IDENTIFICATION OF PRIORITY AREAS FOR MULT-SECTORAL INTERVENTIONS (PAMIs) FOR CHOLERA ELIMINATION

ANALYSIS REPORT

November 2024

A long and healthy life for all South Africans

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NATIONAL DEPARTMENT OF HEALTH SOUTH AFRICA

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Acknowledgements

The South African National Department of Health (NdoH) acknowledges the contributions of various organisations and experts, including provincial health departments, WHO AFRO, the National Institute for Communicable Diseases (NICD), and others (Border Management Authority, District Municipalities, Statistics South Africa and Right to Care) for their insights and technical support in completing the Priority Areas for Multisectoral Interventions for Cholera (PAMIS). We express our gratitude to the WHO AFRO for its technical guidance throughout the PAMIS for Cholera and the WHO Country Office and the ongoing support by Global Task Force on Cholera Control (GTFCC) to the NDoH. Special thanks are also extended to participating sector departments (Water and Sanitation, Cooperative Governance and Traditional Affairs) and our partner organisations who fully contributed to all the sessions throughout the workshop.

Executive Summary

In response to the global cholera resurgence in 2023 and 2024, the South African National Department of Health (NDOH), together with the World Health Organization (WHO) and other stakeholders across the country convened a workshop to enhance cholera prevention, detection, and response efforts. The stakeholders gathered at The Capital Hotel in Mpumalanga Province from 11-13 November 2024, to assess and validate priority areas for multi-sectoral interventions (PAMIs) aimed at eliminating cholera.

The exercise followed the systematic collection of secondary data to identify regions with recent cholera cases and vulnerability factors. This data was collected, analysed and validated by a core team including NDOH, Statistics South Africa (STATSSA), and WHO. Local stakeholders that participated in the validation workshop included Water and Sanitation, Local Municipalities, Border Management Authorities, Cooperative Governance and Traditional Affairs, Disaster Management, and National Institute for Communicable Diseases. As a result, 47 municipalities—representing 22.1% of local municipalities and 50.7% of the national population—were identified as PAMIs. Municipalities at moderate to low risk will continue to be monitored. The local NGO, Right to Care (RTC), provided vital remote support by creating maps showing municipalities at risk, based on cholera vulnerability indices. The next phase will focus on engaging stakeholders to develop a National Plan to eliminate cholera from South Africa.

Abbreviations

CED	Centre for Enteric Disease
CFR	Case Fatality Rate
GDP	Gross Domestic Product
GTFCC	Global Task Force on Cholera Control
IDSR	Integrated Disease Surveillance and Response
IMT	Incident Management Team
NCP	National Cholera Plan
NdoH	National Department of Health
NHLS	National Health Laboratory Service
NICD	National Institute for Communicable Disease
NMC	Notifiable Medical Condition
NMCSS	Notifiable Medical Condition Surveillance System
OCV	Oral Cholera Vaccine
PAMIs	Priority Areas for Multisectoral Interventions
PCR	Polymerase Chain Reaction (PCR)
RTC	Right to Care
SA	South Africa
STATS SA	Statistics South Africa
VRAM	Vulnerability Risk Assessment and Mapping
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization

Foreword

Dr SSS Buthelezi

Direct General: Health

The ongoing challenge of cholera in the African Region calls for a unified, multi-sectoral approach. The World Health Organization (WHO) and the Global Task Force on Cholera Control (GTFCC) launched the “Ending Cholera – a Global Roadmap to 2030” to reduce cholera deaths by 90% and stop transmission in up to 20 countries by 2030. South Africa, having experienced significant cholera outbreaks, supported the Regional Framework for Cholera Prevention and Control, emphasizing risk analysis and identification of priority areas and multi-sectoral interventions.

Cholera, an acute diarrheal illness caused by Vibrio cholerae, has been a recurring public health issue in South Africa, often exacerbated by natural disasters and inadequate access to clean water and sanitation. South Africa is a nation marked by its geographical diversity, which brings with it a range of natural hazards including droughts, floods, wildfires, and occasional seismic activity. Each region faces unique risks: the Western Cape is particularly susceptible to wildfires, while the eastern regions often contend with periodic flooding due to seasonal heavy rains. Droughts have become an increasingly significant issue, impacting agricultural productivity and water availability, especially in the Western Cape, Eastern Cape, and Northern Cape provinces. The 2018 “Day Zero” water crisis in Cape Town starkly highlighted the vulnerability of urban water supply systems to prolonged dry spells. Flooding, particularly in coastal regions and areas along rivers, poses another major challenge. The Eastern Cape, KwaZulu-Natal, and Mpumalanga provinces have experienced devastating floods in recent years. While South Africa is generally less affected by tropical cyclones compared to its neighbours, cyclones making landfall in Mozambique can still bring heavy rains and winds, impacting regions like Limpopo and Mpumalanga.

The first confirmed cholera case in South Africa was reported in 1974, with significant outbreaks occurring in subsequent decades. The largest outbreak between August 2000 and July 2001 affected over 106,000 people. More recent outbreaks, such as those linked to cross-border transmission from Zimbabwe in 2008-2009, highlight the ongoing need for regional collaboration and robust public health interventions. Prevention measures, including improving water, sanitation, and hygiene (WASH) conditions and the targeted use of oral cholera vaccines (OCV), are crucial. Effective risk communication and community engagement are also essential components of these efforts. Following the 2023 and 2024 cholera outbreaks, the South African government directed the development of a comprehensive National Cholera Plan. The first step involves identifying Priority Areas for Multi-sectoral Interventions (PAMIs) to effectively target cholera elimination efforts and optimize resource allocation. This collaborative approach aims to enhance the effectiveness of the cholera control plan in line with global targets.

This report, stemming from the stakeholder data validation workshop, marks a significant step in identifying key cholera priority areas for targeted interventions across various sectors. It compiles the insights and methodologies from the workshop, highlighting the need for coordinated action. By leveraging the strengths and expertise of each sector, we can implement effective measures to protect communities and prevent future cholera outbreaks. The report emphasizes the importance of multi-sectoral collaboration in tackling the complex challenges posed by natural disasters and

cholera outbreaks in South Africa. Through collective efforts, we can enhance preparedness, mitigate risks, and safeguard the health and well-being of our communities.

Dr SSS Buthelezi
Director General: Health
Date: 31/07/2025

CHAPTER ONE

INTRODUCTION

General information on South Africa

South Africa is a one, sovereign, democratic state with three government tiers and an independent judiciary. The government tiers comprise national, provincial, and local, each possessing executive and legislative authority, being independent but interrelated via a cooperative governance system. There are nine provinces (Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, Northwest, Northern Cape, and Western Cape), 52 districts, ten international airports, 54 land borders, and eight harbours. Figure1 depicts the administrative boundaries of South Africa. Gauteng, KwaZulu-Natal, and Western Cape are the most populous provinces. Gauteng has the highest population density at 831 people per km2. It also contributes 33% of the country's GDP. The country's population is 61,997,140 people, according to 2024 mid-year population estimates. South Africa shares borders with six countries (Botswana, eSwatini, Lesotho, Mozambique, Namibia, Zimbabwe) and two oceans (the Atlantic Ocean and the Indian Ocean). Lesotho is an enclave of South Africa. South Africa (SA) occupies the most southern tip of Africa with its long coastline stretching more than 3,000 km from the desert border with Namibia on the Atlantic coast southwards around the tip of Africa and then north to the border of subtropical Mozambique on the Indian Ocean.

Figure 1. Administrative Boundaries of South Africa

South Africa is a climate patchwork of warm coastal subtropics, hot deserts, humid highlands, snow-topped mountains, and a southwest enclave of Mediterranean weather. The hot, humid summer seaports, overcrowded communities, with low standards of environmental sanitation, and scanty, restricted, and unprotected water supplies in some areas facilitate the transmission of infectious diseases, especially diarrheal diseases, including cholera.

South Africa is one of the most developed countries on the African continent, yet it faces economic challenges, including high unemployment and income inequality. The country's GDP has fluctuated in recent years, partly due to global economic shifts and domestic issues such as power shortages and socio-political factors. It has a mixed economy with strengths in mining, agriculture, services, and manufacturing, but also faces the challenge of inclusive economic growth to reduce disparities.

Natural Disasters in SA

South Africa experiences a variety of natural hazards, including droughts, floods, wildfires, and occasional seismic activity. Due to its geographical diversity, different regions face different risks; for example, the Western Cape is particularly prone to wildfires, while parts of the eastern regions experience periodic flooding due to seasonal heavy rains. Droughts has become an increasingly significant issue, affecting agricultural productivity and water availability, particularly in the Western Cape, Eastern Cape, and Northern Cape provinces. In recent years, prolonged droughts have caused severe water shortages, most notably the 2018 "Day Zero" water crisis in Cape Town, which highlighted the vulnerability of urban water supply systems to prolonged dry spells.

Flooding from heavy seasonal rains poses a significant threat, especially in coastal regions and areas along riverbanks. The provinces of Eastern Cape, KwaZulu-Natal, and Mpumalanga in particular, have experienced devastating floods in recent years. In April 2022, unprecedented rainfall caused widespread flooding in the region, resulting in significant loss of life, damage to infrastructure, and displacement of thousands of people. In 2023, floods severely impacted 36 districts of the country, leaving 19,911 people affected, including 2,436 displaced individuals. The disaster resulted in 52 deaths, 12 missing persons, and widespread property damage, with 3,728 houses destroyed. The limited capacity to prevent and respond to disease outbreaks during these emergencies highlighted the urgent need for improved preparedness and response measures.

While the country is generally less affected by tropical cyclones than other countries in the region, cyclones that make landfall in neighbouring Mozambique can bring heavy rains and strong winds, indirectly impacting northeastern regions such as Limpopo and Mpumalanga.

Cholera Epidemiology in South Africa

Cholera is an acute, diarrheal illness caused by infection of the intestine with the toxigenic bacterium Vibrio cholera sero-group O1 or O139. According to WHO (2024), an estimated 1.3 to 4 million people around the world get cholera each year and 21,000 to 143,000 people die from it. People who get cholera often have mild symptoms or no symptoms, but cholera can manifest with a severe disease. Approximately 1 in 10 people who get sick with cholera will develop severe symptoms such as watery diarrhea, vomiting, and leg cramps. In these people, rapid loss of body fluids leads to dehydration and shock. Without treatment, death can occur within hours. The increase in natural disasters like floods have increased the occurrence of cholera outbreaks. Prevention measures include improving water, sanitation, and hygiene (WASH) conditions and the targeted use of oral cholera vaccine (OCV) anchored on strong and robust risk communication and community engagement.

Cholera outbreaks in South Africa date back several decades, often linked to natural disasters and inadequate access to clean water and sanitation. The first confirmed cholera case was officially reported in 1974. The subsequent outbreaks occurred annually between 1980 and 1987 which resulted in over 25,000 cumulative cases and 348 overall fatalities (CFR, 1.4%). Effective interventions, such as Water, Sanitation, and Hygiene (WASH) programs, helped prevent further outbreaks until a significant re-emergency occurred between August 2000 and July 2001, originating in KwaZulu-Natal and affecting 106,389 people with 289 fatalities (CFR of 0.2%). Another major outbreak from 2008 to 2009 was linked to cross-border transmission from Zimbabwe, impacting around 12,000 individuals and resulting in 65 deaths (CFR of 0.5%). The most recent outbreak in 2023 affected over 1,395 people, with 47 deaths (CFR of 3.4%) and was associated with the cholera outbreak in Malawi.

The recent outbreak, which happened in 2023, affected over 1395 people including 47 deaths (CFR, 3.4%), and was linked to the cholera outbreak in Malawi. Between 01 December 2023 and 25 April 2024, a cumulative total of 188 suspected cholera cases were notified through the notifiable medical conditions surveillance system (NMCSS) from eight provinces. Laboratory tests were conducted on a total of 170 suspected cases (stool culture/PCR); 18 cases had no specimen collected. Of the 170 suspected cases tested, 13 were laboratory-confirmed (Vibrio cholerae O1), including one death (CFR, 0.5); while 157 tested negative for Vibrio cholerae O1. These laboratory-confirmed cases of cholera were identified from three provinces: Limpopo Province 85% (11/13; 1 death); Eastern Cape Province 8% (1/13); Gauteng Province 8% (1/13). Of the 13 confirmed cases, 3 were imported cases with a travel history to Zimbabwe (No definite history of travel or contact with a confirmed case could be established for the other confirmed cases).

Cholera surveillance

Cholera is a category one notifiable medical condition in South Africa. It is legally mandated to be notified and reported to an electronic surveillance system within 24 hours of clinical suspicion under the country's National Health Act. Notification to the Notifiable Medical Conditions Surveillance System (NMCSS) is done in the context of the Integrated Disease Surveillance and Response System (IDSR). All health facilities across the public and private sectors can notify to the NMCSS. Public laboratories automatically send case data to the NMCSS for specimens where vibrio cholera was identified.

Case detection

Case definitions are taken from the IDSR technical guidelines and adapted by the Department of Health and Centre for Enteric Disease at the National Institute for Communicable Diseases (NICD). Notification to the NMCSS includes the completion of a case investigation form.

Suspected case

A person of any age who develops severe dehydration or dies from acute watery diarrhoea with or without vomiting.

Probable case

A suspected case with an epidemiologic link to a confirmed cholera case.

Confirmed case:

A case of cholera is confirmed when toxigenic Vibrio cholerae O1 or O139 is isolated from any patient with diarrhoea.

Case registration

All suspected cases are reported to the NMC either electronically or via paper-based notification which is later electronically captured into the system to produce the linelist.

Case confirmation

Cases are epidemiologically classified by the Centre for Enteric Disease epidemiologist together with laboratory data and case investigation data as per the above case definitions. To confirm cholera in South Africa, the NICD conducts a PCR test on a stool sample that has tested positive in culture.

Data analysis and feedback

Access to the NMC is controlled through verified users and password access. Data is available in real-time from the NMC system at the appropriate level, i.e. registered local area managers are only able to access data for their local area and national

teams can access national data. The Centre for Enteric Disease under the NICD provides daily situational reports. Public-facing dashboards may be made available in the context of an outbreak through the NICD.

Response

Districts and the national level activate the incident management system upon the confirmation of an outbreak. The response is coordinated by the IMT with various pillars to ensure all aspects of the response are addressed. The rapid response team is responsible for field investigations and implementation of the response activities and provides feedback to the Incident Management Team (IMT) for decision-making.

Testing strategy

Figure 2 illustrates the SA testing strategy.

Upon suspicion of cholera, a stool specimen is submitted to the local National Health Laboratory Service (NHLS) in Cary-Blair transport medium for culture. Rectal swab specimens are inferior to stool specimens for the diagnosis of cholera and are not recommended; however, there could be instances where the collection of a stool sample is not feasible, and a rectal swab sample is acceptable (e.g., a post-mortem investigation, shortage of universal specimen containers). Rectal swab specimens are also submitted the in Cary-Blair transport medium for culture. At the NHLS, if the organism is confirmed as V. cholerae by culture, sero-grouping is performed to differentiate V. cholerae O1 from V. cholerae non-O1 serogroups. If the NHLS laboratory does not have V. cholerae O1 polyvalent antisera, then they refer the isolate to the Centre for Enteric Diseases (CED) at NICD for further testing. The results are reported on TrakCare System as ‘Vibrio cholerae.’ If the laboratory has V. cholerae O1 polyvalent antisera, then they perform the agglutination test according to the kit instructions and always ensure that they first perform a NEGATIVE control (using saline) to check for auto-agglutination. If auto-agglutination is observed, they refer the isolate directly to the CED at NICD for further testing. All isolates of Vibrio species are referred to the CED at NICD.

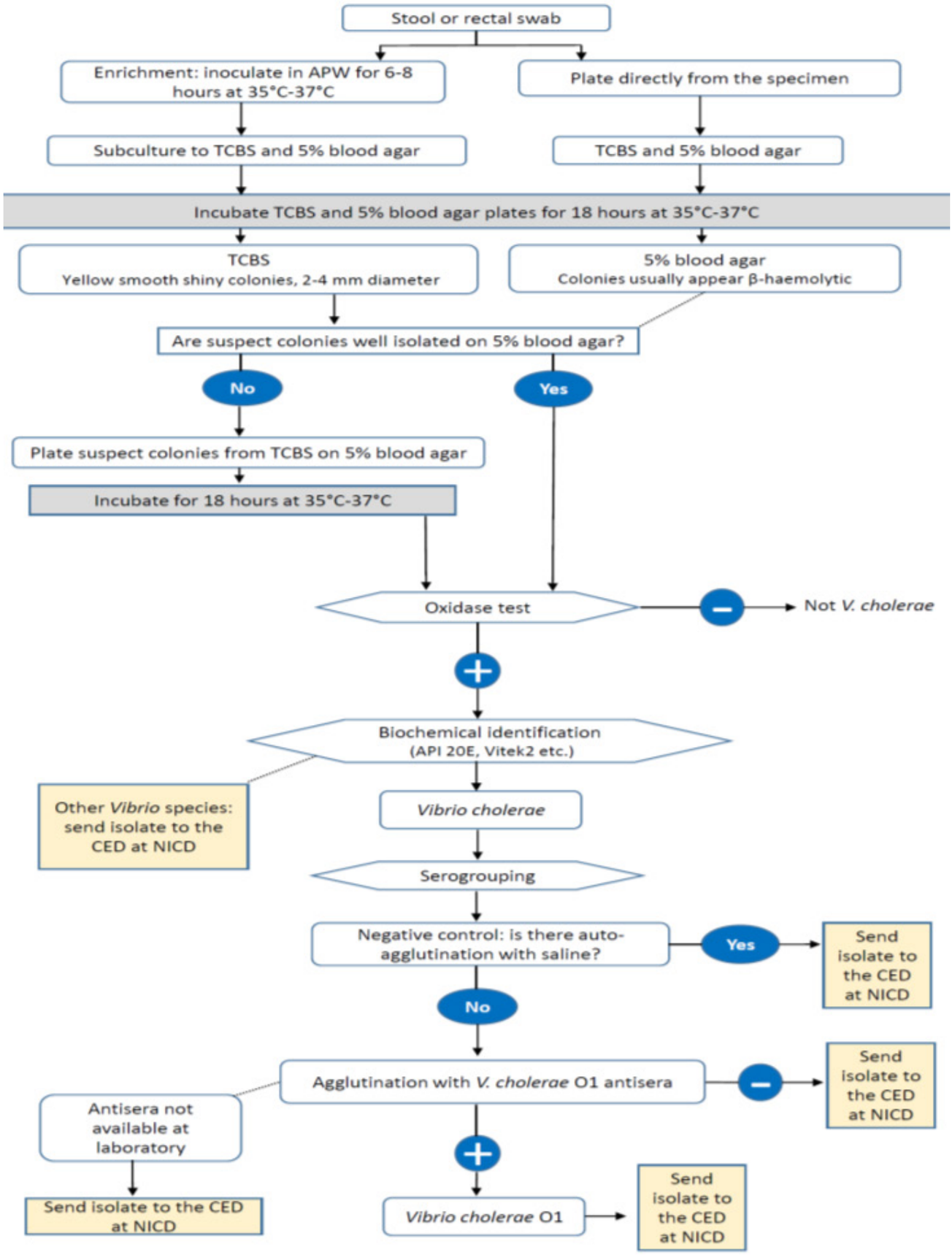


Figure 2. SA cholera testing strategy.

Rationale

The World Health Organization (WHO) and the Global Task Force on Cholera Control (GTFCC) along with partners and various stakeholders launched the Ending Cholera – a Global Roadmap to 2030, which is an initiative to fight and reduce cholera transmission globally. This strategy identifies priorities to reduce cholera deaths by 90% and stop transmission in up to 20 countries by 2030. As stated above, South Africa has experienced major outbreaks of cholera in past decades, with a resurgence of outbreaks occurring in 2023 and 2024. The South African Department of Health supported the adoption of the Regional Framework for the Implementation of the Global Strategy for Cholera Prevention and Control, 2018–2030 during the Regional Committee Meeting, Agenda Item No: 10 (AFR/RC68/7). The Regional Framework highlighted the need to conduct risk analysis, mapping and profiling [conducting systematic cholera Vulnerability Risk Assessment and Mapping (VRAM)], and improvement of water, sanitation and hygiene (WASH), case management, epidemiology and surveillance, laboratory, and oral cholera vaccines to mitigate the impact of cholera globally. In addition, South Africa has a representative that participates in the GTFCC.

Following the 2023 and 2024 cholera outbreak in South Africa, the government directed the Department of Health and other key line ministries to develop a comprehensive National cholera plan to ensure cholera is eliminated in the country in line with the GTFCC target of ending cholera by 2030. The initial step towards formulating the National Cholera Plan involves identifying Priority Areas for Multi-sectoral Interventions (PAMIs). This identification process, facilitated by evidence-based tools, aims to enhance the targeting of cholera elimination measures to optimally allocate limited resources and ensure the effective implementation of the National Cholera Plan (NCP). Building on this foundation, the Ministry/Department of Health, in collaboration with partners, sought to identify PAMIs as the initial and critical step in the development the cholera elimination plan.

CHAPTER TWO

METHODS

This chapter highlights detailed steps that were taken to identify Cholera priority areas for multi-sectoral interventions. Here we detail steps including preparation of datasets, assessment of vulnerability factors, calculation and scoring vulnerability indicators, calculation of vulnerability index, and stakeholder validation to come up with the final list of PAMIs. This section is presented in two steps: Data sets and vulnerability index scoring.

Step 1. Datasets

General

Definition and administrative level of NCP operational geographic units
We selected administrative level 3(Sub-district) as NCP operational geographic unit for identification of PAMI's for cholera elimination. This administrative level corresponds to the local municipality level, which is a subdivision of a district municipality. Although administrative level 2 (district) is the lowest level at which resources are allocated and cholera elimination decisions are made, the communities within the districts are not affected equally, therefore, we settled for the administrative level 3 as NCP operational geographic unit for identification of PAMIs for cholera elimination, thus identifying communities that require multi-sectoral interventions.

Definition of analysis period

The vulnerability index calculation was based on retrospective data collected over the last five and half years from January 2019 to October 2024, corresponding to (286) weeks. The global task force for cholera elimination recommends that the analysis period should involve retrospective data of at least five years.

Vulnerability index

Sources of data for calculation of Vulnerability index
The core data team was comprised of national experts involved in cholera response from the National Department of Health (NDoH), Statistics SA (STATSSA), and the World Health Organization, who collected and prepared data to calculate the vulnerability index. We collected data on 2024 population estimates and cholera vulnerability factors for each NCP operational geographic.

List of NCP operational geographic units

The list of geographic units, and the unique identifiers was obtained from the STATSSA. A total of 213 NCP operational geographic units (local municipalities) from all nine provinces and 52 districts were listed in the data obtained from STATSSA.

Population data by NCP operational geographic unit

Data on yearly estimated population by NCP operational geographic unit were obtained from the Statistics South Africa (STATSSA 2024), which provides yearly mid-year population projections. The STATSSA population estimates are based on extrapolation from the most recent population census.

Surveillance data

Surveillance data on suspected and laboratory confirmed cases was received from the NICD for the period between 2019 and 2024.

Vulnerability factors

List of vulnerability factors

We used the following GTFCC indicative list of generic vulnerability factors (and there were no additional vulnerability factors identified):

- Cholera outbreak in the NCP operational geographic unit;
- Confirmed cholera imported case(s) in the NCP operational geographic unit considered;
- Cross-border areas adjacent to frequently cholera-affected areas or identified PAMIs in neighboring country(ies);
- Location along major travel routes with transportation hubs;
- Major population gatherings.
- High population density locations or overcrowded settings;
- High-risk populations;
- Hard-to-access populations;
- Population that received oral cholera vaccine (OCV) more than three years ago;
- High-risk for extreme climate and weather conditions;
- Complex humanitarian emergency;
- Unimproved water;
- Unimproved sanitation; and
- Limited access to hygiene.

Data sources for vulnerability factors

The STATSSA provided data on high population density locations or overcrowded settings, unimproved water; unimproved sanitation; and limited access to hygiene. Data on WASH was also obtained from the Department of Water and Sanitation (Blue drop, green drop, and No drop certification system). Unfortunately, the STATSSA could not provide data beyond administration level 3 and there was a need to delve deeper into these administrative levels, as certain areas within this level are impacted in different ways. As a result, the STATSSA data was used in conjunction with information known or reported beyond districts to identify PAMIs. Data on cholera outbreak and confirmed cholera imported case(s) in the NCP operational geographic unit was obtained from the NICD. Data on cross-border areas adjacent to frequently cholera-affected areas or identified PAMIs in neighbouring country(ies) and location along major travel routes with transportation hubs was from the Port of Entry. Data on high-risk populations, hard-to-access populations, population that received oral cholera vaccine (OCV) more than three years ago, and complex humanitarian emergency was obtained from the Department of Health and Disaster Management Centre. Data on high-risk for extreme climate and weather conditions was obtained from Disaster Management Centre. All NCP operational geographic units underwent a vulnerability assessment.

Data for vulnerability testing were collected through the physical workshop of the stakeholders who were invited to participate in the PAMIs identification exercise. The stakeholders were divided into nine groups and each group focussed on the revision of existing material and provided data for units within each province: Mpumalanga, Gauteng, Limpopo, Northwest, Free State, Northern Cape, Eastern Cape, Western Cape and KwaZulu Natal. In each group, data for vulnerability factors was gathered from different sources such as districts reports, online sources including Google map to identify features in various geographical units. Besides, participants were put in each group based on familiarity with the provinces as well as knowledge and working experience in a particular province, such that stakeholders coming from the districts belonging to the same province were put in one group.

Method for assessing vulnerability factors

Each group appointed a chairperson and a secretary to ensure smooth deliberations. The team assessed vulnerability factors for each geographic unit by going through each NCP operational geographic unit one by one across all districts in each province. Workshop facilitators provided each team with a list of vulnerability factors. To ensure objective and standardized assessment, the definition for each selected indicator was given to each team and discussed in a plenary. Each team then assessed each unit against a set of vulnerability factors. The assessment involved the assignment of a score of Yes or No for the presence or absence of the vulnerability respectively.

Step 3. Stakeholder validation

Table 1 shows the list of stakeholders involved in the validation exercise. A three-day stakeholder validation workshop was organized to assess the vulnerability factors to receive their feedback and input. This was an in-person workshop that took place in Mbombela, Ehlanzeni District, Mpumalanga province from 11 to 13 November 2024. The workshop was facilitated by emergency and preparedness personnel from the NDoH with technical support from the World Health Organisation, South Africa country office and regional office. WHO presented the methodology. This was followed by group sessions where the stakeholders were divided into nine groups to discuss the methodology and findings. Each group presented their findings and received feedback from other groups and facilitators. This process allowed consensus and unit of purpose in the PAMI identification process. Stakeholders expressed their expert opinion and country context which enriched the process extensively. Where the stakeholders were not satisfied i.e., when they felt like a certain geographical unit was a Cholera PAMI but had a priority score below the threshold, they could propose the re-assessment of vulnerability factors and possible inclusion of the geographical unit on the PAMIs list.

Table 1. Stakeholders participated in the data validation workshop.

Table1. Stakeholders participated in the data validation workshop.

Stakeholders	Location
WHO South Africa Country Office	South Africa
World Health Organization -Africa Regional Office	Kenya
National Department of Health	Pretoria
Provincial Departments of Health	Provinces and districts
Department of Water and Sanitation	National and provinces
District Municipalities	All the provinces
Border Management Authorities	National and province
NICD	Johannesburg
FETP	Johannesburg (NICD)
Disaster Management Centre	Provinces

CHAPTER THREE

RESULTS

The PAMIs identification exercise are presented according to the following sequence of sub-sections: Vulnerability index and Stakeholder validation.

Vulnerability index

Data overview

Table 2 shows an overview of data that was used for calculating the vulnerability index for the NCP geographical units for identification of priority areas for multi-sectoral interventions (PAMIs). A total of 213 geographical units at the level of the local municipality, representing 100% of all geographical units in South Africa were included in the analysis. The period of analysis covered five and half years from January 2019 to June 2024.

Table 2: An overview of data used for calculating priority index for PAMIs identification in South Africa.

Vulnerability factors	Num. of observations				Relative percentage			
	Missing values	"No"	"Yes"	Total	Missing values	"No"	"Yes"	Total
Confirmed cholera outbreak(s) over the analysis period	0	199	14	213	0,0%	93,4%	6,6%	100,0%
Confirmed cholera imported case(s) in the NCP operational geographic unit considered	0	199	14	213	0,0%	93,4%	6,6%	100,0%
Cross-border areas adjacent to frequently cholera-affected areas or identified PAMIs in neighbouring country(ies)	0	200	13	213	0,0%	93,9%	6,1%	100,0%
Location along major travel routes with transportation hubs	0	157	56	213	0,0%	73,7%	26,3%	100,0%
Major population gatherings	0	168	45	213	0,0%	78,9%	21,1%	100,0%
High population density locations or overcrowded settings	0	163	50	213	0,0%	76,5%	23,5%	100,0%
High-risk populations	0	145	68	213	0,0%	68,1%	31,9%	100,0%
Hard-to-access populations	0	172	41	213	0,0%	80,8%	19,2%	100,0%
Population that received oral cholera vaccine (OCV) more than three years ago	0	213	0	213	0,0%	100,0%	0,0%	100,0%
High-risk for extreme climate and weather conditions	0	156	57	213	0,0%	73,2%	26,8%	100,0%
Complex humanitarian emergency	0	211	2	213	0,0%	99,1%	0,9%	100,0%
Unimproved water	0	114	99	213	0,0%	53,5%	46,5%	100,0%
Unimproved sanitation	0	87	126	213	0,0%	40,8%	59,2%	100,0%
Limited access to hygiene	0	128	85	213	0,0%	60,1%	39,9%	100,0%

Table 3 and Figure 3 Epi-curve shows an overview of data that was used to support identification of areas where cholera outbreaks or confirmed cholera importation have occurred at the NCP geographical units for identification of priority areas for multi-sectoral interventions (PAMIs). Of the total geographical units, 14 (6.6%) units had recorded at least a cholera outbreak during the analysis period. A total of 1 597 suspected cholera cases (including 48 deaths) were reported from January 2019 to April 2024. Laboratory tests were conducted on 62% (988/1597) of the suspected cases (stool culture/PCR); while 38% (609/1597) of the cases had no specimen collected. Of the 988 suspected cases tested, 22% (215/988) were laboratory-confirmed (Vibrio cholerae O1)

Table 3: Number of laboratory-confirmed cases by province and year, South Africa,2019 - 2024

	Year					
Province	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Eastern Cape	0	0	0	0	1	0
Free State	0	0	0	0	11	0
Gauteng	0	0	0	0	177	1
KwaZulu-Natal	1	1			1	0
Limpopo	0	0	0	0	4	11
Mpumalanga	0	0	0	0	1	1
North West	0	0	0	0	6	0
Northern Cape	0	0	0	0	0	0
Western Cape	0	0	0	0	0	0
Total	**1**	**1**	**0**	**0**	**201**	**13**

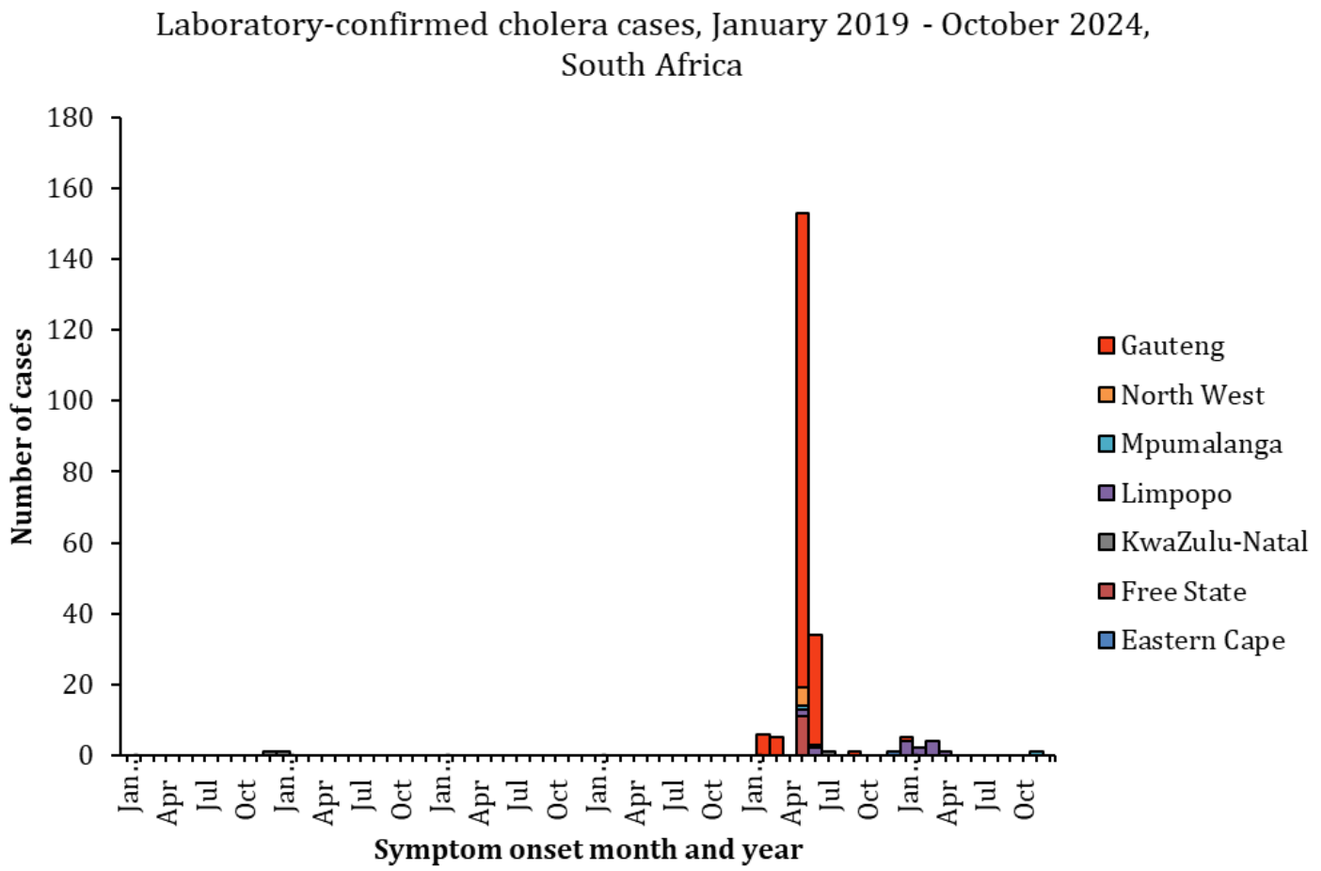


Figure 3: Epi-curve, Laboratory – confirmed Cholera cases, January 2019-October 2024

Vulnerability index threshold and justification for the threshold selected

South Africa considered the factors related to feasibility of implementation of the interventions (human, technical and financial resources) and the public health impact of those interventions in selecting the vulnerability index threshold. After a considerable period of discussions, reflections and wide engagements and consultations among all the stakeholders, the team agreed to set a realistic target. **A vulnerability index threshold of six (6)** was unanimously selected (Table 4).

Table 4: Vulnerability index threshold.

Vulnerability index values	Number of geographic units	Cum. number of geographic units	Rel. % of the num. of geographic units	Cum. % of the num. of geographic units	Total population	Rel. % of total population	Cum. % of total population
(blank)		0	0.0%	0.0%		0.0%	0.0%
Initial PAMI	14	14	6.6%	6.6%	19,182,597	30.9%	30.9%
8	2	16	0.9%	7.5%	712,661	1.1%	32.1%
7	13	29	6.1%	13.6%	3,607,830	5.8%	37.9%
6	18	47	8.5%	22.1%	7,899,135	12.7%	50.7%
5	31	78	14.6%	36.6%	6,855,846	11.1%	61.7%
4	19	97	8.9%	45.5%	9,435,025	15.2%	76.9%
3	20	117	9.4%	54.9%	3,562,288	5.7%	82.7%
2	25	142	11.7%	66.7%	3,802,896	6.1%	88.8%
1	28	170	13.1%	79.8%	3,457,053	5.6%	94.4%
0	43	213	20.2%	100.0%	3,481,810	5.6%	100.0%
Grand Total	213		100.0%		61,997,140	100.00%	

Number and percentage of NCP operational geographic units selected as PAMIs

At the vulnerability index threshold of 6, a cumulative 47 local municipalities (NCP geographic units) were selected as the final list of PAMIs with 14 as initial PAMIs and 33 as additional PAMIs. The 47 PAMIs represent 22.1% of all local municipalities corresponding to 50.7% (31,402, 222) of the country's population (Figure 4 and Table 5 and 6)

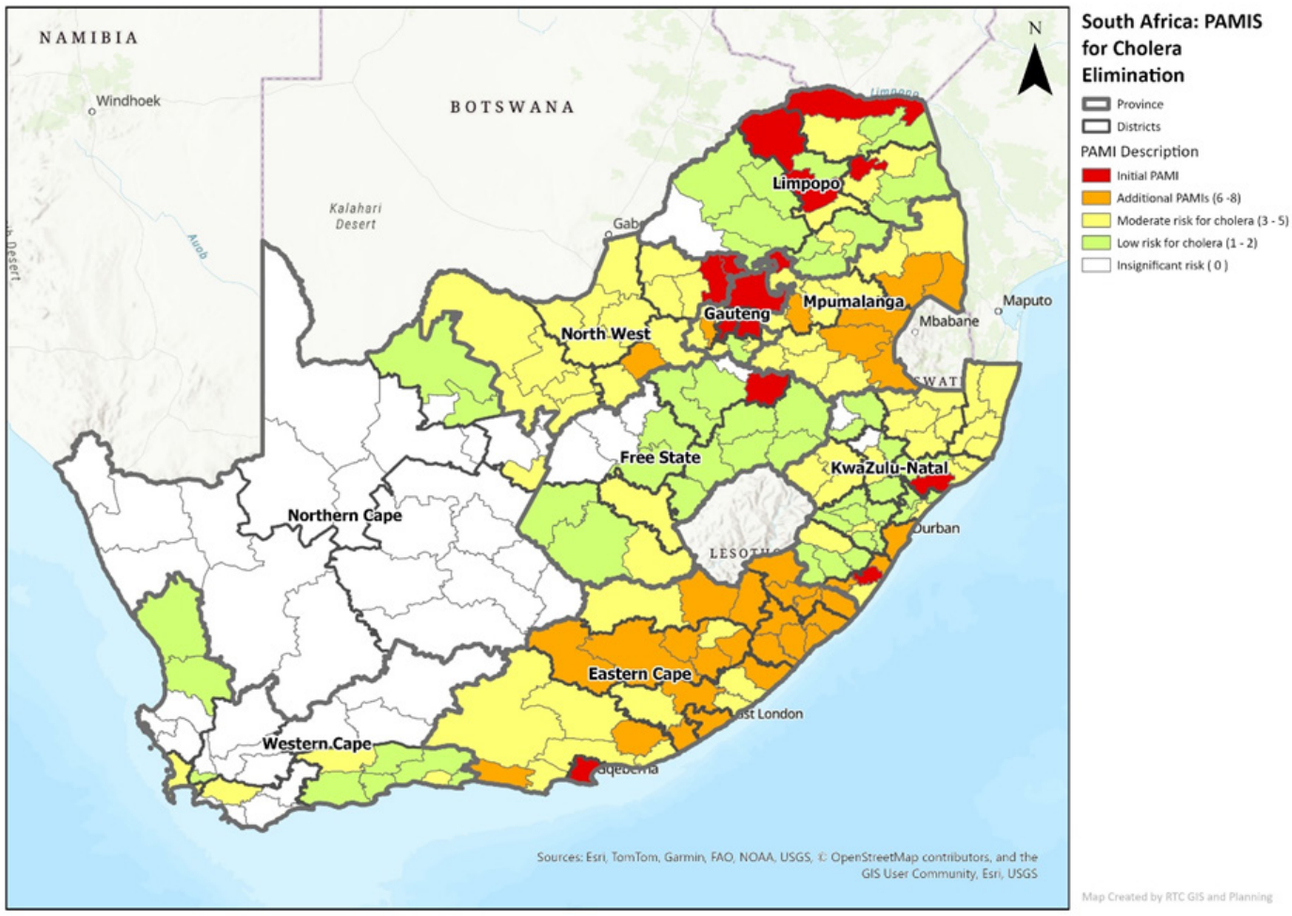


Figure 4: Map showing initial PAMIs and additional PAMIs, South Africa

Table 5: Vulnerability factors and priority index score by geographical unit (local municipality)

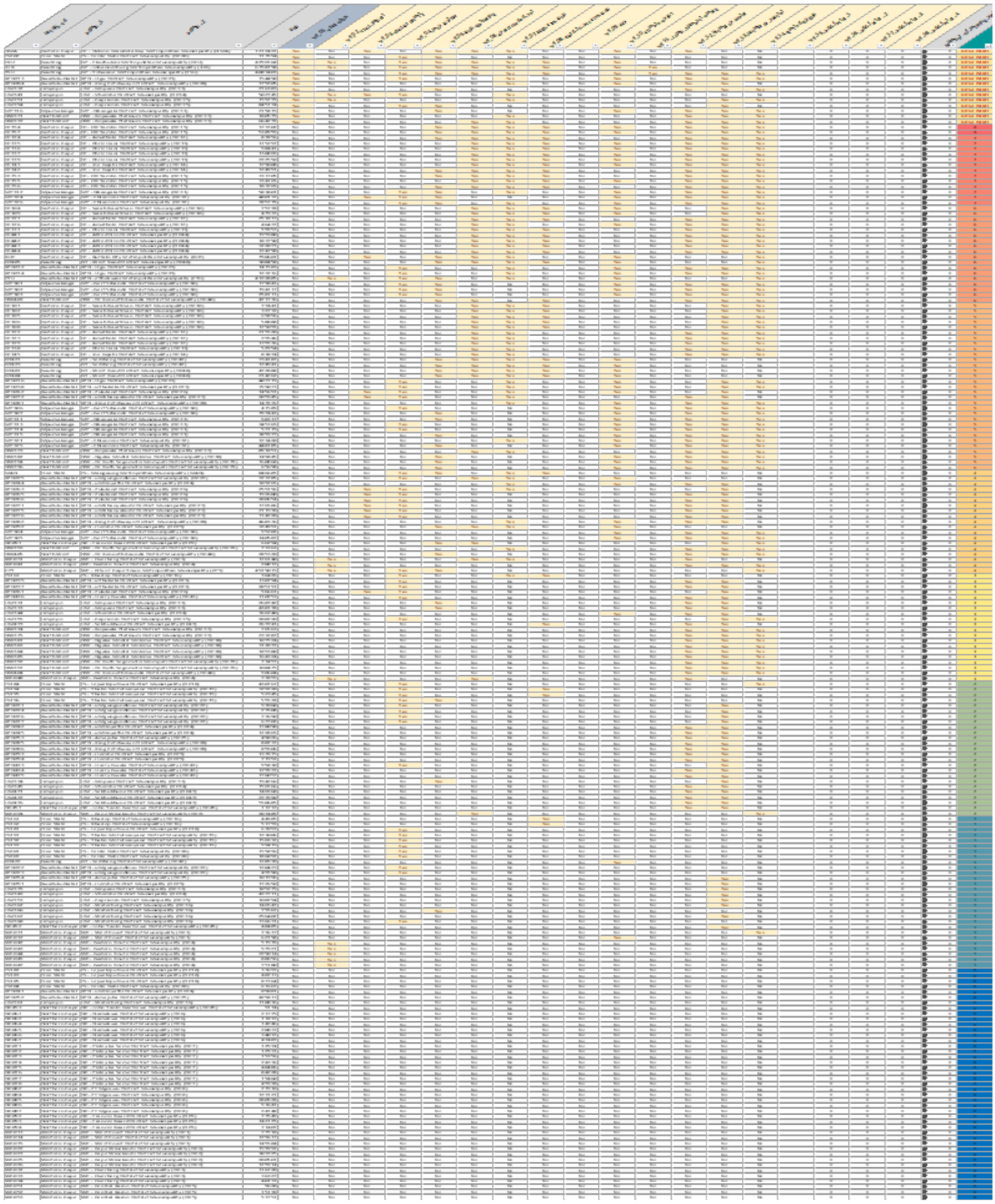
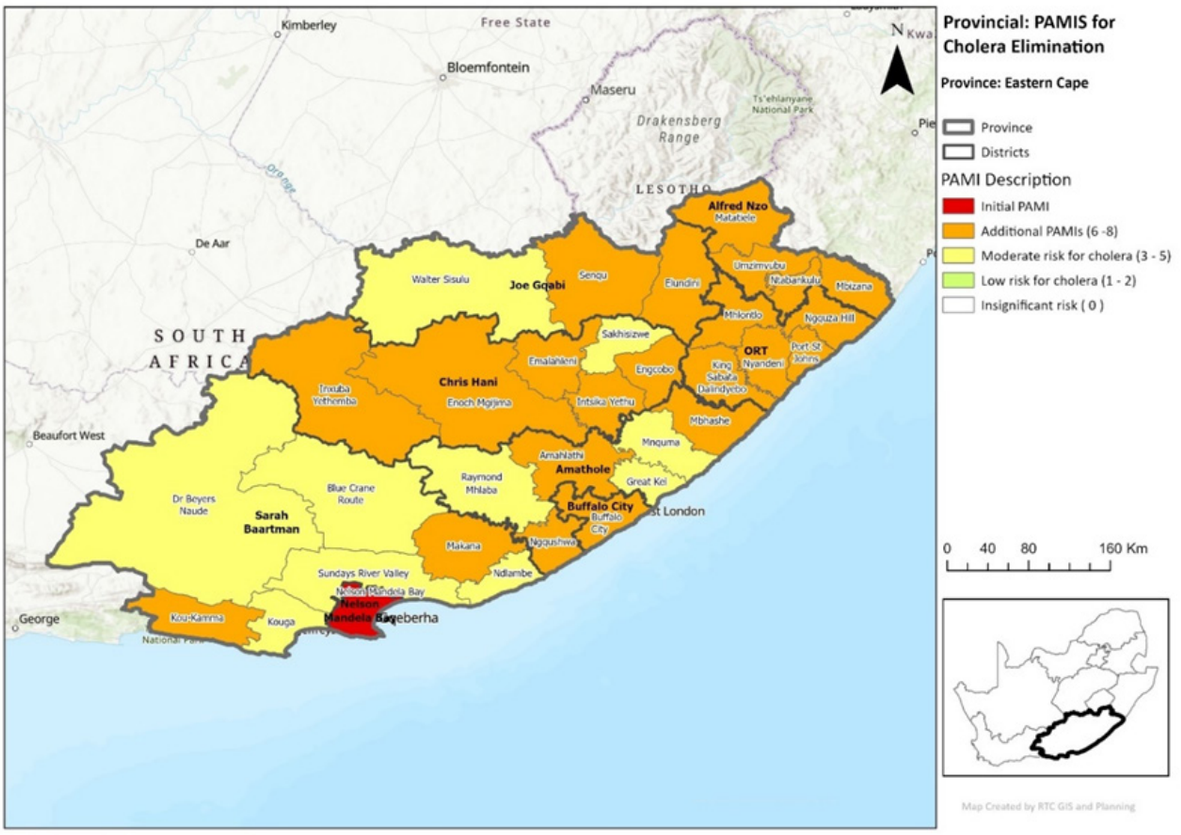
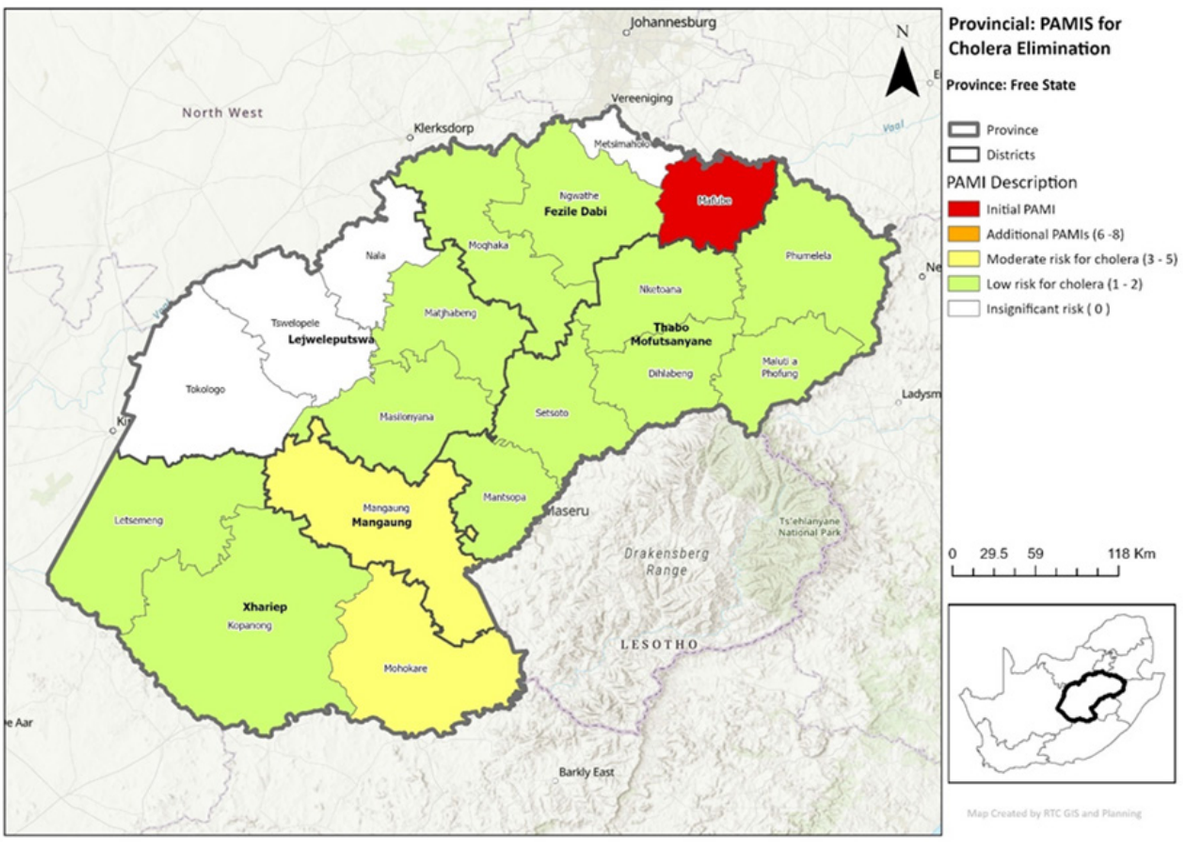


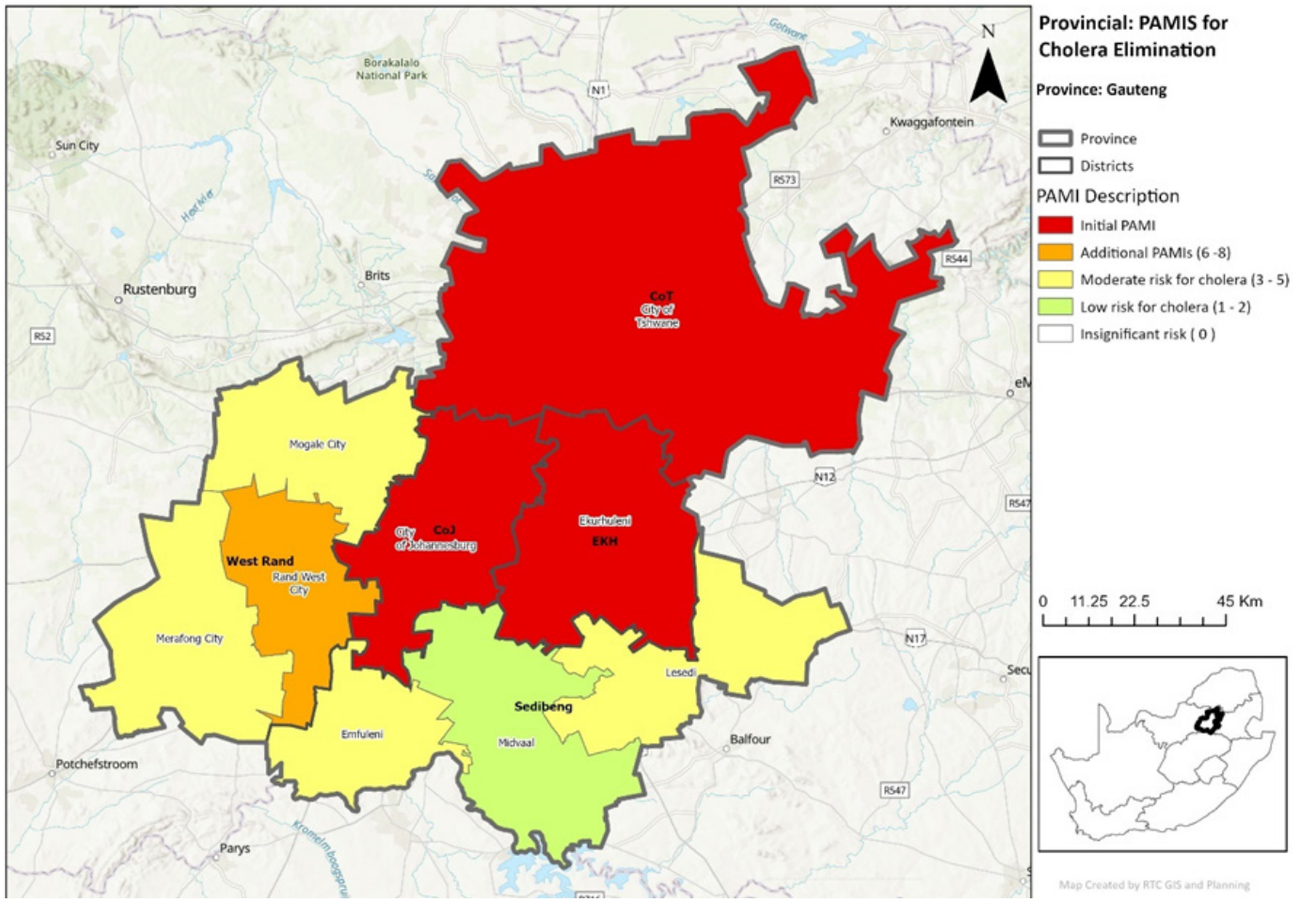
Table 6: Final list of the selected PAMIs

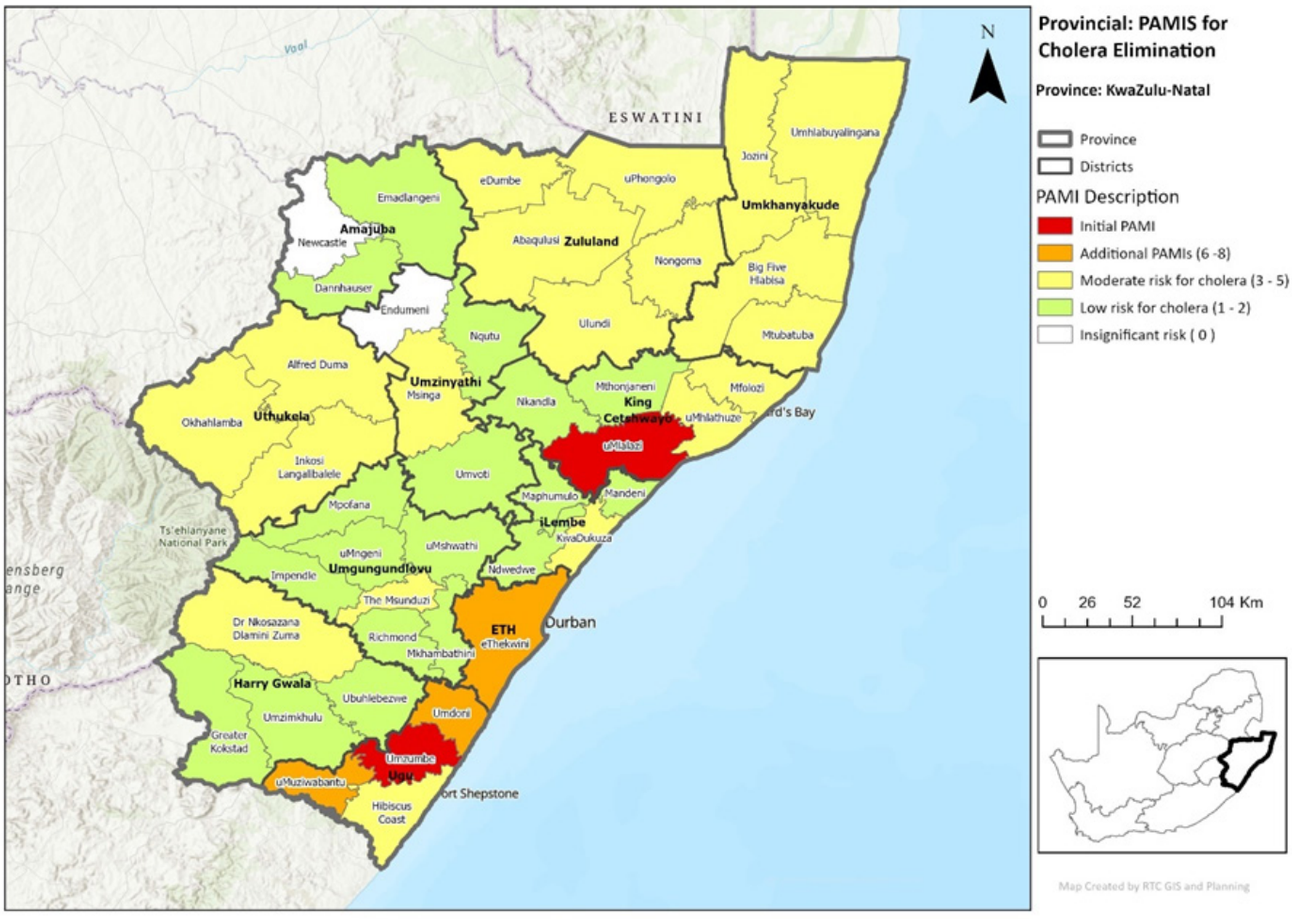
Province	District	Local Municipality	Priority_index
Eastern Cape	Nelson Mandela Bay Metropolitan Municipality (NMA)	Nelson Mandela Bay Metropolitan Municipality	Initial PAMI
Free State	Fezile Dabi District Municipality (DC20)	Moqhaka	Initial PAMI
Gauteng	Ekurhuleni Metropolitan Municipality (EKU)	Ekurhuleni Metropolitan Municipality	Initial PAMI
Gauteng	Johannesburg Metropolitan Municipality (JHB)	Johannesburg Metropolitan Municipality	Initial PAMI
Gauteng	Tshwane Metropolitan Municipality (TSH)	Tshwane Metropolitan Municipality	Initial PAMI
KwaZulu-Natal	Ugu District Municipality (DC21)	uMzumbe local municipality	Initial PAMI
KwaZulu-Natal	King Cetshwayo District Municipality (DC28)	uMlalazi local municipality	Initial PAMI
Limpopo	Mopani District Municipality (DC33)	Greater Letaba local municipality	Initial PAMI
Limpopo	Vhembe District Municipality (DC34)	Musina local municipality	Initial PAMI
Limpopo	Capricorn District Municipality (DC35)	Blouberg local municipality	Initial PAMI
Limpopo	Capricorn District Municipality (DC35)	Polokwane local municipality	Initial PAMI
Mpumalanga	Nkangala District Municipality (DC31)	Dr JS Moroka local municipality	Initial PAMI
North West	Bojanala Platinum District Municipality (DC37)	Moretele local municipality	Initial PAMI
North West	Bojanala Platinum District Municipality (DC37)	Madibeng local municipality	Initial PAMI
Eastern Cape	OR Tambo District Municipality (DC15)	Port St Johns local municipality	8
Eastern Cape	OR Tambo District Municipality (DC15)	King Sabata Dalindyebo local municipality	8
Eastern Cape	Amathole District Municipality (DC12)	Amahlathi local municipality	7
Eastern Cape	Chris Hani District Municipality (DC13)	Intsika Yethu local municipality	7
Eastern Cape	Chris Hani District Municipality (DC13)	Emalahleni local municipality	7
Eastern Cape	Chris Hani District Municipality (DC13)	Engcobo local municipality	7
Eastern Cape	Chris Hani District Municipality (DC13)	Enoch Mgijima local municipality	7
Eastern Cape	Joe Gqabi District Municipality (DC14)	Elundini local municipality	7
Eastern Cape	Joe Gqabi District Municipality (DC14)	Senqu locla municipality	7
Eastern Cape	OR Tambo District Municipality (DC15)	Ngquza Hill local municipality	7
Eastern Cape	OR Tambo District Municipality (DC15)	Nyandeni local municipality	7
Eastern Cape	OR Tambo District Municipality (DC15)	Mhlontlo local municipality	7
Mpumalanga	Nkangala District Municipality (DC31)	Emalahleni local municipality	7
Mpumalanga	Ehlanzeni District Municipality (DC32)	Nkomazi local municipality	7
Mpumalanga	Ehlanzeni District Municipality (DC32)	City of Mbombela local municipality	7
Eastern Cape	Sarah Baartman District Municipality (DC10)	Makana local municipality	6
Eastern Cape	Sarah Baartman District Municipality (DC10)	Kou-Kamma local municipality	6
Eastern Cape	Amathole District Municipality (DC12)	Mbhashe local municipality	6
Eastern Cape	Amathole District Municipality (DC12)	Mnquma local municipality	6
Eastern Cape	Chris Hani District Municipality (DC13)	Inxuba Yethemba local municipality	6
Eastern Cape	Alfred Nzo District Municipality (DC44)	Matatiele local municipality	6
Eastern Cape	Alfred Nzo District Municipality (DC44)	Umzimvubu local municipality	6
Eastern Cape	Alfred Nzo District Municipality (DC44)	Mbizana local municipality	6
Eastern Cape	Alfred Nzo District Municipality (DC44)	Ntabankulu local municipality	6
Eastern Cape	Buffalo City Metropolitan Municipality (BUF)	Buffalo City Metropolitan Municipality	6
Gauteng	West Rand District Municipality (DC48)	Rand West City local municipality	6
KwaZulu-Natal	Ugu District Municipality (DC21)	Umdoni local municipality	6
KwaZulu-Natal	Ugu District Municipality (DC21)	uMuziwabantu local municipality	6
KwaZulu-Natal	eThekwini Metropolitan Municipality (ETH)	eThekwini Metropolitan Municipality	6
Mpumalanga	Gert Sibande District Municipality (DC30)	Chief Albert Luthuli local municipality	6
Mpumalanga	Gert Sibande District Municipality (DC30)	Msukaligwa local municipality	6
Mpumalanga	Gert Sibande District Municipality (DC30)	Mkhondo local municipality	6
North West	Dr Kenneth Kaunda District Municipality (DC40)	City of Matlosana local municipality	6

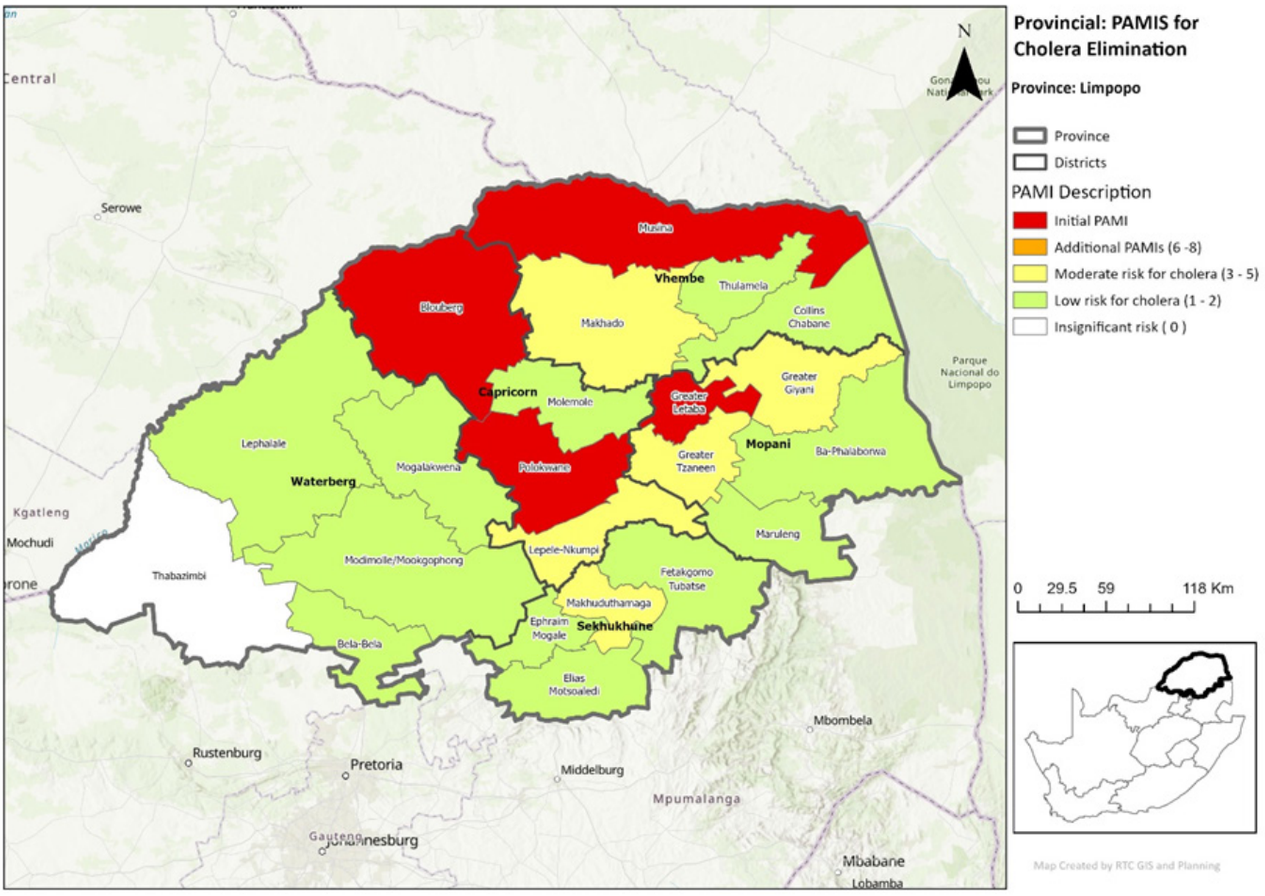
Below are all the 9 provincial cholera risk maps highlighting the location of PAMIs within various provinces. The name of the province is provided in the legend.

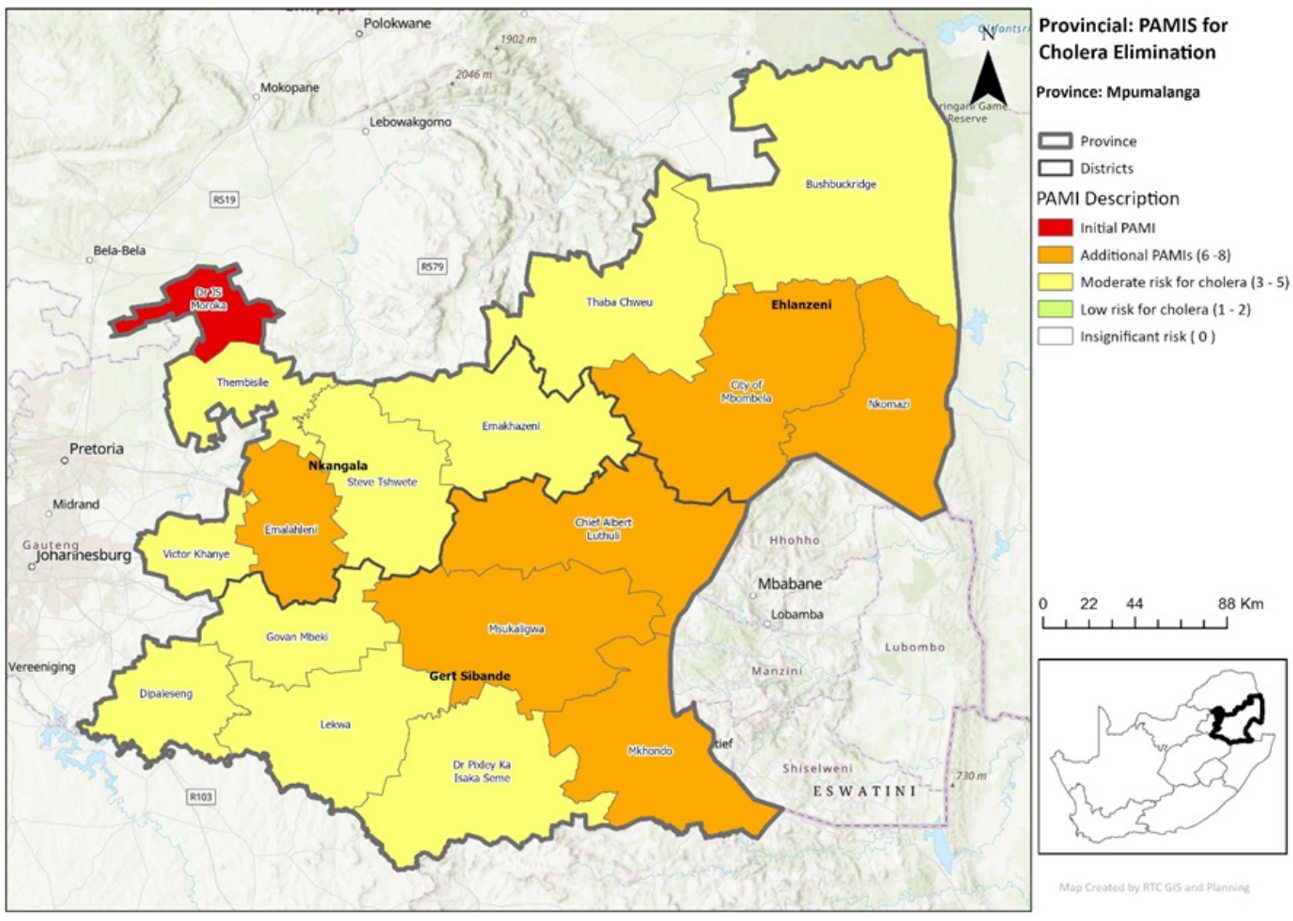


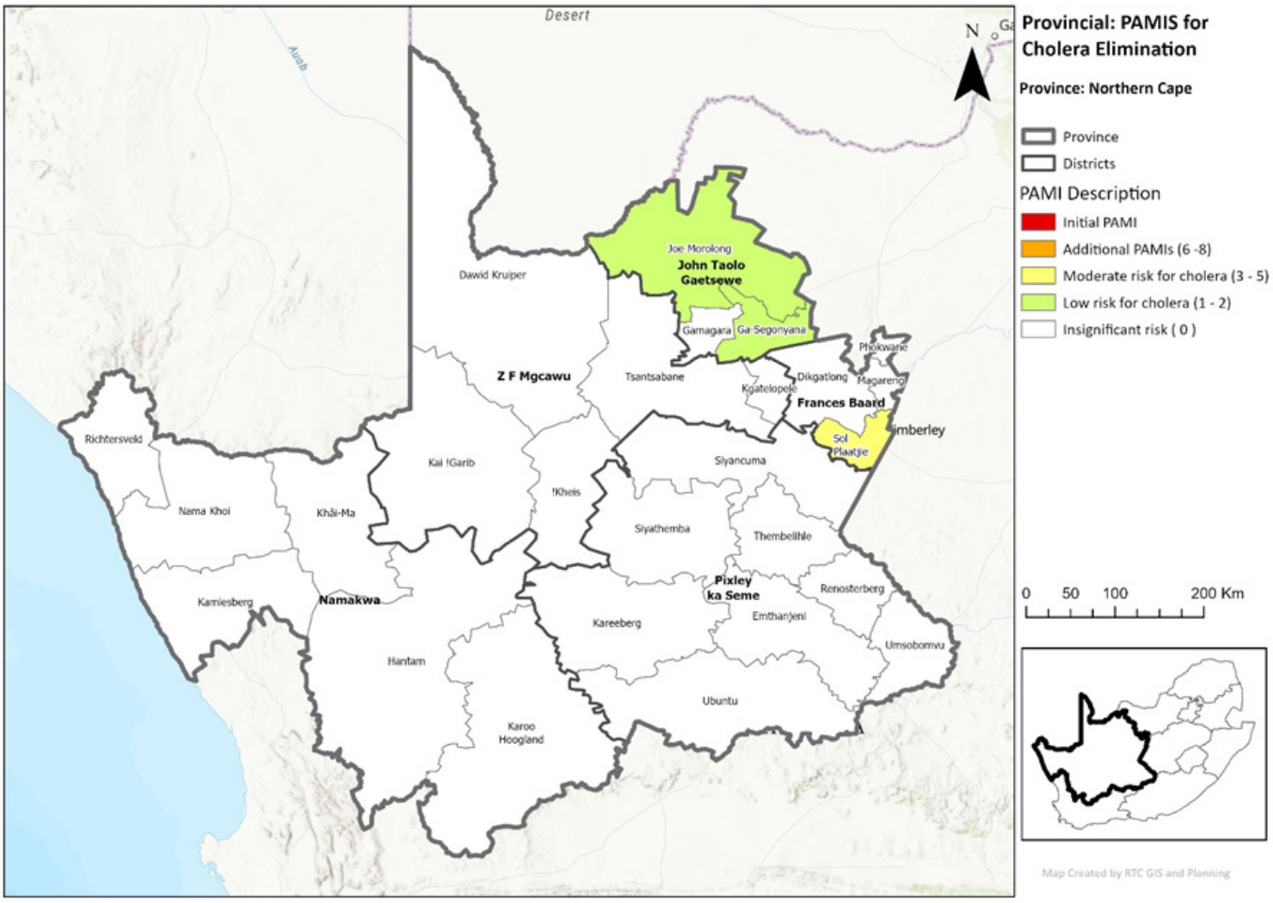


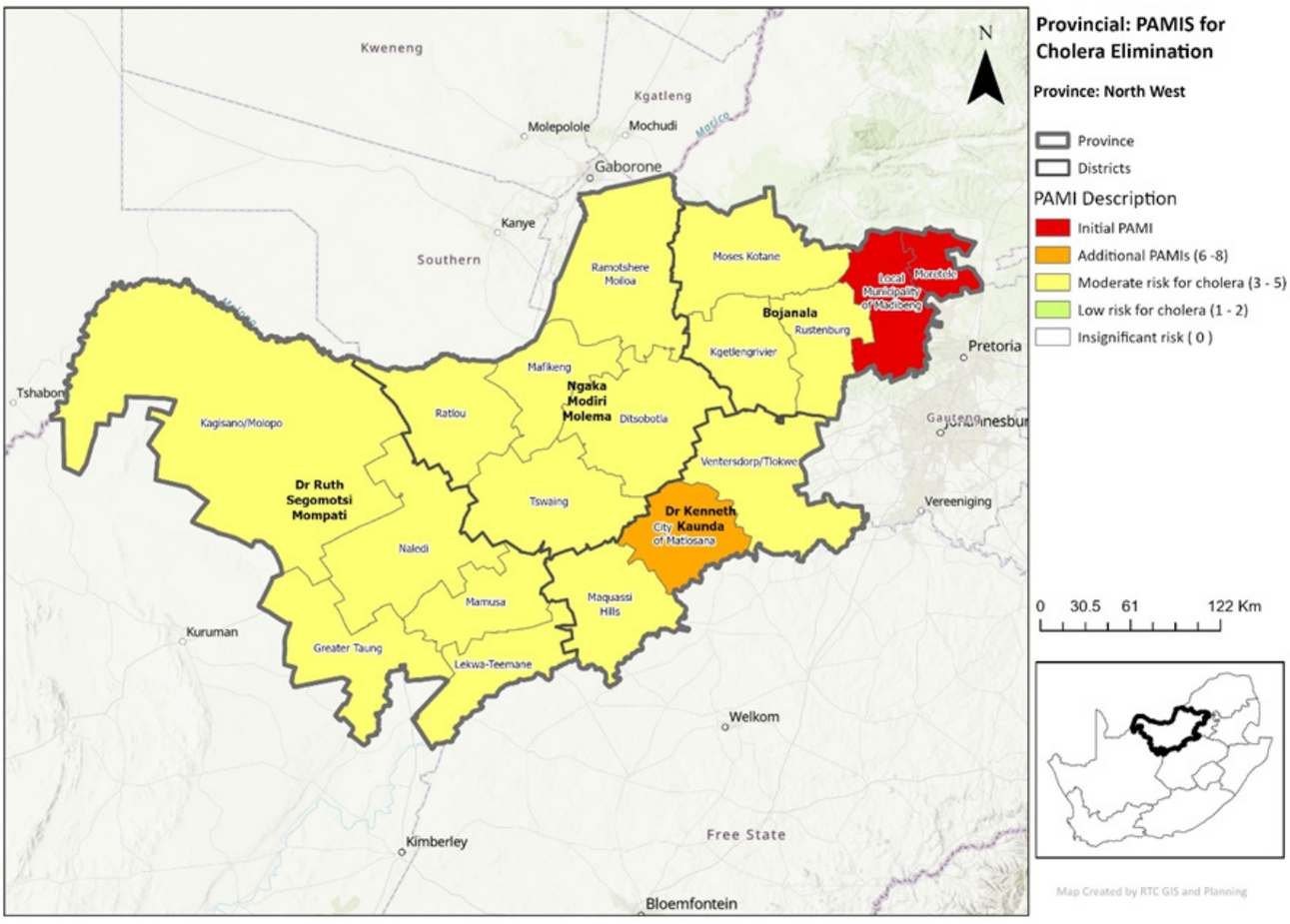

Provincial: PAMIS for Cholera Elimination
Province: Gauteng
Province
Districts
PAMI Description
Initial PAMI
Additional PAMIs (6 -8)
Moderate risk for cholera (3 - 5)
Low risk for cholera (1 - 2)
Insignificant risk (0)
0 11.25 22.5 45 Km
N
Borakalalo National Park
Sun City
Rustenburg
Brits
Kwaggafontein
Mogale City
West Rand
Rand West City
Merafong City
CoT City of Tshwane
CoJ City of Johannesburg
Ekurhuleni EKH
Sedibeng
Emfuleni
Midvaal
Lesedi
Balfour
Potchefstroom
Parys
N1
N12
N17
R52
R544
R573
R547
Map Created by RTC GIS and Planning

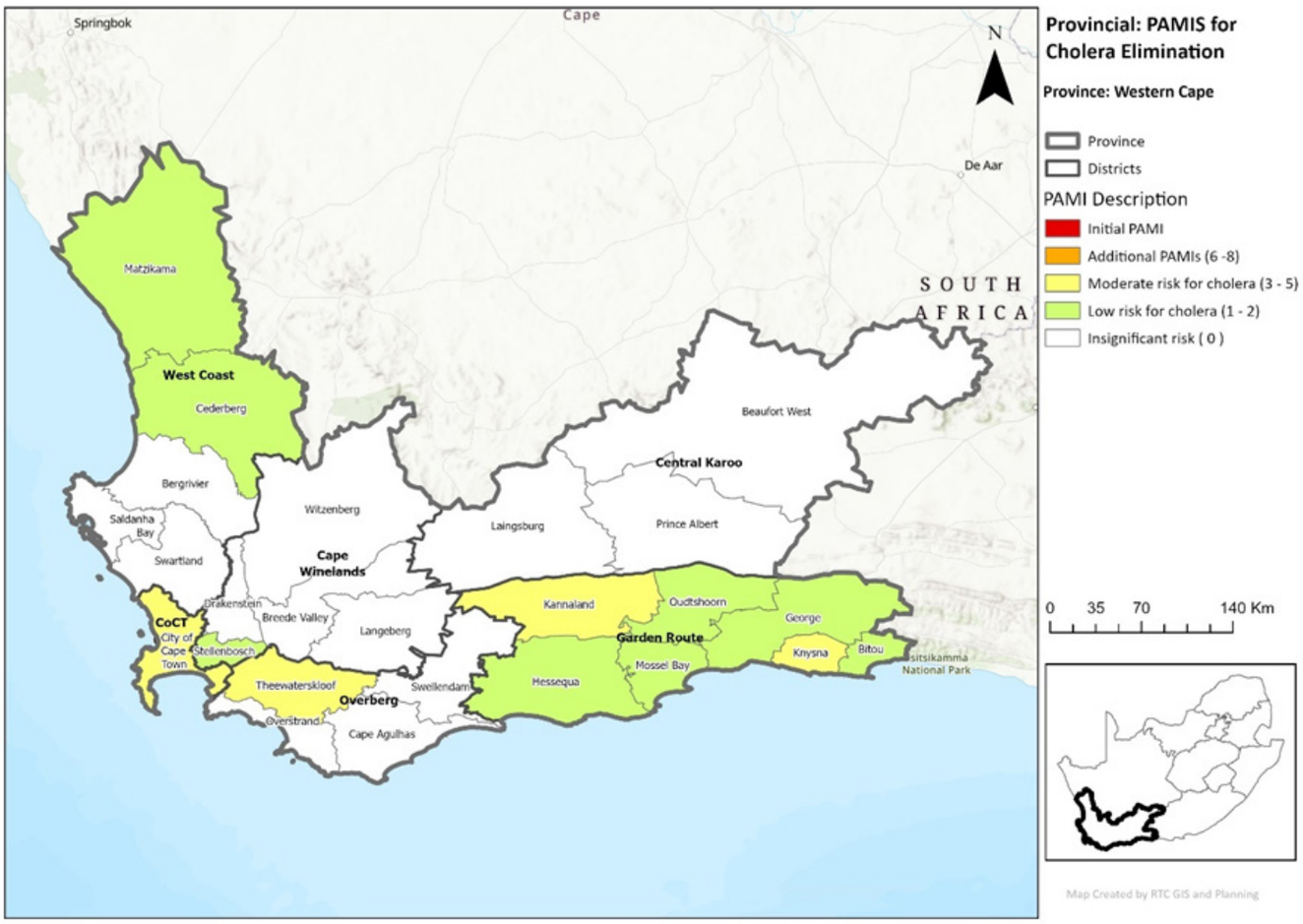

Provincial: PAMIS for Cholera Elimination
Province: KwaZulu-Natal
Province
Districts
PAMI Description
Initial PAMI
Additional PAMIs (6 -8)
Moderate risk for cholera (3 - 5)
Low risk for cholera (1 - 2)
Insignificant risk (0)
0 26 52 104 Km
N
ESWATINI
Umhlabuyalingana
Jozini
Umkhanyakude
uPhongolo
eDumbe
Emadlangeni
Amajuba
Newcastle
Abaqulusi
Zululand
Nongoma
Big Five Hlabisa
Dannhauser
Endumeni
Ulundi
Nquthu
Mtubatuba
Alfred Duma
Umzinyathi
Msinga
Nkandla
Mthonjaneni
King Cetshwayo
Mfolozi
uMhlathuze
Richard's Bay
Okhahlamba
Uthukela
uMlalazi
Inkosi Langalibalele
Umvoti
Mandeni
Maphumulo
Mpofana
iLembe
KwaDukuza
Ndwedwe
Ts'ehlanyane National Park
uMshwathi
uMngeni
Umgungundlovu
Impendle
The Msunduzi
Dr Nkosazana Dlamini Zuma
Richmond
Mkhambathini
ETH eThekwini
Durban
Harry Gwala
Ubuhlebezwe
Umzimkhulu
Umdoni
Greater Kokstad
Umzumbe
uMuziwabantu
Ray Nkonyeni
Port Shepstone
Hibiscus Coast
Map Created by RTC GIS and Planning


Provincial: PAMIS for Cholera Elimination
Province: Limpopo
Province
Districts
PAMI Description
Initial PAMI
Additional PAMIs (6 -8)
Moderate risk for cholera (3 - 5)
Low risk for cholera (1 - 2)
Insignificant risk (0)
0 29.5 59 118 Km
Map Created by RTC GIS and Planning
N
Central
Serowe
Kgatleng
Mochudi
Rustenburg
Pretoria
Middelburg
Mpumalanga
Johannesburg
Gauteng
Mbombela
Mbabane
Lobamba
Musina
Vhembe
Thulamela
Collins Chabane
Blouberg
Makhado
Capricorn
Molemole
Greater Letaba
Greater Giyani
Parque Nacional do Limpopo
Lephalale
Waterberg
Mogalakwena
Polokwane
Greater Tzaneen
Mopani
Ba-Phalaborwa
Maruleng
Modimolle/Mookgophong
Lepele-Nkumpi
Fetakgomo Tubatse
Thabazimbi
Makhuduthamaga
Ephraim Mogale
Sekhukhune
Bela-Bela
Elias Motsoaledi


Provincial: PAMIS for Cholera Elimination
Province: Mpumalanga
Province
Districts
PAMI Description
Initial PAMI
Additional PAMIs (6 -8)
Moderate risk for cholera (3 - 5)
Low risk for cholera (1 - 2)
Insignificant risk (0)
0 22 44 88 Km
Map Created by RTC GIS and Planning
N
Polokwane
1902 m
2046 m
Mokopane
Lebowakgomo
R519
R579
R103
Bela-Bela
Dr JS Moroka
Thembisile
Thaba Chweu
Bushbuckridge
Ehlanzeni
City of Mbombela
Nkomazi
Emakhazeni
Pretoria
Nkangala
Steve Tshwete
Midrand
Emalahleni
Victor Khanye
Gauteng
Johannesburg
Chief Albert Luthuli
Hhohho
Mbabane
Lobamba
Msukaligwa
Govan Mbeki
Lubombo
Vereeniging
Gert Sibande
Manzini
Dipaleseng
Lekwa
Mkhondo
Dr Pixley Ka Isaka Seme
Shiselweni
ESWATINI
730 m


Desert
Auob
N
Joe Morolong
John Taolo Gaetsewe
Dawid Kruiper
Gamagara
Ga-Segonyana
Phokwane
Z F Mgcawu
Tsantsabane
Dikgatlong
Magareng
Kgatelopele
Frances Baard
Sol Plaatje
Richtersveld
Kai !Garib
Siyancuma
!Kheis
Nama Khoi
Khâi-Ma
Siyathemba
Thembelihle
Kamiesberg
Namakwa
Pixley ka Seme
Renosterberg
Emthanjeni
Kareeberg
Umsobomvu
Hantam
Ubuntu
Karoo Hoogland
Provincial: PAMIS for Cholera Elimination
Province: Northern Cape
Province
Districts
PAMI Description
Initial PAMI
Additional PAMIs (6 -8)
Moderate risk for cholera (3 - 5)
Low risk for cholera (1 - 2)
Insignificant risk (0)
0 50 100 200 Km
Map Created by RTC GIS and Planning


Kweneng
Kgatleng
Molepolole
Mochudi
Gaborone
Kanye
Southern
Ramotshere Moiloa
Moses Kotane
Local Municipality of Madibeng
Bojanala
Rustenburg
Kgetlengrivier
Pretoria
Mafikeng
Ngaka Modiri Molema
Ditsobotla
Ratlou
Tshabong
Kagisano/Molopo
Ventersdorp/Tlokwe
Dr Ruth Segomotsi Mompati
Tswaing
Dr Kenneth Kaunda
City of Matlosana
Vereeniging
Naledi
Mamusa
Maquassi Hills
Kuruman
Greater Taung
Lekwa-Teemane
Welkom
Kimberley
Free State
Bloemfontein
N
Provincial: PAMIS for Cholera Elimination
Province: North West
Province
Districts
PAMI Description
Initial PAMI
Additional PAMIs (6 -8)
Moderate risk for cholera (3 - 5)
Low risk for cholera (1 - 2)
Insignificant risk (0)
0 30.5 61 122 Km
Map Created by RTC GIS and Planning


Springbok
Cape
N
De Aar
SOUTH
AFRICA
Matzikama
West Coast
Cederberg
Bergrivier
Saldanha
Bay
Swartland
Witzenberg
Cape
Winelands
Drakenstein
Breede Valley
Langeberg
CoCT
City of
Cape
Town
Stellenbosch
Theewaterskloof
Overberg
Overstrand
Cape Agulhas
Swellendam
Laingsburg
Beaufort West
Central Karoo
Prince Albert
Kannaland
Oudtshoorn
George
Garden Route
Mossel Bay
Knysna
Bitou
Messequa
sitsikamma
National Park
Provincial: PAMIS for
Cholera Elimination
Province: Western Cape
Province
Districts
PAMI Description
Initial PAMI
Additional PAMIs (6 -8)
Moderate risk for cholera (3 - 5)
Low risk for cholera (1 - 2)
Insignificant risk (0)
0 35 70 140 Km
Map Created by RTC GIS and Planning

WAY FORWARD

The next step will be to develop the National Cholera Elimination Plan. This will involve ensuring that the leadership and coordination mechanism align with GTFCC guidance on multisectoral collaboration for effective cholera elimination by 2030. This will be done in the form of a meeting involving senior management from the National and Provincial Departments of Health and other sector Departments and stakeholders and partners to provide feedback on the PAMIs identification. This meeting will be conducted in April 2025, and will be followed by the implementation of the following strategic actions:

- Developmental phase (May 2025) where each Pillar will be expected to:
  - Formulate & prioritize activities.
  - Develop operational plans & associated budget.
  - Develop a monitoring & evaluation framework including definition of indicators & milestones.
- Implementation phase (July 2025) where each Pillar will be expected to implemented according to:
  - Prioritized activities.
  - Established timelines.
  - Available budget.
- Monitoring and reporting phase (September 2025) where each pillar will be expected to:
  - Conduct monitoring of indicators.
  - Provide an annual report of progress against targets and indicators.
  - Prioritize activities for next period.

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