THE REPUBLIC OF SOUTH SUDAN

REPORT ON IDENTIFICATION OF PRIORITY AREAS FOR MULTI-SECTORAL INTERVENTIONS FOR CHOLERA CONTROL– SOUTH SUDAN.

December 2025

Acknowledgement

We would like to express our sincere gratitude to all individuals and organizations who contributed to the successful identification of the Priority Areas for Multisectoral Interventions (PAMIs) through dedication, collaboration, and foresight. The commitment and teamwork demonstrated throughout the PAMIs identification process is commendable.

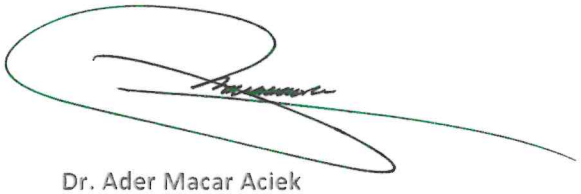
Our deepest appreciation goes to the Ministry of Health leadership for the unwavering support and commitment during the entire planning process up to the report writing. Furthermore, our appreciation goes to the various line ministries whose contributions were vital to this effort: the Ministry of Water Resources and Irrigation, Ministry of Environment and Forestry, Ministry of Agriculture and Food Security, Ministry of Humanitarian Affairs and Disaster Management, Ministry of Finance and Planning, Ministry of Livestock and Fisheries; Ministry of Wildlife, Conservation and Tourism, Ministry of General Education, Ministry of Transport, Ministry of Foreign Affairs and International Cooperation, Ministry of Information, Communication Technology and Postal Services, Ministry of Gender, Child, and Social Welfare, Ministry of Defense and Veterans Affairs; among others. The contribution from all State Ministries of Health and line institutions and County Health Departments has been critical in shaping this exercise.

We commend the tireless efforts of our national technical working group, who dedicated countless hours to the planning process of this workshop.

Our sincere gratitude goes to all our partners who have significantly contributed to the realization of this PAMIs identification process and the report writing. It is our hope that these efforts will be translated into tangible actions.

Finally, special thanks to the World Health Organization (WHO and the Global Task Force on Cholera Control (GTFCC) for technical and financial support. We recognize the special roles played by Dr. Fred Kapaya, the WHO AFRO Cholera Focal Point and Yamikan Chilipo, Surveillance and Data Officer at the WHO Country Office in Malawi for technically guiding the process.

We, therefore, endorse this report on behalf of our Ministries to allow the next steps of updating the South Sudan Multisectoral Cholera Prevention and Control Plan 2023 – 2027 and access to the preventive oral cholera vaccines from the Global Task Force on Cholera Control (GTFCC). In a country experiencing its largest and longest cholera outbreak driven by poor water, sanitation and hygiene (WASH) conditions, flooding, and cross-border transmission, preventive oral cholera vaccination will act a short-term strategy to prevent cholera outbreaks, allowing the country to buy time to build the critical WASH infrastructure.



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Background

South Sudan is actively implementing the National Multisectoral Cholera Prevention and Control Plan (NMCPCP) 2023 – 2027 aimed at building sustainable, resilient, high quality and equitable cholera prevention and control systems that are integrated and mainstreamed into the national health system and national health sector and development plans. The NMCPCP is a fundamental strategic document and constitutes the key instrument to efficiently implement the prevention and control of cholera in South Sudan. This is a guidance document to all stakeholders, including donors for planning, implementation and monitoring of strategic interventions and activities to achieving the goal of reducing morbidity and mortality associated with cholera in South Sudan.

This strategic plan 2023 - 2027 is aligned to the Global Strategy for Cholera Control and Elimination 2030 and outlines key strategies and interventions based on the guiding principles of **multi-sectoral and integrated approach, community and Stakeholder engagement**, **service equity, continuous quality improvement and gender sensitivity and responsiveness approach.** The plan builds on best practices, gaps and lessons learned in response to previous outbreaks. The after-action review of the response to the cholera outbreak in 2022 identified the following critical gaps; weak coordination characterized by infrequent and inconsistent coordination meetings at all levels, delayed confirmation of the index case which led to the delay in the declaration of the outbreak, delayed shipment of samples to the NPHL partly attributed to the use of only one airline services (UNHAS), inadequate quantities of laboratory reagents for testing cholera, inadequate forecasting resulting in inadequate quantities, poor sample collection, packaging and storage techniques leading to rejection, lack of capacity to do serotyping for cholera and this made it difficult to identify the serotype of the current cholera outbreak, Inadequate availability of IDSR/EWARS reporting tools -EWARS in the box (phones and laptops) in some locations, incomplete filling of line list which was attributed to the inadequate orientation of data clerks and M/E officers. This led to incomplete analysis of cholera data at the national level, contact tracing was difficult to conduct due to wrong personal addresses which was mainly due to stigma and people not knowing their exact addresses, inadequate supportive supervision during OCV campaigns leading to poor outcomes.

The process for developing these Priority Areas for Multisectoral Intervention (PAMIs) brings together different sectors from National and State Ministries, agencies, development partners, academia, and civil society organizations. The consultative and participatory approach was instrumental in ensuring a comprehensive list of PAMIs with commitment and shared **vision of a cholera free, healthy, and productive population of South Sudan** by all stakeholders, Uniting to Save Lives, Building Synergies for a coordinated Cholera Response.

Demographic, socio-economic, and political context

The Republic of South Sudan is the world's youngest nation and became Africa's 55th country on July 9, 2011. Located in Eastern Africa, South Sudan is bordered by Sudan, Ethiopia, Kenya, Uganda, Democratic Republic of Congo, and Central African Republic. The country expands on an area of 644,329 square kilometres and has an estimated population of 14.2 million (51.1% male, 48.9% female), an annual population growth rate of 3.57%, and total fertility rate of 4.5 (2020). It has one of the youngest populations in the world with about 73.7% of the population below the age of 30 years.

The Country administratively comprises of 10 States namely, Northern Bahr el Ghazal, Western Bahr el Ghazal, Warrap, Lakes, Upper Nile, Unity, Jonglei, Central Equatoria, Eastern Equatoria, and Western Equatoria, and three Administrative Areas namely, Greater Pibor, Ruweng and Abyei. These are further subdivided into Counties and Payams, with the lowest administrative level being Boma.

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Most of the population lives in rural areas, with only 17% living in urban areas. Access to safe water and improved sanitation is estimated at 40% and 10%[1] respectively, whereas only 7.2% of the population has access to electricity. Public infrastructure, such as roads and bridges, is lacking in most parts of the country, compromising access to over 60% of the population during rainy seasons. Many communities continue to remain at risk of disease outbreaks including waterborne diseases, given poor access to safe water and improved sanitation, and the perennial flooding of the country's experiences.

Literacy rates are among the lowest in the world, estimated at 34.5% for those 15 years and older with higher literacy rates among males (40.3%) than females (28.9%). From 2010 to 2020, the total net enrolment rate in primary, lower secondary, and upper secondary education were as low as 38%, 44%, and 36% respectively. The country's human development index of 0.385 (2021), is the lowest in the world (with a life expectancy of 55.0 years at birth, 5.5 expected years of schooling, 5.7 mean years of schooling, and gross national income per capita of 768 [2017 Purchasing Power Parity (PPP$)].

Economy

South Sudan's economy relies heavily on exploiting natural resources particularly oil, which accounts for an estimated 90% of the total government revenue, 95% of total exports and more than half of the country's gross domestic product (GDP). The GDP per capita in 2015 was US$ 1,071.78 and has been declining since 2013 when it was at its highest (US$ 1659.14). The economy has been affected by the fluctuating oil prices, high inflation rates, conflict, the COVID-19 pandemic and crises such as flooding, that have eroded the country's productive capacity; consequently, the economy is estimated to have contracted by an estimated 5.4% in the 2020/2021 financial year (FY). It is however, projected to grow in the subsequent financial years due to improving macroeconomic conditions and relative peace, although this outlook could be affected by various factors including bottlenecks in oil production, natural disasters like floods, and potential conflict.

The country has also struggled with high inflation rates as well as a widening gap between the official and parallel currency exchange rates. The Bank of South Sudan is implementing an exchange rate policy reform as part of a wider reform process to facilitate macroeconomic stabilization, which has resulted in a reduction of the gap between the official and parallel currency exchange rates.[2]

With no formalized welfare system in the country, and most of the population living in rural areas and depending on land for their livelihoods, given the main source of livelihood for at least 85% of the population is crop, livestock, and fisheries production, most South Sudanese are economically vulnerable. Poverty is overwhelming, estimated at 76.4% nationally (at the international poverty line of $1.90 per person per day in 2011 PPP), and large disparities in living standards exist across the country, with inherent income inequalities, given the country's Gini coefficient of 44.1.

Nevertheless, it is hoped that the implementation of the 2018 Revitalized Agreement for Resolution of Conflict in South Sudan will be a key driver for the economy, with reduction of conflict in the county, allowing other non-oil sectors to register some growth. It remains critical that the country diversifies into non-oil revenue for a more stable economy.

Demographic and health indicators

Mortality by age and sex:

Life expectancy at birth is among the lowest in the world, remaining relatively consistent between 55-56 years from 2017 to 2020, with females having higher life expectancy (57 years in 2020) than males (54 years in 2020).

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Adult mortality rate between 15 and 60 years of age for South Sudan has gradually declined since its independence in 2011 from an estimated 348.5 deaths per 1000 population to an estimated 321.4 deaths per 1000 population in 2016, with males having a higher mortality rate (335.2) than females (307.8).

Neonatal mortality rate, which is the highest globally, estimated at 39.63 deaths per 1000 live births in 2021, showed minimal gradual decline from 39.88 in 2017.

Infant mortality rate estimate, which is among the highest in the world, remained at 63.76 deaths per 1000 live births from 2017 to 2021.

Under-five mortality rate also among the highest globally, remained at 98.69 deaths per 1000 live births from 2017 to 2021.

Maternal mortality ratio although having significantly reduced since the 2006 Sudan household health survey from an estimated 2054 deaths per 100,000 live births, has been gradually increasing since 2010 from an estimated 1100 deaths per 100,000 live births to 1150 deaths per 100,000 live births in 2017, the highest globally.

Health Security

The South Sudan National Action Plan for Health Security (2020-2024) was developed 'to guide the process of building national capacities to prepare for, prevent, detect and respond to any public health events of international concern'. The Joint External Evaluation of the International Health Regulations (IHR) implementation capacities for South Sudan, conducted in October 2017 highlighted the country's capacities and gaps in relation to health security, which the National Action Plan for Health Security endeavors to address. Some of the key findings from the evaluation included: inadequate legal frameworks for implementation of IHR regulations; lack of formal inter-ministerial/sectoral coordination structures; lack of an antimicrobial resistance (AMR) national action plan; lack of a one-health policy/plan; under-developed regulatory system for food safety; limited capacities to respond to chemical threats and radiation emergencies; low immunization coverage; and low health workforce capacities. of the 48 indicators assessed, only one (syndromic surveillance system) scored 4 (demonstrated capacity), with five indicators, mostly surveillance and national vaccine access and delivery, scoring 3 (developing capacity). Thirty (30) of the 48 indicators scored 1 (no capacity) while 12 scored 2 (limited capacity). The country has however, made some progress on these low-capacity areas, with current planning and development of a 'one-health plan' underway, as well as plans to develop an AMR action plan; an inter-ministerial/sectoral coordination platform has also been established, and immunization coverage has been improving, whilst continuous capacity building initiatives for the health workforce have been established.

The evaluation also established the existence of surveillance systems such as the Integrated Disease Surveillance and Response (IDSR), availability of comprehensive outbreak guidelines and reporting forms, existence of a main reference laboratory, the National Public Health Laboratory, existence of disease specific response plans e.g., for Viral Hemorrhagic Fever, measles, polio, cholera, malaria, meningitis, and Hepatitis E, multi-sectoral rapid response teams, an Emergency Operations Centre (EOC) at the national level, and established risk communication structures.

The IDSR system is well established with good reporting rates compared to reporting through the DHIS2. By week 50 of 2022, IDSR reporting timeliness was 85% and timeliness for the Early Warning, Alert, and Response System (EWARS) sites at 75%.[3] Analysis of the proportion of alerts investigated within 48 hours showed a progressive improvement from 50% in 2017 to 81% in 2020, and the proportions of outbreaks investigated, confirmed, and reported also improved to a high of 88% in 2020.[4]

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Due to the poor coverage of vaccination in the past years and the weak health systems, the country experienced several outbreaks of vaccine preventable disease. Cholera and Hepatitis E outbreaks continued to occur because of poor access to safe water and sanitation. In 2022, 424 cholera cases and 01 death, giving a case fatality rate of 0.1% were reported (figure 4). 1,101,160 OCV doses have been administered in 3 locations (Leer, Yirol East, Rubkona and Juba counties).

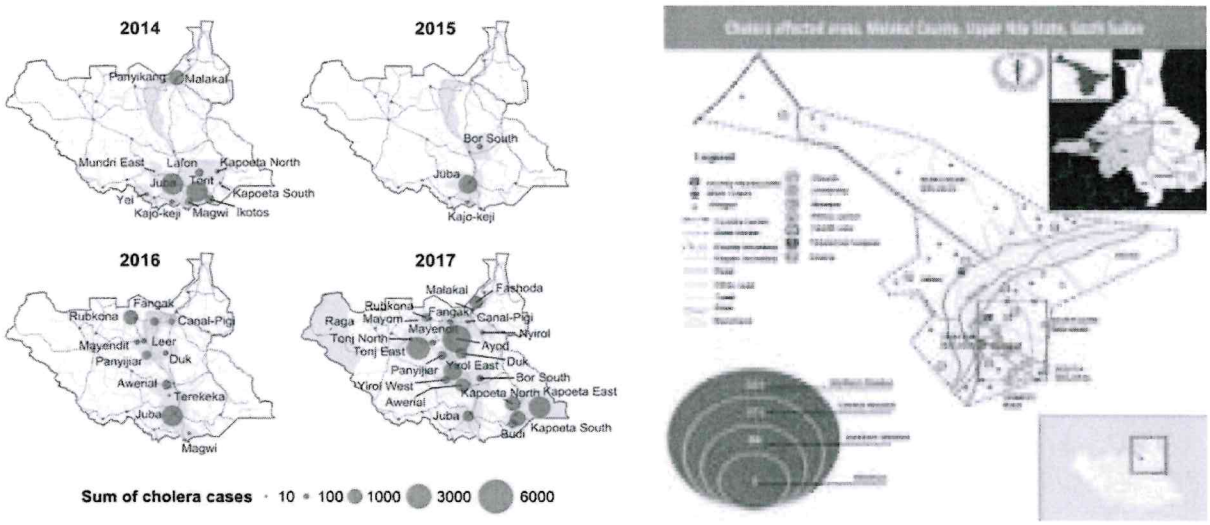

Figure 1: Counties affected with cholera outbreak in South Sudan 2014 - 2022

In 2022, at least 58 counties across all ten States reported at least one suspected case of measles, totaling to 4,137 suspected cases of measles reported in 2022, increasing to 5,283 by 2023 with 53 deaths reported since January 2022, giving a case fatality rate of one (1) percent. Reactive vaccination campaigns were conducted in 19 counties reaching 858,274 children. The country continues to respond to the COVID-19 pandemic although the incidence of cases has substantially declined.

In 2022, South Sudan also faced and continues to face the risk of importation of diseases such as Ebola, following outbreaks in neighboring Congo and Uganda, especially given the inadequate capacities already existing in the health system, underscoring the need to strengthen the surveillance capacities at ports of entry given the porous borders.

The country also continues to face humanitarian crisis due to conflict, food insecurity, flooding, and disease outbreaks resulting from ethnic tensions, poor socio-economic status (including high poverty and high inflation rates), poor infrastructural development, and inherently weak health systems. In 2022, the country faced its fourth consecutive year of incessant floods that affected 37 Counties, destroying 45 health facilities, and causing massive population displacement. The South Sudan Humanitarian Response Plan (2022) estimates about 8.9 million people (including 4.6 million children) in need of some form of humanitarian assistance (6 million in the host community, 1.4 million internally displaced, 1.2 million returnees, and 350,000 refugees).

South Sudan is also facing acute food insecurity; the Integrated Food Security Phase Classification (IPC) projected that over half of South Sudan's population experienced high levels of acute food insecurity (IPC phase 3 or worse) in October and November 2022, including 2.2 million people in IPC phase 4 (emergency) and 61 000 people in IPC phase 5 (catastrophe). These numbers are expected to hit 7.8 million by April-July 2023. OBJ

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There is need therefore to implement strategic interventions to address the challenges facing health security in the country including disease outbreaks and humanitarian emergencies, which are exacerbated by the weak health systems and the political-socio-economic situation, that undermines the health and productivity of the population.

Determinants of Health

Health is defined as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' (WHO). Determinants of health simply are the 'non-medical' factors that can affect health; these are the 'circumstances in which people are born, grow, live, work, and age'. They can either be social, environmental, or political factors. Addressing these determinants of health requires a whole government approach to identify and measure the impact of these determinants on health, raise public awareness on these determinants of health, and implement policies to address them.[5]

Social determinants of health

Higher income and social status are linked to better health. The greater the gap between the richest and poorest people, the greater the differences in health. Low education levels are also linked to poor health. Other social determinants of health include access to affordable health services of good quality, genetics, gender, employment/job security, culture, and food security.[6]

South Sudan performs poorly against these social determinants of health. The country's human development index of 0.385 (2021) is the lowest in the world. The country's economic productivity is declining, income inequalities are high (Gini coefficient of 44.1), more than three quarters of the population (76.4%) are below the international poverty line of $1.90 per person per day, literacy rates are among the lowest in the world at 34.5% for those 15 years and older – higher in males (40.3%) than females (28.9%), there is poor access to health services with only 44% of the population living within a 5 km radius of a health facility also depicted by the low facility density in the country (1.4 facilities per 10,000 population) and low service utilization rate (1.3 versus the minimum required of 5 visits per person per year), unemployment rates are high largely due to the low education levels, and the country has high levels of acute food insecurity affecting more than half the population (IPC phase 3 or worse) consequently resulting in high levels of malnutrition. Some cultural practices also exist that undermine health, such as early/girl child marriages and limited access to contraception especially for girls and women, predisposing them to reproductive health complications. These social determinants have adversely affected the health of South Sudanese resulting in poor health status, with high morbidity and mortality rates, and lack of financial risk protection, thereby constraining the country' progress towards achieving Universal Health Coverage.

Environmental determinants of health

The physical environment in which people live, which includes housing conditions, infrastructure such as roads, and access to safe water and sanitation, contributes to healthier populations. With a mostly rural population (83%) in South Sudan, access to safe water and improved sanitation are estimated at only 40% and 10% respectively. Public infrastructure, such as roads, is lacking in most parts of the country, compromising access to over 60% of the population during rainy seasons. Many communities continue to remain at risk of disease outbreaks including waterborne diseases, given poor access to safe water and improved sanitation, and the perennial flooding of the country's experiences. Poor housing conditions also predispose to spread of diseases such as respiratory tract infections including COVID-19 and TB. Environment health regulations are weak, with lack of proper waste disposal systems, resulting in environmental pollution and contamination with toxic substances that can predispose to diseases, and

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providing breeding grounds for vectors and therefore contributing to the spread of vector-borne diseases including malaria.

Political determinants of health

Peace and stability are pre-requisites for sustainable development and consequently, health. Governance structures also determine the kind of laws, legislations, and policies that will be established to guide health care in a country. South Sudan has experienced two major episodes of conflict in 2013 and 2016 and continues to face ethnic conflicts in different parts of the country. Such conflict has affected health service delivery and the health of the populations, through destruction of health facilities, death or displacements of health workforce, and population displacements limiting their access to health services. Conflict itself also directly leads to death, injuries, and disabilities. The risk of conflict and the need to maintain the hard-earned peace in South Sudan, has also resulted in prioritization of security, with a larger allocation of the general government budget allocated to security, reducing the allocation to social sectors such as health which received only 4% of the budget allocation in the 2022/2023 financial year. It is hoped that successful implementation of the Revitalized Agreement on the Resolution of the Conflict in the Republic of South Sudan (R-ARCSS) will contribute towards ensuring peace and stability, that will contribute towards sustainable development and better health for the people of South Sudan. The government has also put in place legislations and developed policies and strategies such as the revised national development strategy and national health policy among others to guide implementation of the country's constitutional commitment to provide health care as a right for every citizen.

Investments in the Health Sector

Human Resources for Health

Health workforce is the backbone of any health system as delivery of quality health services requires adequate numbers and a mix of skilled and motivated health workforce. Although South Sudan reported an increase in the core health workforce density (the number of physicians, nursing, and midwifery personnel per 10,000 population) to 7.6 per 10,000 population[7] from 0.17 per 10,000[8] population in 2010, this is still far short of the WHO recommended norm of 44.5 per 10,000 to achieve UHC. A 2018 health workforce survey gave the following stock of some of the different categories of health workers in the country, which still reflect the dire shortage of trained health workers: 338 general physicians, 73 specialist physicians, 3,726 nurses/midwives/associates, 1306 clinical officers, 32 dentists/dental assistants, 360 pharmacists/pharmaceutical technicians/assistants, 272 laboratory technicians, 1,455 community health workers, 1,694 other health workers and 2,897 management and support staff.

Training of additional health workforce, mostly mid-level cadres, has improved, although gaps still exist in having adequately equipped training facilities and teaching hospitals, and limited training institutions for professional categories and specialists. From 2017 to June 2021, a total of 5,297 health workers of various cadres were trained, the highest proportions being clinical officers (1,936; 36.5%) registered nurses (1,356; 25.6%), and registered midwives (1,138; 21.5%), with only 255 doctors (4.8%) trained over that period.[9] The government has established bi-lateral collaborations with universities in the region, to train specialist medical doctors, however, the country continues to face challenges of attraction and retention of these specialists due to the poor retention policies and remuneration packages. Differences in incentive structures among the various service providers have also led to mobility of health workers, leading to maldistribution and challenges in deployment and retention in rural areas. Efforts to increase production of health workforce will need to be scaled up through establishment of well-equipped training institutes, increased regional collaborations and development of favorable retention and remuneration policies.

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The Human Resources for Health Strategy, which should provide a framework for planning and guiding the sector, is outdated (2007-2017), while lack of a national Human Resources for Health Information System (HRHIS) greatly hampers optimal management of the available health workforce.

Infrastructure and Support Services

Health sector infrastructure in South Sudan is still not well developed; furthermore, the chronic conflict the country experienced before independence and the intermittent episodes of conflict post-independence have undermined the availability and sustainability of the requisite infrastructure to effectively deliver health services. The 2018 SARA survey revealed a low health facility density of 1.42 per 10,000 population (target is 2 facilities per 10,000 population) with inequities in distribution across the States ranging from 0.43 to 6.92 facilities per 10,000 population (**figure 2**). From the survey, most health facilities have permanent buildings (62%), while 20% are temporary and 14% are semi-permanent. Basic amenities in health facilities are in short supply; in 2018, about half of all facilities had access to sanitation facilities (58%), while less than half had access to a consultation room (38%), communication equipment (38%), emergency transport (37%), improved water source (36%), a power source (13%), and a computer with internet (4%). Basic equipment is also not readily available across all health facilities; only 66% of facilities had a thermometer, 63% a stethoscope, and 56% and 51% had adult and child weighing scales respectively. The most commonly available diagnostic capacity items were malaria diagnostic capacity (86%) and urine test for pregnancy (43%). The availability of the following diagnostic capacity items was low: HIV diagnostic capacity (19%), urine dipstick-protein (13%), urine dipstick-glucose (12%), haemoglobin (9%), and blood glucose (8%). In general government and rural health facilities had lower scores in comparison to NGO or urban facilities.

The low health facility density, inadequate basic amenities, equipment, and diagnostic capacity constrain service delivery, contributing to the low service utilization rate. Furthermore, there is a gap in availability of requisite norms, standards, and frameworks to regulate and monitor adherence to minimum infrastructure standards, with inadequate capacity and funding at the national and sub-national levels to support this. Periodic maintenance of infrastructure and equipment is not regularly done; and implementation of appropriate occupational health policies, which is lacking, remains a priority.

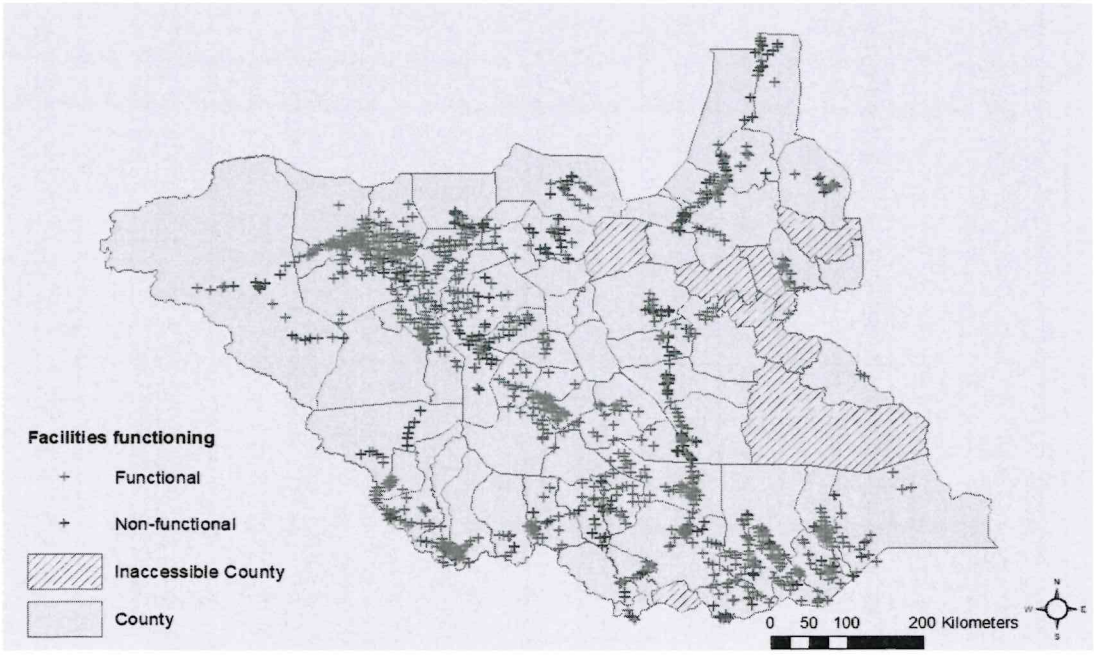

Figure 2: Distribution of functional and non-functional, accessible health facilities (N = 1293*), South Sudan 2018, SARA survey

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Service Delivery Systems

Health services in South Sudan are delivered through a four-tier system: community health which is implemented through the Boma Health Initiative (BHI); primary care provided by Primary Health Care Units (PHCU) and Primary Health Care Centers (PHCC); secondary care through the County and State hospitals; and tertiary care through the teaching, referral, and specialized hospitals. Currently there are 1,395 functional facilities in the country: 967 PHCUs, 358 PHCCs, 70 Hospitals, with no functional specialized hospitals. According to the 2011 Health Facility Mapping, only around 44% of the population lived within a 5 kilometers radius of a health facility.[10] The Boma Health Initiative (BHI) was established to bring services closer to the communities; it delivers an integrated package of health promotion and disease prevention along with treatment for selected common conditions (malaria, pneumonia, and diarrhoea). By June 2021, BHI had been established in only 42% (934/2219) of Bomas.[11] The services to be offered by each facility level are defined in the BPHNS, and there are standard treatment guidelines for each level, however, adherence to the delivery of the BPHNS as defined for each level varies across the country, undermining equitable access to health services.

Referral between the different levels of care is weak, mainly due to lack of an established referral and ambulance system, poor communication, and poor road infrastructure. Due to the dire gap of specialist medical services in the country, medical tourism to other countries in the region is common.

The overall general service availability score in health facilities is low at 30.4%, with health infrastructure index and service utilization index at 43.2% and 15.05% respectively, whereas the general service readiness score is also low at 37%, implying poor quality of services given it measures the overall capacity of health facilities to provide general health services.[12] The capacity of health facilities to conduct basic laboratory diagnostic tests (all eight tracer tests) was only 4%, with a similar proportion (4%) of facilities offering blood transfusion services in 2018. In South Sudan nationally, there are 6.53 inpatient beds per 10,000 population (recommended target is 25), and 3.26 maternity beds per 1,000 pregnant women (recommended minimum target is 10), signifying, low access to both inpatient and delivery services. Service utilization is low for 1.3 consultations per person per year compared to the recommended WHO norm of 5 consultations per year.

Stewardship and management of the health service delivery network is compromised by the limited government capacity and is more pronounced at primary health care level. Most CHDs charged with oversight over primary health care are disproportionately dependent on Non-Governmental Organizations. The current funding mechanism is the Health Sector Transformation project that provides service delivery in close to 51% of health facilities in the country.

Governance of the Health Sector

The health sector's stewardship is decentralized and premised on the three tiers of governance. The Ministry of Health, State Ministry of Health and County Health Department are responsible for the sector leadership at the National, State and County levels, respectively. [illegible] The decentralized governance system challenges effective linkages between the levels with decision making premised at each level of governance.

The institutional and technical capacity for sector governance, however, remains limited, progressively worse at the subnational levels. At the national level, there are nine directorates, each led by a Director General, under which are relevant departments headed by Directors, a number of positions of which are vacant. This has undermined functionality of health sector leadership as well as coordination at all levels in spite of the existence of proposed coordination mechanisms which includes the Health Sector Steering

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Committee chaired by the Minister of Health at the National level that brings together all key health sector actors on a quarterly basis at a policy and decision-making level. Humanitarian coordination through the cluster system (Health and Nutrition) is relatively more well established, with presence at the subnational levels. Other coordination platforms are program specific, including thematic Technical Working Groups (TWGs) which are mostly functional at the national level.

Whilst the overall health sector policy and strategy as well as several sub-thematic strategies and guidelines are in place, comprehensive operational planning is not institutionalized, rendering systematic sector performance tracking and reviews suboptimal.

Data and Information

A well-functioning health information system is one that ensures production, analysis, dissemination, and use of reliable and timely information on health determinants, health system performance and health status. Progress has been made in institutionalizing the District Health Information System (DHIS), from County to National level and migration to DHIS2.0 from DHIS1.4. However, some disease specific programs still run parallel/vertical reporting systems including NTDs, HIV, Nutrition, resulting in the fragmentation of the health information system. Efforts are being made to integrate EWARS with DHIS2, which should provide lessons for the integration of the other parallel systems.

The paper-based Health Management Information System (HMIS) at facility level experiences perennial challenges of shortages of HMIS forms and tools which compromise the overall completeness and timeliness of reporting. The 2018 SARA assessment of the HMIS reported the mean availability of systems assessment tracer items at 43%. Only 34%; 42% and 51% of health facilities had guidelines; staff trained on HMIS; and reported no stock outs of tally sheets, registers, and reporting forms, respectively. Data use and provision of feedback remain poor with only 39% of facilities reporting analyzing and using data, while 57% of facilities reported receiving supervision and feedback on data quality. Completeness and timeliness in HMIS reporting remained consistently low at 37.9% and 36% respectively. Data quality remains sub-optimal.

The generation of comprehensive health sector data through critical surveys like the demographic and health survey was last done in 2010, making it challenging to derive national estimates of key outcome indicators. The conduct of Joint Annual Reviews Review (JAR) is not institutionalized, with only 2 reviews (2017 and 2021) conducted in the past five years. Programmatic reviews, however, occur on a more regular basis. The Health Information System Policy and Strategy are outdated and currently being revised.

Analysis of the cholera situation in South Sudan

South Sudan is one of the high-risk cholera countries in the world due to several risk factors which include poor water, sanitation and hygiene services, persistent flooding in some states predisposing communities to the risk of cholera. Several cholera outbreaks of varying magnitude were reported from 2006 to 2022 with a total of 157,227 cases reported and an average CFR of 1.5% (Fig. 3 below).

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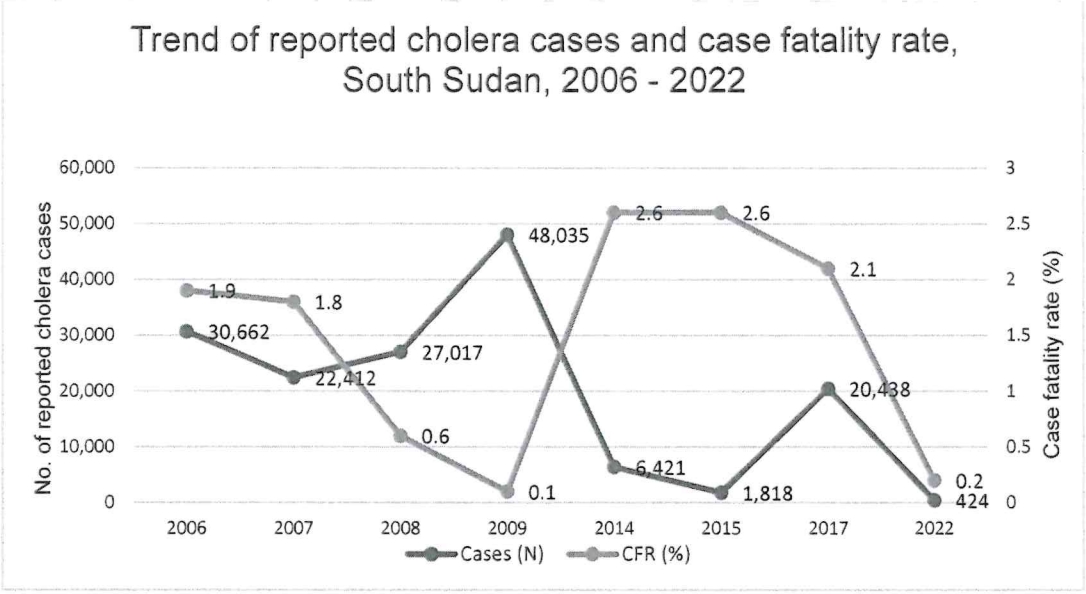

Figure 3: Trend of cholera cases and case fatality rate, South Sudan, 2006 - 2022

Spatial distribution of cholera outbreaks 2014-2017

Over the recent years, outbreaks have varied both in magnitude and spatial extent, including several years where cholera remained focused in Juba alone. Other populations downstream the Nile River (north of Juba, Figure 6) have also been affected by cholera, with few cases reported from areas further away, which may be attributed to downstream contamination of river water or simply a reflection of where most of the population live, and the comparative strength of the surveillance systems.

Since 2014, the initial cholera cases have been reported and confirmed from Juba County before spreading through major commercial routes to towns like Torit, Yei, and Mundri. During 2014, cholera outbreaks were reported downstream along River Nile in places like Bor, Malakal, Wau Shiluk, and Manyo. Based on detailed case investigations, this spread appears to be related to common vehicle transmission with contaminated water from Rive Nile being the main risk factor for epidemic spread. Indeed, a case control study undertaken in Juba during the 2014 outbreak showed that cholera disease was associated with travel, eating outside, and inability to treat water at home (Ujjiga et al., 2015).

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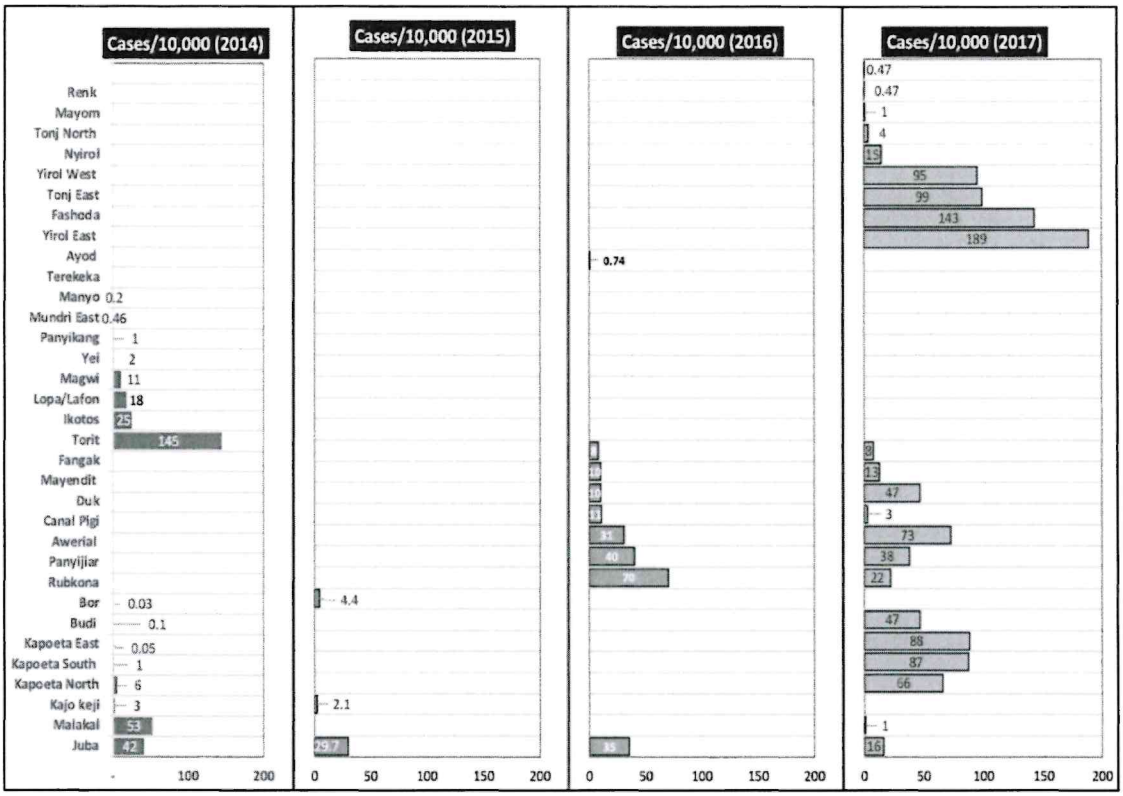

Figure 4: Estimated Annual Incidence Rate per 10,000 population by county and year.

During the 2014 cholera outbreaks, 6,421 cholera cases including 167 deaths (CFR 2.60%) were reported from 16 counties in five states in South Sudan. Prior to the 2014 cholera outbreaks, pre-emptive oral cholera vaccine campaigns were implemented in several IDP camps, UN House PoC, Tongping PoC, Bor PoC, Bentiu PoC, Malakal PoC, and Mingkaman IDP settlement (Abubakar et al., 2015). While cholera cases were reported in UN House PoC and Tongping PoC IDPs, there was little evidence of active transmission in comparison to affected IDP sites like Wau Shiluk where pre-emptive oral cholera vaccination was not implemented (Abubakar et al., 2015; Andrew S. Azman et al., 2016).

Molecular analysis of the Vibrio cholerae cholera strains from the 2014 cholera outbreaks in South Sudan and Uganda showed the two outbreaks were interrelated with genetic uniformity that is consistent with spread from a single clone. This therefore suggests that the two outbreaks were epidemiologically linked, thus highlighting the risk of cross-border spread.

In 2015, cholera was confirmed in South Sudan with three counties, Juba, Kajo-Keji, and Bor South being affected. During the 2015 cholera outbreaks, 1,818 cholera cases including 47 deaths (CFR 2.59%) were reported from Juba, Kajo-Keji, and Bor South counties. In Juba County, 1,622 cases including 45 deaths (CFR 2.77%) were reported from seven Payams while in Kajo-Keji County, 57 cases including one death (CFR 1.75%) were reported from four Payams. In Bor, 139 cases including one death (0.72%) were reported from Makuach Payam and other areas in the county.

The 2015 cholera outbreak started in Juba before spreading to Bor and KajoKeji counties. The limited geographical spread of the 2015 outbreak may be attributed to reactive oral cholera vaccine campaigns that were implemented in Juba to interrupt transmission in 2015; and the population protection conferred by the pre-emptive OCV campaigns in several IDP sites in Juba, Mingkaman, Bentiu, and Malakal in 2014 (Abubakar et al., 2015; Parker et al., 2017). There were several other factors that contributed to these trends including the fact that there was no significant population mobility that may have limited the spatial extent (Parker et al., 2017).

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The 2016/2017 cholera outbreak started in Juba shortly after violence erupted in Juba in July 2016. The outbreak thus spread rapidly with transmission continuing even after the rainy season ended. During the 2016 outbreak, cases were reported in counties along River Nile with a trend that is related to common vehicle transmission following exposure to contaminated water from the Nile. This trend was sustained by nomadic cattle pastoralists who move during the dry season searching for water and pasture for their animals in the swampy areas 'Toch' as they are popularly called locally. Indeed, during the 2016/2017 outbreaks, most of the cases in the dry season were reported from this population in counties along River Nile (Awerial, Yirol East, Bor, Duk, Tonj East, Ayod, and Kapoeta South, North, and East). Insecurity and constrained access also contributed to the protracted outbreaks in 2016/2017. Due to pockets of insecurity in some of the cholera affected locations, response could not be optimized in several cholera outbreak areas, thus contributing to the sustained transmission in 2016 and late 2017 (WHO and MoH, 2017). Security was a major challenge in areas like Juba (during the July 2016 crisis), in areas like Leer, Mayendit, Panyijiar, and Yirol East. The sustained transmission in these locations contributed to further spread of the outbreak to areas like Bentiu, Malakal, Tonj East, and Yirol West. During the 2016/17 cholera outbreaks, Ayod, Tonj East, Yirol East, Fashoda, Kapoeta East, and Kapoeta South were the most affected counties.

Information on NCP status and targets (past, current, and future) in the country

The South Sudan National Multisectoral Cholera Prevention and Control Plan (NCPCP) is currently being implemented, with significant progress made in various areas, particularly in response to the large-scale cholera outbreak that began in September 2024. The plan, initially developed as the Cholera Prevention and Control Plan 2023-2027, serves as the blueprint for readiness and response operations.

The NCPCP has been instrumental in coordinating the response to South Sudan's largest and longest cholera outbreak since its independence in 2011, declared on October 28, 2024, following the confirmation of the first case on September 28, 2024.

As of 14th January 2026, South Sudan has reported 97,516 suspected cholera cases and 1,600 deaths.

The Public Health Laboratory network has tested over 20,183 samples using rapid diagnostic testing (RDT) of which 12,766 tested positive (positivity rate: 63.3%) and 4,345 samples tested using culture and 453 testing positive on culture (10.4% positivity). Active surveillance and rigorous testing of suspected AWD cases using RDTs have enabled rapid detection and timely response in newly infected geographies.

The plan includes Water/Sanitation/Hygiene promotion interventions. However, significant challenges remain, with access to improved sanitation facilities at less than 10% and safe drinking water at approximately 50%.

A total of 8,623,298 individuals (84.7%) has been vaccinated so far against a target of 10,184,408 Targeted Deployment.

The plan also calls for renewed commitment to improve emergency preparedness, strengthen national capacity, introduce molecular laboratory methods, expand community-based systems, secure sustainable financing, and preposition life-saving supplies.

Concise description of the cholera epidemiological situation in the country in recent years (up to last 10 years)

South Sudan is one of the high-risk cholera countries in the world due to a number of risk factors which include poor water, sanitation and hygiene services, persistent flooding in some states, predisposing communities to the risk of cholera. The country has witnessed several outbreaks in the past decade. Between 2014 and 2023, five cholera outbreaks of different sizes 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

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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
2024-2026	105,440	1688	28 Sept. -15th June	55	Rubkona Juba, Mayom Aweil West, Nyirol	0.01(6.9)	Yes
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 others 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

Current description of the ongoing cholera outbreak in the Country. (2024 to 2026)

Due to the ongoing cholera outbreak in Sudan, north of South Sudan, and widespread flooding affecting large parts of South Sudan, the Ministry of Health with support from WHO has been actively preparing for potential cholera outbreak in South Sudan, particularly in Upper Nile State that is witnessing a significant influx of returnees and refugees because of the protracted conflict in Sudan.

On 28 September 2024, the Ministry of Health received a report of two suspected cases of cholera from Wunthou Primary Health Care Centre. Samples from the two suspected cholera cases were collected and immediately shipped to the National Public Health Laboratory (NPHL) in Juba on 30th September 2024. The two samples were tested using culture and one of the samples tested positive confirming Vibrio cholerae O1.

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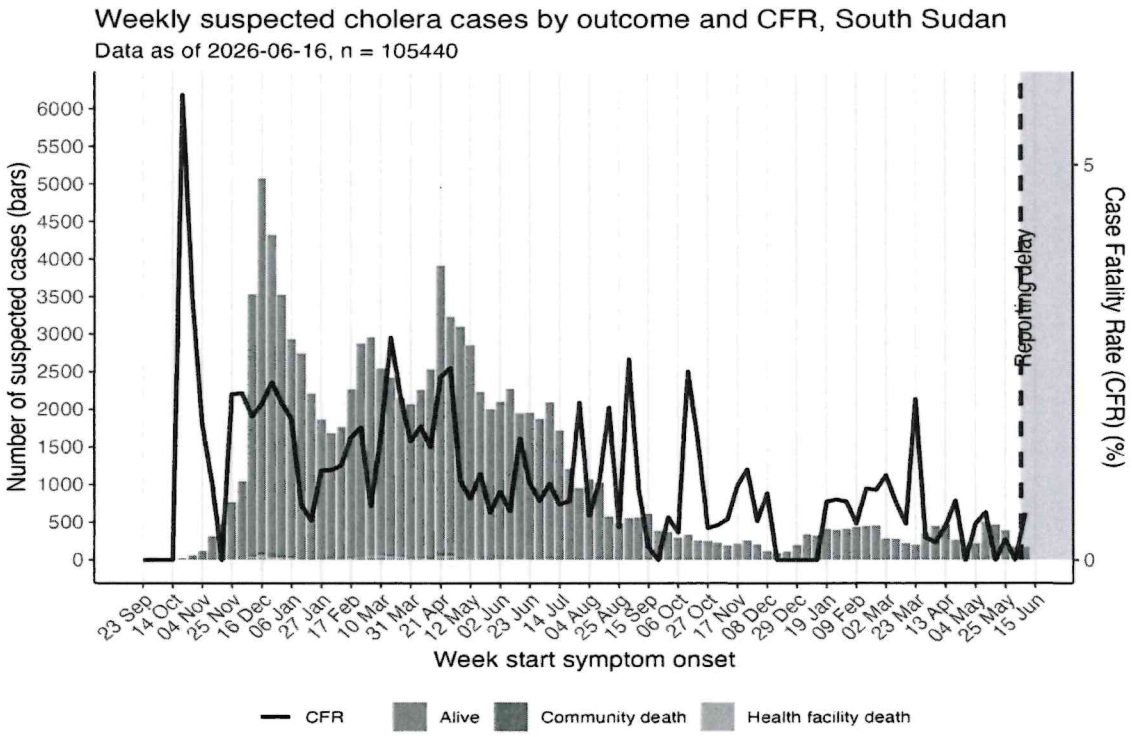
As of 16th June 2026, Cholera outbreak has cumulatively affected a total of 105,250 cases and 1,686 deaths (CFR: 1.6%, target < 1%), reported by 55 counties across 9 states and all 3 administrative areas (i.e., Ruweng, Greater Pibor, and Abyei). Cumulatively 103,564 of the cases are fully recovered and discharged, representing 98.4% of the total case burden, while 41 cases are reported as still admitted at various CTCs/CTUs in Rubkona, Mayom, Panyijiar, Leer, Awerial, and Renk counties

Active transmission remains concentrated in Unity State, particularly in Mayom, Leer, and Rubkona
In the last 2 weeks, the outbreak is now geographically limited to three states: Unity, Lakes, and Upper Nile, largely driven by conflict and poor WASH conditions especially among displaced and returnee/refugee populations. Nimule is the latest area to report resurgence of cholera cases after more than 6 months of no cases with a total of 33 new cases and 0 deaths were reported since the resurgence started in early May. However, no cases have been reported in the last 21 days.

In the last 7 days **(onset from 05 June 2026 to 11 June 2026),** 90 new cases and 0 deaths (CFR: 0%) were reported by 7 counties, a 26.2% decrease from the cases reported in the previous week (122 cases) The new cases came from Renk (46), Rubkona (40), Mayom (26), Awerial (12), Koch (6), Leer (3), and Panyijiar (2). Forty-seven (34.8%) of the new cases were among IDPs, (40 from Rubkona, 6 from Awerial, and 1 from Renk). A total of 428 RDTs have been conducted in the last 4 weeks, with 231 samples (54%) testing positive. Mayom (50%), Renk (29%), Rubkona (11.9%), and Leer (4.7%) accounted for about 96% of the RDTs done in the last 4 weeks



1151 (1.1%) cases without date information are excluded from the graph.

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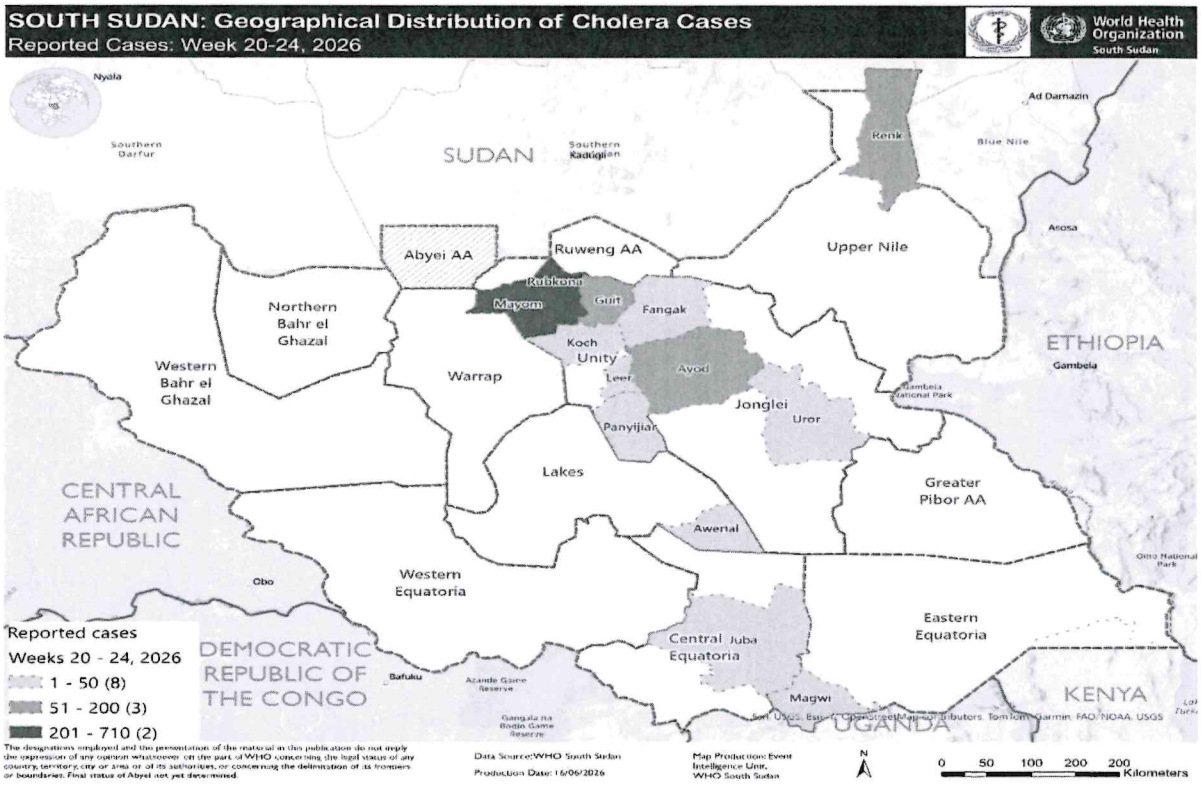
Geographic spread of active transmission Counties of South Sudan, as of 11th June 2026



Concise description of cholera surveillance system

Cholera is one of the priority diseases for immediate reporting in South Sudan. Although not updated, the country has a cholera preparedness and response plan. The country also uses integrated disease surveillance and response (IDSR) guidelines to guide case detection, reporting, and response. Training on IDSR has been rolled out to all the 80 counties of South Sudan and this has improved IDSR key performance indicators (KPIs) of timeliness and completeness of reporting over the years. The use of electronic IDSR (e-IDSR) and event-based surveillance (EBS) will further bolster detection and timely reporting of signals and alerts related to acute watery diarrhea (AWD).

Case detection

Detection of cholera cases in South Sudan largely depends on the use of case definitions that are clearly outlined in the 3rd edition of the IDSR guidelines and the Global Task Force on Cholera Control (GFTCC) interim guidance 2023. The cholera case definitions are defined in the table below:

Table 2: Cholera case definitions

Cholera	**Suspected cholera case:** In areas where a cholera outbreak has not been declared: Any patient aged two years and older presenting with acute watery diarrhoea and severe dehydration or dying from acute watery diarrhoea. In areas where a cholera outbreak is declared: any person presenting with or dying from acute watery diarrhoea. **Confirmed cholera case:** A suspected case with Vibrio cholerae O1 or O139 confirmed by culture or PCR polymerase chain reaction and, in countries where cholera is not present or has been eliminated, the Vibrio cholerae O1 or O139 strain is demonstrated to be toxigenic

Diarrhoea with dehydration in children less than 5 years of age	**Suspected case:** Passage of 3 or more loose or watery stools in the past 24 hours with or without dehydration and: **Some dehydration** -- two or more of the following signs: restlessness, irritability; sunken eyes; thirsty; skin pinch goes back slowly, or **Severe dehydration** -- two or more of the following signs: lethargy or unconsciousness; sunken eyes; not able to drink or drinking poorly; skin pinch goes back very slowly. **Confirmed case:** Suspected case confirmed with stool culture for a known enteric pathogen. Note: Laboratory confirmation of specific agent causing outbreak is not routinely recommended for surveillance purposes.

Case registration

Once a cholera case has been detected, it is registered in the facility register at the cholera treatment facility (CTU/CTC) and line listed. Case-based forms are used for recording cases.

Case confirmation

Cholera cases are confirmed through laboratory tests with culture or PCR. In a setting where the Cholera outbreak has already been confirmed, epidemiological linkage with a confirmed Cholera case is used to confirm cases.

Reporting

The reporting of cholera cases is structured from the treatment facilities to the national level through the counties and states' surveillance officers. The surveillance officers submit the data using the standard cholera line list via email.

Data analysis and feedback

Data is analyzed according to person, time, and place at all levels to inform interventions. Information products including situation reports and epidemiologic reports are produced on a regular basis. These information products are one way of giving feedback to counties where data is generated.

Concise description of cholera testing strategy

The main testing strategy for cholera confirmation of cholera in South Sudan is culture. Initial testing of suspected cases is tested using antigen-based rapid diagnostic tests (RDT) for screening purposes. The tests that become positive for RDT are sent for culture tests for confirmation. Cases are confirmed if they are culture-positive or if they are epidemiologically linked with Cholera confirmed cases. Culture-positive tests are then escalated for polymerase chain reaction (PCR) and whole genomic sequencing. Once cholera is confirmed in a geographical location, additional cases are enrolled using the case definition.

Justification for using the method "PAMIs for cholera control" (i.e., provide percentage of NCP operational geographic units with cholera outbreaks cumulatively over the past five years).

The 2024 – 2025 cholera outbreak clearly highlighted the changing epidemiological pattern compared to the cholera hotspot mapping conducted in 2019. This outbreak was peculiar in the sense that it was fueled by cross-border transmission because of the conflict in Sudan, population movements, flooding, and severe

A.M.A

funding cuts in the context of a weak health system. According to the data collected in the 2024 – 2025 cholera outbreak, 54.6% of all reported cases were in 36 counties that are outside the 20 hotspot counties in the 2019 mapping. This demonstrates that the risk for cholera transmission significantly shifted beyond traditional hotspots. It is in this context that identifying PAMIs using the new GTFCC methodology becomes urgently necessary for South Sudan. It offers a structured, multi-dimensional approach that integrates epidemiological evidence and vulnerability factors. It is explicitly designed to identifying where the risk is and escalating to and where investment in WASH, OCV, RCCE and surveillance will yield the greatest impact. In resource-constrained settings such as South Sudan, PAMI identification provides the analytical foundation needed to realign cholera strategy with present day realities ensuring that the most vulnerable populations are not overlooked.

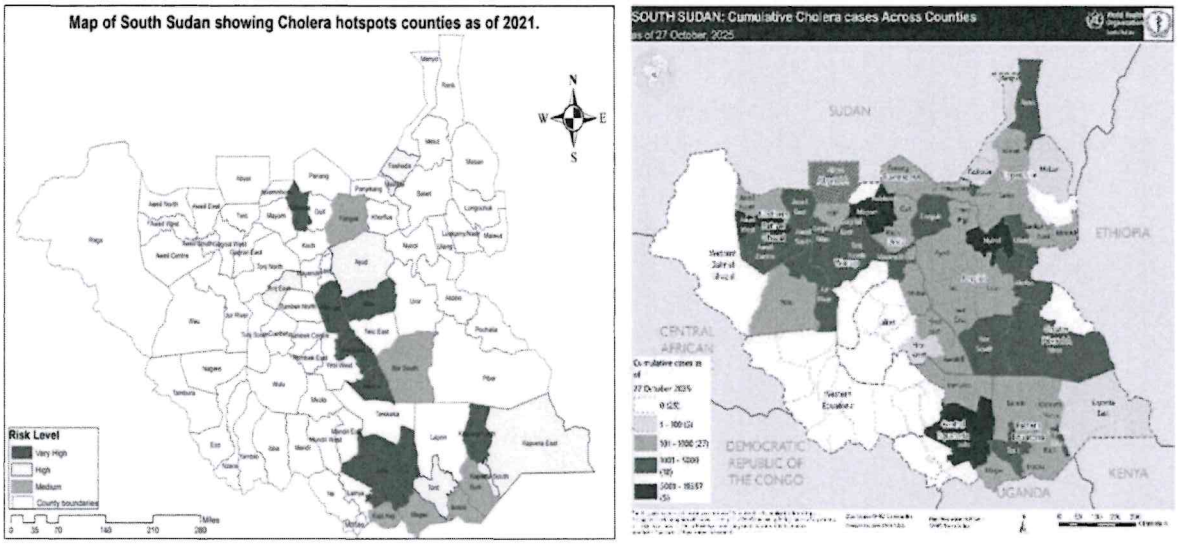


Figure 5: Cholera hotspot mapping and counties affected by the ongoing cholera outbreak in South Sudan

Based on the guidance provided by the GFTCC on the use of PAMIs, the country initiated the process to conduct the PAMIs mapping with initial orientation on the data collection using the data tool. The collected data was analyzed and validated in a workshop to identify the initial and additional PAMIs. The identified PAMIs will guide targeted multisectoral interventions.

Methods.

This chapter highlights detailed steps that were taken to identify Cholera priority areas for multi-sectoral interventions. In this section, we detail steps including preparation of datasets, assessment of vulnerability factors, calculation and scoring of epidemiologic indicators, assessment of representativeness of test data, calculation of priority index, and stakeholder validation. The section is presented in two steps: Data sets and priority index scoring.

■ Datasets

General

Definition and administrative level of NCP operational geographic units

The identification of PAMIs in South Sudan was facilitated by the Ministry of Health with technical support from the WHO Country Office (South Sudan) and the WHO AFRO. The country selected the second-highest geographic unit — the county (administrative level 2) — as the operational geographic unit for identification of the PAMIs for cholera control. This not only allows for precision in the implementation of multisectoral interventions but also aligns with the government's designation of the County Health Department (CHD) as the main implementing entity for health programs and the first point where data from the health facilities

A.M.A

are aggregated and then sent to the state and national levels. It is envisaged that through this PAMI identification process, each county will be strongly encouraged to allocate resources intended specifically for cholera control interventions.

Definition of the analysis period

The Global Task Force on Cholera Control (GTFCC) recommends that the analysis period should involve retrospective data of five (5) to 15 years and that any analysis periods shorter than five (5) years may be considered only when data is not available over longer periods. For South Sudan, the priority index calculation was based on retrospective data collected over the last 12 years from January 2014 to December 2025, corresponding to 624 weeks.

However, the intermittent nature of outbreaks, combined with surveillance and access limitations in some areas, suggests that the absence of recent reported cases should not be interpreted as absence of risk. This further supports the inclusion of additional PAMIs to ensure equitable and preventive targeting of structurally vulnerable populations.

Justification for the Analysis Period

For South Sudan, the priority index was calculated using retrospective data spanning a 12-year period, from January 2014 to December 2025, covering a total of 624 epidemiological weeks., the period (2014–2025) was deliberately selected to capture the complex and episodic nature of cholera transmission in South Sudan. Cholera in the country is not endemic in a stable, predictable pattern but rather occurs in irregular waves driven by contextual shocks such as conflict, large-scale population displacement, flooding, disruptions to water and sanitation systems, and cross-border population movements. These factors result in significant temporal and geographic variability in disease burden, where counties may remain silent for several years before experiencing sudden outbreaks when conditions become favorable.

A shorter analysis window (e.g., 2021–2025) would fail to adequately capture this cyclical and re-emergent pattern, potentially underestimating risk in historically affected counties that continue to face structural vulnerabilities. Many counties classified as low risk in recent years may still lack resilient WASH infrastructure, have weak health systems, and remain highly susceptible to future outbreaks when triggering conditions arise. Excluding earlier outbreak data would therefore bias prioritization and weaken preparedness planning.

The extended 12-year timeframe also allows for the inclusion of multiple major outbreak waves, providing a more comprehensive understanding of transmission dynamics, spatial spread, and recurrence patterns. This strengthens the robustness of the priority index by incorporating both high-intensity outbreak periods and inter-epidemic phases, ensuring that prioritization decisions are informed by long-term epidemiological evidence rather than short-term fluctuations.

Importantly, this approach balances historical trends with recent burden. While the full 12-year dataset ensures that no at-risk areas are overlooked, weighting and interpretation of the data still allow for consideration of more recent transmission patterns to maintain operational and programmatic relevance. This ensures that prioritization supports both immediate response planning and longer-term preparedness and resilience-building efforts

Priority index

Sources of data for calculation of priority index

Table 3 shows the category of data for the calculation of the priority index, data collected by geographical unit, periodicity, and the data source. The data team comprised experts from the Ministry of Health, the National Bureau of Statistics (NBS), WHO, IOM, UNICEF, and line ministries (Ministry of Humanitarian Affairs

A.M.A

and Disaster Management, Ministry of Water Resources and Irrigation, etc.). The following data were collected for each geographic unit for each year of the analysis period: estimated population, number of reported cholera cases (suspected, probable, or confirmed), number of reported cholera deaths (suspected, probable, or confirmed), number of reported suspected cholera cases tested (regardless of the method of testing), number of cholera cases tested positive (regardless of the testing method), number of weeks with at least one reported cholera case (suspected, probable, or confirmed), number of weeks with at least one reported suspected cholera case tested, and information on vulnerability factors.

Table 3: Definitions of Data by NCP operational geographic units

Category	Data by operational geographic units	Periodicity	Data source
Administrative	List of NCP operational geographic units	**2020**	**NBS**
	Geographic units in geospatial vector data format for geographic information system (e.g., shapefile)	**Most recent**	**NBS**
Demography	**Population**	**Annual**	**NBS/MOH**
Surveillance	Number of reported cholera cases (suspected, probable, and confirmed)	**Weekly**	**MOH**
	Number of reported cholera deaths (suspected, probable, and confirmed)	**Weekly**	**MOH**
Test for cholera	Number of reported suspected cholera cases tested	**Weekly**	**MOH/NPHL**
	Number of reported suspected cholera cases tested positive	**Weekly**	**MOH/NPHL**

List of geographic units

The list of counties was obtained from the NBS, including the shapefiles covering the entire country (80 counties). The counties in the shapefile were checked against those in the PAMI dataset for any discrepancies. It was noted that one county (Akoka) was created after the shapefiles were released, and the county of Canal/Pigi in the shapefile has since been renamed as only Pigi.

Population data by geographic unit

Data on the yearly estimated population by the counties was obtained from the NBS frame, which provides national 10-year population projections. The National population estimates are based on extrapolation from the 2008 census of population and housing.

Surveillance data: Surveillance data were collected on the following variables of interest:

- Number of cholera cases (suspected, probable, or confirmed) per year

A.M.A

- Number of cholera deaths (suspected, probable, or confirmed) per year
- Number of weeks with at least one reported cholera case (suspected, probable, or confirmed) by county per year

As an initial step, we gathered information on the cholera surveillance system, including case definitions, surveillance data flow from the sub-national to the national levels, cholera key performance indicators, and cholera standard operating procedures (SOPs). This information is valuable to interpret epidemiologic indicators.

The team collected surveillance data from the national cholera line list aggregated from the line lists reported by the counties. In addition, the MOH and WHO provided data on previous cholera outbreaks (2014-2023) in the country, which were obtained from the Early, Warning, Alerts, and Response System (EWARS). The team noted that cholera outbreaks were previously reported in 2014, 2015, 2016-2017, 2022, and 2023), with no outbreaks between 2018 and 2021. Therefore, the data for all years with previous cholera outbreaks were added to the analysis period. Data for all years in the analysis period were shared with sub-national level surveillance officers for verification and validation. Additionally, the team ensured that the number of weeks of reporting is superior to zero when at least one cholera case is reported for a given year in a county.

Cholera test positivity data

The team collected data on the following variables to facilitate the calculation of cholera test positivity:

- Number of weeks with at least one suspected cholera case tested over the analysis period
- Number of suspected cholera cases tested over the analysis period
- Number of suspected cholera cases tested positive over the analysis period
- Number of years with case(s) tested positive

Cholera testing strategy changed overtime in the analysis period, reflecting improvements in testing capacity over time. Culture testing was only done on samples with positive RDT cases.

The workflow of data exchange between laboratories and cholera surveillance systems was in place. The specimen for testing was collected from the suspected case at the treatment unit/Centre or initial point of care where the case was being managed. For RDTs, the samples were tested onsite, and the results were recorded in the patient's register and case notes. Surveillance was responsible for recording the test results in the case line list. For culture test, once the sample was taken at the cholera treatment facilities, it was transferred to the NPHL where culture capacity was available. The results were communicated back to the sub-national level through the laboratory focal point. At this point, the culture results were recorded in the case line list. Therefore, the team obtained data to calculate testing positivity from the updated line list. All testing methods were considered equally in the calculation of the test positivity indicators. If multiple testing methods were used (or multiple samples are tested) for a given suspected case, the corresponding suspected case was considered only once in the calculation of this indicator (numerator and denominator). Since the line list was used as the data source for testing data, we were not required to link surveillance data to testing data.

Management of missing data

The comparison of priority areas according to the priority index implies that epidemiologic and testing information is available for all counties and all years over the analysis period. The team noted that cholera data for the earlier outbreaks (2014, 2015, and 2016-2017) had some missing data compared to the data for the 2022, 2023, and 2024-2025 outbreaks. Therefore, to limit bias we ensured that data was available for all counties for the analysis period by checking with the surveillance officers at the state and county levels to retrieve the missed data. Checks were made with surveillance officers to differentiate the active reporting

A.M.A

of zero values from missing reports. Consequently, the data used to identify the PAMIs was quite accurate, and no counties reported any missing information.

Vulnerability factors

List of vulnerability factors

The following vulnerability factors were considered for vulnerability assessment of the counties. All the 12 vulnerability factors in GTFCC indicative list were deemed relevant to the South Sudan context and were considered for the vulnerability assessment and are listed in Table 4.

Table 4: *List of vulnerability factors and data sources*

Component	Indicator name	Data source
Cross-border	Location adjacent to cross-border cholera-affected areas or identified PAMIs	NCP/MOH/Cholera reports from neighboring countries
Major travel routes	Location along major travel routes with transportation hubs	Ministry of Roads and Bridges
Major population gatherings	Population gatherings such as large-scale seasonal marketplaces/animal markets, seasonal nomadic/pastoralist population gatherings, etc.	IOM/UNHCR/FAO/Ministry of Livestock and Fisheries
Population density	Areas with high population density or overcrowded settings (e.g., refugees/IDP camps)	IOM/UNHCR/Ministry of Humanitarian Affairs and Disaster Management
High-risk populations	Areas with high-risk populations (e.g., fishermen and miners)	FAO/ Ministry of Livestock and Fisheries/Ministry of Mining
Hard-to-access populations	Populations living in areas that are not regularly accessible to health and humanitarian actors for the purpose of sustained health services due to insecurity, conflict, borders, and other regulatory barriers, etc.	UNOCHA/ Ministry of Humanitarian Affairs and Disaster Management
OCV	Population received OCV more than 3 years (two-doses)	MOH/WHO
Extreme climate and weather conditions	Areas at high risk for extreme climate and weather conditions such as heavy rains, floods, droughts	UNOCHA/ Ministry of Humanitarian Affairs and Disaster Management
Complex humanitarian emergencies	A total or considerable breakdown of authority resulting from internal or external conflict, and which requires an international response that goes beyond the mandate or capacity of any single agency	UNOCHA/ Ministry of Humanitarian Affairs and Disaster Management

A.M.A

Component	Indicator name	Data source
Water facility type	Areas with more than 30% of the population with access to improved water facility type	UNICEF/WASH Cluster/Ministry of Water Resources and Irrigation
Sanitation facility type	Areas with more than 50% of the population with access to unimproved sanitation facility type	UNICEF/WASH Cluster/Ministry of Water Resources and Irrigation/Ministry of Environment
Handwashing facility on premises	Areas with more than 50% of the population with no handwashing facility on premises	UNICEF/WASH Cluster/Ministry of Water Resources and Irrigation

All NCP operational geographic units underwent a vulnerability assessment.

Method for assessing vulnerability factors

We implemented a scoring system for assessing each vulnerability factor giving a score of 1 when the vulnerability factor is present and 0 if the vulnerability factor is absent. The scoring was influenced by benchmarks set by the GTFCC, with more than 50% of the population using unimproved sanitation facilities and more than 30% of the population relying on unimproved water sources, each scored at the highest vulnerability level (score = 1). This method ensures that each factor is appropriately considered in the overall assessment of vulnerability.

■ Priority index calculation

Principle

GTFCC guidance recommends that each geographic unit be scored with a numeric priority index. Therefore, the priority index is calculated by combining four indicators: incidence, mortality, persistence, and cholera test positivity. These indicators are derived from epidemiologic and cholera testing data over the analysis period. The outcome of step 2 is a data table, where indicators and population data, indicator scores, and the priority index are assigned to each geographic unit in the country.

Determine the appropriate cholera test positivity indicator

Calculate weekly testing coverage

The weekly testing coverage indicator determines whether the representativeness of testing allows for test positivity indicators to be included in the calculation of the priority index. Depending on the value of the weekly testing coverage indicator, the positivity rate, or the number of years with cases tested positive may be included as test positivity indicators. If the representativeness of testing is determined to be insufficient, test positivity indicator is excluded altogether.

We calculated the weekly testing coverage for each county using the automated Excel based tool developed by GTFCC. We followed the step-by-step instructions provided by the GTFCC (see Part II: User guide for the GTFCC Excel-based tool).

Assess cholera testing representativeness

We assessed cholera testing representativeness using the automated GTFCC Excel tool as described above. The assessment of the representativeness of testing was automated and was based on the weekly testing coverage indicator. The table below describes criteria for assessing representativeness of cholera testing and determines the cholera test indicator to be included in the priority index. If testing coverage (for what

A.M.A

percentage of weeks with reported suspected case(s) was at least one suspected cholera case tested?) is greater than or equal to 50% in at least 80% of geographical units, then testing representativeness is deemed acceptable. On the other hand, if the weekly testing coverage is less than 50% but > 0% in at least 80% of the counties, then the testing representativeness is deemed suboptimal. However, if weekly testing coverage is > 0% in less than 80% of the counties, the testing representativeness is deemed insufficient.

Determine test positivity indicator to be included in the priority index

The GTFCC recommends that the positivity indicator to be included in the priority index be determined based on cholera test representativeness. The determination of positivity indicator was done using the GTFCC provided Excel tool that automates the determination of the positivity indicator based on the test representativeness. The determination is based on the following criteria:

If the representativeness of cholera testing is **acceptable**, the positivity rate is used as the cholera test positivity indicator. The positivity rate is scored in four classes as described in **table 6** below, and a positivity rate score ranging from 0 to 3 points is attributed to each county.

If the representativeness of cholera testing is **suboptimal**, the number of years with cases tested positive is used as the test positivity indicator. The number of years with case(s) tested positive is scored in three classes as described in Table 6, and a score ranging from 0 to 2 points is attributed to each county.

If the weekly testing coverage is > 0% in less than 80% of geographic units, the representativeness of cholera testing is **insufficient** for inclusion in the priority index. Only three indicators will then be used to calculate the priority index (i.e., incidence, mortality, and persistence) and reinforcement of routine testing for cholera shall be planned in the NCP with high priority.

In the case of our PAMIs identification exercise, testing coverage was **> 0% in 96.6%** of the units. Hence, the representativeness of testing was suboptimal, and the number of years with confirmed cases was included in the priority index.

Calculation of epidemiological indicators

The calculation of epidemiological indicators including incidence, mortality, and persistence was automated using an Excel based tool developed by GTFCC. The definitions and calculations for indicators are provided in Table 5.

Table 5: Calculation of epidemiological indicators

Indicator	**Calculation and definition**
Incidence	**Calculation** Cholera incidence rate in an NCP operational geographic unit is calculated by dividing: - the total number of cholera cases (including suspected cases and cases tested positive) reported in the unit over the analysis period by - The cumulative person-time (i.e., the sum of population of the geographic unit for each year over the analysis period), then multiplied by 100,000
	Definition

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	This indicator is the number of cholera cases reported per 100,000 person-years over the analysis period
Mortality	**Calculation** Cholera mortality rate in an NCP operational geographic unit is calculated by dividing: - the total number of deaths attributed to cholera reported in the unit over the analysis period by - The cumulative person-time (i.e., the sum of the annual population over the period), then multiplied by 100,000.
	Definition This indicator is the number of deaths attributed to cholera reported per 100,000 person-years in the unit over the analysis period.
Persistence	**Calculation** Cholera persistence in an NCP operational geographic unit is calculated by dividing: - the number of weeks with at least one reported suspected cholera case over the analysis period by - the total number of weeks over the analysis period
	Definition This indicator is the percentage of weeks with at least one reported suspected cholera case in the unit over the period of interest.

Scoring of epidemiologic indicators

Calculation of distribution thresholds (median and 80th percentiles of respective distributions)
The 50th and 80th percentiles of incidence, mortality, and persistence distributions thresholds were automatically calculated in the GTFCC excel based tool. The distribution of thresholds (median and 80th percentile) was calculated out of the counties where at least one cholera case (suspected, probable, or confirmed) was reported over the analysis period.

Scoring of epidemiological indicators for each geographical unit (county)

The scoring of epidemiologic indicators for each geographic unit was also done in the GTFCC excel based tool. Epidemiologic indicators (i.e., incidence, mortality, persistence) were scored in four categories based on the 50th (median) and the 80th percentiles of their respective distributions. A score ranging from zero to three points was attributed to each geographic unit for each epidemiologic indicator. Table 6 describes the criteria that were used to describe epidemiological indicators.

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Table 6: *Scoring of epidemiological indicators for each geographical unit (county)*

Epidemiological Indicator	Score			
	0 Point	1 Point	2 Points	3 Points
Incidence*	No case	> 0 and < median	≥ median and < 80th percentile	≥ 80th percentile
Mortality*	No death	> 0 and < median	≥ median and < 80th percentile	≥ 80th percentile
Persistence*	No case	> 0 and < median	≥ median and < 80th percentile	≥ 80th percentile
Number of years with case(s) tested positive included in priority index	0 years	1 year	>1 year	Not Applicable

Calculation of priority index

The priority index was calculated for each county by summing the scores of the indicators as follows:

Priority index = incidence score + mortality score + persistence score + number of years with cases tested positive score

Calculation of vulnerability assessments

An additional assessment of the vulnerability factors specific to counties was done to provide a rationale for their potential selection as additional PAMIs. Specifically, the assessment of 12 vulnerability factors, including proximity of a county to an area affected by or prone to cholera outbreak, location along a major transportation hub, presence of refugees and IDPs, availability of clean and safe drinking water and the coverage of sanitation to identify areas at higher risk. A comparative analysis was conducted across counties selected primarily on vulnerability factors to identify the additional PAMIs with the expert opinion of stakeholders from the respective states. The complete list of the vulnerability factors is included in **Table 4.** The data for the vulnerability factors came from reports from government ministries and agencies, UN agencies, WASH cluster, and humanitarian

Step 3. Stakeholder validation

Table 7 lists the stakeholders who participated in the validation exercise. A stakeholder validation meeting was organized in Juba on December 8-11, 2025, to identify, review, and endorse the final list of PAMIs. With technical support from the WHO South Sudan Country Office and the WHO Regional Office for Africa, facilitators presented the methods and findings from the PAMI identification exercise, followed by group sessions where stakeholders were divided into smaller groups to review and discuss the process and findings in detail. When stakeholders identified discrepancies such as areas perceived as cholera hotspots but scored below the priority threshold, they were able to propose reassessing vulnerability factors, potentially adding those areas to the PAMIs list. This collaborative approach allowed for adjustments, resulting in the inclusion of some previously excluded geographical units in the final prioritized list.

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Table 7: List of Stakeholders represented during PAMI data analysis and validation

#	Stakeholders
1	Ministry of Health
2	Ministry of Water Resources and Irrigation
3	Ministry of Wildlife, Conservation, and Tourism
4	Ministry of Environment and Forestry
5	Ministry of Humanitarian Affairs and Disaster Management
6	World Health Organization
7	United Nations Children's Fund
8	University of Juba
9	Medair
10	Tearfund
11	International Organization for Migration

Results

The results of the PAMIs identification exercise are presented in two subsections: (1) Priority Index and (2) Stakeholder validation.

- **Priority index**

Data Overview

Table 8 shows an overview of the data that was used for calculating the priority index for NCP identification of PAMIs. A total of 80 NCP geographical units at the level of the county, representing 100% of all geographical units in South Sudan were included in the analysis. The period of analysis covered 12 years from January 2014 to December 2025. A total of 59 out of 80 counties (64%) had recorded at least one Cholera case during the analysis period. During that period, a cumulative 135,144 cases were recorded over the period of analysis; 28,108 suspected cases tested, with 19,235 testing positive and an overall positivity rate of 68.4%.

Table 8: An overview of data used for calculating the priority index for PAMIs identification in South Sudan

Data description *	
Number of NCP operational geographic units	80
Study period: start year	2014
Study period: end year	2025
Study period: number of years	12
Number of NCP operational geographic units with at least one case	59
Total number of cases	135,144
Total number of deaths	2,487
Overall case fatality	1.8%
Total number of suspect cases tested **	28,108
Total number of suspect cases tested positive **	19,235
Overall positivity rate **	68.4%

** The totals are calculated for the entire set of geographical unist over the study period*
*** Regardless of the testing method applied*

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Epidemiologic indicators score thresholds

The epidemiological indicators score thresholds are used for scoring epidemiological indicators that feed into the calculation of the priority index for each geographical unit. **Table 9** lists the epidemiological indicator score thresholds.

Table 9: Epidemiological indicators score threshold

EPIDEMIOLOGICAL INDICATORS		
Epidemiological indicator score thresholds		
Incidence (100,000 pers.y-1)*	Median	**62.14**
	80th percentile	**160.35**
Mortality (100,000 pers.y-1)*	Median	**1.35**
	80th percentile	**3.26**
Persistence (% of weeks with ≥ one case)*	Median	**4.6**
	80th percentile	**6.6**

** Calculated out of geographic units with indicator value >0*

Score values by epidemiological indicators				
Epidemiological indicator	**Score**			
	0 point	**1 point**	**2 points**	**3 points**
Incidence	No case	> 0 and < median	≥ median and < 80th percentile	≥ 80th percentile
Mortality	No death	> 0 and < median	≥ median and < 80th percentile	≥ 80th percentile
Persistence	No case	> 0 and < median	≥ median and < 80th percentile	≥ 80th percentile

Assessment of representativeness of testing

The assessment of representative testing is done to inform the selection of positivity indicator that will be used in the calculation of the priority index. The first step involves assessing whether the positivity rate should be selected as a test indicator (if weekly testing coverage is> 50% in at least 80% of the NCP operational geographic units). The second step aims to find out if the number of years with case(s) that tested positive score should be included in the priority index. The analysis showed that only 35 (59.3%) of the NCP geographic units achieved weekly testing coverage equal to or greater than 50%. This indicates that overall testing representativeness did not meet the threshold for using the positivity rate in calculating the priority index. However, as reflected in Step 2, 57 (96.6%) of NCP geographic units had a weekly testing coverage greater than 0%, suggesting that the representativeness of testing was suboptimal, and thus the number of years with confirmed cases was used in the calculation of the priority index.

Table 10: Assessment of representativeness of cholera testing*

Assessment of representativeness of cholera testing *	
Step 1	
Number of NCP operational geographic units with weekly testing coverage ≥ 50%	**35**
Percentage of NCP operational geographic units (with at least one case) with testing coverage ≥ 50%	**59.3%**
Is weekly testing coverage ≥ 50% in at least 80% of the NCP operational geographic units of the country?	**No**
Level of representativeness of testing	See step 2: check if weekly testing coverage is > 0 in at least 80% of geo.
Inclusion of positivity rate score into the priority index	**No inclusion of the positivity rate score, see next step 2**
Step 2	
Number of NCP operational geographic units with weekly testing coverage > 0%	**57**
Percentage of NCP operational geographic units with testing coverage > 0%	**96.6%**
Is the weekly testing coverage > 0 in at least 80% of the NCP operational geographic units of the country ?	**Yes**
Level of representativeness of testing	**Suboptimal**
Inclusion of the num. of years with case(s) tested positive score into the priority index	**Num. of years with confirmed case(s) score included the priority index**

NA: not applicable
** Regardless of the testing method applied*

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Priority index scores

All the parameters were used to determine the priority index; the maximum score was 11. Therefore, the priority index values ranged from zero to eleven (0 - 11). A total of 21 NCP geographical units had a priority index of zero. A total of 38 had a priority index ranging from 6 to 11. A total of 21 had a priority index ranging from 3 – 5.

Approximately 7,132,507 people live in geographical units with a priority index between 6—11. These areas account for 54.7% of the total population and for 93.1% of all reported cases and 88.9% of all reported deaths.

Over 3.5 million people are in the priority index ranging from 3 – 5. About 2.2 million people are in the priority index of zero.

Geographical units with the highest priority index value (11) had the highest number of cholera cases and deaths over the analysis period with 49,336 (36.5%) cases and 607 (24.4%) deaths.

Copy of table of sheet 'R.3| Priority index summary' of the GTFCC Excel-based tool

Table 11: Summary table of key parameters stratified by priority index values

■ Stakeholder validation

Priority Index Threshold

Stakeholders determined the priority index threshold value through consensus, considering both public health impact and the feasibility of implementing interventions. After extensive discussion and reflection, the team agreed on six (6) as the threshold. Consequently, all counties with a priority index score ≥6 were included in the initial list of PAMIs.

List of initial PAMIs

Initial list of PAMIs

A total of 38 PAMIs had a priority index score ≥ 6 and were thus selected and formed the initial list of PAMIs representing 47.7% of all geographical units covering a total of 7,132,507 (54.7%) people living in these counties. Further, these counties represented 125,842 (93.1%) of cholera cases and 2,212 (88.9%) deaths over the analysis period.

Table 12: List of initial PAMIs

State	County	Priority index
Unity	Rubkona	11
Unity	Payinjiar	10
Unity	Mayom	10
Unity	Mayendit	9
Unity	Guit	8
Unity	Koch	7
Unity	Leer	7
CES	Juba	11
Lakes	Awerial	10
Lakes	Yirol East	9
NBGZ	Aweil Center	10

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NBGZ	Aweil South	8
NBGZ	Aweil West	7
NBGZ	Aweil East	6
EES	Torit	10
EES	Kapoeta South	9
EES	Budi	8
EES	Ikwotos	7
EES	Magwi	6
EES	Lafon	6
EES	Kapoeta East	6
EES	Kapoeta North	6
JS	Duk	10
JS	Nyirol	10
JS	Fangak	9
JS	Ayod	9
JS	Pigi	7
JS	Bor South	7
JS	Akobo	6
UNS	Malakal	9
UNS	Renk	7
UNS	Ulang	7
UNS	Fashoda	7
WRP	Tonj North	8
WRP	Tonj East	8
WRP	Tonj West	7
AAA	Abyei	7
GPAA	Pibor	6

List of additional PAMIs

Additional PAMIs were identified based on vulnerability factors. To aid in the selection of Additional PAMIs, the multisectoral stakeholders developed two sets of criteria:

1. An NCP geographic unit with a priority index of 5 and a vulnerability index of greater to or equal to 9.
2. Any NCP geographic unit that had a priority index of less than 5 but vulnerability index of greater to or equal to 9 plus any of the following:

    - Unique location and livelihood with frequent humanitarian emergencies that make the community highly susceptible to cholera outbreaks, which can be very difficult to control
    - The government prioritizes these counties as special areas requiring urgent attention to improve water and sanitation infrastructure.

The multisectoral stakeholders considered all 12 vulnerability factors in the GTFCC indicative list in assessing and selecting the additional PAMIs. Using the first criterion, 11 counties were selected as additional PAMIs. Additionally, the team also selected two (2) counties that had met the second criterion.

Therefore, a total of 13 counties (11 based on a priority index score of 5 with at least nine vulnerability factors + 2 based on a vulnerability index of greater than or equal to 9, and also unique country contextual factors. Table # below gives a summary of the priority and vulnerability index scores per county of the additional PAMIs, while Table # gives detailed documentation of the vulnerability factors

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Table 13: Summary of priority and vulnerability index scores per county of additional PAMIs

Unique_id	Admin_1	Admin_2	Priority index	Sum_vuln_factors	FN_PAMIs
1	WBGZ	Wau	5	9	Ad PAMI
8	WRP	Tonj East	5	9	Ad PAMI
13	LS	Yirol West	5	12	Ad PAMI
31	UNS	Manyo	5	9	Ad PAMI
34	UNS	Maiwut	5	12	Ad PAMI
35	UNS	Luakpiny/Nasir	5	11	Ad PAMI
52	CES	Terekeka	5	11	Ad PAMI
54	CES	Kajo-Keji	5	9	Ad PAMI
60	NBGZ	Aweil North	5	11	Ad PAMI
62	RAA	Panrieng	5	9	Ad PAMI
79	JS	Twic East	5	11	Ad PAMI
22	WES	Mundri East	0	9	Ad PAMI
27	WES	Tambura	0	10	Ad PAMI

Table 14: Detailed description of vulnerability factor

State	County	PI-Score	VI-score	Justification
WBG	Wau	5	9	Located along a major transportation route, with 2 major transportation hubs linking South Sudan to Khartoum in Sudan, generating continuous cross border population movement, and increasing the risk of importation and spread of cholera This is an international route with heavy traffic on a daily basis given the ongoing impact of the Sudan Crisis. Major population gatherings- The County has one of the biggest markets in South Sudan where traders converge with inadequate water and sanitation facilities. In addition, the county hosts large numbers of nomadic pastoralists who usually practice open defecation because of inadequate sanitation facilities. Currently, there is an ongoing outbreak of Hepatitis E which is associated with lack of safe water and sanitation. In 2025, the county hosted approximately 7,000 IDPs that overwhelmed the WASH facilities. In addition, there's a huge number of refugees because of the conflict in Sudan.

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State	County	PI-Score	VI-score	Justification
				Presence of high-risk populations, mainly fishermen who live in fishing camps with poor WASH conditions. Approximately 68% of the population have access to unimproved sanitation facility type
Warrap	**Tonj East**	**5**	**9**	The county hosts large numbers of nomadic pastoralists who usually practice open defecation because of inadequate sanitation facilities. In addition, the county hosts a number of IDPs settled in Makuac, Wuldit, and Angapanwut Payams. Presence of high-risk populations, mainly fishermen who live in fishing camps and cattle keepers who live in cattle camps with poor WASH conditions. Some locations within the county are hard to access due to factors such as insecurity due to internal conflict and poor road infrastructure rendering some areas inaccessible, especially during the rainy season. Cholera outbreaks in such areas challenges surveillance and response capacities. The area is prone to extreme climatic conditions especially floods. There are recurrent intercommunal conflicts between the communities with neighboring counties which impacts access rendering the affected communities at increased risk of health emergencies. Approximately 46% have access to unimproved water facility type and 99% to unimproved sanitation facility type. Widespread open defecation.
Lakes	**Yirol West**	**5**	**12**	The county borders cholera-prone counties – Terekeka, Yirol East and Awerial. Located along a major transportation route linking Central Equatoria state to the Greater Bahr El Ghazal region. The county hosts large numbers of nomadic pastoralists located in remote locations, who usually practice open defecation because of inadequate sanitation facilities. There is a major traditional wrestling ceremony that attracts large gathering from across the country annually.

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State	County	PI-Score	VI-score	Justification
				There are recurrent intercommunal conflicts between the communities within the county as well as the neighboring counties. Presence of high-risk populations, mainly fishermen who live in fishing camps and cattle keepers who live in cattle camps with poor WASH conditions. Some locations e.g. Anuol Payam are usually cut off during the rainy season due to poor road infrastructure. The population has been vaccinated with a single dose of OCV in 2025. The area is prone to extreme climatic conditions especially heavy rains and floods. Approximately 44% have access to unimproved water facility type and 96% to unimproved sanitation facility type. Open defecation is common.
UNS	**Maiwut**	**5**	**12**	Maiwut is located at the border with Ethiopia; and borders a cholera prone county – Nasir Located along a major transportation route, linking South Sudan to Ethiopia. This is an international route with daily movement between South Sudan and Ethiopia. The area is prone to extreme climatic conditions especially floods. Approximately 40% have access to unimproved water facility type and 65% to unimproved sanitation facility type This is a hard-to-reach location that is only accessible mainly through air from Juba. The county hosts large numbers of nomadic pastoralists located in remote locations, who usually practice open defecation because of inadequate sanitation facilities.
UNS	**Luakpiny/Nasir**	**5**	**11**	Nasir is located at the border with Ethiopia; and borders a cholera prone county – Ulang county Affected by periodic insecurity linked to ongoing conflict in the county.
UNS	**Manyo**	**5**	**9**	Located at the border with Sudan; and borders cholera prone county – Renk county. Located along a major transportation route, linking South Sudan to Sudan. The county hosts large numbers of nomadic pastoralists located in remote locations, who

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State	County	PI-Score	VI-score	Justification
				usually practice open defecation because of inadequate sanitation facilities.
CES	Terekeka	5	11	Located along a major transportation route linking Central Equatoria state to the Greater Bahr El Ghazal region. The county hosts large numbers of nomadic pastoralists who usually practice open defecation. There are major cultural events such as traditional wrestling tournaments that attract large gathering from across the country. Recurrent intercommunal conflicts between the communities with neighboring counties due to cattle raiding. Presence of high-risk populations, mainly fishermen who live in fishing camps and cattle keepers who live in cattle camps with poor WASH conditions. One of the payams – Tali payam is a remote location that is not easily accessible from Juba (the state capital). The population has been vaccinated with a single dose of OCV in 2025. The area is prone to extreme climatic conditions, especially floods. Approximately 61% have access to unimproved water facility type and 99% to unimproved sanitation facility type. Open defecation is common.
CES	Kajo-Keji	5	9	Kajo-Keji is located at the border with Uganda. Located along a major transportation route linking South Sudan to Uganda. The county hosts seasonal nomadic pastoralists who usually practice open defecation. The county hosts IDPs due to conflicts who usually practice open defecation because of inadequate sanitation facilities. Due to poor road infrastructure, the population is hard to access during outbreaks from Juba (state capital)
RAA	Panrieng	5	9	Panrieng is located at the border with Sudan; and borders cholera prone counties – Rubkona, Guit and Fangak counties. Located along a major transportation route, linking South Sudan to Sudan. This is an international route with daily movement between South Sudan and Sudan.

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State	County	PI-Score	VI-score	Justification
				The County has one of the biggest refugee settlements in South Sudan with inadequate water and sanitation facilities. There are recurrent intercommunal conflicts among the communities. Approximately 40% have access to unimproved water facility type and 91% have access to unimproved sanitation facility type. Open defecation is common.
JS	**Twic East**	**5**	**11**	Twic East borders cholera prone counties – Bor South, Duk, Yirol East and Panyijiar counties. Located along a major transportation route along the River Nile for goods and people to neighboring counties. The county hosts large numbers of nomadic pastoralists who usually practice open defecation. Presence of high-risk populations, mainly fishermen who live in fishing camps and cattle keepers who live in cattle camps with poor WASH conditions. During the rainy season, the population and health facilities are hard to access as the roads are submerged in floods. The area is prone to extreme climatic conditions, especially floods. There are recurrent conflicts with neighboring counties: Approximately 45% have access to unimproved water facility type and 82% to unimproved sanitation facility type. Open defecation is common.
WES	**Mundri East**	**0**	**9**	Mundri East presents significant structural vulnerabilities that elevate the risk of cholera outbreaks despite the absence of current high transmission indicators. Strategic Mobility Corridor: The county is located along a major transportation route connecting Juba to Western Equatoria State, which facilitates high population movement and trade interactions. This mobility increases the risk of importation and rapid spread of infectious diseases, particularly cholera and other waterborne illnesses. Critical WASH Gaps: Approximately 37% of the population relies on unimproved water sources, around 82% lack access to improved sanitation facilities. These conditions significantly increase

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State	County	PI-Score	VI-score	Justification
				and creates an enabling environment for cholera transmission. Latent Outbreak Risk: Even in the absence of reported outbreaks, the combination of poor sanitation, unsafe water, and population movement creates a high-risk epidemiological setting, warranting early preventive action. Health System Sensitivity: Like many counties in South Sudan, Mundri East faces limited health service capacity, including Limited partners presence, gaps in surveillance, case management, and rapid response capability. In Mundri East, the absence of reported cases is most likely attributable to weak surveillance capacity and limited health system presence, rather than an absence of cholera risk. The county has limited partner coverage, reduced diagnostic capacity, and gaps in community-based surveillance, resulting in low detection sensitivity. In addition, seasonal flooding and poor road infrastructure constrain access to health facilities and limit active case finding and reporting. The county lies along a major population movement corridor linking Western Equatoria to Central Equatoria, increasing the risk of disease importation and spread, which may not be captured in routine surveillance systems. These factors suggest that the priority index score of zero reflects under-detection rather than true absence of transmission risk.
WES	**Tambura**	**0**	**10**	Tambura represents a high-risk, complex emergency setting where multiple factors converge to significantly increase the likelihood of public health crises **Cross-Border Risk Exposure:** Tambura borders cholera-prone regions of the Democratic Republic of Congo (DRC) and lies along a transnational corridor linking South Sudan to CAR and DRC. This exposes the county to cross-border importation of cholera and other epidemic-prone diseases. **Severe WASH Vulnerabilities:** Approximately 57% of the population relies on unimproved water sources. Around 62% lack access to improved sanitation facilities

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State	County	PI-Score	VI-score	Justification
				These conditions create sustained environmental risk for waterborne disease transmission, especially in displacement settings. **Displacement and IDP Presence:** Tambura hosts internally displaced populations (IDPs) due to ongoing intercommunal conflict, resulting in: • Overcrowded settlements • Increased pressure on already limited WASH infrastructure • Higher vulnerability of children, women, and elderly populations • IDP populations are particularly at risk of cholera, measles, and acute malnutrition. **Access Constraints and Insecurity:** 1). Poor Road infrastructure significantly limits humanitarian access. Persistent insecurity disrupts service delivery and delays response interventions. These constraints increase the risk of delayed outbreak detection and response, which can lead to higher morbidity and mortality. **Compounded Risk Environment:** Tambura combines cross-border exposure, displacement, poor WASH conditions, and limited access, making it a high-complexity setting with elevated risk of rapid outbreak escalation.
NBGS	**Aweil North**	**5**	**11**	The county is located at the border with Sudan which has an active cholera outbreak amidst a civil war and displacement of people into Northern Bahr el Ghazal

Final list of PAMIs

Rationale for the Selection of 51 Priority Areas for Multisectoral Interventions (PAMIs) in South Sudan's National Cholera Plan

The final list of PAMIs is 51 with 38 initial PAMIs and 13 additional PAMIs. The GTFCC PAMI guidance requires country-specific stakeholder consensus to balance feasibility and potential impact when setting priority index thresholds. Thresholds set too low risk producing an overly ambitious, resource-constrained plan, while overly restrictive thresholds exclude high-burden areas and undermine national cholera control goals. The 51 PAMIs selected in South Sudan (Table 15)reflect a deliberate balance between what is feasible and what is needed for maximum impact. Given South Sudan's epidemiologically and structurally unique context, a narrower prioritization would fail to capture the true national cholera burden, making this broader designation both justified and necessary.

The selection of additional Priority Areas for Multisectoral Interventions (PAMIs) was guided by a dual-criteria approach, combining the quantitative outputs of the priority index with qualitative and contextual risk

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assessments. While the priority index provides a robust, data-driven foundation for ranking counties based on historical cholera burden, it is recognized that in fragile and data-constrained settings such as South Sudan, sole reliance on surveillance-derived metrics may not fully capture the true risk profile in all locations.

In the 13 additional counties identified, the priority index is likely to underestimate risk due to well-documented limitations in data completeness and representativeness. These include surveillance blind spots and chronic underreporting, particularly in areas with limited functional health facilities, weak community-based surveillance systems, and delayed reporting mechanisms. Consequently, absence of reported cases in these areas does not necessarily indicate absence of risk but rather gaps in detection capacity.

Furthermore, access constraints—including recurrent flooding, insecurity, and poor infrastructure—significantly limit the reach of surveillance and response activities. Many high-risk populations reside in hard-to-reach or intermittently accessible locations where routine data collection is inconsistent or absent. These structural barriers contribute to systematic underestimation of incidence and, by extension, lower prioritization scores within the index.

Population mobility and displacement further complicate the reliability of the priority index. South Sudan experiences continuous movements due to conflict, seasonal flooding, and livelihood patterns, leading to fluctuating population denominators that are difficult to accurately capture. This affects both the calculation of incidence rates and the interpretation of disease burden, potentially masking true transmission dynamics in highly mobile populations.

In addition, cross-border transmission dynamics represent a critical risk factor that is not fully reflected in retrospective national surveillance data. Several of the additional PAMIs are located along porous international borders with neighboring countries that have experienced recurrent cholera outbreaks. These areas remain at elevated risk of importation and onward transmission, even in the absence of recent locally reported cases.

In light of these limitations, vulnerability indicators were systematically incorporated as complementary evidence to strengthen the prioritization process. These indicators include factors such as WASH access, population density, displacement burden, historical outbreak exposure, accessibility constraints, and proximity to cross-border hotspots. By integrating these dimensions, the prioritization framework aligns more closely with the operational realities on the ground and provides a more comprehensive assessment of risk.

This combined approach ensures that the identification of additional PAMIs is not a deviation from evidence-based prioritization, but rather a necessary methodological adjustment to address known data gaps and structural biases inherent in the surveillance system. It enhances the sensitivity of the prioritization process, ensuring that high-risk but under-detected populations are not excluded from preventive interventions.

Ultimately, this approach strengthens the overall credibility and equity of the PAMI selection by ensuring that resource allocation is both data-informed and context-sensitive, in line with ICG expectations for targeting vulnerable populations at highest risk of cholera outbreaks.

The Unique Epidemiological and Structural Context of South Sudan

South Sudan's cholera burden is unparalleled among endemic nations. Unlike most countries, where transmission clusters around discrete hotspots, cholera in South Sudan is structurally embedded across an exceptionally wide geographic footprint, driven by multiple overlapping factors rarely encountered simultaneously in a single country:

- **Massive cross-border population inflows** from Sudan, Ethiopia, Uganda, and the Democratic Republic of Congo continuously reintroduce cholera strains and overwhelm local WASH and health systems in border counties.
- **Protracted conflict,** flooding, and drought fuel large-scale internal displacement, generating overcrowded IDP settlements with acute sanitation deficits that are inherently conducive to rapid transmission
- **Seasonal mobility** of pastoralist and fishing communities along the River Nile belt and migration corridors create fluid, boundary-defying transmission pathways.

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- **Recurrent climatic shocks** repeatedly devastate water and sanitation infrastructure across vast areas, effectively resetting WASH conditions to critical levels
- Furthermore, **chronic surveillance gaps** in remote payams result in systematic under-detection of cholera cases, warranting PAMI designation under GTFCC's exceptional vulnerability criteria even where epidemiological scores fall below the standard threshold.

Collectively, these interlocking drivers produce a transmission landscape far more geographically diffused than in comparable settings, making the designation of a larger number of PAMIs technically sound, epidemiologically justified, and operationally necessary.

Population Coverage as a Reflection of Burden, Not Overreach

The 51 PAMIs covering 72.2% of South Sudan's national population are not an overextension of the prioritization framework; it is a precise reflection of where cholera risk is greatest. These counties follow well-established transmission corridors along the River Nile belt, cross-border trade routes, and high-density urban centers such as Wau, Bor, and Renk. In a country where up to 99% of people in many areas lack access to safe water or sanitation, the line between priority and non-priority areas is razor thin. A broader PAMI designation is therefore not only desirable, but it is necessary

Differentiated Intervention Packages: Not All PAMIs Are Equal

Designating 51 PAMIs does not mean every county receives the same interventions. In line with GTFCC guidance, the strategy adopts a risk-stratified model, targeting each area with tailored interventions based on its specific cholera transmission drivers and vulnerabilities.

- PAMIs with severe WASH deficits, where up to 90% of the population lacks safe water or sanitation, flooding regularly destroys infrastructure, or IDP settlements face overwhelmed WASH systems, will be prioritized for intensive WASH rehabilitation, including water system repair, communal point chlorination, household water treatment, and emergency latrines. This will be complemented by Oral Cholera Vaccination (OCV) as a bridge protection measure in border counties, riverine belt areas, and communities with high population mobility.
- Where WASH infrastructure is comparatively adequate, the focus shifts to Health Systems Strengthening. Interventions will target counties with weak surveillance, limited case management, and poor rapid response capacity — reinforcing EWARS, establishing or upgrading cholera treatment points, prepositioning essential supplies, and ensuring rapid response teams can effectively reach even the most remote areas.

This differentiated approach ensures resources are deployed where they matter most, targeting each PAMI's predominant risk driver, maximizing impact, and maintaining the operational efficiency that GTFCC guidance rightly demands in resource-constrained settings.

The selection of 51 PAMIs is not a departure from GTFCC principles; it is their faithful application to a country where cholera risk is structurally dispersed, chronically under-reported, and continuously amplified by displacement, climate shocks, and cross-border mobility. Far from overreach, this broad prioritization reflects South Sudan's uniquely complex epidemiological reality. Paired with a differentiated, risk-stratified intervention model, the NCP ensures that ambition is matched by strategic precision, channeling the most intensive WASH, OCV, and health system investments precisely where they are most urgently needed

To implement multisectoral cholera interventions across the 51 PAMIs, the strategy integrates **WASH, health, surveillance, OCV, RCCE, and coordination**. WASH actions include rapid rehabilitation of water systems, chlorination of communal water points, provision of household water treatment, and emergency latrines in displacement settings. Health interventions focus on strengthening EWARS, establishing cholera treatment points, prepositioning supplies, and ensuring rapid response teams can reach hard-to-access areas. **Oral**

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Cholera Vaccination will be deployed in waves covering the highest-risk populations first, including border counties, river belt counties, and areas with pastoralist mobility. Community engagement will involve chiefs, cattle camp leaders, fishermen, and market associations to promote safe water, sanitation, and hygiene practices. Coordination across Health, WASH, Nutrition, and CCCM clusters will ensure unified, rapid action—ultimately interrupting transmission and reducing cholera morbidity and mortality in the most vulnerable populations.

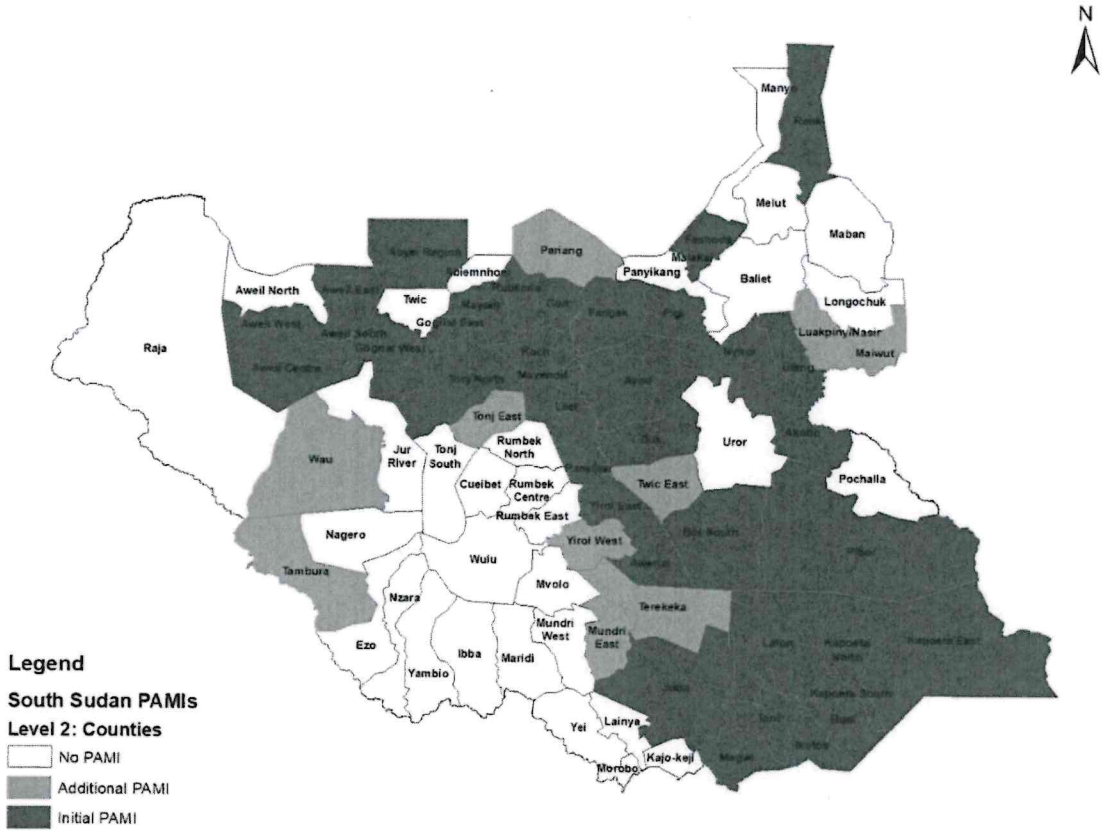

Figure 6: Map showing initial PAMIs and additional PAMIs

Table 15: Consolidated List of Initial and Additional PAMIs

State	County	Initial PAMIs	Additional PAMIs)
		County Priority Index	**County Priority Index**
Unity	Rubkona	Rubkona (11), Panyijar (10), Mayom (10), Mayendit (9), Guit (8), Koch (7), Leer (7)	—
Central Equatoria	Juba	Juba (11)	Terekeka (5)
Lakes State	Awerial	Awerial (10), Yirol East (9)	Yirol West (5)
			—

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Northern Bahr el Ghazal (NBGZ)	Aweil Centre	Aweil Center (10), Aweil South (8), Aweil West (7), Aweil East (6).	
Eastern Equatoria (EES)	Torit	Torit (10), Kapoeta South (9), Budi (8), Ikotos (7), Magwi (6), Lafon (6), Kapoeta East (6), Kapoeta North (6.)	—
Jonglei State (JS)	Duk	Duk (10), Nyirol (10), Fangak (9), Ayod (9), Pigi (7), Bor South (7), Akobo (6).	Twic East (5)
Upper Nile (UNS)	Malakal	Malakal (9), Renk (7), Ulang (7), Fashoda (7)	Maiwut (5), Luakpiny/Nasir (5)
Warrap (WRP)	Tonj North	Tonj North (8), Gogrial East (8), Gogrial West (7)	Tonj East (5)
Abyei Administrative Area (AAA)	Abyei	Abyei (7)	—
Greater Pibor Administrative Area (GPAA)	Pibor	Pibor (6)	—
Western Bahr el Ghazal (WBGZ)	Wau	—	Wau (5)
Ruweng Administrative Area (RAA)	Pariang	—	Panrieng (5)
Western Equatoria (WES)	Mundri East	—	Mundri East (0), Tambura (0)

Attach the PAMI table generated from the sheet 'R.5| Table PAMIs export' of the GTFCC Excel-based tool

Way forward

1. Strengthen multisectoral Collaboration, by ensuring integrated efforts across health, WASH (Water, Sanitation, and Hygiene), and community stakeholders.
2. Cross-Border Collaboration: strengthened mechanisms for data sharing and coordinated response measures between neighboring countries, as cholera outbreaks often have cross-border implications.
3. The PAMIS needs to be disseminated to all stakeholders for use when planning Cholera control interventions in South Sudan to guide in the development of the country's 5-Year Cholera Control Plan.
4. Deployment of OCV to PAMIs as a complementary short- to medium-term measure in targeted preventive campaigns within high-risk areas to immediately reduce disease burden while longer-term WASH solutions are being implemented.
5. Improve early detection through focused and stronger IDSR/EWARS
6. Intensify RCCE in PAMIs to promote hygiene practices, reduce misinformation, and improve OCV acceptance.

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7. Strengthen logistics, forecasting, and supply chain management.
8. Expand testing to 80% coverage, train lab staff in culture, PCR, RDTs, and ensure regular reagents & supplies.
9. Institutionalize reviews (Intra Action, and After Action) and simulation exercises.

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Summary table of key parameters stratified by priority index values

										Assessment of representativeness of cholera testing				
										Level of representativeness of testing			Suboptimal	
										Testing indicator score included into the priority index			Num. of years with confirmed case(s)	
Priority index values	Number of geographic units	Cum. number of geographic units	Rel. % of num. of geographic units	Total population	Rel. % population	Cum. % population	Num. of cases	Rel. % of num. of cases	Cum. % of num. of cases	Num. of deaths	Rel. % of num. of deaths	Cum. % of num. of deaths	Average of positivity rate	Mean of number of years
11	2	2	**2.5%**	744,054	**5.7%**	5.7%	49,336	**36.5%**	36.5%	607	**24.4%**	24.4%	85.0	5.5
10	7	9	**8.8%**	875,178	**6.7%**	12.4%	23,262	**17.2%**	53.7%	505	**20.3%**	44.7%	55.6	3.3
9	6	15	**7.5%**	924,480	**7.1%**	19.5%	16,931	**12.5%**	66.2%	350	**14.1%**	58.8%	59.3	3.7
8	5	20	**6.3%**	757,564	**5.8%**	25.3%	8,516	**6.3%**	72.5%	215	**8.6%**	67.4%	50.3	1.8
7	11	31	**13.8%**	1,985,492	**15.2%**	40.5%	18,113	**13.4%**	86.0%	292	**11.7%**	79.2%	63.7	2.5
6	7	38	**8.8%**	1,845,739	**14.2%**	54.7%	9,664	**7.2%**	93.1%	243	**9.8%**	88.9%	48.4	2.3

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5	13	51	**16.3%**	2,188,056	**16.8%**	71.5%	6,841	**5.1%**	98.2%	223	**9.0%**	97.9%	78.1	2.0
4	6	57	**7.5%**	1,249,976	**9.6%**	81.1%	2,468	**1.8%**	100.0%	52	**2.1%**	100.0%	58.6	1.0
3	2	59	**2.5%**	183,223	**1.4%**	82.5%	13	**0.0%**	100.0%	0	**0.0%**	100.0%	50.0	1.0
0	21	80	**26.3%**	2,286,767	**17.5%**	100.0%	0	**0.0%**	100.0%	0	**0.0%**	100.0%	0.0	NA
Grand Total	**80**		**100.0%**	**13,040,528**	**100.0%**		**135,144**	**100.0%**		**2,487**	**100.0%**		**45.9**	**2.4**

Table 15: Summary of key parameters stratified by priority index values

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Figure 7: Map showing All initial PAMIs and additional PAMIs

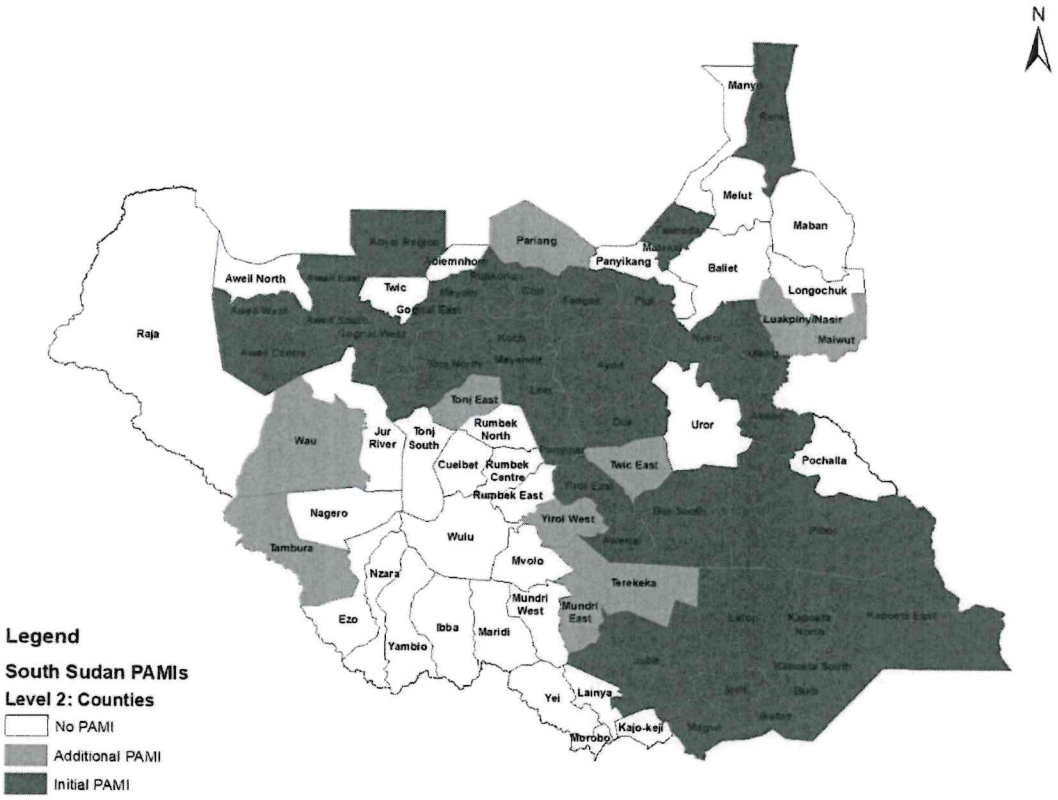

Figure 8: Map showing initial PAMIs and additional PAMIs. - Central Equatoria.

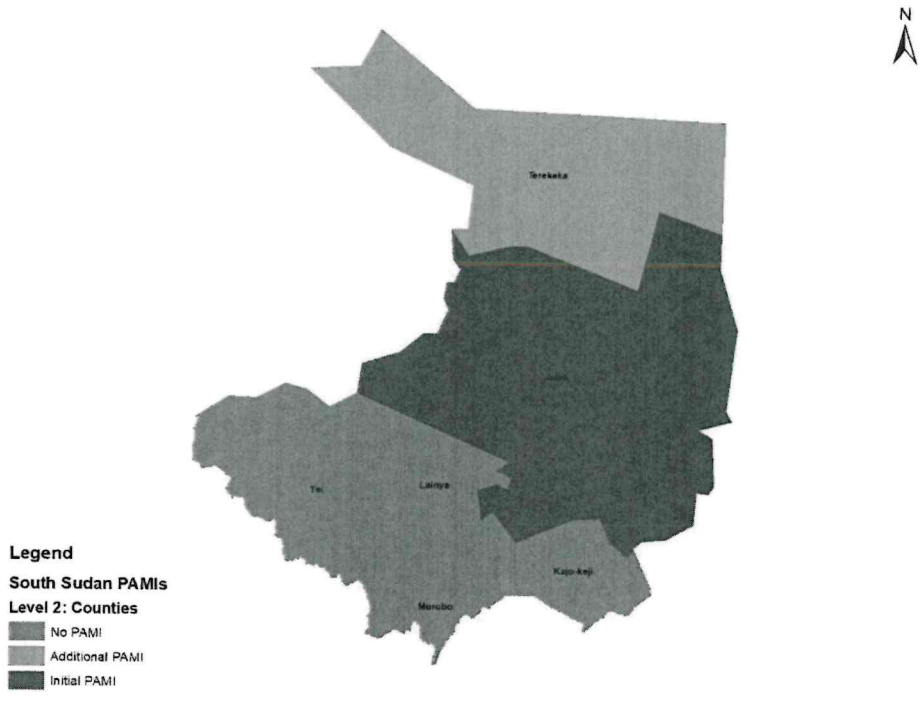

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Figure 9: Map showing initial PAMIs and additional PAMIs. - Eastern Equatoria.

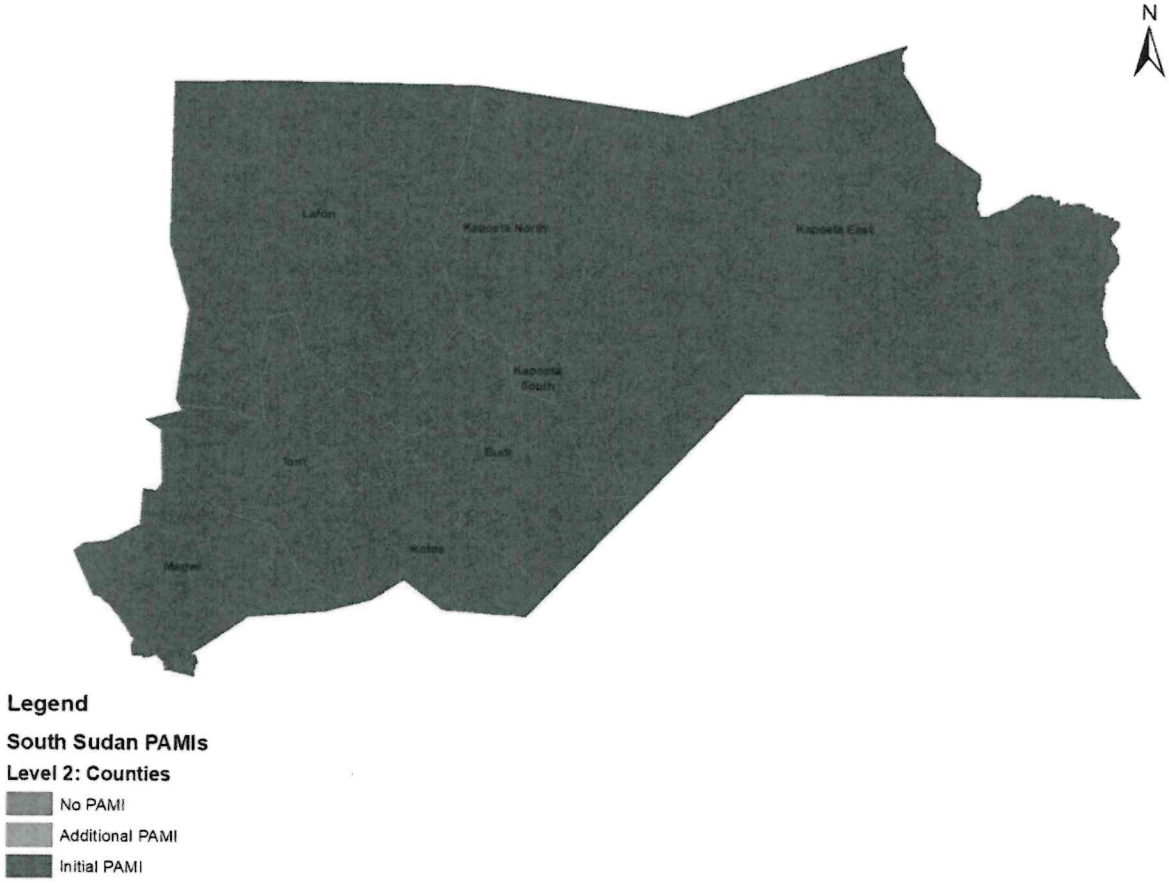

Figure 10: Map showing initial PAMIs and additional PAMIs. - Western Equatoria

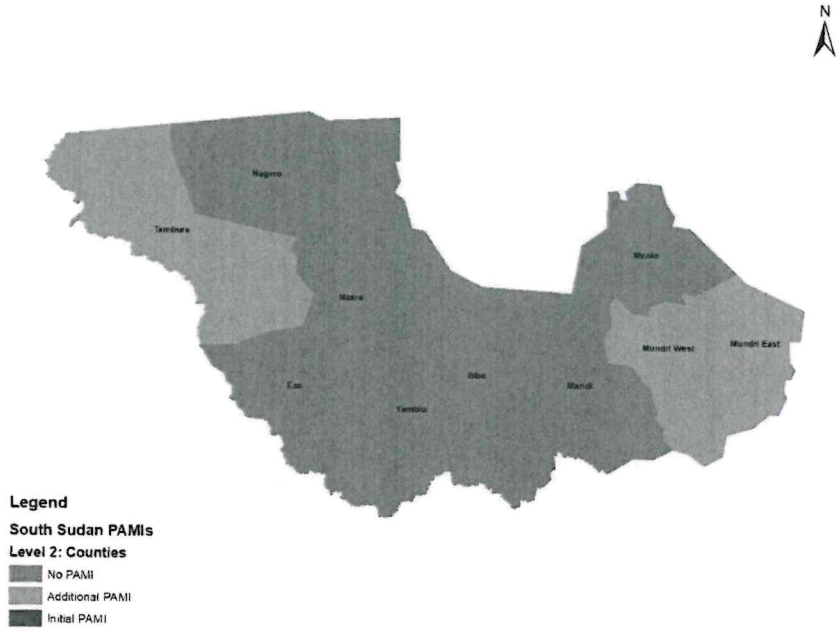

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Figure 11: Map showing initial PAMIs and additional PAMIs. - Jonglei State.

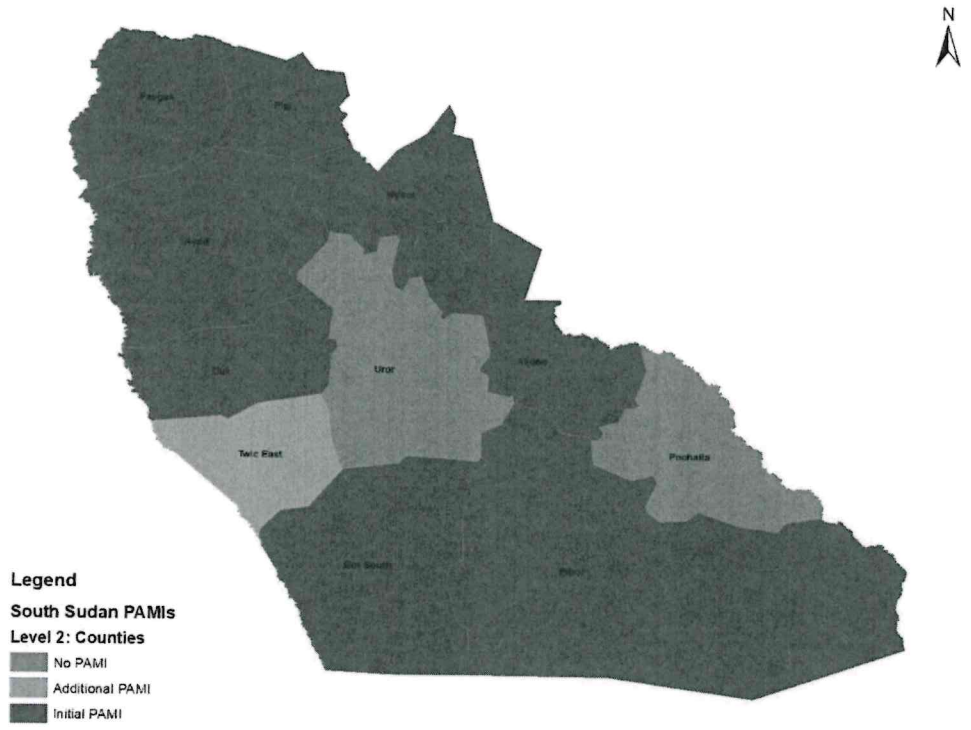

Figure 12: Map showing initial PAMIs and additional PAMIs. - Lakes State.



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Figure 13: Map showing initial PAMIs and additional PAMIs. - Northern Bahr El- Ghazal.

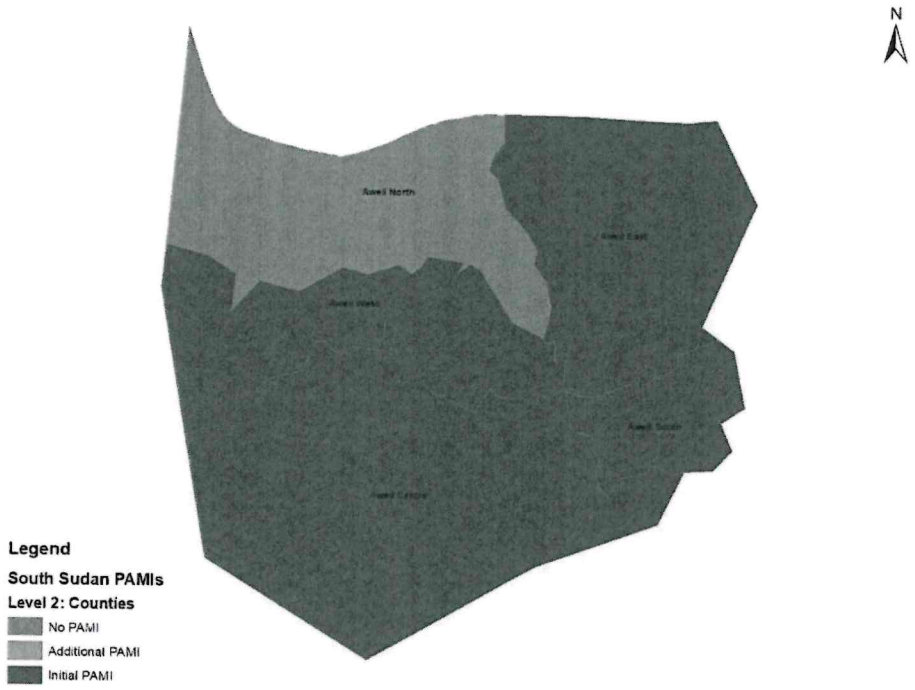

Figure 14: Map showing initial PAMIs and additional PAMIs. - Unity State.

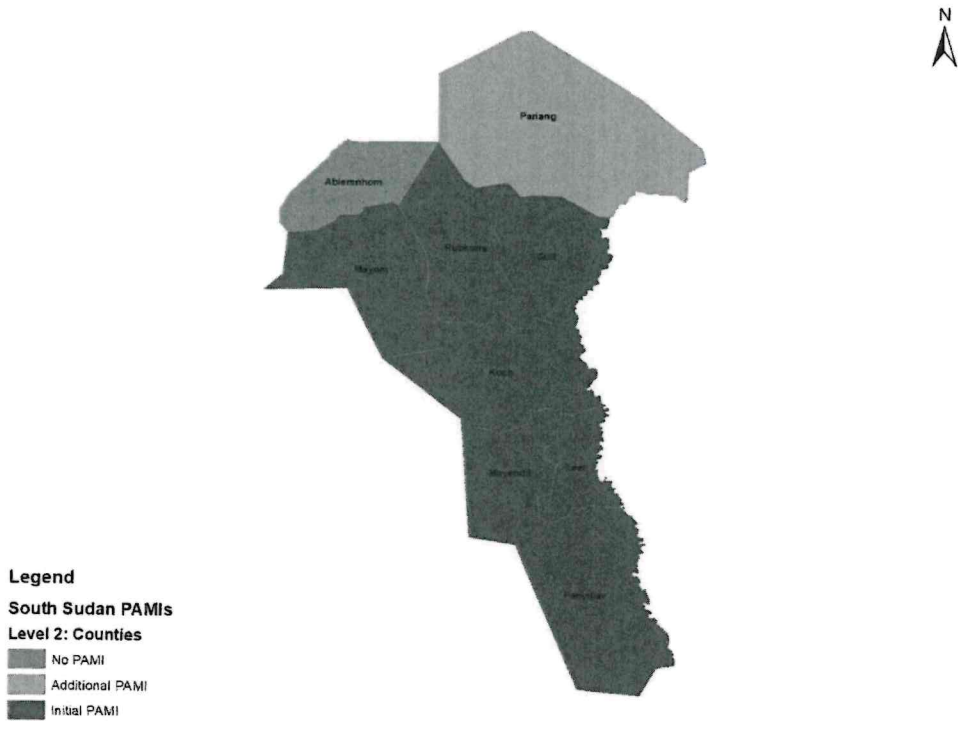

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Figure 15: Map showing initial PAMIs and additional PAMIs. - Upper Nile State .



Figure 16: Map showing initial PAMIs and additional PAMIs. - Warrap State

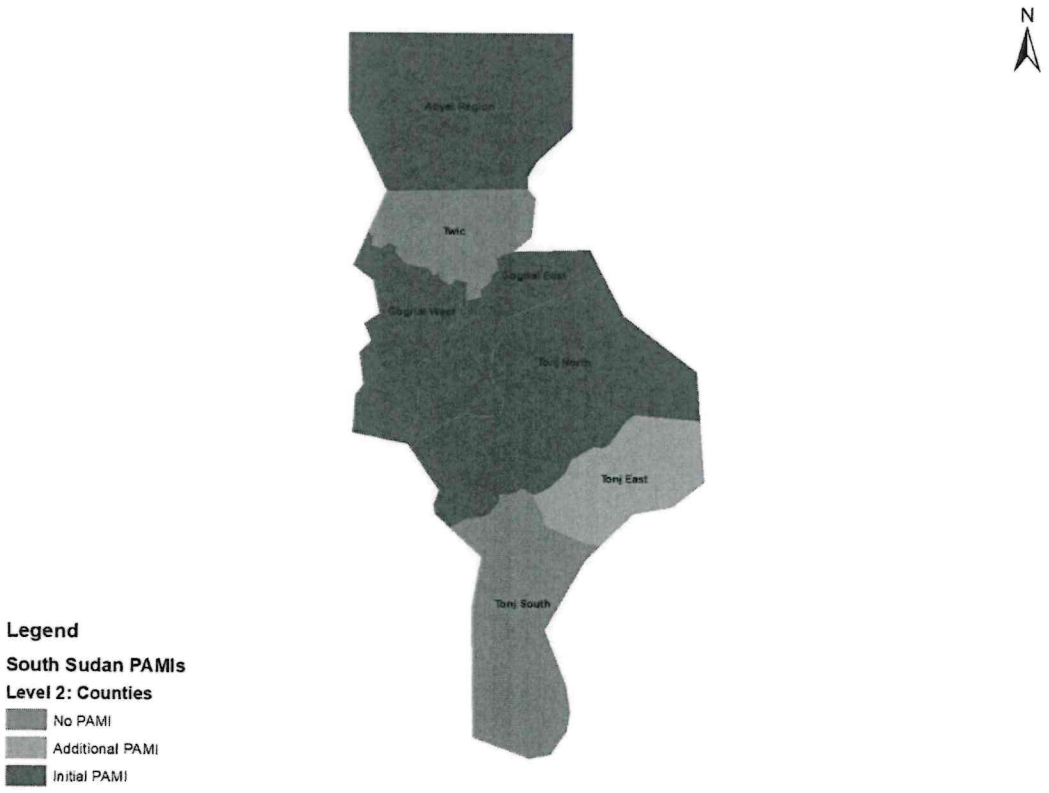

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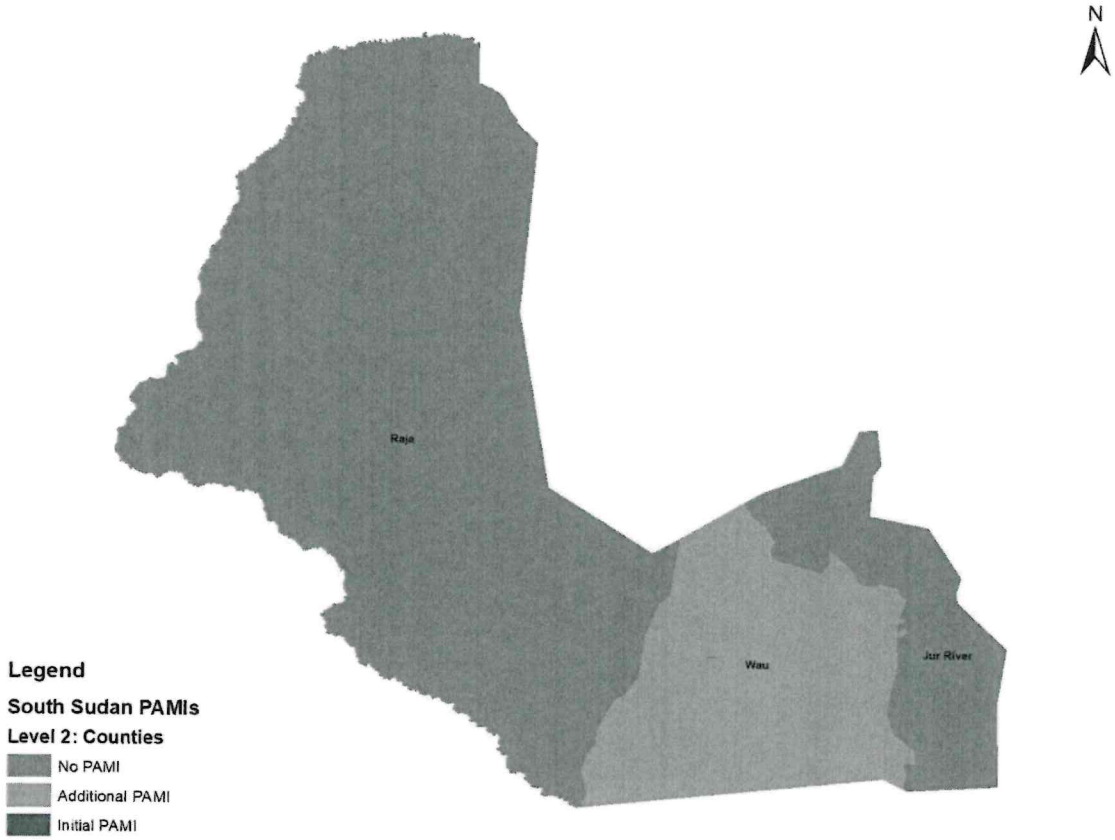
Figure 17: Map showing initial PAMIs and additional PAMIs. - Western Bahr Al-Ghazel State Unity State.



List of Stakeholders

#	Stakeholders
1	Ministry of Health
2	Ministry of Water Resources and Irrigation
3	Ministry of Wildlife, Conservation, and Tourism
4	Ministry of Environment and Forestry
5	Ministry of Humanitarian Affairs and Disaster Management
6	World Health Organization
7	United Nations Children's Fund
8	University of Juba
9	Medair
10	Tearfund
11	International Organization for Migration

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Agenda



Agenda PAMI[1].pdf
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List of Participants – PAMI Training (Updated)

S/No	Name of Participant	Organization	Position / Title
1	Dr. Kennedy Gaaniko	Ministry of Health (MoH)	Undersecretary
2	Yar Manyuon	MoH	Director General, Preventive health Services/Emergency Preparedness and Response
3	Monday Charles	MoH	Office of the DG – EPR
4	Dr. Adhiu Riak Adior	MoH	Director General, Primary Health Care
5	Khamis Bol	MoH	Office of the Undersecretary
6	Dr. Bino Andrea	MoH	Office of the Undersecretary
7	Dr. Alual Mangar	MoH	Public Health Officer
8	Duniana Marko	MoH	Surveillance Officer
9	Anges Jokudu	MoH	Surveillance Officer
10	Mabior Kiir Kudior	MoH	Surveillance Officer
11	Atem Mayen David	MoH	Public Health Officer
12	Brenda Nyokani	MoH	Surveillance Officer
13	Dr. Harriet Pasqual	MoH	Director General IHR & Coordination
14	Peter Lado	MoH	Surveillance Officer
15	Bol Adiang	MoH	Surveillance Officer
16	Anyang David	MoH	Surveillance Officer
17	Dr. Bior K. Bior	MoH	Emergency Operations Centre Manager
18	Dhieu Deng Dut	MoH	Surveillance Officer
19	Emmanuel Nyawela	MoH	Surveillance Officer
20	Solomon Yanga	MoH	Surveillance Officer
21	Hakim Akol	MoH	Surveillance Officer

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22	Buay James Hoth	MoH	Surveillance Officer
23	Khoryien Kun	MoH	Surveillance Officer
24	Mabior Kiir Kudior	MoH	Chief of Planning
25	Andrew Khot	MoH	Data Manager
26	Nyijal James	MoH	Surveillance Officer
27	Stephen Wani Ablino	MoH	Chief of Operations
28	Dr. Zakeria Modi	MoH	Director, Environment
29	Abraham Malith	MoH	IPC / WASh
30	Yona Kenyi Manoah	State MoH,	State Surveillance Officer
31	Akolde Madong	MoH	Public Health Officer
32	Dr. Bul M. Bul	MoH	Director
33	Buay Gatluak Ngep	MoH	Rapid Response Team – SO
34	Thon Mayen Thon	MoH	Emergency Hotline Manager
35	Jacob Thon Dhiei	Ministry of Water Resources & Irrigation	Director
36	Gabriel Ayuen Deng	BHI / MoH	Public Health Officer
37	Dr. Abe Manase	MoH	Assistant Director, Infectious Disease Unit
38	Isaac Seme Solomon	Ministry of Wildlife Conservation & Tourism	One Health Focal Point
39	Aldo Gwake Lazarus	Ministry of Wildlife	One Health Focal Point
40	John Mayor Bol	MoH	IPC / Water, Sanitation and Hygiene
41	Dr. James Wani Tom	State MoH	Director General
42	Kockedhic Mabor	MoH	Surveillance Officer
43	Jennifer Benson	MoH	Public Health Officer
44	Monday John	MoH	Deputy Director General
45	Michael Pajock Lok	MoH	Administration & Finance
46	Marol Mark	MoH	Emergency Operations Centre
47	Mayom Majok Reec	MoH	IPC / Water, Sanitation and Hygiene
48	Emmanuel Ajal Kuol	University of Juba	Lecturer
49	James Deng Agoth	University of Juba	Lecturer

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50	Akuein Awan Akuein	MoH	Operations Officer
51	Badeng Koang Gatwech	MoH	Emergency Operations Centre
52	Emmanuel Richard Roman	State MoH,	Public Health Officer
53	Ngong Ngor	MoH / EOC	Public Health Officer
54	Garang Achiek Peter	MoH	Public Health Officer
55	Justin Nelson	MoH	Public Health Officer
56	Mary Abdusio J. Leju	Ministry of Humanitarian Affairs & Disaster Management.	One Health Focal Point
57	Lutana Musa Lasu	Ministry of Environment & Forestry	Director
58	Daniel Maluk Marial	MoH	Participant
59	Gabriel Majok Bol	Ministry of Water Resources & Irrigation	Deputy Director
60	Riek Lony Diany	MoH	Participant
61	Nyamere John	MoH	Public Health Officer
62	Mbabazi William	WHO	CPI Lead
63	Sheila Baya	WHO	Participant
64	Korsuk Scopas	WHO	Participant
65	Baguma Andrew	WHO	Participant
66	Jetri Regmi	WHO	Participant
67	Tony Tombe	WHO	Participant
68	Onyango Okec	WHO	Participant
69	Barbra Akita	WHO	Participant
70	Mukasa Kabiri	WHO	Participant
71	Pamela Angeth	WHO	Participant
72	Gloria Ayub	WHO	Participant
73	Kennedy Muni	WHO	Participant
74	Martin Lasu	WHO	Participant
75	David Chan	WHO	Participant
76	Eric Rurangwe	WHO	Participant
77	Kapaya Fred	WHO	Participant

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78	Yamikani Chilipo	WHO	Participant
79	Mira Khadka	UNICEF	Participant
80	Tombari Prince Zabbeh	UNICEF	Participant
81	Edwin Emmanuel	Medair	Participant
82	Phoebe Sarfo	Medair	Participant
83	Dr. Augustine Okwahi	Health link	Participant