World Health Organization
South Sudan

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Evidence Summary on Meningitis Risk and Vaccine Introduction Options for South Sudan: Based on MenRAT Assessment, November 2025

South Sudan is located within the African meningitis belt and experiences recurrent bacterial meningitis transmission linked to seasonal and ecological patterns. The epidemic season occurs between epidemiological weeks 1 and 26 with increased transmission during dry conditions from September to March. Historical data show meningitis outbreaks before introduction of Men5CV and a confirmed outbreak in 2022.

Population movement across internal routes and border areas with Sudan influences exposure and transmission pathways. Nearly two million people live in refugee and internally displaced persons settings where population density and service access gaps affect detection and response. Counties in border regions experience mobility and intermittent access which influence surveillance functionality.

The national meningitis preparedness and response plan identifies gaps in surveillance, laboratory confirmation, case management readiness, and operational response systems. These gaps affect early detection and verification of suspected outbreaks and influence the national capacity to prepare for the planned introduction of the MenFive conjugate vaccine.

The MenRAT assessment conducted in 2025 provided a county and state level classification of meningitis risk and informed national decision making on introduction options for Men5CV.

Burden of Meningitis

South Sudan, as one of the seven East African countries in the African meningitis belt, continues to experience recurrent meningococcal meningitis outbreaks, with the most recent incident caused by serogroup X (NmX) in 2023. The country faces unique challenges, including ongoing conflict, humanitarian crises, inconsistent health facility functionality, shortages of healthcare workers, and limited access to essential supplies. These factors underscore the urgent need for a comprehensive, evidence-based risk assessment to guide vaccine introduction and appropriate strategies.

In alignment with the "Defeat Meningitis by 2030" initiative and the recommendations outlined in the WHO Position Paper (2023), the Ministry of Health of South Sudan is preparing to transition from MenAfrivac to the new multivalent meningococcal conjugate vaccine (Men5CV/ Men5CV), targeting serogroups ACXWY. This transition is critical for reducing mortality and disability associated with bacterial meningitis, particularly among vulnerable populations aged 1–19 years.

State level data from 2017 to 2025 recorded 1513 suspected meningitis cases and 127 deaths representing a case fatality rate of 8.4 percent. Northern Bahr el Ghazal, Unity, Eastern Equatoria, and Warrap reported the highest numbers of suspected cases. Seven outbreaks were documented between 2017 and 2025 in three states.

Pathogen confirmation for this period shows Streptococcus pneumoniae at 53 percent, NmW at 25 percent, Hib at 12 percent, NmX at 5 percent, GBS at 3 percent, and other organisms at 2 percent. Multiple counties reported suspected cases across the period with variation in detection linked to confirmation capacity and access constraints.

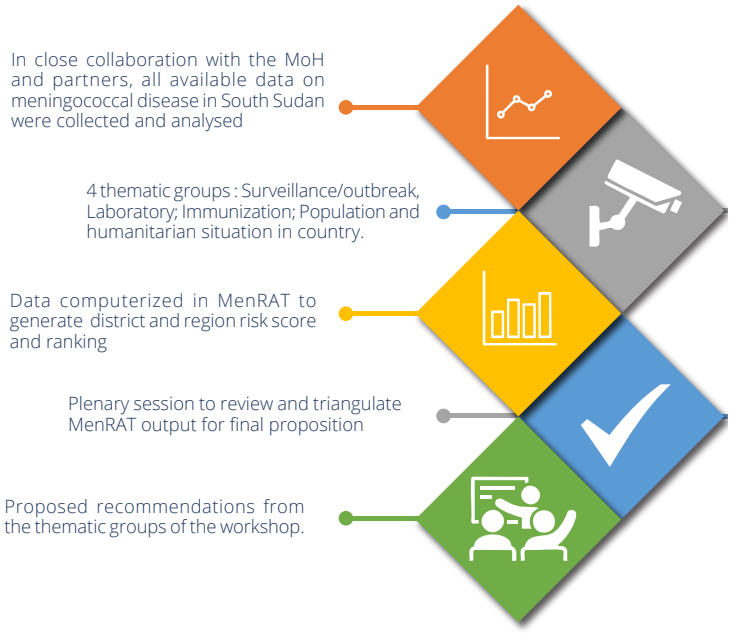
Counties that did not implement MenAfriVac preventive campaigns during 2016 and 2018 include Ayod, Uror, Canal or Pigi, Leer, Mayendit, Manyo, Fashoda, and Panyikang. These counties retain unvaccinated cohorts with increased susceptibility.

Meningitis Suspected Cases in South Sudan From 2017-2025

YEAR	CASES	DEATHS	CFR
2017	67	3	4.5%
2018	302	41	13.6%
2019	178	10	5.6%
2020	124	3	2.4%
2021	51	0	0.0%
2022	407	34	8.4%
2023	147	6	4.1%
2024	155	26	16.8%
2025	82	4	4.9%
Total	**1513**	**127**	**8.4%**

STATES	CASES	DEATHS	CFR
Central Equatoria	86	4	4.7%
Eastern Equatoria	225	36	16.0%
Jonglei	40	1	2.5%
Lakes	88	2	2.3%
Northern Bahr El Ghazal	723	67	9.3%
Unity	106	4	3.8%
Upper Nile	54	0	0.0%
Warab	113	4	3.5%
Western Bahr El Ghazal	34	3	8.8%
Western Equatoria	44	6	13.6%
Grand Total	**1513**	**127**	**8.4%**

Methodology of the Meningitis Risk Assessment Tool (MenRAT)



General Objective:

Engage country health authorities to assess the risk of meningitis and the status of meningitis surveillance, prevention and control and discuss the strategy for introduction of Men5CV in their country

Specifics Objectives:

1. To engage national health authorities in discussion on Men5CV introduction in South Sudan;
2. To review the epidemiology of meningococcal disease and assess the risk of meningitis epidemics through i) analysis of historical surveillance and outbreak data and ii) consultation of local expert knowledge of meningococcal disease epidemiology and risk factors;
3. To review the outputs of the risk assessment with the national authorities to support decision-making and discuss issues and options for disease control;
4. To determine areas of the country that should be prioritized for MenACV and Men5CV introduction and propose an introduction strategy, including estimated total target population and number of vaccine doses needed;
5. To discuss opportunities for strengthening meningococcal disease surveillance, including the laboratory component.

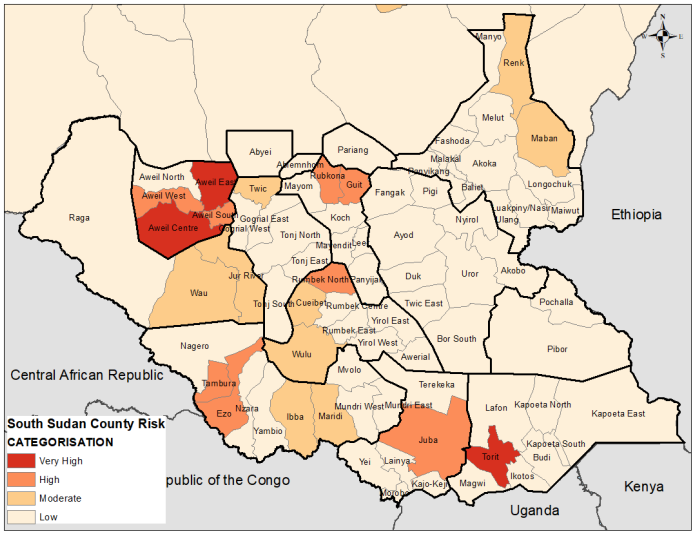
MenRAT Findings

The MenRAT assessment conducted in 2025 classified meningitis risk at county and state levels using epidemiological indicators, immunization history, pathogen distribution, and expert consultations. The assessment generated county level priority categories and national level introduction options for MenFive.

At county level, three counties were categorized as very high risk including Aweil Centre Aweil East and Torit. Eight counties were categorized as high risk, nine as moderate risk, and sixty as low risk. At state level, Northern Bahr el Ghazal was categorized as very high risk, while Eastern Equatoria and Western Equatoria were categorized as high risk states. Six states were categorized as moderate risk and four as low risk.

The findings indicate persistent susceptibility in counties that did not implement MenAfriVac preventive campaigns in 2016 and 2018. Seven outbreaks occurred between 2017 and 2025, confirming ongoing transmission and vulnerability in selected locations.

As per the WHO position on the use of Men5CV issued in October 2023 and published in January 2024, all countries in the African meningitis belt should introduce Men5CV into their routine immunization programs in a single-dose schedule for infants and young children aged 9–18 months. In high-risk countries, and countries with high-risk districts, a one-off mass preventive campaign with Men5CV should also be conducted at the time of Men5CV introduction. Each country needs to conduct a comprehensive meningococcal disease risk assessment to inform its Men5CV introduction strategy and the decision to conduct initial mass preventive campaigns in high-risk regions/districts.



Map of meningitis risk by county in South Sudan

Meningitis Risk Score by state

NEW_STATES	NEW_COUNTY	CBR	CIR	ERI	Total Risk Score
Northern Bahr El Ghazal	Awiel Centre	100	100	33	233
Eastern Equatoria	Torit	75	75	33	183
Northern Bahr El Ghazal	Awiel East	75	25	0	100
Central Equatoria	Juba	50	25	0	75
Lakes	Rumbek North	25	50	0	75
Northern Bahr El Ghazal	Awiel South	25	50	0	75
Unity	Guit	25	50	0	75
Western Equatoria	Ezo	25	50	0	75
Western Equatoria	Tambura	25	50	0	75
Northern Bahr El Ghazal	Awiel West	25	25	0	50
Unity	Rubkona	25	25	0	50
Lakes	Cuebit	25	0	0	25
Lakes	Wulu	0	25	0	25
Upper Nile	Maban	0	25	0	25
Upper Nile	Renk	25	0	0	25
Warap	Twic	25	0	0	25
Western Bahr El Ghazal	Jur River	25	0	0	25
Western Bahr El Ghazal	Wau	25	0	0	25
Western Equatoria	Ibba	0	25	0	25
Western Equatoria	Maridi	0	25	0	25
Central Equatoria	Kajo Keji	0	0	0	0
Central Equatoria	Lainya	0	0	0	0
Central Equatoria	Morobo	0	0	0	0
Central Equatoria	Terekeka	0	0	0	0
Central Equatoria	Yei	0	0	0	0
Eastern Equatoria	Budi	0	0	0	0
Eastern Equatoria	Ikotos	0	0	0	0

Key Drivers and Determinants

The MenRAT assessment conducted in 2025 classified meningitis risk at Several determinants influence meningitis transmission and outbreak risk in South Sudan. These determinants align with the long term epidemiological profile of the meningitis belt, historical outbreak patterns, and health system capacity constraints.

- Dry season climatic conditions influence seasonal increases in meningitis incidence consistent with the meningitis belt.
- Historical fluctuations in routine immunization coverage affect population level immunity to meningococcal disease.
- Population movement across internal and cross border areas including Unity Upper Nile Western Bahr el Ghazal Abyei and Ruweng Administrative Area influences exposure and transmission pathways.
- Limited laboratory capacity for cerebrospinal fluid analysis affects confirmation of suspected cases and delays pathogen identification.
- Counties that did not implement MenAfriVac preventive campaigns retain large unvaccinated cohorts with ongoing susceptibility.
- Humanitarian settings with restricted access influence timeliness of detection referral and sample transport High turnover of clinical and surveillance staff reduces continuity of case detection reporting and follow up.

These determinants shape the geographic and seasonal distribution of cases and inform the recommended approach for MenFive introduction.

Analysis

Access

Access to diagnostic and case management services is influenced by limited availability of lumbar puncture capability in many health facilities. Subnational laboratory capacity for bacteriological testing is limited, affecting confirmation of suspected cases. Insecurity restricts movement of surveillance teams and limits access to facilities in several counties including those that did not implement MenAfriVac preventive campaigns. Population movement from Sudan and internal displacement increases the number of people living in high density settings where health service access is variable. Referral pathways remain constrained by limited ambulance coverage and variable readiness of county level treatment facilities.

Quality

Quality of meningitis surveillance and diagnosis is affected by shortages of trained health workers and frequent staff turnover. Subnational laboratories have limited equipment for bacteriological testing, and stockouts of laboratory reagents are documented. Sample collection, packaging, transportation, and storage practices remain inconsistent. Quality management systems and external quality assessment for meningitis diagnostics are not yet fully established. These gaps reduce reliability and completeness of surveillance data and confirmation of suspected outbreaks.

Demand

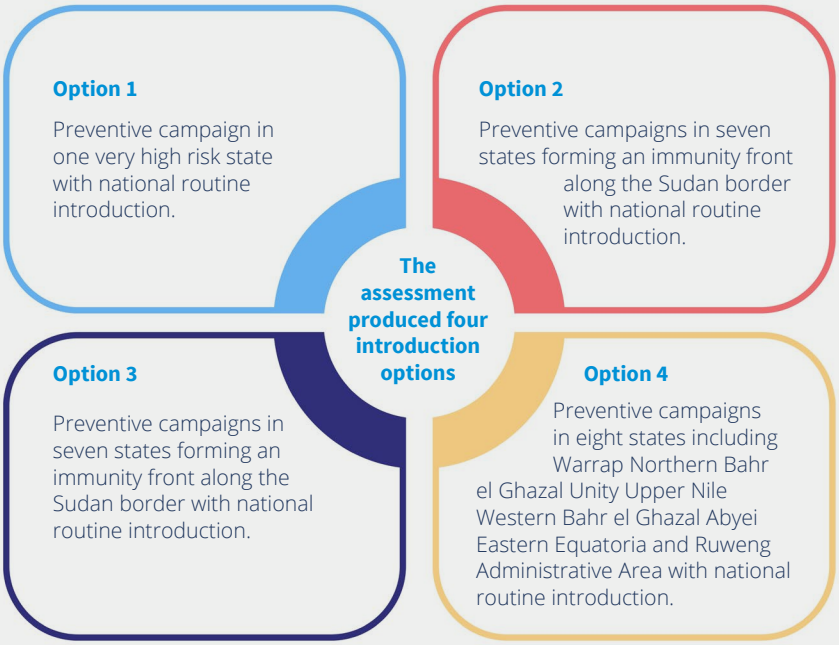
Care seeking for suspected meningitis depends on proximity to health facilities with diagnostic capability and availability of clinical staff trained in case identification and referral. Counties with incomplete MenAfriVac

implementation retain large unvaccinated cohorts aged one to twenty-nine years, influencing demand for preventive vaccination. Uptake of routine immunization varies due to denominator adjustments related to the 2022 Population Estimate Survey and the influx of returnees from Sudan. Introduction of MCV2 in 2025 provides a delivery platform that aligns with the recommended age for MenFive introduction and may influence community level demand for vaccination.

Resilience

Resilience of meningitis prevention and response systems is influenced by the presence of humanitarian settings with limited-service continuity. Surveillance linkages between boma, facility, and county levels remain variable. Cold chain capacity requires reassessment to support introduction of new vaccines including multi dose presentations. Laboratory readiness for confirmation of meningitis requires reinforcement at national and subnational levels. Operational readiness for rapid response depends on availability of transport, supplies, and coordination capacity at state and county levels.

Strategic Options for MenFive Introduction



Option 4 aligns with the geographic distribution of outbreaks, historical susceptibility, cross border movement patterns, and gaps in previous MenAfriVac coverage. Therefore, the MenRAT findings support application of Option 4 as the preferred approach.

According to Gavi's updated Eligibility, Transition, and Co-Financing model, which will be implemented starting in 2026, South Sudan will be required to co-finance its preventive campaign and the introduction of Men5CV into routine immunization. This requirement poses a significant challenge given the country's fragile economic, social, and financial situation, which could compromise the timely introduction of Men5CV in the short term

Way Forward

- Apply Option 4 as the national approach for MenFive introduction, with preventive campaigns in high risk and border states and routine introduction in all states.
- Integrate MenFive introduction with the second year of life platform to support routine delivery and long term population immunity.
- Strengthen confirmation capacity for meningitis through targeted improvement of cerebrospinal fluid collection and bacteriological testing at national and subnational levels.
- Prioritize surveillance enhancement in counties with previous MenAfriVac gaps and in high mobility border areas to improve early case detection and outbreak verification.
- Support country to strengthen surveillance including laboratory activities across the country as soon as possible
- Establish readiness for rapid reactive vaccination by aligning surveillance thresholds with operational triggers and ensuring timely deployment capability.
- Submit the Men5CV application to GAVI as soon as possible in 2026 or other partners.
- Advocacy with country authorities to increase MoH immunization programme budget to cover the co-financing required for Men5CV introduction and other new vaccines.

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The development of these knowledge series is coordinated by
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This factsheet is based on the MenRAT Assessment (Nov 2025) conducted by WHO, Immunization, Vaccines and Biologicals and WHO EPR Teams , with the Ministry of Health, South Sudan

This issue was produced by Strategic Health Information team, and Health Programs Cluster under the leadership of Dr. Mutale Senkwe together with Immunization, Vaccines and Biological program