Report on the identification of Priority Areas for Multisectoral Intervention (PAMIs) for cholera control in Nigeria - 2024

The Federal Republic of Nigeria

November 2024

The Nigeria Centre for Disease Control and Prevention (NCDC)

The National Primary Healthcare Development Agency (NPHCDA)

The Federal Ministry of Health and Social Welfare (FMoHSW)

Federal Ministry of Water Resources and Sanitation (FMoWRS)

Federal Ministry of Environment (FMoEnv.)

Nigeria Metrological Agency (NiMeT)

The Global Task Force for Cholera Control (GTFCC) Country Support Platform (CSP)

World Health Organization (WHO)

International Federation of the Red Cross and Red Crescent Society (IFRC)

Abuja, Nigeria

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EXECUTIVE SUMMARY

Cholera remains a significant public health concern in Nigeria. Having committed to the Global Task Force on Cholera Control's (GTFCC) goal to end cholera by 2030, Nigeria is ensuring that resources and efforts are appropriately channelled for maximum impact. To this end, Nigeria has utilised the 2023 GTFCC Priority Area for Multi-sectoral Intervention (PAMI) tools. This updates the previous hotspot mapping from 2021, which utilised the 2019 GTFCC methodology. This current PAMI identifies 134 Local Government Areas (LGAs) as new priority areas for intervention, replacing the earlier 126 hotspot LGAs from 2021.

This PAMI Process, which began in August of 2024 and was completed in a Validation Workshop in November of 2024, involved extensive stakeholders' engagement across sectors in keeping with the multi-sectoral approach to cholera control. It ensured that data and insights were garnered from stakeholders from various government Ministries, Departments, and Agencies, including but not limited to the Federal Ministry of Health and her agencies, the Federal Ministries of Water Resources and Federal Ministry of Environment, and Partner members of the Cholera TWG.

The process involved compiling and consolidating data per LGA across six years (2019 to 2024). These data include Administrative and Demographic data, weekly surveillance (reported cases and cholera deaths), and Cholera testing data from 2019 – 2024. Also compiled are vulnerability factors from data and expert qualitative opinions, such as WASH, Travel routes, and climate events.

This data developed a priority index, scoring LGAs based on cholera incidence, mortality, persistence, and vulnerability factors. A consensus was reached at the Validation Workshop to set the priority threshold at a score of 7, identifying 134 LGAs. These LGAs, representing 17.7% of Nigeria's population, account for 71.1% of cholera cases and 65.6% of cholera deaths during the reporting period.

Prioritisation is an essential step that helps to strategise amidst limited resources; it also helps with targeted interventions such as surveillance and reporting, case management and IPC, use of Oral Cholera Vaccine (OCV), Water Sanitation and Hygiene (WASH), Risk Communication and Community Engagement, depending on specific gaps and needs of each PAMI LGA. The commitment of stakeholders to this cause has been evident. We sincerely acknowledge the support and guidance provided by the GTFCC Country Support Platform (CSP), WHO and all partners and individuals who have contributed to developing this PAMI. Our gratitude extends to countless others whose contributions have been indispensable yet remain unlisted. The effort to control and eliminate cholera continues.

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1. BACKGROUND

1.1. Cholera epidemiological situation in Nigeria

Nigeria has experienced several cholera outbreaks since its first reported outbreak in Ibadan in 1971, when 22,931 cases were reported, with a case fatality rate (CFR) of 12.8%. Afterwards, relatively few cases were recorded between 1972 and 1990. The next major outbreak occurred in 1991, with a total number of 59,478 cholera cases, doubling the number of reported cases in 1972 and a CFR of 12.9%. Since 1991, at least 300 cases have been reported yearly, with cyclical, more significant outbreaks recorded every 3 – 5 years. CFR has progressively plummeted since 1991, and from 2018 -2022, CFR ranged between 1.11% to 3.94%, remarkable progress on CFR that is still above the acceptable CFR of <1%.

In 2018, an outbreak of cholera occurred, affecting 20 out of the 37 states. 44,208 suspected cases with 836 deaths were reported, out of which 957 tested positive. There was a decrease in cases in the 2019 outbreak; 3,456 suspected cases were recorded, with 74 deaths and a CFR of 2.1%. In 2021, Nigeria recorded the largest cholera outbreak with 111,062 suspected cases, including 3,604 deaths (CFR 3.2%), which were reported from 33 states of the 36 states and the Federal Capital Territory (FCT). Likewise, in 2022, 23,763 suspected cases, including 592 deaths with a CFR of 2.5%, were reported from 30 states. As of 31 December 2023, a total of 3,683 suspected cases, including 128 deaths (CFR 3.5%), were reported from 28 states.

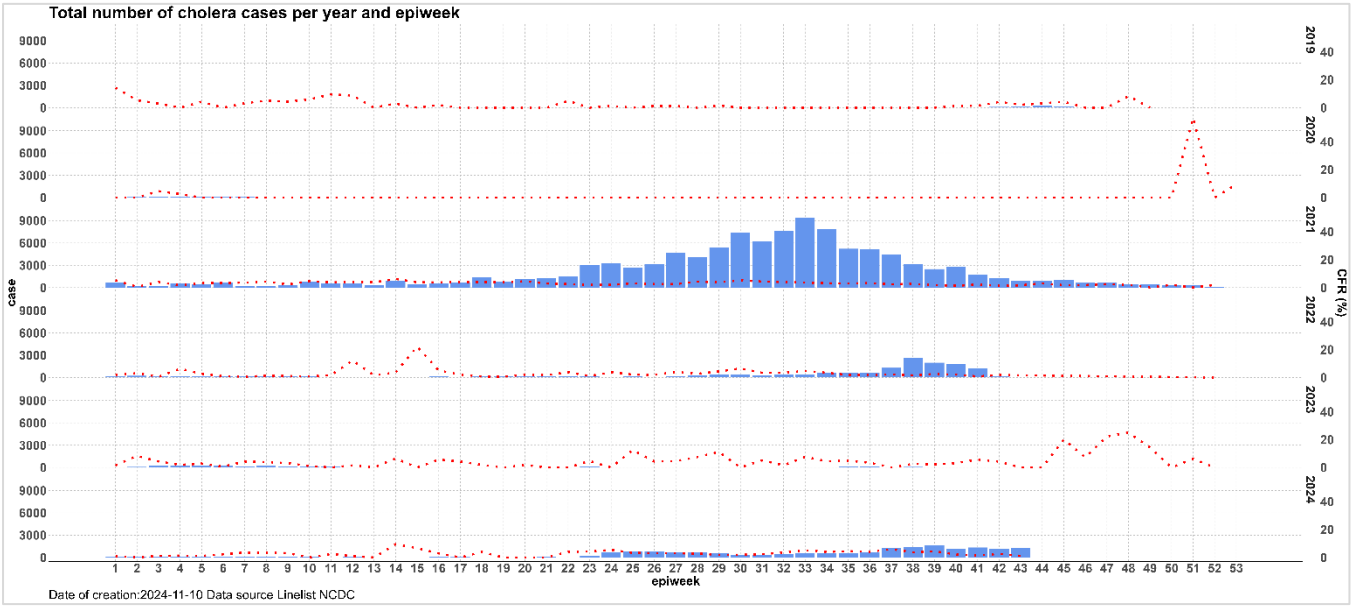

Figure 1: Epi-curve of suspected cholera cases and CFR by year

As of Epi Week 43 in 2024, 18,782 suspected cases, including 600 deaths, were reported, with a CFR of 3.2%. In 2024, 36 States and the FCT recorded at least one suspected case across 387 Local Government Areas. Comparing data from the 2023 and 2024 reporting periods, the report indicated a significant increase in the number of suspected cases in 2024.

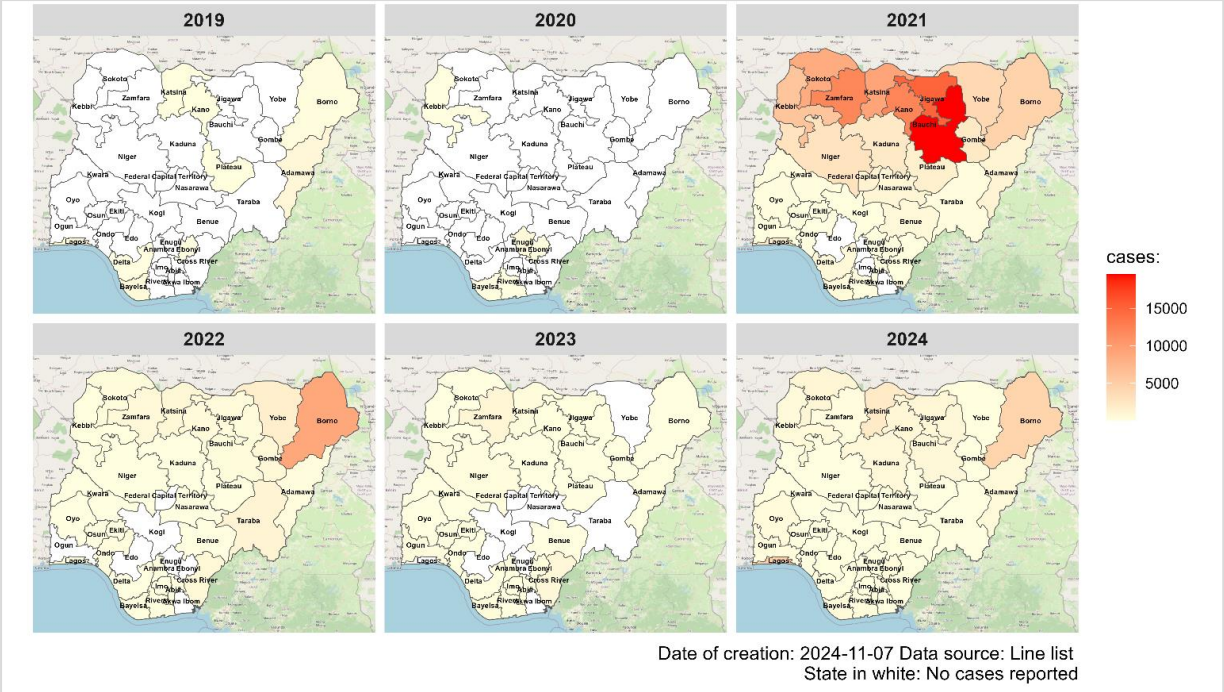

Figure 2: Maps of suspected cholera cases from 2019 to 2024

1.2. Concise description of the cholera surveillance system

The Cholera Surveillance System in Nigeria is a comprehensive public health framework designed to monitor and manage cholera outbreaks. It involves active data collection from healthcare facilities and community health workers, using standardised case definitions to classify suspected and confirmed cases. Laboratory diagnostics, including stool culture testing, are utilised to identify the disease accurately. The system enables real-time surveillance and quick outbreak response, including vaccination campaigns and improvements in water, sanitation, and hygiene (WASH). Collaboration among stakeholders such as the Nigeria Centre for Disease Control and Prevention (NCDC), State health ministries, and international and local organisations enhances the system's capacity. By analysing collected data, the surveillance system aims to reduce cholera morbidity and mortality, improve public health responses, and strengthen overall health infrastructure in the country.

1.3. Concise description of cholera testing strategy

Nigeria has a multipronged approach to cholera detection and control, emphasising prompt epidemic detection and response. To reduce mortality and achieve a CFR of ≤ 1, a comprehensive strategy was developed to coordinate multi-sectoral preparedness and response efforts. The approach will thrive on early detection and response capacities, including laboratory capacity for testing, reporting and early warning systems to quickly detect and report. It will coordinate multi-sectoral efforts from Government Ministries, Departments and Agencies (MDAs) and partners through the Incident Management System (IMS) and Technical Working Group (TWG). This system highlights efforts from all IMS pillars to coordinate important surveillance and response elements.

Rapid Diagnostic Tests (RDT): The RDT's implementation yielded rapid findings, allowing prompt intervention. However, their sensitivity and specificity can differ; therefore, additional conclusive

techniques are required for confirmation.

Laboratory Confirmation: Vibrio cholerae, the causal agent, is isolated from stool samples through culture, which is required to confirm instances and comprehend the epidemiology of outbreaks.

Surveillance and Reporting: A robust monitoring system guarantees that suspicious cases are reported on time, allowing quick action. This approach is essential for monitoring trends and successfully implementing control measures.

Nigeria collaborates with global organisations like the World Health Organization (WHO), UNICEF, IFRC, MSF and other key partners to enhance testing capabilities and response strategies. This partnership is vital for resource mobilisation and technical support.

1.4. Previous Hotspot Mapping:

The Global Task Force for Cholera Control (GTFCC) team supported the hotspot mapping in 2021, using the 2019 GTFCC's Guidance and Tool for countries to identify priority areas for intervention. It took a two-step approach:

i. A quantitative approach for the initial identification and prioritisation/ranking of hotspots using epidemiological indicators and

ii. A qualitative approach via a validation workshop using established vulnerability factors and local contextual knowledge from local expertise is needed.

The quantitative analysis was conducted based on two epidemiological indicators:

i. Mean annual incidence (MAI) - the average annual number of cholera cases (suspected and confirmed) per 100,000 populations per administrative unit over the review period

ii. Persistence over five years - The proportion of weeks in the period of interest with at least one reported cholera case.

The administrative unit considered for mapping is the level of 774 Local Government Areas (LGAs) of Nigeria (i.e., second sub-national level) from 2017-2021. The retrospective surveillance data were obtained from the Nigeria Centre for Disease Control and Prevention (NCDC), while population statistics were sourced from the Nigeria Population Commission (NPC) census 2016.

Table 1: Types of transmission levels for hotspot mapping

Transmission Type	Definition
Regular Transmission	A stable marked increase in the prevalence of cholera in a specific population or area
Epidemic Transmission	A marked increase in the prevalence of cholera in a specific population or area

No Transmission	Zero increase in the prevalence of cholera in a specific population or area

Nigeria, cholera hotspots, 2021

Table 2. Impact of thresholds and transmission classification on LGA category

	Thresholds based on 70th percentile MAI: 17 p100,000 Persistence: 5%	**Thresholds based on 60th percentile** MAI: 12 p 100,000 Persistence: 4%
High-Regular	28 (4%) LGAs 10 States Population: 9 million (4%)	40 (5%) LGAs 14 States Population: 14 million (6%)
Total hotspots (i.e, High-Regular and High-Epidemic)	80 (10%) LGAs 19 States Population: 25 million (11%)	126 (16%) LGAs 22 States Population in high: 41 million (18%)
Medium	92 (12%) LGAs Population: 34 million (15%)	86 (11%) LGAs Population: 30 million (13%)
Low	602 LGAs (78%) Population: 166 million (74%)	562LGAs (73%) Population: 155 million (69%)

LGAs of high priority based on 70th percentile thresholds and LGAs of high priority based on 60th percentile thresholds were classified into "high priority LGAs with regular transmission" and "high priority LGAs with epidemic transmission" according to the definition tables above. in identifying hotspots, 60th percentile incidence and persistence thresholds was considered the best balance between the NCP sizing and its expected impact -under the hypothesis that controlling and preventing cholera in LGAs with regular transmission would also affect limiting spill over and spread to other LGAs. The hotspot covered 126 LGAs across 22 states.

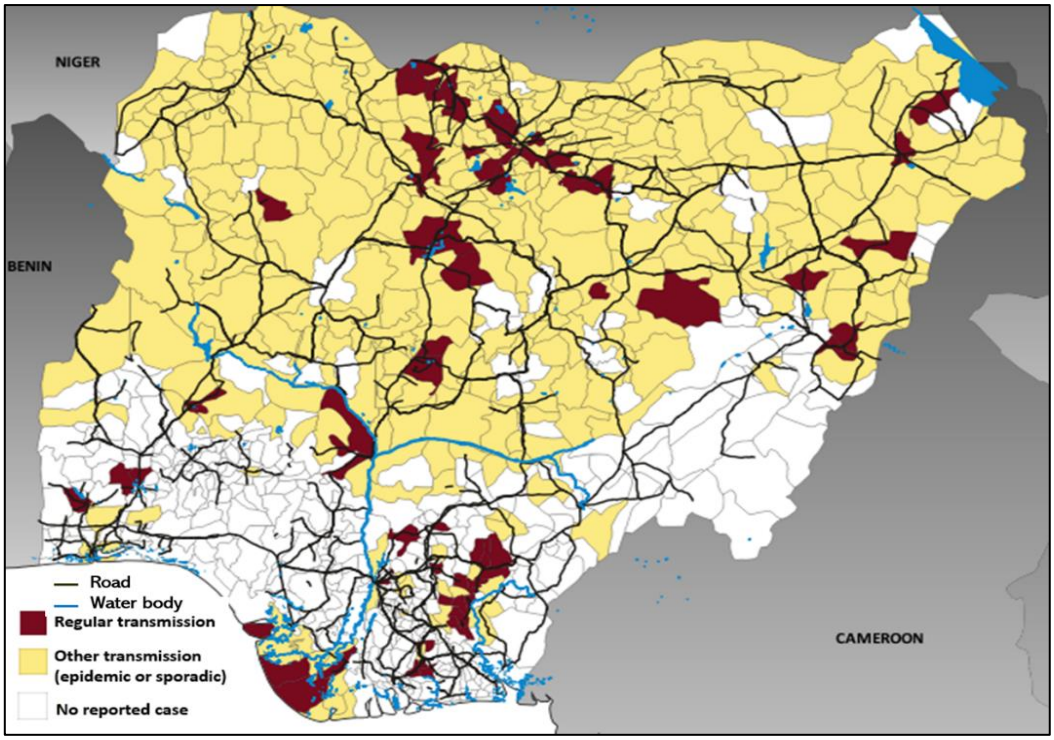

Figure 3: LGAs with regular transmission and major roads

1.5. Nigeria Cholera Plan status and targets (past, current, and future) in the country

Nigeria has developed its multi-sectoral National Cholera Plan (NCP), a comprehensive strategy for controlling and eliminating cholera. Nigeria has a working document of the NCP from the National Strategic Plan of Action on Cholera Control (NSPACC) for 2024 -2028. The GTFCC CSP supports the country's efforts to strengthen resource mobilisation and advocacy. The NCDC has also released a document outlining its preparedness and response plans. It includes mapping cholera hotspots that align with the overarching cholera control and elimination strategy captured in the Nigeria Cholera Plan. The NCDC hosts the secretariat involving multiple stakeholders, including the Federal Ministries of Environment, the Federal Ministry of Water Resources and Sanitation, the National Primary Health Care Development Agency (NPHCDA), and other developmental partners. The previous version of the NCP ran from 2018 to 2022.

This strategy focuses on improving surveillance and outbreak response efforts to promptly report, as well as water, sanitation, and hygiene (WASH) Interventions to improve access to safe drinking water, proper sanitation, and hygiene practices in communities. The strategy also supports to improve Cholera Case Management that provides prompt administration of Oral Rehydration Solution (ORS), appropriate antibiotics to treat cholera cases, Risk Communication and cholera awareness messages through various channels, including jingles in local languages and Partnership and Coordination efforts to foster collaboration among stakeholders to ensure a unified response to cholera outbreaks. It also has plans to improve Research and Logistics.

Nigeria's National Cholera Plan has been concluded and submitted to the GTFCC Independent Review Panel (IRP), and plans are underway for its launch. There are ongoing efforts to strengthen preparedness, response, and control measures. The country has made significant progress in controlling

and responding to cholera outbreaks.

The Nigerian government has shown a clear interest in implementing measures to prevent, control, and eliminate cholera. In 2016, Nigeria established the Expanded WASH (PEWASH) Strategy 2016-2030. Subsequently, in 2018, there was the Presidential Declaration of the State of Emergency in the WASH Sector and the National WASH Sector Revitalization Action Plan 2018-2022. This plan aligns with NCDC strategies to implement preparedness capacity building and response activities.

1.6. Justification for using the method "PAMIs for cholera control."

Over the past five years, Nigeria has experienced cholera outbreaks across various states, with the most significant incidents occurring in 2021 (see Figure 2) across different regions. In 2019, 62 out of the 774 LGAs reported cases of cholera. In 2021, 435 LGAs reported suspected and confirmed cases; in 2022, 271 LGAs reported suspected and confirmed cholera cases. In 2023, 166 LGAs reported cases, and 389 LGAs reported suspected and confirmed cholera cases from 36 states in 2024. These outbreaks highlight the persistent cholera risk in Nigeria, underscoring the need for ongoing surveillance and improved water, sanitation, and hygiene infrastructure.

2. METHOD

The identification of PAMIs for cholera control in Nigeria took a three-step process. It includes:

Step 1 - Compile and consolidate all necessary data

Step 2 - Score all NCP operational geographic units according to a priority index

Step 3 - Validate a final list of PAMIs among relevant stakeholders

Nigeria conducted a Multi-Diseases Risk Analysis workshop from 7-13 August 2024 in Abuja, Nigeria. The objectives were to conduct an integrated risk analysis and modelling for meningitis, yellow fever, and cholera to identify geographic locations that should be the focus for tailored interventions and impact and apply evidence generated for the risk analysis to develop applications to access appropriate vaccines for preventive campaigns for cholera, yellow fever, meningitis. Steps 1 and 2 were done with the data for 5 years, from 2019 to 2023.

The validation workshop was conducted in Lagos from 1 to 4 November 2024. Because of the ongoing cholera outbreak, stakeholders extended the PAMI to cover six years of data, including 2024 (43 epidemiological weeks). This was done by all stakeholders and subsequently validated. GTFCC CSP, WHO, IFRC, MSF, and multiple government agencies provided technical support to the process.

2.1. STEP 1: Compile and consolidate all necessary data

1.1 **Overview:** Cholera-related data were sourced from the NCDC, the Federal Ministry of Water Resources and Sanitation, the Nigeria Meteorological Agency, the Federal Ministry of Environment, the National Population Commission, etc.

1.2 The case definitions used by NCDC are

Suspected Case:

- In areas where a Cholera outbreak is declared, any person presenting with or dying from acute watery diarrhoea with or without vomiting.
- Any patient aged ≥2 years with acute watery diarrhoea and severe dehydration or dying from acute watery diarrhoea with or without vomiting.

Confirmed Case: A suspected case in which culture isolated Vibrio cholerae O1 or O139 in the stool.

Table 2: Data from these sources were compiled using the following steps

Variable	Steps
Define the scope of the analysis.	• For the administrative level of the NCP operational geographic unit, the local government area (LGA) was identified as the administrative level for the country (total of 774 LGAs) • The analysis period was defined – cholera dataset obtained from the NCDC and other relevant data from 2019 to Epi week 43 of 2024 were used (303 Epi weeks)
Collect and prepare data for the calculation of the priority index	• Weekly cholera surveillance (Suspected + Confirmed cases) and testing data were compiled from 2019 to Epi week 43 of 2024.
Collect and prepare data for the vulnerability assessment **For the vulnerability factors, a Yes/No response was used**	• In consultation with stakeholders, a list of vulnerability factors was considered

Collation of the dataset for the priority index calculation: The data gathered were uploaded into the GTFCC Excel-based data tool. Table 3 describes the data collected for each LGA over the analysis period (from 2019 to 2024).

Table 3: Data for the calculation of the priority index

Category	Data by NCP operational geographic unit	Periodicity
Administrative	List of LGAs in Nigeria	-
Demography	Population by LGA	Annual
Surveillance	a. Number of reported cholera cases (suspected and tested positive) b. Number of reported cholera deaths (suspected and tested positive)	Weekly Weekly
Testing for cholera	a. Number of reported suspected cholera cases tested for cholera (regardless of the testing method) b. Number of reported suspected cholera cases tested positive for cholera	Weekly Weekly

Dataset for the Cholera Vulnerability Assessment:

A vulnerability assessment was also conducted to identify PAMIs. The following list of vulnerability factors was considered and captured as either present or absent in each LGA.

1. Location adjacent to cross-border cholera-affected areas or identified PAMIs

2. Location along major travel routes with transportation hubs
3. Major population gatherings
4. Areas with high population density or overcrowded settings (e.g., urban slums, refugees/IDP camps)
5. Areas with high-risk populations (e.g., seasonal workers/fishermen/miners in informal settlements)
6. The population received Oral Cholera Vaccine (OCV) more than three years ago (two-dose campaign with coverage for both rounds>70%)
7. Areas at high risk for extreme climate and weather conditions, which include rains, floods, and droughts)
8. Areas affected by complex humanitarian emergencies
9. Areas with more than 30% of the population using unimproved water facility
10. Areas with more than 50% of the population using unimproved sanitation facility
11. Areas with more than 50% of the population with no handwashing facility on-premises

2.2. STEP 2: Score all NCP operational geographic units according to a priority index

Each NCP operational geographic unit (LGA) was scored with a numeric priority index. The priority index was calculated by combining four indicators:

1. Incidence of cholera
2. Cholera mortality
3. Persistence of Cholera in the LGA and
4. Cholera test positivity**

These indicators were derived from epidemiologic and cholera testing data from 2019 to 2024.

Based on the GTFCC guidance document, **Cholera test positivity was not considered when calculating the priority index. This was because the representativeness of cholera testing was insufficient for inclusion (less than 50% testing coverage in less than 80% of the geographical units). Hence, only three indicators **(i.e., incidence, mortality, and persistence)** were used in calculating the priority index.

2.1.1 Scoring of indicators

The epidemiologic indicators (i.e., incidence, mortality, and persistence) were scored in four categories based on the 50th (median) and the 80th percentiles of their distributions. The distribution thresholds (median and 80th percentile) were calculated based on LGAs that reported at least one cholera case between 2019 and 2024.

A score ranging from zero to three (3) points was attributed to each LGA for each epidemiologic indicator **(Table 3).** If the indicator is above the 80th percentile of the incidence distribution, the indicator **scores three (3) points.**

Table 4. Scoring of epidemiologic indicators

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

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

Priority index = incidence score + mortality score + persistence score

- **Giving a minimum of zero and a maximum score of nine (9) points.**

The result was captured on the "Priority index summary sheet" in the GTFCC Excel-based tool (See Section 3: Result). A table and map of the country presenting hotspot locations were also generated.

2.3. STEP 3: Stakeholder validation

The stakeholder validation process included an in-person workshop with input from national and subnational-level stakeholders and experts across multiple sectors, including water, hygiene, sanitation, health, environment, and partners.

The objectives of the stakeholder validation workshop:

1. Conduct a PAMI training for participants facilitated by GTFCC CSP, WHO and MSF
2. Review the PAMI documents (GTFCC PAMI Tool) developed in earlier workshop
3. Agree on the priority index threshold value
4. Agree on the final list of PAMIs
5. Develop final Documents, including maps and PAMI report.

2.4. List of Contributing Stakeholders

Government Ministries, Departments and Agencies.

- Nigeria Centre for Disease Control and Prevention (NCDC)
- National Primary Healthcare Development Agency (NPHCDA)
- Federal Ministry of Health and Social Welfare (FMoHSW)
- Federal Ministry of Water Resources and Sanitation FMoWRS)
- Federal Ministry of Environment (FMoEnv)

- Nigerian Meteorological Agency (NiMet)
- National Orientation Agency (NOA)
- National Population Commission (NPC)
- State Ministries of Health
- National Institute of Pharmaceutical Research and Development (NIPRD)
- University of Benin, Edo State
- Global Health and Infectious Disease Control Institute, Nasarawa State University

Partners

- The Global Task Force for Cholera Control (GTFCC) Country Support Platform (CSP)
- World Health Organization (WHO)
- International Federation of the Red Cross and Red Crescent Society (IFRC)
- Médecins Sans Frontières (MSF)
- Nigerian Red Cross Society (NRCS)
- UNICEF
- USAID Nigeria Mission
- JHPIEGO
- Resolve to Safe Life (RTSL)
- eHealth Africa

3. RESULT

3.1. Priority Index thresholds consideration and consensus building

During the workshop, the summary table of the priority index, map and vulnerability factors generated in Step 2 were used to engage multi-sectoral stakeholders. The stakeholders validated the data and agreed on a **priority index score value** for the LGAs:

- **Very High Risk:** Score 8 and 9
- **High Risk:** Score 7
- **Moderate Risk:** Score 4, 5 and 6
- **Low Risk:** Score 0, 1, 2 and 3

Consensus was reached for **score 7 as the priority index threshold** through a voice vote among participants, who considered the following factors:

- **Feasibility:** The ability to implement interventions effectively, given available resources and infrastructure.
- **Impact:** The potential positive health outcomes for the target population

Results:

- **Very High Risk (score 9 and 8):** 79 out of 774 (10.2%) local government areas (LGAs) fall under the Very High-Risk category, covering areas with extreme cholera incidence and high mortality rates. Scores of 9 and 8 could leave some vulnerable regions under-prioritised, potentially spreading cholera in unaddressed areas. This score focuses resources on the affected areas, covering just 10.2% of the total population, but it may overlook areas with growing vulnerabilities.
- **High risk (score of 7):** 55 LGAs out of 774 are in High Risk. This score covers high-priority regions where cholera remains a pressing concern at emergency levels. It could enable preventative measures in at-risk zones while concentrating resources on the hardest-hit areas.
- **Moderate risk (score of 4, 5 and 6):** 203 LGAs out of 774 are in Moderate Risk. This includes areas with moderate risk, incidence and mortality rates, extending coverage to a broader population but not potentially feasible. These scores may dilute impact by overextending resources to less-urgent areas, reducing focus on immediate hotspots.
- **Low risk (score of 0, 1, 2 and 3):** 437 out of 774 LGAs are in Low Risk. This includes areas with low risk, incidence and mortality rates, extending coverage to a broader population but not potentially feasible.

The **priority index threshold selected was 7** (covering scores 7, 8 and 9) as High Priority Areas for Multi-sectoral Intervention (PAMI). This enables resources to cover 134 LGAs (17.3% of Geographical Unit - LGA) and 17.7% of the total population. This would balance feasibility and impact based on population. Also, these LGAs, over the analysis period of 6 years, accounted for 71.1% of cases and 65.6% of the deaths.

Feasibility: The priority threshold 7 (including scores 7, 8, & 9) streamlines the response, focusing on fewer but critically affected areas. This is feasible within limited resources and facilitates more intensive interventions.

Impact: A threshold of (7) balances addressing critical needs and enabling preventive action in high-risk areas. It targets high-incidence and high-vulnerability areas, maximising the impact on disease reduction while ensuring feasible implementation. This prioritisation aligns with the goals of the National Cholera Plan, optimising limited resources to achieve significant public health outcomes while addressing high-risk populations.

Table 5: Summary table of key parameters stratified by priority index values

Priority index values	Number of geographic units	Cum. number of geographic units	Rel. % of num. of geographic units	Total population	Rel. % of population	Cum. % of 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
9	26	26	3.4%	8,327,077	3.6%	3.6%	44,615	29.0%	29.0%	969	20.2%	20.2%	46.7	3.7
8	53	79	6.8%	15,060,251	6.6%	10.2%	39,446	25.6%	54.7%	1,387	28.8%	49.0%	59.1	2.8
7	55	134	7.1%	17,020,162	7.4%	17.7%	25,248	16.4%	71.1%	798	16.6%	65.6%	56.9	2.9
6	68	202	8.8%	24,903,998	10.9%	28.5%	19,683	12.8%	83.9%	662	13.8%	79.4%	51.0	3.0
5	75	277	9.7%	27,549,057	12.0%	40.6%	12,813	8.3%	92.2%	510	10.6%	90.0%	43.0	2.6
4	60	337	7.8%	21,196,926	9.3%	49.9%	6,980	4.5%	96.7%	287	6.0%	95.9%	41.7	2.2
3	79	416	10.2%	22,527,120	9.8%	59.7%	3,507	2.3%	99.0%	190	4.0%	99.9%	28.3	1.6
2	160	576	20.7%	42,808,921	18.7%	78.4%	1,507	1.0%	100.0%	5	0.1%	100.0%	17.1	1.4
0	198	774	25.6%	49,373,006	21.6%	100.0%	6	0.0%	100.0%	0	0.0%	100.0%	0.5	NA
Grand Total	774		100.0%	228,766,518	100.0%		153,805	100.0%		4,808	100.0%		28.1	2.2

DATA OVERVIEW

Data description *	
Number of NCP operational geographic units	774
Study period: start year	2019
Study period: end year	2024
Study period: number of years	6
Number of NCP operational geographic units with at least one case	576
Total number of cases	153,805
Total number of deaths	4,808
Overall case fatality	3.1%
Total number of suspect cases tested **	13,153
Total number of suspect cases tested positive **	5,709
Overall positivity rate **	43.4%

** The totals are calculated for the entire set of geographical unist over the study period*

*** Regardless of the testing method applied*

Adopting a priority index threshold of 7 covering 134 LGAs with a population of 40,407,491 ensures a strategic response, focusing on immediate containment and proactive prevention within feasible operational limits. No additional PAMIs were added via a consensus decision as the LGAs of interests were already captured.

3.2. Final List of PAMIs:

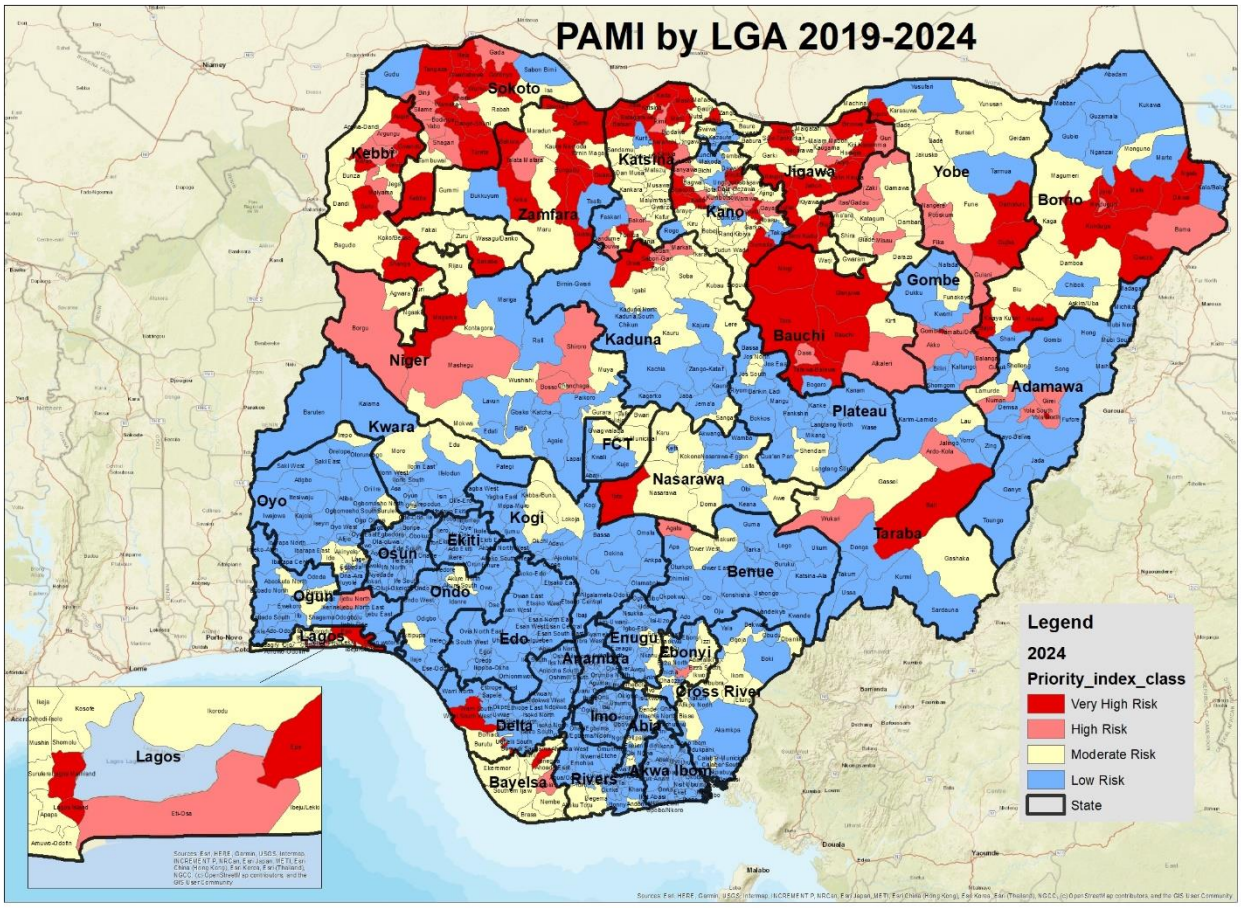

Figure 4: Map showing PAMIs

Table 6: List of PAMI LGAs

S/N	State	LGA	Priority_index	RISK
1	Adamawa	Yola North	9	Very High Risk
2	Bauchi	Bauchi	9	Very High Risk
3	Bauchi	Toro	9	Very High Risk
4	Bayelsa	Kolokuma/Opokuma	9	Very High Risk
5	Borno	Jere	9	Very High Risk
6	Borno	Konduga	9	Very High Risk
7	Borno	Mafa	9	Very High Risk
8	Jigawa	Auyo	9	Very High Risk
9	Jigawa	Birnin Kudu	9	Very High Risk
10	Jigawa	Dutse	9	Very High Risk
11	Jigawa	Jahun	9	Very High Risk
12	Jigawa	Ringim	9	Very High Risk
13	Kano	Gwarzo	9	Very High Risk
14	Kano	Shanono	9	Very High Risk

15	Kano	Sumaila	9	Very High Risk
16	Katsina	Batsari	9	Very High Risk
17	Katsina	Charanchi	9	Very High Risk
18	Katsina	Funtua	9	Very High Risk
19	Katsina	Jibia	9	Very High Risk
20	Katsina	kaita	9	Very High Risk
21	Kebbi	Sakaba	9	Very High Risk
22	Lagos	Lagos Island	9	Very High Risk
23	Sokoto	Gwadabawa	9	Very High Risk
24	Sokoto	Illela	9	Very High Risk
25	Sokoto	Wamako	9	Very High Risk
26	Yobe	Damaturu	9	Very High Risk
27	Bauchi	Ganjuwa	8	Very High Risk
28	Bauchi	Ningi	8	Very High Risk
29	Bauchi	Tafawa-Balewa	8	Very High Risk
30	Borno	Bayo	8	Very High Risk
31	Borno	Dikwa	8	Very High Risk
32	Borno	Gwoza	8	Very High Risk
33	Borno	Ngala	8	Very High Risk
34	Delta	Bomadi	8	Very High Risk
35	Delta	Warri South-West	8	Very High Risk
36	Gombe	Gombe	8	Very High Risk
37	Jigawa	Biriniwa	8	Very High Risk
38	Jigawa	Buji	8	Very High Risk
39	Jigawa	Hadejia	8	Very High Risk
40	Jigawa	Kafin Hausa	8	Very High Risk
41	Jigawa	Kiri Kasama	8	Very High Risk
42	Jigawa	Sule Tankakar	8	Very High Risk
43	Kaduna	Giwa	8	Very High Risk
44	Kano	Kabo	8	Very High Risk
45	Kano	Minjibir	8	Very High Risk
46	Kano	Wudil	8	Very High Risk
47	Katsina	Batagarawa	8	Very High Risk
48	Katsina	Kankia	8	Very High Risk
49	Katsina	Mani	8	Very High Risk
50	Katsina	Mashi	8	Very High Risk
51	Katsina	Safana	8	Very High Risk
52	Kebbi	Aleiro	8	Very High Risk
53	Kebbi	Augie	8	Very High Risk
54	Kebbi	Gwandu	8	Very High Risk
55	Kebbi	Kalgo	8	Very High Risk
56	Kebbi	Shanga	8	Very High Risk
57	Kebbi	Suru	8	Very High Risk
58	Kebbi	Yauri	8	Very High Risk

59	Lagos	Epe	8	Very High Risk
60	Lagos	Lagos Mainland	8	Very High Risk
61	Nasarawa	Toto	8	Very High Risk
62	Niger	Magama	8	Very High Risk
63	Sokoto	Bodinga	8	Very High Risk
64	Sokoto	Dange-Shuni	8	Very High Risk
65	Sokoto	Goronyo	8	Very High Risk
66	Sokoto	Kebbe	8	Very High Risk
67	Sokoto	Tangaza	8	Very High Risk
68	Sokoto	Tureta	8	Very High Risk
69	Sokoto	Wurno	8	Very High Risk
70	Taraba	Bali	8	Very High Risk
71	Yobe	Gujba	8	Very High Risk
72	Yobe	Nguru	8	Very High Risk
73	Zamfara	Anka	8	Very High Risk
74	Zamfara	Bakura	8	Very High Risk
75	Zamfara	Bungudu	8	Very High Risk
76	Zamfara	Gusau	8	Very High Risk
77	Zamfara	Kaura Namoda	8	Very High Risk
78	Zamfara	Shinkafi	8	Very High Risk
79	Zamfara	Zurmi	8	Very High Risk
80	Adamawa	Girie	7	High Risk
81	Adamawa	Numan	7	High Risk
82	Adamawa	Yola South	7	High Risk
83	Bauchi	Alkaleri	7	High Risk
84	Bauchi	Dass	7	High Risk
85	Bauchi	Itas/Gadau	7	High Risk
86	Bauchi	Misau	7	High Risk
87	Bauchi	Zaki	7	High Risk
88	Bayelsa	Ogbia	7	High Risk
89	Benue	Agatu	7	High Risk
90	Borno	Bama	7	High Risk
91	Borno	Hawul	7	High Risk
92	Borno	Maiduguri	7	High Risk
93	Ebonyi	Ezza South	7	High Risk
94	Gombe	Akko	7	High Risk
95	Gombe	Balanga	7	High Risk
96	Gombe	Yamaltu/Deba	7	High Risk
97	Jigawa	Guri	7	High Risk
98	Jigawa	Kaugama	7	High Risk
99	Kaduna	Kudan	7	High Risk
100	Kaduna	Makarfi	7	High Risk
101	Kaduna	Sabon Gari	7	High Risk
102	Kano	Dawakin Kudu	7	High Risk

103	Kano	Gaya	7	High Risk
104	Kano	Kumbotso	7	High Risk
105	Kano	Rimin Gado	7	High Risk
106	Kano	Tsanyawa	7	High Risk
107	Kano	Ungongo	7	High Risk
108	Kano	Warawa	7	High Risk
109	Katsina	Bakori	7	High Risk
110	Katsina	Kusada	7	High Risk
111	Katsina	Rimi	7	High Risk
112	Katsina	Sabuwa	7	High Risk
113	Kebbi	Argungu	7	High Risk
114	Kebbi	Birnin Kebbi	7	High Risk
115	Kebbi	Maiyama	7	High Risk
116	Lagos	Eti Osa	7	High Risk
117	Niger	Borgu	7	High Risk
118	Niger	Bosso	7	High Risk
119	Niger	Mashegu	7	High Risk
120	Niger	Shiroro	7	High Risk
121	Ogun	Ijebu North	7	High Risk
122	Sokoto	Binji	7	High Risk
123	Sokoto	Gada	7	High Risk
124	Sokoto	Kware	7	High Risk
125	Sokoto	Shagari	7	High Risk
126	Sokoto	Silame	7	High Risk
127	Sokoto	Yabo	7	High Risk
128	Taraba	Ardo-Kola	7	High Risk
129	Taraba	Wukari	7	High Risk
130	Yobe	Fika	7	High Risk
131	Yobe	Gulani	7	High Risk
132	Yobe	Nangere	7	High Risk
133	Yobe	Potiskum	7	High Risk
134	Zamfara	Talata Mafara	7	High Risk

4. WAY FORWARD

Description of the next steps of the PAMI process, including provisional timelines:

S/N	Activity	Timeline	Responsible
1.	Submission of the PAMI to GTFCC Secretariate for endorsement	November, 2024	NCDC/TWG Coordination lead

2.	Conduct Cholera Readiness and Preparedness training for the country with an emphasis on Hotspot states	November 2024 – March 2024	NCDC, WHO
3.	Update the National Cholera Strategy to align with the PAMI	December 2024 – January 2025	NCDC/GTFCC CSP
4.	Launching of the NCP, including the PAMI, with all the relevant stakeholders	December 2024-January 2025	NCDC and Cholera TWG, GTFCC CSP
5.	Dissemination of the PAMI to diverse stakeholders in the form of a report/policy brief, peer-reviewed article, and oral presentations at scientific and non-scientific meetings (GTFCC Annual Meeting)	Jan. – Dec. 2025	NCDC and Cholera TWG
6.	Utilise the PAMI to drive advocacy to hotspot political and technical leadership, including Governors, Commissioners, Local Government Chairmen, and Legislative leaders.		Cholera TWG, Steering Committee, NCDC, GTFCC CSP
7.	Support Ward level Micro Hotspot mapping for States.	2025	NCDC, Cholera TWG