range of activities linked to its five core objectives, which were initially developed when the E8 Initiative was created and further refined in 2017 (E8, 2015, 2017a):

- Core Function 1: To coordinate member states and partners to achieve cohesiveness of a common approach to malaria elimination.

Successfully eliminating malaria within the E8 region is highly dependent on the ability of cross-border responses to effectively limit malaria importation. The E8 therefore provides and supports a regional coordination platform that facilities the development and coordinated implementation of effective cross-border strategies in the E8 member states

- Core Function 2: To advocate for increased political attention to malaria elimination.

Recognising the potential for governments to redeploy essential resources to other disease areas as the malaria burden decreases, the E8 uses its access to government senior officials (Permanent Secretaries/Director Generals or Principal Secretaries) and SADC Health Ministers to regularly advocate for increasing or maintaining current investments in malaria so that the end-game of malaria elimination can be achieved.

- Core Function 3: To facilitate policy harmonisation to address similar ecologies across national borders.

The harmonisation of elimination practices and strategies is fundamental to achieving an effective coordinated regional response to malaria elimination. Building on the harmonisation efforts of SADC to encourage economic growth and development across southern Africa, the E8 supports the development and implementation of regional elimination strategies that complement and reinforce existing in-country polices.

- Core Function 4: To facilitate the reduction of cross-border transmission of malaria.

Persistent importation of malaria together with residual transmission in border areas have been identified as significant barriers to the malaria elimination aspirations of the E8 region. As a means of effectively addressing these two factors, the E8 facilitates the joint planning, implementing, and monitoring of cross-border malaria initiatives.

- Core Function 5: To mobilise additional resources to achieve malaria elimination targets.

Sustained financing is crucial for the long term sustainability of E8's malaria elimination programming.

IMPACT OF THE E8 INITIATIVE

In the ten years that the E8 has been in existence, it has successfully advanced the SADC elimination agenda through strong leadership, strategic partnerships and the implementation of impactful targeted interventions. The major achievements of E8 over the past decade are discussed below.

1 Maintaining malaria on the SADC Health Leadership Agenda

The E8 has played a pivotal role in strengthening political commitment for malaria elimination in the region by maintaining malaria and malaria elimination on the SADC leadership health agenda. Through its advocacy platform, the E8 has ensured that malaria is on the agenda of all meetings involving SADC Health Ministers and Heads of State and together with the E8 ambassador, the E8 has lobbied aggressively for increased domestic investments in malaria control and elimination. The collective advocacy efforts of the E8 have resulted in long-term commitment and promises of accountability from all eight E8 countries and the remaining malaria-endemic countries in the SADC region to achieving malaria elimination by 2030 (E8, 2018b); lent valuable support to South Africa's investment case for additional domestic funding for malaria; helped ensure that malaria health budgets in the E8 region were not significantly re-programmed in the light of the coronavirus disease 2019 (COVID-19) pandemic and that the national malaria control programmes received the appropriate resources to continue facilitating routine vector control and community case management during COVID-19 pandemic.

2 Resource mobilisation and System Strengthening

Since its inception, the E8 has actively worked to fulfil its mandate of driving the SADC elimination agenda by securing essential financial, infrastructural and human resources. Between 2015 and 2019, the initiative mobilised over $40 million USD (E8, 2019a) from a variety of funders (Table 1), to support the SADC regional malaria elimination agenda. In addition, the E8 forged critical partnerships with key stakeholders from within and outside the E8 region, including Research/Academic institutions, non-governmental organisations and funders (Table 1), to ensure the necessary capacity for malaria elimination exists within the E8 region. This resource mobilisation facilitated the systems strengthening of the national malaria control programmes, which enabled the transition from a malaria control to a malaria elimination-focused package of interventions across all E8 member states. As E8-driven initiatives were the main drivers of the systems strengthening process, the six of the most impactful initiatives developed and/or implemented by the E8 are discussed in greater detail below.

a. Cross-border collaborations: In line with its core functions and objections of preventing malaria importation into receptive areas to advance the region's elimination efforts (E8, 2015), an E8 priority has been and continues to be the establishment of new and/or strengthening existing cross-border malaria control initiatives. E8-led inter-country dialogues have facilitated improved data sharing between countries, and increased commitment from countries to effectively tackle cross-border malaria issues through a harmonised coordinated approach. The E8 is currently coordinating and supporting five cross-border malaria control initiatives (Table 2). Technical inputs from the E8 have ensured the harmonisation of malaria messaging, vector control interventions and entomological surveillance processes between countries in each initiative, greatly enhancing the impacts of these interventions in reducing the malaria burden and improving health outcomes in the affected populations.

Table 2. Cross-border malaria control initiatives with the elimination 8 (E8) region currently coordinated and supported by the E8 initiative.

Name of initiative	Countries involved	Funding source[a]	Year operationalised
BOMOZISA Malaria Initiative	Botswana, Mozambique, Zimbabwe and South Africa	Global Fund, Governments of Botswana, South Africa and Zimbabwe	2019
MOSASWA Malaria Initiative	Mozambique, South Africa and Eswatini	Global Fund, Goodbye Malaria, Governments of Eswatini, and South Africa	2014
Trans-Kunene Malaria Initiative (TKMI)	Angola and Namibia	Global Fund, Isdell Flowers Foundation Government of Angola, President's Malaria Initiative (USA)	2011
Trans-Zambezi Malaria Initiative (TZMI)	Namibia and Zambia	Global Fund, Isdell Flowers Foundation	2018
ZIM-ZAM Malaria Initiative	Zambia and Zimbabwe	Global Fund, Isdell Flowers Foundation	2013

[a]South Africa in the only Elimination 8 country that does not qualify to apply for Global Fund Malaria-related Grants. South Africa is only able to access Global Fund grant funds for malaria as part of regional grants. Currently the South African Malaria Control/Elimination Programme is entirely domestically funded.

Impact of the E8-led and supported initiatives are monitored through a malaria elimination scorecard developed by the E8 (Figure 3). The E8 uses the scorecard to assess the progress each country has made towards achieving a set of critical regional elimination targets as well as to promote accountability among the E8 member states (SADC, 2017), as the scorecard is presented to the E8 ministerial sub-committee, on an annual basis. Based on the indicator scores achieved, the E8 makes recommendations and provides support to improve performance in underperforming areas, both at a country- and regional-level. Assessment of the scorecard revealed suboptimal use of single-low dose primaquine in the four front-line countries due to limited access. This led to the E8, with the support of the WHO, developing a pooled procurement process which increased country-level access to single-low dose primaquine. The scorecard also highlighted the limited guidance on case classification and malaria hotspot investigations. The E8 supported the development of a regional protocol development for case classification and hotspot investigation as part its acceleration plan for regional malaria elimination (E8, 2017b).

a. Malaria Border Clinics: To increase access to malaria treatment and educational services to migrant populations and residents of border communities as recommended by the WHO (2018b), the E8 adopted a modified version of the cross-border service delivery model deployed along the Thai-Myanmar border, which significantly decreased malaria importation in the Thai-Myanmar region (Landier *et al.*, 2016). The E8 established 46 malaria health posts at key locations along shared borders between 2016 and 2018 (Figure 4; E8, 2020a).

MALARIA ELIMINATION EIGHT (E8) SCORECARD - 2018 DATA

2018	Epidemiology									Vector control		Financing	Policy: Surveillance			Policy: Diagnosis		Policy: Treatment	Managment
Country	Number of confirmed malaria cases	Malaria incidence rate	Indigenous malaria incidence rate	Reported indigenous malaria cases	Reported malaria deaths	Test positivity rate (%)	Proportion of suspected cases tested	Completeness of reporting (%)	Proportion of confirmed cases treated as per guidelines (%)	IRS operational coverage (%)	LLINs operational coverage (%)	National public sector financing (%)	Malaria is a notifiable disease (YES/NO)	Case and foci investigation and case classification is conducted	Case reporting from the private sector is mandatory	Quality assurance oversight by national reference laboratory	Confirmation of all malaria (Microscopy or RDT (I) / Microscopy (II))	Treatment of cases with primaquine (Falciparum / Vivax)	National malaria elimination committee is in place
Botswana	585	0.3	0.2	534	9	0.1	95	86	79	74	N/A	17	Yes	Yes	Yes	Yes	Both	Both	Yes
Eswatini	640	4.6	1.9	268	2	7.7	100	100	100	83	N/A	9	Yes	Yes	Yes	Yes	Both	Both	Yes
Namibia	36,451	14.8	12.0	29,834	82	3.8	89	97	100	85	N/A	12	Yes	Yes	Yes	Yes	Both	Both	Yes
South Africa	18,638	1.9	1.0	9,562	120	N/A	100	96	100	98	N/A	14	Yes	Yes	Yes	Yes	Both	Both	Yes
SUB-NATIONAL ELIMINATION TARGETS																			
Mozambique[1]	72,226	35.0	35.0	76,226	17	57	100	98	98	96	99.5		Yes	Yes	Yes	Yes	Both	No	Yes
Zambia[2]	175,635	155.4	N/A	N/A	26	43	98	89	100	97			No	Yes	Yes	Yes	Both	No	Yes
Zimbabwe[3]	3,847	1.4	0.6	1,981	20	4	100	97	100	67	100		Yes	Yes	No	Yes	Both	Both	Yes
SECOND LINE Countries																			
Angola	5,922,260	203	N/A	N/A	11,814	51	92.8	81.57	86	90[4]	99		Yes	No	Yes	No	Both	Yes / No	No
Mozambique	10,336,065	359	N/A	N/A	968	55	100	99	97	96	86		Yes	No	No	Yes	Both	No	Yes
Zambia	5,046,921	312	N/A	N/A	1,209	51	98	94	100	94			No	Yes	No	Yes	Both	No	Yes
Zimbabwe	263,515	19	N/A	N/A	192	21	98	98	100	85	100		Yes	Yes	Yes	Yes	Both	Both	Yes

Figure 3. The Elimination 8 (E8) malaria scorecard which is used to monitor the progress of the eight E8 countries towards malaria elimination against 22 critical indicators. Progress is tracked using the traffic-light colour scheme with green denoting the country is on track, yellow denoting that this indicators needs attention while red denotes that the country's performance in sub-optimal, and urgent action is required to improve performance. (Source: The Elimination 8 Secretariat).

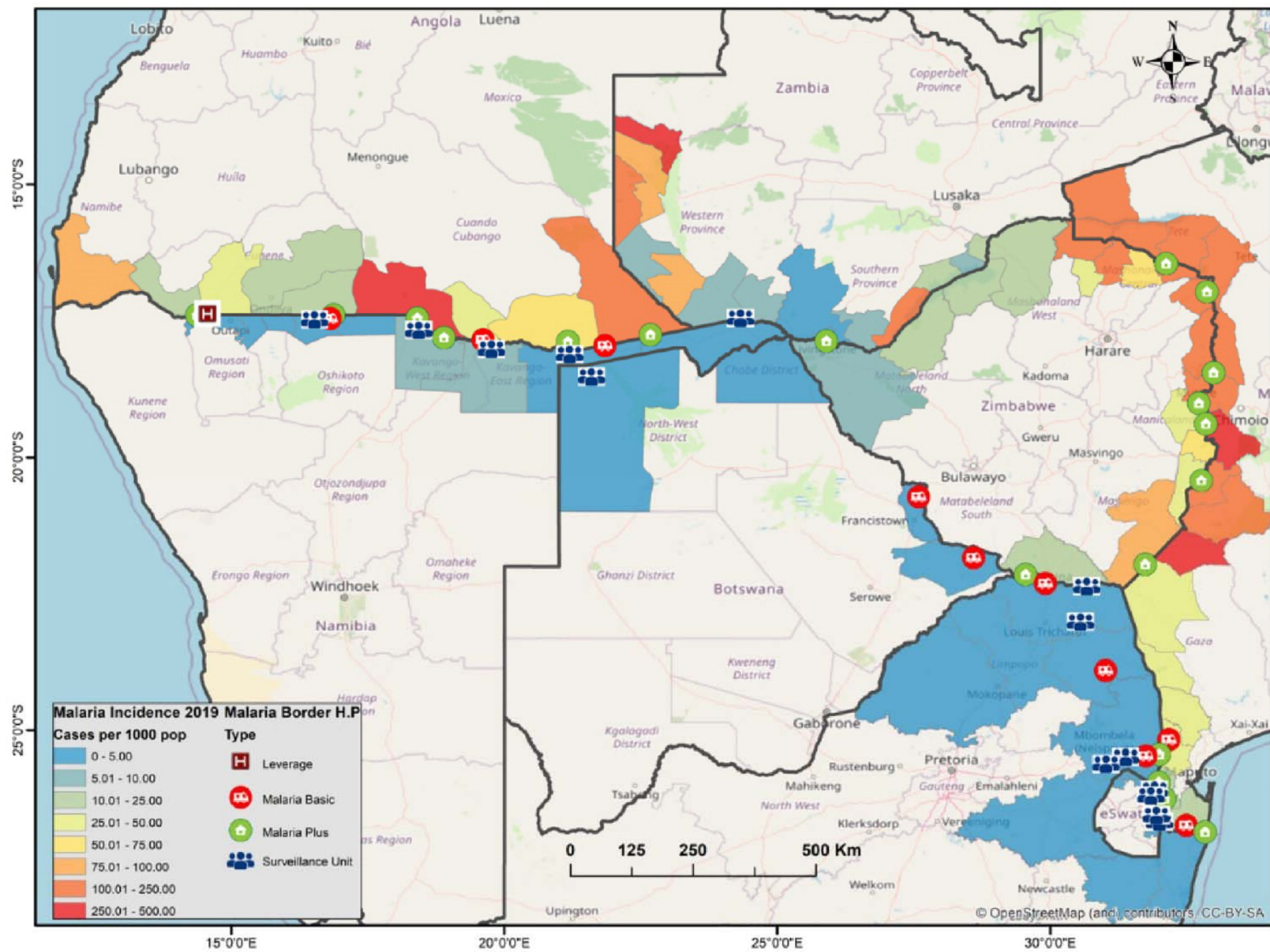


Figure 4. Location and Type of Malaria Border Clinic deployed along the Elimination 8 (E8) country borders, overlaid with the malaria incidence per 1000 population in each border district (source: Elimination 8 Initiative Secretariat).

Malaria transmission gradient data were used to identify potential locations for the malaria posts. However to accommodate the large highly mobile populations in the E8 border regions, and address the heterogeneity across these shared borders in terms of access to malaria services and malaria burden, the E8 opted to deployed four different types of malaria border health posts, as follows:

1. **Mobile units**: These units comprise healthcare workers who actively search for malaria carriers in the borders communities and migrant mobile populations using the WHO track, test, and treat strategy (WHO, 2012)
2. **Static units**: These are permanent structures built using E8 funds to expand basic healthcare services to communities in malaria hotspots border and hard-to-reach regions, with limited access to healthcare services. These static healthcare facilities offer a standard primary healthcare package which includes basic malaria case management services to the communities they serve.
3. **Surveillance units**: These mobile units consist of teams of malaria surveillance and environmental health personnel who conduct active case detection and reactive case investigations in borders communities where malaria cases have been reported
4. **Partnerships with National Priority Disease Programmes**: In an effort to achieve universal access to malaria diagnosis and treatment services, a fundamental component of the WHO Global Technical Strategy for Malaria 2016–2030 (WHO, 2015), the E8 partnered with in-country National Priority Disease Programmes such as National HIV and Tuberculosis programmes that had a presence in malaria hotspot border communities. The E8 strengthened these programmes in border regions by providing additional human resources and increased access to malaria services by ensuring these priority programmes has the basic malaria case management commodities.

Since becoming operational, these malaria health border units have tested more than 1.2 million suspected malaria cases and treated over 71 000, malaria rapid diagnostic test positive cases on site (E8, 2020a). The prompt detections and treatment of malaria carriers in receptive border areas by these malaria border units together with the activities of the cross-border initiatives have contributed to the 30% and 46% reduction in malaria incidence and mortality, respectively, in E8 border regions (Figure 5, E8, 2020a). The value of these malaria border units in supporting the region's elimination agenda was further emphasised when their ability to detect and treat large numbers of asymptomatic carriers in pre-elimination receptive areas with a transmission blocking antimalarial, single low-dose primaquine, was recently demonstrated (Raman *et al.*, 2020).

a. *The E8 Situation Room:* As the E8 region is highly susceptible to malaria outbreaks, access to current accurate malaria data is essential for prompt effective responses. Aware of this, the E8 created and supports the E8 Situation Room, which is a regional malaria surveillance and outbreak response platform. The routine sharing of malaria data by E8 member states and technical partners through this platform has enabled the routine monitoring and rigorous interrogation of regional malaria trends, the early detection of and prompt response to outbreaks and harmonisation of interventions for optimal impact.

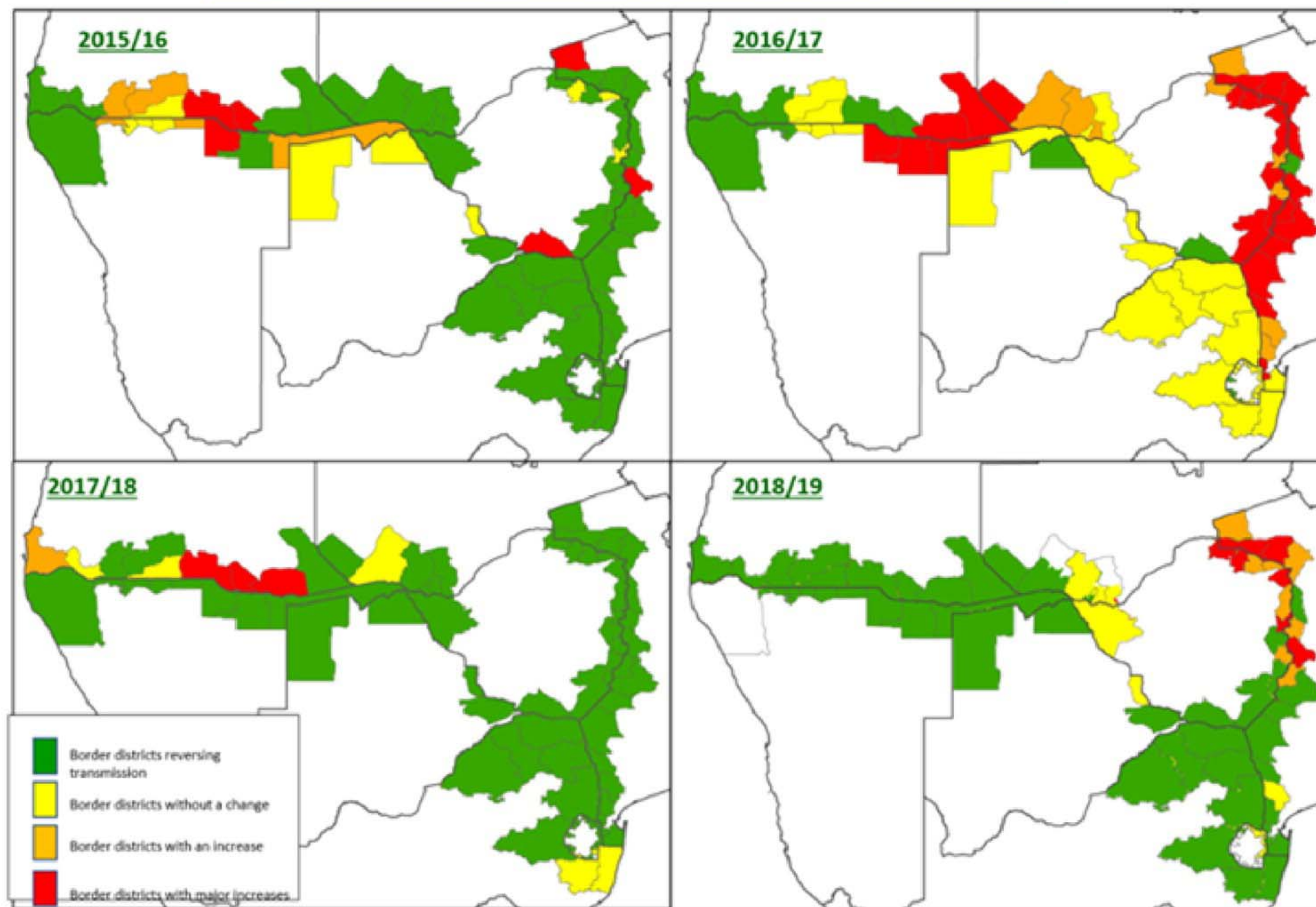


Figure 5. Changes in malaria incidence along the E8 border regions from 2015 to 2019 (source: E8, 2020a).

The Situation Room has been critical to the E8's ability to react swiftly to emergency malaria situations and has even been instrumental in facilitating rapid responses to the COVID-19 related malaria up-surges in southern Africa. Through the weekly data and information sharing sessions on this platform, the E8 was able to promptly identify and rapidly mobilise reponses to resources gaps. The E8 facilitated a regional pooled procurement strategy which enabled the urgent procurement of essential commodities such as antimalarials and rapid diagnostic test kits and ensured the region stayed on track to realise its elimination targets.

The E8 Situation Room publishes a quarterly Surveillance Bulletin which is shared the wider malaria community within and beyond the E8 region. The Bulletin highlights current malaria transmission patterns in the E8 region in terms of malaria incidence, weather, climatic conditions and commodity tracking. Updates on the region's epidemic monitoring, preparedness and response (EPR) plans are also shared.

> *a. Expert Microscopy and the Malaria Slide Bank*: The E8 is supporting the national malaria control programmes from the E8 region achieve the WHO's malaria elimination certification requirement of in-country quality-assured expert malaria microscopy through two mechanisms. The first is increasing expert microscopy capabilities across the region by facilitating microscopy and accreditation training courses. A total of 118 malaria microscopists from six of the eight E8 countries have been trained, substantially increasing the critical mass of expert microscopists in the region. These expert microscopists, in turn, conduct on-the-job quality control in healthcare facilities and independent laboratories in their respective countries.

Related to expert microscopy, has been the establishment of a Regional Malaria Slide Bank to serve as a regional reference for quality control and assurance purposes. Since becoming operational in 2018, the slide bank has produced over 20 000 falciparum and non-falciparum malaria teaching specimens. A selection of these teaching specimens have been distributed to reference laboratories in each of the E8 countries for training purposes.

> *a.Entomology Fellowship Programme:* In response to the scarcity of adequately qualified entomologists within the national malaria control programmes to drive the regional elimination agenda, the E8 in collaboration with regional and international research institutions developed an Entomology Fellowship Training Programme (E8, 2019b). Through this training programme one fellow from each of the eight malaria control programmes with basic entomological skills was upskilled on all aspects of entomology relevant to malaria elimination and improved decision-making. The eight entomology fellows trained through this programme, have returned to their respective countries and are currently guiding the selection and implementation of the appropriate cost-effective anti-vector interventions.

> *b.SADC/E8 Regional IRS Training of Trainers' Manual:* Sub-optimal coverage and quality of indoor residual spraying (IRS) operations, together with an inadequately skilled IRS workforce were identified as significant drivers of 2017 region-wide malaria outbreak (SADC, 2017). In response to these findings, the E8 through its vector control technical working group, in collaboration with the WHO, conducted a regional IRS training of trainers' course and developed a standardised and harmonised guide to trainings and implementation of IRS across all eight E8 countries (E8, 2020b).

These E8 achievements have been recognised nationally, regionally and internationally and enabled the E8 to secure additional funds to implement its elimination acceleration plan (E8, 2017b). A further indictment of the success of the E8, was the resolution from the SADC

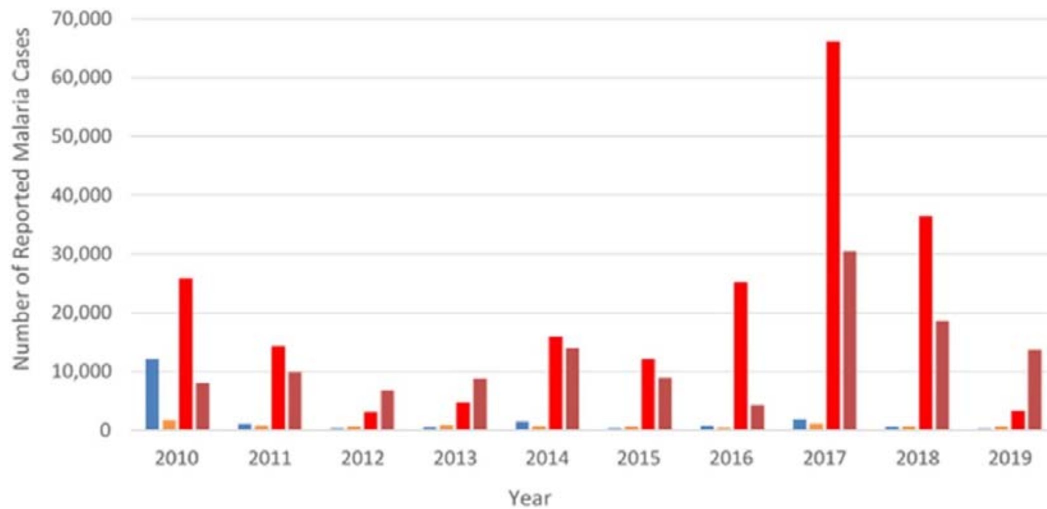
Health Ministers Meeting in Dar as Salaam, Tanzania towards the end of 2019, that the E8 Secretariat would be responsible for coordinating all malaria-related matters for the entire SADC block.

CHALLENGES EXPERIENCED BY THE E8 INITIATIVE

Although the E8 region has made significant progress towards eliminating malaria, progress at the individual country-level has been extremely varied (E8, 2019c). The front-line four countries have not meet their initial elimination target of 2020, with malaria incidence in South Africa higher in 2019 compared to 2010 (Figure 6). Even more concerning are the increases in case numbers documented in three of the four second line countries from 2010 until 2019 (Figure 6). There five persisting challenges across the E8 region that will continue impeding the progress towards malaria elimination if not promptly and adequately addressed.

1. ***Limited domestic funding to drive the malaria elimination agenda:*** In all E8 member states, with the exception of South Africa, the successful implementation of malaria elimination strategies is highly dependent on access to external donor funding. This over-reliance on donor funding to support the national elimination efforts is further exacerbated by the fact that E8 regional elimination strategic plan is totally donor funded, despite the E8 being a subsidiary of the southern African economic development agency-SADC. As donor funding is generally time-limited, it is essential that domestic and regional funding are sourced to ensure long term sustainability of elimination efforts in the E8 region. Sourcing alternative regional funding is now a matter of urgency. Due to changes in the income classification status of three member states, namely Botswana, Eswatini and Namibia, they together with South Africa, are no longer be eligible for Global Fund aid (The Global Fund, 2020).
2. ***Disconnect/misalignment between ministerial endorsements and technical implementation**:* Policy decisions pertaining to malaria are often made at a Head of State and Ministerial level. However, these have frequently not translated directly into technical and the operational instructions. This is partly due to the fact that initially senior government officials were not included in the E8 governance hierarchy. This has been partially addressed through the inclusion of the permanent secretaries in the E8 governance structures, however further strengthened is required.
3. ***Reluctance to share data on a regional platform:*** Although data sharing agreements have been signed by all E8 Health Ministers, National Malaria Control Programmes have been reluctant to share their malaria data on the E8 regional data sharing platforms. It was only following the early detection of and prompt mitigating responses to the 2017 upsurge in malaria cases (SADC, 2017) by the E8, that the value of routinely sharing data was recognised and accepted by the National Malaria Control Programmes. The routine sharing of accurate and timely data must be encouraged to allow for prompt actions as required.
4. **Reluctance to adopt new technologies and techniques:** Although it is widely acknowledged that novel technologies and techniques are required to achieve malaria elimination, National Malaria Control Programmes are extremely wary of adopting and implementing new techniques and technologies, such as single-low-dose-primaquine (Chen *et al*., **201**5) and genomic surveillance (Tessema *et al*., **201**9), which has greatly limited the progress to elimination. The National Malaria Control Programmes must be encouraged and supported to adopt and implement novel techniques with evidence of impact and training.
5. ***Health systems challenges and systemic bottlenecks**:* Across the E8 region, the misalignment between national budget cycles and the seasonality of malaria, has in most cases led to significant delays in the procurement and deployment of essential

commodities, responsiveness to emergency situations, and efficient deployment of malaria preventative activities. Although the E8 is mandated to advance the SADC malaria elimination agenda, the E8 cannot enforce the adoption of its recommended best practices and policies by every member state, as every country is regarded as a sovereign entity. In certain instances, this has resulted in the non-harmonisation and mis-synchronisation of initiatives across E8 country borders. Greater effort must be placed in ensuring harmonisation and synchronisation of activities between countries and that robust stock management and procurement practices and procedures are in place to prevent delays and/or stock-outs of essential malaria commodities.



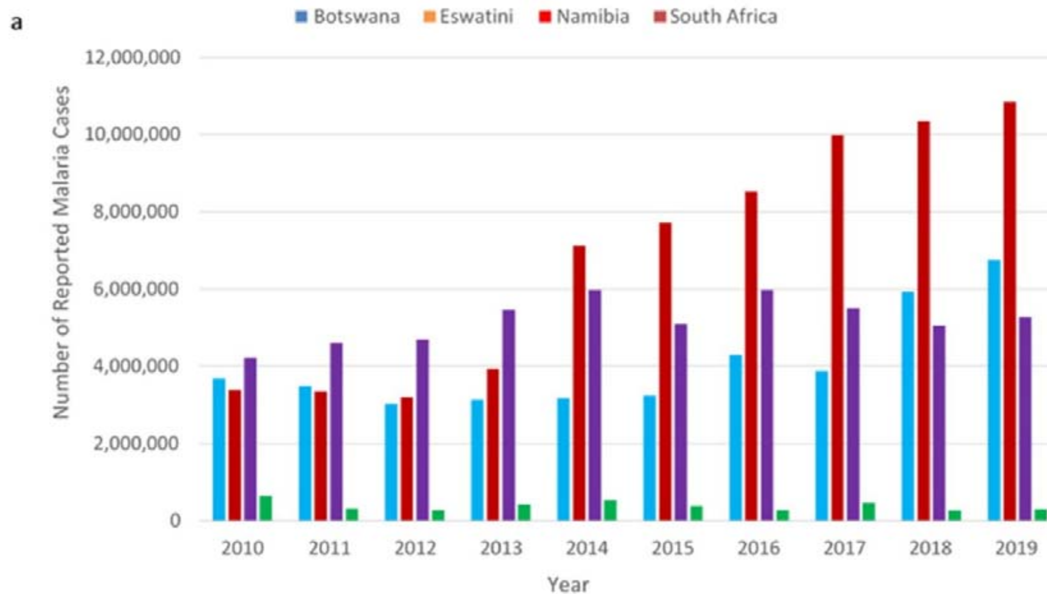


Figure 6. Total number of malaria cases reported from 2010 to 2019 in (a) the four front line (Botswana, Eswatini, Namibia, South Africa) E8 countries and (b) the four second line (Angola, Mozambique, Zambia, Zimbabwe) E8 countries (source: Elimination 8 Secretariat).

CONCLUSION

The E8 model has clearly demonstrated that a well-coordinated and well-resourced regional collaboration can accelerate southern Africa towards malaria elimination. However, achieving the end-game of malaria elimination will require sustained political commitment and accountability, ring fenced domestic funding for malaria elimination, elimination agendas developed and implemented by local experts in collaboration with National Malaria Control Programmes and an effective regional coordination platform. Successful effective regional platforms, such as the E8, encourage best practices, monitor quality and impact of interventions while ensuring sustained government support and the harmonisation and synchronisation of interventions across all participating countries.

DISCLOSURE STATEMENT

No potential of conflicts were reported by the authors.

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