



CHOLERA IN SOUTH SUDAN: Past, Present and Future

Executive Summary

Cholera is endemic in South Sudan, with frequent outbreaks driven by risk factors such as recurrent flooding, displacement due to political instability, limited access to healthcare and inadequate water and sanitation services. The current outbreak was declared on the 28 of October 2024 and has surpassed 22,000 cases. The current outbreak is unusual in several aspects, including its timing - as it emerged at the end of the rainy season rather than during the typical beginning or peak - and a different *V. cholerae* serotype compared to previous outbreaks, which was introduced to the country. The main drivers of transmission likely include multiple introductions, widespread population movements and displacement, overcrowding, and poor Water, Sanitation and Hygiene (WASH) conditions exacerbated by recent flooding and poor socio-economic conditions.

While case numbers have stabilized in hotspots like Rubkona and Juba as of mid-January, a concerning increase in cases and deaths in hard-to-reach counties like Mayom, Guit and Fangak indicate that cholera is continuing to spread, and the outbreak is far from over. With a cholera outbreak being declared in Sudan in August 2024 and ongoing conflict driving cross-border movements, cholera cases in South Sudan were likely to appear. With the country's limited WASH infrastructure, further worsened by displacement and the 2024 floods, the risk of a widespread outbreak was high.

To address the current outbreak, we urge for proactive and rapid scaling of response measures in newly affected areas including vaccination with Oral Cholera Vaccines (OCV). Long-term efforts to prevent similar outbreaks in the future requires sustainable investments in development, particularly in infrastructure for WASH together with a proactive readiness to prevent cholera outbreaks when there is high risk of spillover into South Sudan.

Past: Cholera in the last 10 years

Between 2014 and 2023, five cholera outbreaks of different size and spread were recorded in South Sudan, reporting between 424 to 20,038 cases, 1 to 436 deaths and a case fatality rate (CFR) of 0.14% to 2.6% (Table 1). The largest of these started in mid-June 2016 and lasted until August 2017 (14 months) with a national attack rate of 1.8/1000 inhabitants. As response, 21 campaigns in 14 counties distributed close to 2,700,000 doses of OCV. After this outbreak ended, no community transmission of cholera was reported until 2022. The two most recent outbreaks were both contained within one county, Rubkona in 2022 and Malakal in 2023. For the outbreak in Rubkona 2022, a two-dose proactive OCV campaign was conducted among IDPs prior to the outbreak reaching over 175,000 individuals (>85% of target), likely aiding in containing the outbreak and explaining the very low case number (424) and CFR (0.2%).

Table 1. Summary of historical cholera outbreaks in South Sudan 2014-2023. AR = attack rate per 1000, OCV = oral cholera vaccine, CFR = case fatality rate. Duration between start of outbreak and OCV campaign in parenthesis when applicable.

Year	Cases	Deaths N (CFR)	Start Duration	Affected counties	Top affected counties	AR national avg (range)	OCV campaign
2023	1471	2 (0.14%)	20 Feb 3 months	1	Malakal	0.1 (7.5)	Yes, reactive 16 March (+24 days)
2022	424	1 (0.2%)	14 April 7 months	1	Rubkona	0.03 (1.2)	Yes, proactive (-3 m) and reactive (+28 days)
2016-17	20438	436 (2.1%)	18 June 14 months	27	Ayod, Juba, Kapoeta	1.8 (0.1-19)	Yes Juba (2016+2017), 12 other counties (2017)
2015	1818	47 (2.6%)	20 May 4 months	3	Juba, Bor South	0.2 (0.2-3.2)	Yes Juba
2014	6389	139 (2.2%)	28 April 6 months	13	Juba, Torit, Malakal	0.5 (0.1-5.9)	No

Present: Current Outbreak

The current outbreak was declared on the 28 of October 2024 in Renk county near the border with Sudan. The first cases were seen among returnees, and to some extent, refugees. As of 21 of January, 22,628 cases have been reported from 33/80 counties in 7 of 10 states and 1 of 3 administrative areas many along the river Nile. Together, six counties account for 84% of all the cases; with almost half of the national total reported from Rubkona county (Table 1, Figure 1). Affected individuals in this outbreak are mainly children and young adults, with more than half of all cases in children under 15 years, and 30% being below 5 years old, equally affecting men and women. In large, these demographic trends have been consistent across counties and over time.

As of 21 January 2025, 459 deaths have been reported: 213 in health facilities (HF) and 246 in the community, resulting in a national CFR of 2.0% and an HF CFR of 0.9%. The overall CFR is below the 2016–2017 outbreak levels, and the HF CFR meets the international target of <1.0%, indicating effective case management. However, there are important regional differences reflecting local challenges in high caseloads and resource distribution to hard-to-reach areas. Most deaths occurred among those below 5 years of age (20%) or above 65 years (17%) with higher proportion of men (54%) than women (46%).

Table 2. Summary of suspected cholera cases and deaths in seven top affected counties. AR = attack rate per 1000, HF = health facility, CFR = case fatality rate. In parenthesis % of all deaths that are either HF or community deaths.

County	Cases	% of total	AR	Deaths				
				Total	HF	Community	CFR	HF CFR
Rubkona	9936	44%	27	209	109 (52%)	100 (48%)	2.1%	1.1%
Juba	2528	11%	4	30	13 (43%)	17 (57%)	1.2%	0.5%
Mayom	2006	9%	12	75	20 (27%)	55 (73%)	3.7%	1.0%
Aweil West	1921	8%	9	2	2 (100%)	0	0.1%	0.1%
Malakal	1341	6%	7	6	6 (100%)	0	0.4%	0.4%
Duk	595	3%	3	9	0	9 (100%)	1.5%	0.0%
Renk	587	3%	3	3	3 (100%)	0	0.5%	0.5%

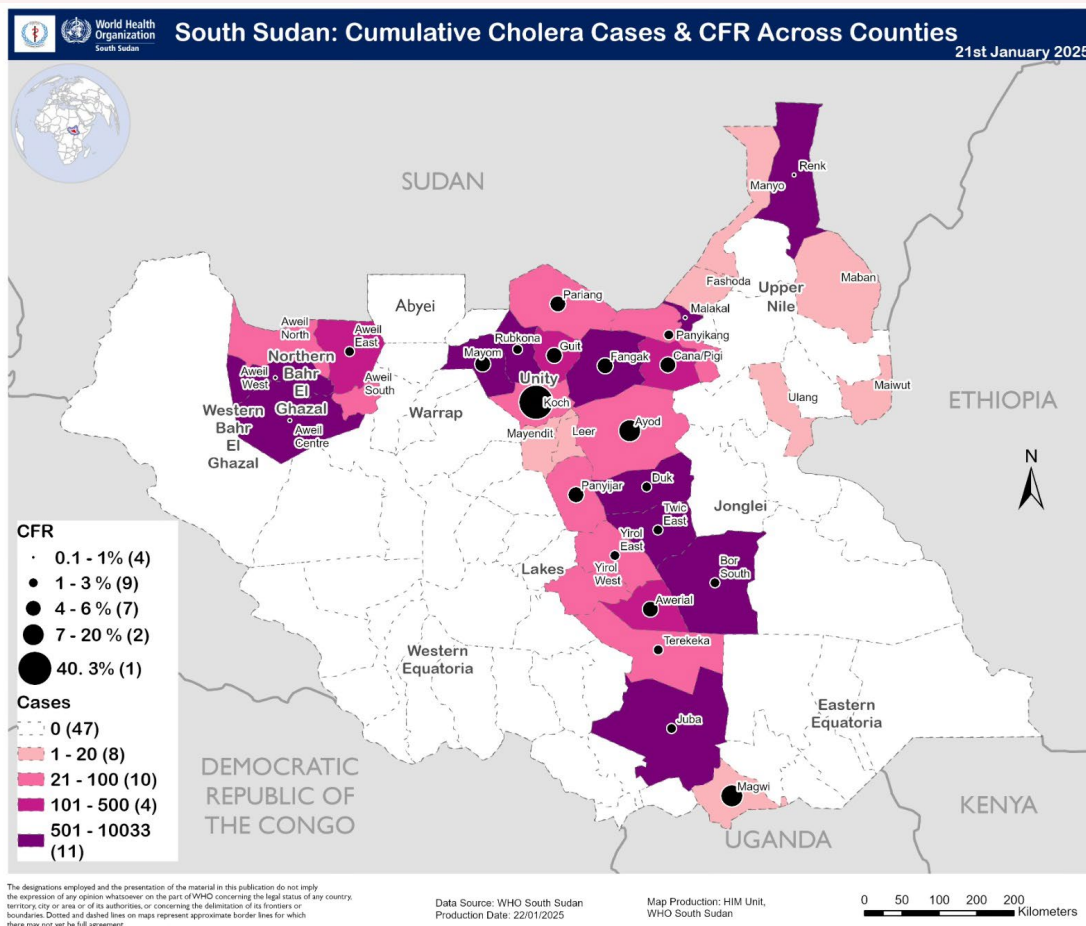


Figure 1. Map of counties with suspected cholera cases as of 21 January 2025.

Drivers of transmission and spread



Introduction of *V. cholerae* O1 Ogawa Serotype: The detection of the Ogawa Serotype, identical to the one of the ongoing outbreak and different from previous outbreaks in South Sudan, indicates likely cross-border introduction or transmission.



Population Displacement and Movement: Displacement and population movements caused by flooding and conflict promotes the spread of cholera to and between counties. Additionally, it leads to overcrowding in camps or temporary settlements with weak health infrastructure.



Inadequate Water, Sanitation and Hygiene (WASH) Conditions and Practices: Access to improved sanitation facilities and safe drinking water in sufficient volumes is low in many areas, particularly in camp like settings, forcing reliance on water from unsafe sources and leads to open defecation amplifying transmission.



High Susceptibility: Although almost 4.4 million doses of OCV were distributed during 2014-2017 and 2022, immunity from vaccination wains quickly over time - especially for the one-dose regimen. This together with high birth rates and migration results in a large pool of susceptible individuals.



Sub-optimal Health-Seeking Behavior: Some counties report cases delaying seeking treatment at a healthcare facility, increasing the risk of community transmission. Additionally, movement of symptomatic individuals to place of origin for treatment have been reported, promoting spread between communities.

Burden of disease and missed opportunities

The current attack rate per 1,000 is 1.7, which so far remains slightly lower than for the 2016-2017 outbreak (1.8). Of reported cases, 64% had severe dehydration. While local context and co-morbidities may can affect the severity with which cholera presents, this is unexpectedly high. An underreporting of mild to moderate cases to cholera treatment facilities is likely. Assuming that 30% of cholera cases presents with severe dehydration, a tentative number of true cases and the missed opportunities for reporting and treatment can be estimated. As of 21 January 2025, this is approximately 48,000 tentative cases and more than 25,000 missed opportunities.

Characteristics of high and low burden counties

The traditionally cholera affected counties (Juba, Malakal and Rubkona) are all among the highly affected counties (high burden counties). These generally have a higher percentage of IDPs and on average fewer health facilities per 100,000 population as compared to low burden counties with laboratory confirmed *V. cholerae*. In the risk mapping made by the WHO country office in November 2024, 19 counties were classified as very high risk, 11 of these (60%) had active cases within the first 3 months of the outbreak compared to 5/41 (10%) of the moderate to low-risk counties.

Response measures and case management

As of 13 January 2025, 120 facilities have reported 3 or more suspected cholera cases. The most common reporting facility is PHCC/PHCU (57%) followed by hospitals (20%), and these have managed 42% and 34% of the cases respectively, reflecting the wider coverage of PHCC/PHCU but higher capacity of hospitals.

As part of the cholera response measures, 53,000 kg (200 m³) of supplies have been dispatched between October and December 2024, reaching 11 counties across 5 states and 1 administrative area, with most high-burden counties receiving supplies within 20 days of their first case. Nationally coordinated rapid response teams (RRTs) were deployed to 11 counties in 7 states.

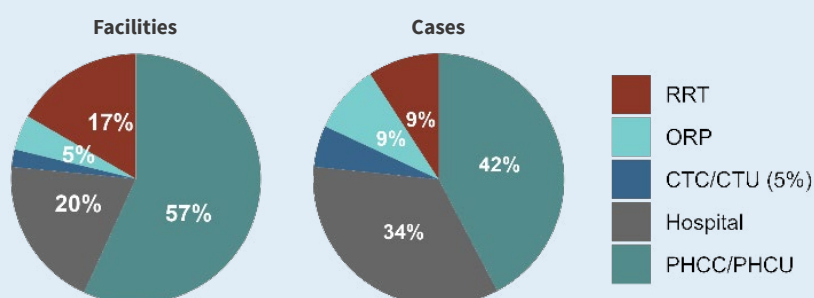


Figure 2. Health facilities managing suspected cholera cases.

Additionally, HF WASH assessments and water testing by WHO found a high proportion of samples contaminated with coliforms (>40%) and few (<4%) meeting recommended chlorine levels, highlighting important areas for improvement.

Deaths averted

Over 99% of symptomatic cholera patients received treatment, with IV fluids and antibiotics (50%) being the most common, especially among severe cases (75%). Assuming a CFR for symptomatic cholera without treatment of 30% (lower range), close to **5,500 deaths have been averted** through the collaborative response efforts.

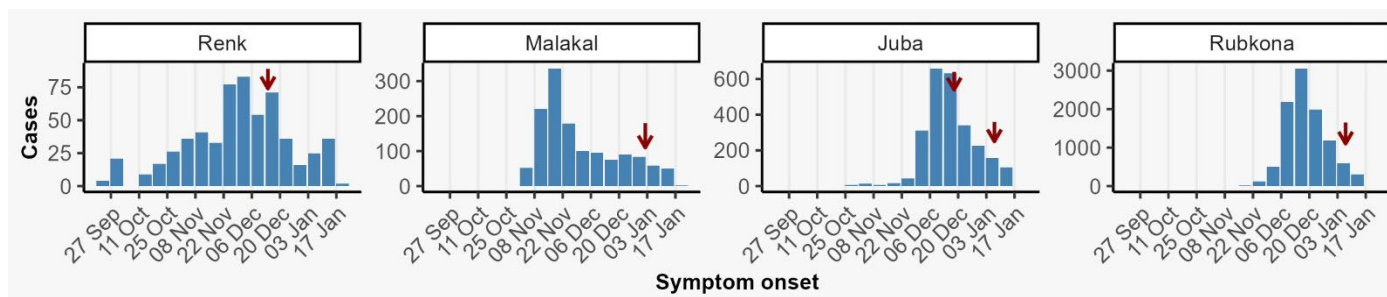


Figure 3. OCV campaigns in relation to case load. Date of OCV campaign launch indicated with a red arrow.

As of 13 January 2025, the country received 4 million doses of OCV out of the required 6 million doses. The Vice President in charge of service cluster, together with the MOH, launched the vaccination campaign in Rubkona on 7 January 2025. Over 1 million doses were distributed by 15 January. Two campaigns (Renk and Juba Phase I) are complete, three (Malakal, Rubkona, Juba Phase II) are ongoing, and others are planned in Northern Bahr el Ghazal and Mayom. Post-vaccination case reductions were observed in Renk and Juba Phase I, while reductions in Rubkona and Malakal pre-vaccination were attributed to strong WASH and IPC measures (Figure 3).

Future: Call to Action

Immediate

- **Rapid response – including (re)allocation of cholera supplies and OCV to new hotspots.** Currently, Mayom, Guit and Fangak counties are seeing an increase in cases, and 5 very high-risk counties remain unaffected. These have a population of 1.3 million and assuming an attack rate of 0.9% (current high burden average) and could result in 12 000 cases unless adequately responded to.
- **Logistic support – to minimize the time from arrival to on-the-ground deployment of supplies.** Current hotspots include hard-to-reach area requiring a combination of air, road, and water transport from Juba, sometimes only accessible by canoes due to shallow flood waters. Strong logistic support for distribution of cholera supplies and vaccines to these areas is essential.
- **Enhanced community engagement – promoting vaccine uptake and good hygiene practices.** Especially in hard-to-reach areas and underserved communities where a limited number of implementing partners are present.
- **Increased water supplies – ensuring sufficient access to safe drinking water.** Safe drinking water from improved water sources is estimated at 50% (48% rural and 60%). Response should prioritize areas with community transmission and particular weak WASH infrastructure.

Medium to long term

- **Scaling up sustainable investment in WASH infrastructure:** Access to improved sanitation facilities in South Sudan is less than 10% (6% rural and 28% urban) Ensuring sufficient supply of safe water and availability of latrines is essential to prevent similar outbreaks in the future.
- **Strengthening testing and laboratory capacity:** With 14 affected counties having no laboratory confirmation despite significant case numbers and 1/3 of facilities not performing RDT testing, efforts should focus on enhancing national reference lab capacity, and establishing reliable systems for RDT distribution, sample collection and transport, particularly in/to remote areas.

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