

Spatial Overlap of Flood Zones and Cholera Naïve Counties in South Sudan: A Looming Health Crisis

Introduction

South Sudan's changing climate is reshaping how infectious diseases like cholera spread. Rising temperatures, heavier rains, and worsening floods are placing millions at greater risk. Cholera, a deadly but preventable waterborne disease, increasingly appears in areas with no history of outbreaks. The ongoing outbreak, which started in October 2024, is driven by inadequate water and sanitation infrastructure, widespread displacement caused by conflict and flooding, and an already fragile healthcare system. While the WHO issued a cholera risk map earlier this year, the emergence of cholera in new geographic areas underscores the need to shift from static risk classification to projections of burden during floods, especially in counties previously considered low risk. Studies show that floods nearly double the likelihood of bacterial diarrheal diseases and increase the frequency of cholera outbreaks by a factor of 2.28¹. These risks are magnified in areas where clean water and sanitation are absent – in a country where 6.4 million people are in need of WASH assistance.²

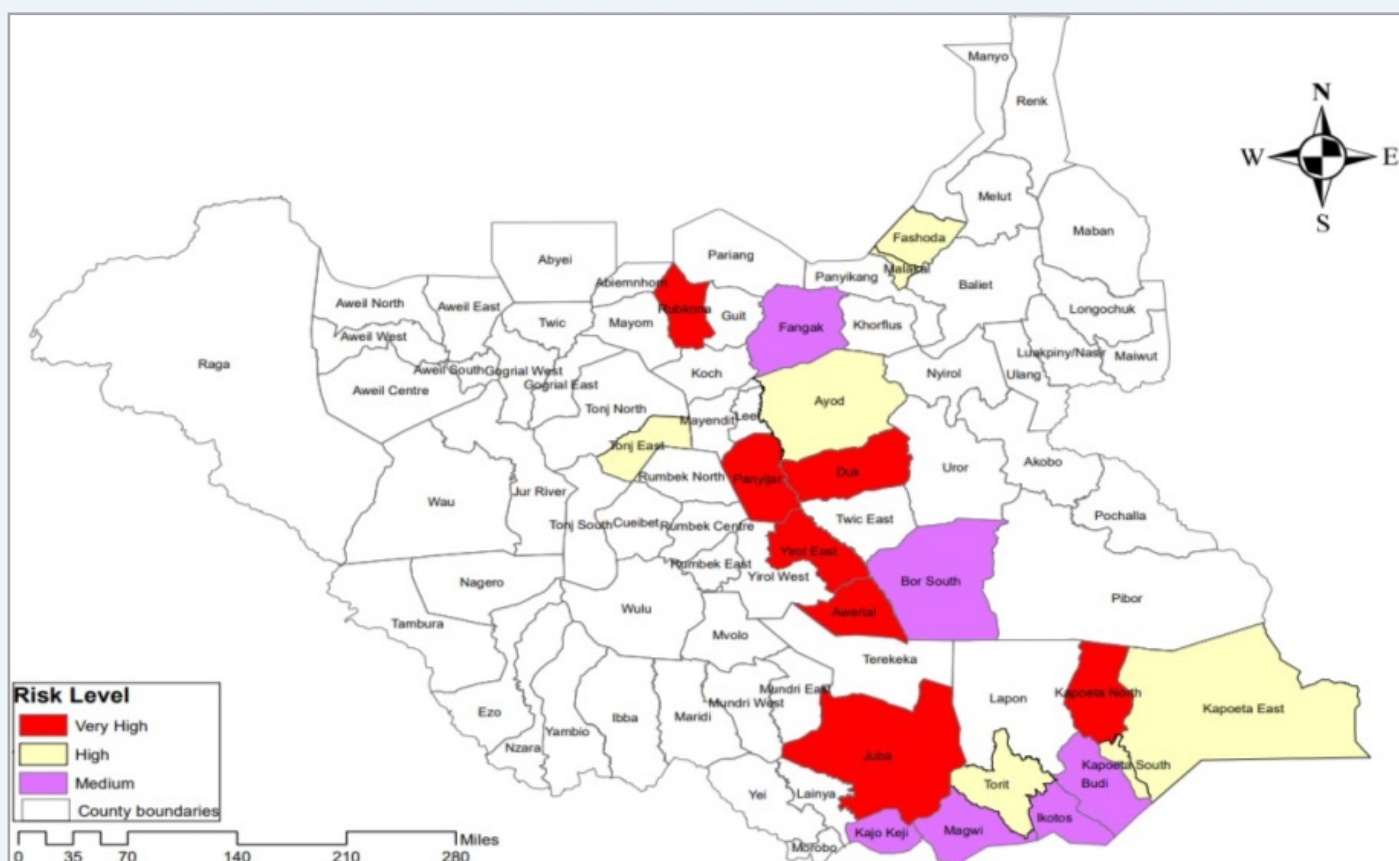


Figure 1: South Sudan hotspots based on cholera risk assessment 2021

Ref: Government of South Sudan Cholera Response Plan Nov 2024

The 2021 risk assessment (Figure 1) missed several key hotspots, including Renk, Mayom, Twic East, Pibor, N.Bhar el Ghazal (Aweil centre, west & north) and Warrap, based on status of 2024-2025 epidemic (Figure 2).

¹Saatchi M, Khankeh HR, Shojafard J, Barzanji A, Ranjbar M, Nazari N, Mahmodi MA, Ahmadi S, Farrokhi M. Communicable diseases outbreaks after natural disasters: A systematic scoping review for incidence, risk factors and recommendations. *Progress in Disaster Science*. 2024 Jun 1:100334.

²IOM South Sudan. Water Sanitation, Hygiene. <https://southsudan.iom.int/water-sanitation-and-hygiene>

Ongoing cholera outbreak in South Sudan

Since October 28, 2024, cholera has spread across 52 of 80 counties, reaching areas far beyond traditional hotspots. As of 2 June 2025, the hardest-hit areas include Juba, Tonj North, Gogrial East, and Rubkona (see Figure 2). This expansion is largely driven by:

- Conflict-driven displacement, flood-induced migration-moving from one high-risk area to another often to overcrowded shelters without proper toilets or clean water.
- The collapse of water and sanitation systems in urban centres.
- In some counties where the population had previously been vaccinated, cases are now picking up again as protection from the single-dose oral cholera vaccine has waned, as expected around six months after vaccination.

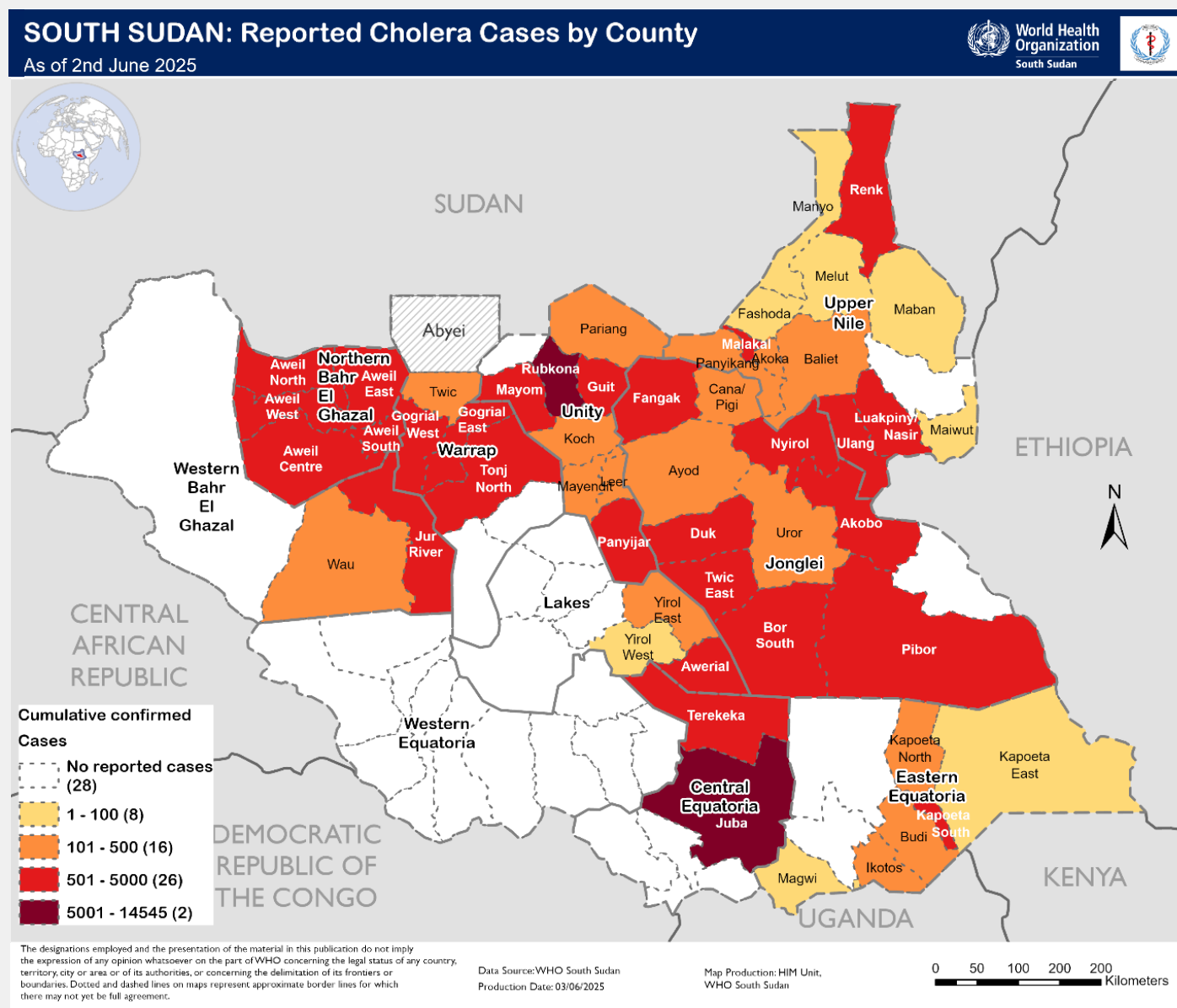


Figure 2: Cumulative cholera cases reported by county as of 2 June 2025

Impact of flooding on health and cholera risk

The Sudd region, Nile basin, and states like Jonglei and Upper Nile are especially flood prone. Floods have hit health infrastructure hard. In 2024 alone, floods damaged 191 health facilities, submerged 59, and partially flooded 102, especially in Upper Nile, Unity, and Jonglei (see Figure 3). These disruptions slow outbreak response efforts in affected areas, particularly detection, case management, and treatment capacity, as response teams struggle to reach those needing assistance because of inaccessible roads and damaged infrastructure.

When floodwaters mix with drainage water, stagnant pools form in open areas, becoming breeding grounds for infectious diseases. Displaced families often live in crowded camps or temporary shelters where safe water is scarce. Open defecation and the use of unsafe water become common. Children are especially vulnerable as they play and bathe in contaminated floodwater.

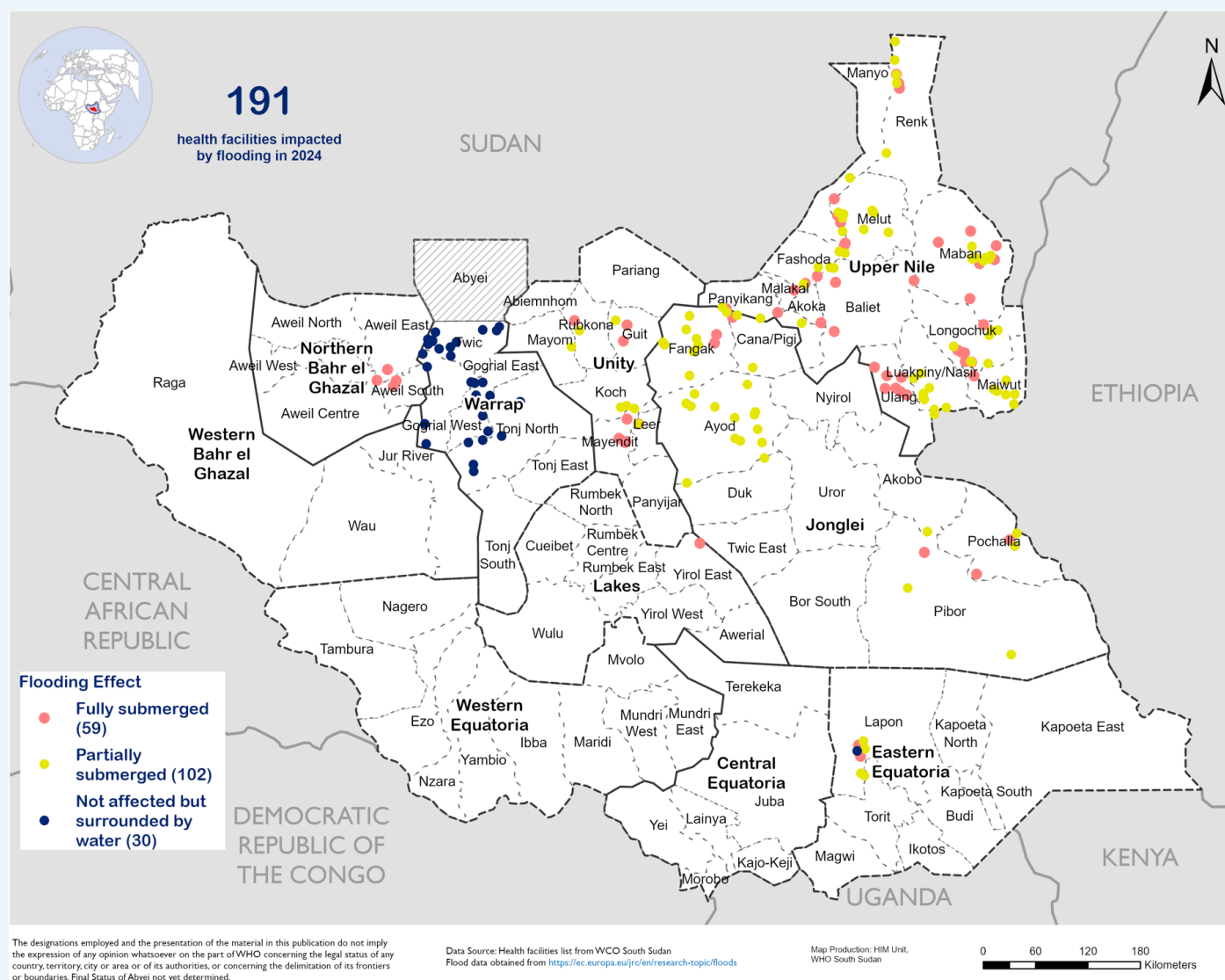


Figure 3: Health facilities impacted by flooding in 2024

Flood projections and cholera risk in naïve counties

Looking ahead, as South Sudan enters another rainy season, the overlap between flood-prone areas and cholera-naïve counties is concerning. Counties susceptible to flooding and lacking cholera immunity are home to over 2.66 million people. Counties in Upper Nile, Unity, Jonglei, Warrap, and Eastern Equatoria are identified as flashpoints. These areas face:

- High population displacement from floods and conflict;
- Fragile or non-functional health services;
- Low OCV coverage;
- Inadequate access to clean water and sanitation;
- Flood outlook and disease risk context.

What's especially worrying is that States with no previous cholera outbreaks, such as parts of Western Bahr el Ghazal, Lakes, and Western Equatoria are now at risk (Figure 4). This geographic shift is driven by the consequences of the 2024 floods, which resulted in migration to the mentioned states. The resulting overlap of flooding, mass displacement, proximity to infected areas, and poor access to clean water and sanitation has expanded the landscape of vulnerability - even into cholera-naïve counties.

SOUTH SUDAN: Cholera Risk Mapping & Flood Extent Area

As of 2nd June 2025

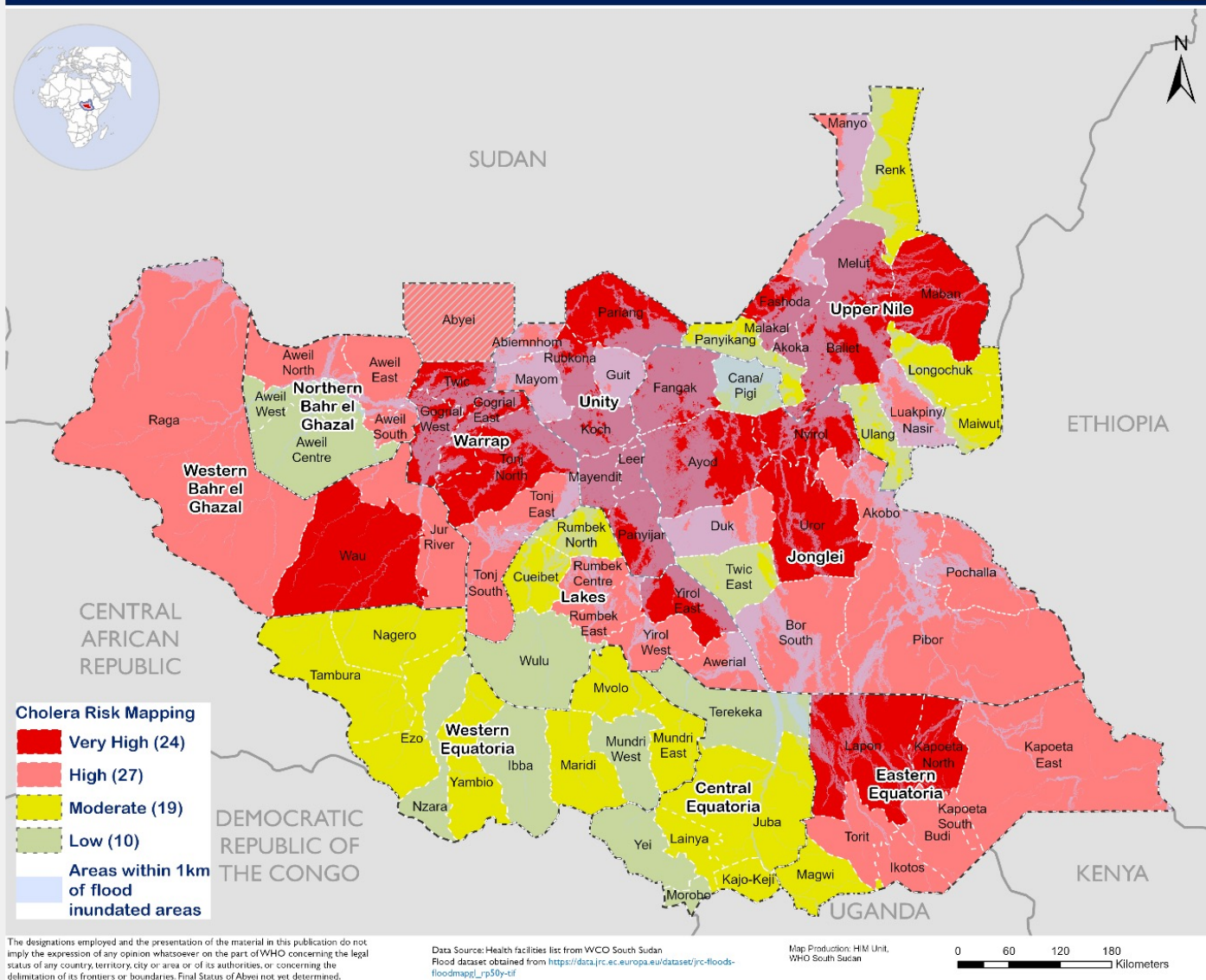


Figure 4: Flood projections and cholera risk

With projections indicating more floods ahead, the public health impact could be severe, given the current widespread transmission and the country's already weak water, sanitation, and health systems.

Call to Action

To mitigate risks and reduce the projected burden, WHO recommends:



- **Expand Case Management/Treatment Capacity:** Equip and support health facilities in hotspots through supplies, workforce training, and operational guidelines.



- **Establish Oral Rehydration Points (ORPs) and Safe Water Points:** Set up rehydration and clean water stations in IDP camps and underserved communities through provision of supplies and training on set-up and management of ORPs. Set up units along key flood-displacement routes.



- **Distribution of Chlorine Tablets:** Ensure household-level access to water treatment across flood-affected and cholera-prone areas.



- **Accelerate Early Diagnosis and Response:** Improve surveillance, rapid testing, and sample collection for quicker detection and treatment.



- **Accelerate Vaccination:** Roll out targeted OCV campaigns in newly affected and high-risk zones to contain spread; actively work towards preventative vaccination priority counties. Also target high-risk counties without prior outbreaks but receiving displaced populations.



- **Deepen Risk Communication and Community Engagement:** Implement community-level campaigns to promote early care-seeking behaviour and ORS usage, targeting displaced populations and women-headed households.



- **Implement Real-Time Surveillance and Alert Systems in Flood Zones:** Integrate mobile reporting tools in health facilities and IDP camps in high-risk counties. Establish a weekly flood-health bulletin to inform operational decisions.