

# Malaria Prevention Strategies in South Sudan

**Harriet Akello Pasquale**

Director,

National Malaria Control Program

National Ministry of Health

Republic of South Sudan

**Correspondence:**

Harriet Akello Pasquale

[harrietpasquale@gmail.com](mailto:harrietpasquale@gmail.com)

Submitted: November 2020

Accepted: December 2020

Published: December 2020

## Abstract

The whole of South Sudan is endemic for malaria, with high transmission in the country throughout the year. Malaria is the leading cause of illness and death in children under five years. In 2019, the malaria incidence (all ages) was estimated at 246 per 1,000 populations (239 per 1,000 for children under-five -years) representing 5,067,464 cases.

Vector control is a key intervention for malaria prevention with Insecticide Treated Nets (ITN) being the main method used by the population. Chemoprevention for malaria for pregnant women is mainly administered through ante-natal clinics. Seasonal malaria chemoprevention is a new strategy that South Sudan has just piloted in Yambio.

By 2014-2019, 6,397,512 ITNs had been distributed. However, the 2017 Malaria Indicator Survey showed that only about 41.7% of children aged under five years had slept under an ITN the previous night, and that only 27% of households owned at least one ITN for every two people. There has been increases in the percentage of pregnant mothers receiving 2 doses of Intermittent Preventive Treatment in Pregnancy (IPTp2).

It is recommended that the Ministry of Health train entomologists and technicians for vector surveillance, and that the National Malaria Programme conduct entomological surveillance and insecticide resistance monitoring and create stratification maps using entomological data.

**Key words:** malaria prevention, South Sudan, Insecticide Treated Net (ITN), vector control, Intermittent Preventive Treatment in Pregnancy (IPTp).

## Introduction

The whole of South Sudan is endemic for malaria, with high transmission in the country throughout the year. Malaria accounts for about 66.8% of all health facility visits in the outpatient departments 30% of all hospital admissions and 50% of all cause of deaths in the hospitals. Malaria is the leading cause of illness and death in children under five years.<sup>[1]</sup> Malaria transmission is all year-round, peaking at the end of the annual rainy season from June to November. Transmission is higher in the southern parts of the country compared with the northern parts.<sup>[2]</sup>

In 2019, the malaria incidence (all ages) was estimated at 246 per 1,000 populations (239 per 1,000 for children under-five -years) representing 5,067,464 cases. This was significant increase (43%) from 2013 when incidence stood at 171 per 1,000 populations.<sup>[4]</sup> Over this same period, malaria mortality (all ages) increased marginally from 45 per 100,000 to 49 per 100,000 population - Health Management Information Systems (HMIS) reports.<sup>[3]</sup>

Vector control is a key intervention for malaria prevention in South Sudan. Long lasting insecticidal nets (ITNs) are the main method used by the population. Indoor residual spraying and larval source management including larviciding are used on a limited scale mainly in refugee camps and camps hosting internally displaced persons. In addition, South Sudan also implements malaria

**Citation:**

Pasquale. Malaria Prevention Strategies in South Sudan. *South Sudan Medical Journal* 2020; 13(5):187-190 © 2020 The Author (s) License: This is an open access article under [CC BY-NC-ND](https://creativecommons.org/licenses/by-nc-nd/4.0/)

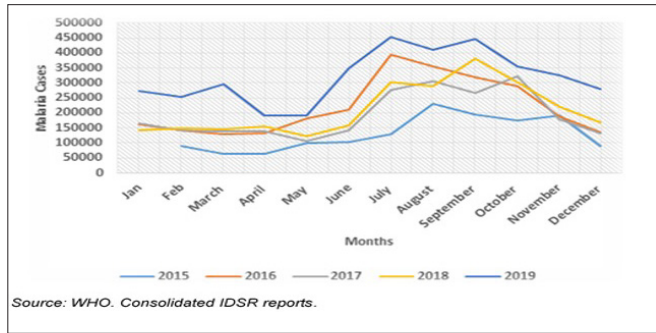


Figure 1. South Sudan Trends of malaria transmission (HMIS report 2015-2019 <sup>[2,4]</sup>)

chemoprevention for special vulnerable populations such as pregnant mothers and children under five years of age.

ITNs are distributed through mass campaigns conducted every three years. The mass campaigns target all households in the whole country. To complement the mass campaigns and ensure that they are always available in the community, ITNs are also distributed through other continuous distribution channels. These include through the Expanded Programme of Immunization (EPI) at the time a child receives her third dose of pentavalent vaccine, through a woman’s first visit to the ante-natal clinic (ANC) and through emergency distribution whenever there is displacement of populations.

Chemoprevention for malaria (Intermittent Preventive Treatment in Pregnancy - IPTp) in pregnant women is mainly administered through ANCs. All pregnant women (except those allergic to sulpha components, or on cotimoxazole for HIV IO prophylaxis) are given at least 3 doses of Sulphadoxine Pyremethamine starting from the second trimester.

Seasonal malaria chemoprevention (SMC) is a new strategy that South Sudan has just piloted in Western Equatoria state in Yambio<sup>[5]</sup>). SMC targets children aged 3 to 59 months who receive a complete treatment of antimalarial drug on a monthly basis for 4 to 5 months during the peak malaria transmission using a combination of Sulphadoxine Pyremethamine and Amodiaquine. SMC is now included in our malaria prevention strategy in the new National Malaria Strategic Plan 2020 – 2025 - see Editorial and figure 4.

Early access to a prompt and effective malaria diagnosis and treatment within 24 hours of onset of treatment can interrupt malaria transmission. Malaria Case management is also a core malaria intervention in South Sudan. Malaria Parasitological diagnosis is mainly done using rapid diagnostic test at all health care levels. Microscopy is used mainly in major hospitals and Primary Health care centres. However, 50% of cases are still clinically diagnosed. Malaria RDT testing is rolled out at the community level

to improve patient care by community health workers. Malaria is treated using an artemisinin combination treatment. The first line treatment for malaria in South Sudan is Artesunate Amodiaquine, Dehydroartemisinin piperaquine is an alternative treatment used mainly in private health facilities. Artemether Lumefantrine is the second line treatment for malaria. Severe malaria is mainly treated with artesunate injection for during the critical stage of illness and as soon as the patient recovers, the treatment is completed with a full course of Artesunate amodiaquine or Artemether lumefantrine. Other drugs used for treating severe malaria are Quinine and Artemether injections.<sup>[6]</sup>

Despite the universal coverage in ITNs and usage of Indoor Residual Spraying (IRS) in targeted areas of South Sudan, the scale up of malaria diagnosis and treatment, current evidences show that these core interventions have not had significant impact to interrupt malaria transmission. Malaria incidence continue to rise from 171 per 1000 population in 2013 to 251 per 1000 population in 2019.<sup>[2,4]</sup> The number of recorded malaria deaths also increased from 1,321 deaths in 2013 to 4,873 in deaths in 2019. This has called for a need of exploring other innovative interventions to complement the core intervention. The new malaria strategic plan is an opportunity to do things differently.

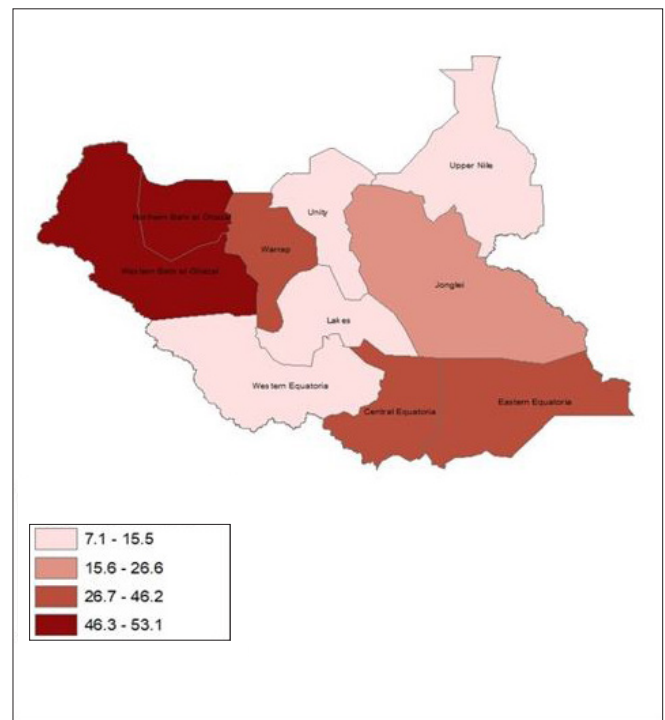


Figure 2. South Sudan Malaria Epi map 2017 from Malaria Indicator Survey prevalence data

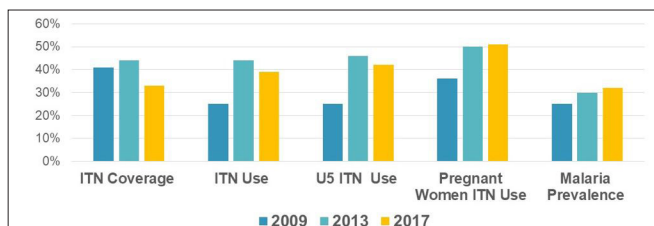


Figure 3. Malaria Intervention coverage <sup>[2,4]</sup>

**Main Achievements**

By 2014-2019, 6,397,512 ITNs had been distributed. The Malaria Strategic Plan (MSP) of 2014/15-2020/21 (revised in 2017) targeted 85% of under-five-year-old children to sleep under a net, and 95% ownership of at least one net per household.<sup>[7]</sup> However, the 2017 Malaria Indicator Survey (MIS),<sup>[2]</sup> showed that only about 41.7% of children aged under five years had slept under an ITN the previous night, that only 27% of households owned at least one ITN for every two people. There were no gains in ITN coverage as the percentage of pregnant women who slept under an ITN the previous night stayed flat at 50% and 51% in 2013 and 2017 respectively.<sup>[2,4]</sup>

The MSP targeted 5% of the population on to be protected by IRS in the past 12 months, but the MIS 2017 did not capture any IRS indicator to assess progress of implementation. However, the Mentor Initiative has conducted IRS in a few selected areas in PoCs (Protection of Civilians) in Bentiu and Malakal and refugee camps in Maban and Jamjang and in the host communities of Bunj and Maban. The insecticide used currently is Actellic.

There was an increase from 25.8% in 2013 to 56.6% 2017<sup>[2,4]</sup> in the percentage of pregnant mothers receiving two doses of Intermittent Preventive Treatment in Pregnancy (IPT2) and ITN distribution through routine ANC.

There was an increase in the uptake of IPTp3+ (IPTp3 or more doses) among pregnant women during the implementation period: A total of 2,740,000 doses were distributed between 2014 to 2019 through the focused antenatal care as part of the IPTp package for malaria prevention during pregnancy. There was close collaboration between the National Malaria Control Programme (NMCP) and the Reproductive and Maternal Health services to ensure optimum uptake of IPTp3+. Midwives from the public sector were trained to promote and provide IPTp3+ services.

The policy guidelines for the implementation of the malaria vector control guidelines were developed. Annual assessments, mapping and larviciding of breeding sites during the dry season in PoCs (Malakal and Bentiu) and refugee camps (Maban) were done by trained community workers through a collaborating partner.

**Challenges and recommendations**

Challenges include:

- Measurement of entomological impact indicators was not planned during the 2014-2020 malaria strategic plan. Entomological surveillance and insecticide resistance monitoring were planned but not implemented. As such it is not possible to adequately assess the impact of the vector control interventions implemented in South Sudan
- Limited capacity (human and infrastructure) for entomological impact assessments. A few entomology technicians have been trained but they are not adequately resourced to conduct simple entomological surveillance.

It is recommended that:

- The Ministry of Health engage and/or train



Figure 4. Launch ceremony for the new National Malaria Strategic Plan 2021 - 2025 at the Ministry of Health (Source: WHO South Sudan)

entomologists and technicians for sentinel sites or county level to facilitate vector surveillance, and the monitoring and evaluation of vector control activities in a timely manner.

- The National Malaria Programme should conduct entomological surveillance and insecticide resistance monitoring and create stratification maps using entomological data.
- The Ministry of health should explore scale up implementation of other vector control intervention such as IRS, larviciding and environmental management among others to prevent the spread of insecticide resistance from the widely used pyrethroid treated ITNs especially in areas where no impact has been documented with ITN alone

3. Health Management Information Systems (HMIS) reports - 2015-2019
4. National Malaria Control Programme. [Malaria Indicator Survey](#) 2013
5. Médecins Sans Frontières Operational Centre Brussels. Seasonal Malaria Chemoprevention study Draft report
6. South Sudan malaria case management Guidelines and training manual Republic of Sudan Federal Ministry of Health Directorate of Preventive Health Services. Malaria Case Management Training Manual, [Part I Learner's Guide](#); [Part II Tutor's Guide](#). New Version
7. Ministry of Health, Republic of South Sudan, South Sudan Malaria Control Strategic Plan 2014/16- 2021/22. Ministry of Health, Republic of South Sudan, Health Sector Development Plan 2012-2016.

References

1. [Integrated Disease Surveillance and response \(IDSR\) and DHIS-2 data](#) 2019
2. South Sudan [Malaria Indicator Survey](#) 2017.

## Malaria Resources

### Preventive malaria treatment among school-aged children in sub-Saharan Africa: a systematic review and meta-analyses

Cohee et al. Lancet October 2020 DOI: [https://doi.org/10.1016/S2214-109X\(20\)30325-9](https://doi.org/10.1016/S2214-109X(20)30325-9)

The burden of malaria infection in sub-Saharan Africa among school-aged children aged 5–15 years is underappreciated and represents an important source of human-to-mosquito transmission of Plasmodium falciparum. Additional interventions are needed to control and eliminate malaria. We aimed to assess whether preventive treatment of malaria might be an effective means of reducing P falciparum infection and anaemia in school-aged children and lowering parasite transmission.

Preventive treatment of malaria among school-aged children significantly decreases P falciparum prevalence, anaemia, and risk of subsequent clinical malaria across transmission settings. Policy makers and programme managers should consider preventive treatment of malaria to protect this age group and advance the goal of malaria elimination, while weighing these benefits against potential risks of chemoprevention.

### Back to school for malaria prevention: a new tool in the era of malaria elimination?

Eijk and Hill Lancet October 2020 DOI: [https://doi.org/10.1016/S2214-109X\(20\)30347-8](https://doi.org/10.1016/S2214-109X(20)30347-8)

Children aged 5–15 years predominantly have the highest risk of asymptomatic malaria and gametocytaemia, and yet low use of long-lasting insecticide treated nets, which puts them at risk. ...

Currently, there is no WHO recommendation for malaria prevention among school children in sub-Saharan Africa. The systematic review by Lauren Cohee and colleagues offers the first comprehensive review and meta-analyses of the effects of different prevention strategies on outcomes in school children.

The results deserve review by policy makers to identify what further evidence is needed before recommending school-based malaria programmes, and discussion with national programmes on how school-based strategies might be funded and implemented. Importantly, malaria preventive strategies in schools will have health and educational benefits for children and can also contribute to reductions in community transmission. That is a goal worth fighting for.