NATIONAL CHOLERA CONTROL PLAN (NCCP)

FOR BANGLADESH

2019-2030

FOREWORD

Cholera has now become a global public health threat with its resurgence as it continues to affect 47 countries with an estimated 2.9 million cases and 95,000 deaths globally each year. The disease is endemic in Bangladesh, causing outbreaks and epidemics. It is however now believed that the disease can be controlled in a multi-sectoral approach using oral cholera vaccine (OCV) and implementation of improved water, sanitation and hygiene (WASH) practices.

The Global Task Force on Cholera Control (GTFCC), WHO has launched 'Ending Cholera: A Global Roadmap to 2030' aiming for at least 90% mortality reduction in 47 endemic countries. With the commitment of cholera affected countries, technical partners and donors as many as 20 countries could eliminate the disease transmission in this timeline. This goal can be achieved by strengthening preparedness, early case detection and quick response to contain cholera outbreaks using OCV as well as by having an implementation plan for improving WASH services. OCV can also be used to control endemic situation.

The Government of Bangladesh affirms its commitment to eliminate cholera in a well-coordinated effort by mobilizing all concerned sectors towards a good planning for effective interventions facilitated by the Ministryof Health and Family Welfare (MOHFW). This will result in implementing the National Cholera Control Plan (NCCP) for Bangladesh which will be used as guiding document to ensure that oral cholera vaccine is delivered to the target population putting in place effective surveillance system and cholera case management, social mobilization and community engagement with improved WASH services.

With committed leadership and adequate funding from the government and partners, it is feasible to eliminate cholera from Bangladesh.

Working in combination with related ministries, development partners, donors and other stakeholders from relevant sectors to commit for achieving the implementation of the multisectoral cholera elimination plan for Bangladesh will be executed in order to stop transmission of cholera in the country with no further public health threat by 2030.

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Contents

ACRONYMS AND ABBREVIATIONS

AMR	: Antimicrobial Resistance
AWD	: Acute Watery Diarrhea
BCC	: Behavior Change Communication
BDHS	: Bangladesh Demography and Health Survey
BHE	: Bureau of Health Education
CC	: Community Clinic
C4D	: Communication for Development
CDC	: Communicable Disease Control
CFR	: Case Fatality Rate
CSFP	: Cholera Surveillance Focal Person
CS	: Civil Surgeon
DC	: Disease Control/Divisional Coordinator
DCC	: Dhaka City Corporation
DSCC	: Dhaka South City Corporation
DNCC	: Dhaka North City Corporation
DGFP	: Directorate General of Family Planning
DGHS	: Directorate General of Health services
DHIS	: District Health Information System
DPHE	: Department of Public Health Engineering
EPI	: Expanded program on Immunization
EWARS	: Early Warning, Alert and Response System
FDMNs	: Forcibly Displaced Myanmar Nationals
FWA	: Family Welfare Assistant
GoB	: Government of Bangladesh
GTFCC	: Global Task Force for Cholera Control
HA	: Health Assistant
HED	: Health Engineering Department
HPNSDP	: Health Population Nutrition Sector Development Program
HSO	: Hospital Surveillance Officer
icddr,b	: international Centre for Diarrheal Disease Research, Bangladesh
IEDCR	: Institute of Epidemiology, Disease Control and Research
IMCI	: Integrated Management of Childhood Illness
JMP	: Joint Monitoring Program for Water, Sanitation and Hygiene
LSO	: Local Surveillance Officers
M&E	: Monitoring and Evaluation
MODC	: Medical Officer- Disease Control

MOHFW	: Ministry of Health and Family Welfare
MOLGRD&C	: Ministry of Local Government, Rural Development and Co-operatives
MIS	: Management Information System
NCCP	: National Cholera Control Plan
NCTF	: National Cholera Task Force
NGO	: Non-governmental organizations
OCV	: Oral Cholera Vaccine
OP	: Operation Plan
ORT	: Oral Rehydration Therapy
PCR	: Polymerase Chain Reaction
RDT	: Rapid Diagnostic Test
RFW	: Result Frame Work
RMO	: Residential Medical Officer
SBCC	: Social and Behavior Change Communication
SFP	: Surveillance Focal Point
SIMO	: Surveillance and Immunization Medical Officer
SOP	: Standard Operating Procedure
UHC	: Upazila Health Complex
UH&FPO	: Upazila Health & Family Planning Officer
UHFWC	: Union Health & Family Welfare Center
UNICEF	: United Nations International Children Fund
UNO	: Upazila Nirbahi Officer
USC	: Union sub-center
VPDs	: Vaccine Preventable Diseases
WASH	: Water, Sanitation and Hygiene
WASH FIT	: Water and Sanitation for Health Facility Improvement Tool
WASA	: Water Supply & Sewerage Authority
WHO	: World Health Organization

Glossary

Acute watery diarrhea (AWD): Acute watery diarrhea is an illness characterized by 3 or more looseor watery (non bloody) stools within a 24-hour period.

Cholera Control: A reduction in the incidence, prevalence, morbidity or mortality of cholera cases to a locally acceptable level (according to NCCP), and no longer considered as a public health problems and continued intervention is required to maintain controlled situation.

Cholera elimination: Any country that reports no confirmed cases with evidence of local transmission for at least three consecutive years and has a well-functioning epidemiological and laboratory surveillance system able to detect and confirm cases.

Cholera-endemic area: An area where confirmed cholera cases, resulting from local transmission, have been detected in the last 3 years. An area can be defined as any sub-national administrative unit including state, district or smaller localities.

Cholera hotspot: A geographically limited area (e.g. city, administrative level 2 or health district catchment area) where environmental, cultural and/or socioeconomic conditions facilitate the transmission of the disease and where cholera persists or re-appears regularly. Hotspots play a central role in the spread of the disease to other areas.

Cholera confirmed case: A suspected case with V. cholerae O1 or O139 confirmed by culture or PCR.

Cholera suspected case: In areas where a cholera outbreak has not been declared, a suspected case is any patient who has acute watery diarrhea and severe dehydration or Rapid Diagnostic Test (RDT) positive case or died from acute watery diarrhea. In areas where a cholera outbreak is declared, a suspected case is any person presenting with or dying from acute watery diarrhea.

Cholera Outbreak: **A cholera outbreak** is defined by the occurrence of at least **one confirmed case** of cholera by culture or PCR and evidence of local transmission. Outbreaks can also occur in areas with sustained year-round transmission. These outbreaks are defined by an unexpected increase in the magnitude or timing of suspected cases over two consecutive weeks, with some cases being confirmed by the laboratory. Investigate and respond to such increases appropriately through additional outbreak response and control measure are required.

Hygiene: Hygiene refers to the conditions and practices that help maintain health and prevent spread of disease including hand washing, menstrual hygiene management and food hygiene (JMP WASH) Safely managed drinking water services: Improved water source located on premises, available when needed, and free from microbiological and priority chemical contamination.

Safely managed sanitation services: Use of improved facilities that are not shared with other households and where excreta are safely disposed of in situ or transported and treated off site (JMP report 2017).

Upazila (Sub-district): The upazilas are the second lowest tier of regional administration in Bangldesh.

Executive Summary

Bangladesh has made significant progress over the years in reducing diarrhea related deaths. Much of it is due to the Government of Bangladesh's political commitment, well established health nationwide infrastructure, improved WASH services, well-trained health and WASH manpower, widespread public awareness on cholera, cooperation from public representatives and key persons of the society. Moreover, the International Centre for Diarrheal Disease Research, Bangladesh (icddr,b) in Dhaka has a long history of carrying out research on diarrheal diseases with emphasis on cholera, and is playing major role in reducing morbidity and mortality due to diarrhea. There is widespread awareness among all segments of the population in the country on the use of oral rehydration solution (ORS) for preventing dehydration in diarrheal disease in children and adults. Cholera disproportionately affects populatioto WASH as well as those who are living in poverty. Nevertheless, Bangladesh is one of the World Health Organization (WHO) recognized cholera endemic countries. In more recent years, growing problems of climate change, urbanization, and population growth are likely to increase the risk of cholera in high risk areas and susceptible populations in the country.

The Global Task Force on Cholera Control (GTFCC) has launched in 2017, a new strategy "Ending Cholera-A Global Roadmap to 2030"[2]. The overall objective is to reduce the mortality resulting from cholera by 90% by 2030. With the commitment of the cholera prone countries, technical partners, and donors, as many as 20 countries including Bangladesh will need to make plans to eliminate cholera in their settings by 2030[2, 7].

A long term multi-sectoral prevention and control strategy ensuring adequate access to cholera vaccine, water and sanitation, social mobilization for health and hygiene promotion, surveillance, and rapid appropriate case management are essential for reducing the morbidity and mortality of cholera in endemic and epidemic contexts.

The National Cholera Control Plan (NCCP) for Bangladesh 2019-2030 is a cholera control strategy, prepared to reach the cholera elimination goal in the stipulated time. However, system of cholera surveillance is limited in Bangladesh. The plans for the reduction of mortality and morbidity of cholera mentioned below have been set based on available surveillance data of IEDCR (Institute of Epidemiology, Disease Control and Research) and icddr,b.

Bangladesh is an endemic country with one of the world's highest burdens of cholera, with an estimated 109,052 cholera cases annually while a population of 66,495,209 is at risk with an annual incidence rate of 1.64/1,000 population[5]. The cholera cases in high-risk populations and cholera hospitalized cases and >1 million infections per year[5]. On the other hand, 56% population covered with safely managed drinking water services, 47% covered with basic sanitation services while 40% people wash hands with soap[8]. Several studies have shown strong link between quality of WASH services with cholera prevalence.

The burden of cholera in Bangladesh is estimated to be high based on information of hospitalization due to acute watery diarrhea from the facility based surveillance data from the DGHS (Directorate General of Health services). Limited culture confirmed data is available. Bangladesh started endemic diseases surveillance including cholera with collaboration of IEDCR and icddr,b in 22 surveillance sites covering overall administrative divisions of Bangladesh and the report showed highest burden in Chittagong, Narayanganj, Comilla and Cox's Bazar (7-14%) and the burden was low in Narsingdi, Thakurgaon, Satkhira, Netrokona, Sunamganj and Chapai Nawabganj (1-2%).

Systematic surveillance of diarrheal patients in the Dhaka hospital of icddr,b was initiated from 1979 and the data shows high rates of cholera for the last 40 years with bi-annual peaks [3, 4] during April to May and August to September with lower rates in the winter months from November to January. This surveillance shows 18-20% of culture confirmed cholera among admitted patients. More recently surveillance in 22 sentinel sites of the country in the last four years (2014- 2018) by IEDCR & icddr,b covering all administrative divisions has shown existence of culture confirmed cholera all over Bangladesh.

Oral cholera vaccine (OCV) is considered as an important public health tool to control both epidemic and endemic cholera globally. The OCVs is available in the World Health Organization (WHO) stockpile from 2013 and over 30 million doses have been administered to control cholera in countries in Africa, Asia as well as Latin America[13]. More recently, between 2017-2018 large campaigns have been carried out in Cox's Bazar, Bangladesh among the Forcibly Displaced Myanmar Nationals (FDMNs).

Cholera vaccine as outlined by the GTFCC should be used in a multi-sectoral cholera manner in complement with Water, Sanitation and Hygiene (WASH), reinforced surveillance, social mobilization and case management. These have been implicated as the most significant factors in the causal pathway of cholera infection and transmission which also incur a remarkable economic loss. In order to decrease the burden of cholera, multi-sectoral approach involving Ministry of Health and Family Welfare (MOHFW), local government, WASH, and education will be integrated together to attain the broader national goal of reducing cholera morbidity and mortality by 90% by 2030. To practically achieve this objective, an aggressive vaccination scheme together with an implementation plan for improved WASH interventions will remain a high-level policy priority.

Effective coordination among concerned government agencies, national multi-sectoral partners and global partners is needed for achieving the elimination goal by 2030. Based on the NCCP strategy document, the national control plan will proceed under the guidance of the MOHFW and will be initiated by the Communicable Disease Control (CDC) unit of DGHS. Cooperation from the Ministry of Local Government, Rural Development and Co-operatives (MOLGRD&C) as well as the Ministry of Education (MOE) and other related ministries, Water Supply & Sewerage Authority (WASA), Department of Public Health Engineering (DPHE), Dhaka North City Corporation (DNCC) and Dhaka South City Corporation (DSCC) are essential. The technical support of concerned

partners/donors, such as World Health Organization (WHO), The United Nations International Children Fund (UNICEF), icddr,b, WaterAid and other Non-governmental organizations (NGOs) are required for implementation of this plan.

To address these challenges and achieve the goals, the MOHFW and stakeholders have developed a multi-year plan, "National Cholera Control Plan (NCCP)" for implementation between 2019 and 2030.

The goal and objectives:

Goal:

The goal is to reduce cholera morbidity and mortality by 90% within 2030 through early case detection and quick response to cholera outbreaks, improved case management and controlling endemic situation. A number of development activities particularly OCV vaccination in hotspots/high-risk areas with water, sanitation & hygiene interventions and surveillance for impact evaluation throughout Bangladesh will contribute to this achievement.

Objectives:

1. Conduct sustained and efficient surveillance system that is able to predict, detect, and respond to cholera outbreaks in a timely manner.
2. Ensure appropriate cholera case management in all health facilities.
3. OCV vaccination in conjunction with WASH in cholera hotspots to complete interruption of transmission, and any new outbreaks.
4. Improve nationwide WASH Services as a long-term solution.

This multi-sectoral and multi-year plan will be implemented phase by phase in a period of 12 years with the MOHFW as the lead Ministry and other government sectors and stakeholders supporting and coordinating the implementation. The NCCP for Bangladesh has a demonstration plan as well a short, mid and long term objectives. The short term activities will include sustainable laboratory supported surveillance system, along with early warning and alert response systems (EWARS), improved case management and use of OCV and WASH activities to adopt integrated approach in controlling cholera transmission in the hotspots, In the midterm and the long term activities, the interventions of the short time activities will be strengthened. As a specific long term activity, WASH facilities will be gradually expanded nationwide. To reach Global Roadmap by 2030, following procedures are outlined:

Table 1: Cholera control strategies at a glance.

Agenda	Major Activities	Outcome Indicators	Lead institute
1. Establishment of national surveillance and outbreak detection and response system for *V. cholerae*	1. Strengthening of laboratory supported Cholera surveillance. 2. Strengthening IEDCR laboratory as referral center and public medical college hospitals as sentinel centers for *V. cholerae* detection (confirmatory capacity). 3. Training on cholera detection at all health facilities. 4. Maintenance of regular cholera surveillance at all sentinel sites. 5. Training of rapid response teams at all levels. 6. Development of early warning and response system. 7. Regular supply of required reagents and other logistics.	1. RDT based *V. cholerae* detection system developed in all health facilities by 2023 2. Lab based confirmatory test facilities strengthened at IEDCR by 2020 and all public medical collegesby 2023 3. Detection of new high risk areas/ population by 2025 4. At least 90% outbreaks are diagnosed/confirmed and addressed by 2023 5. Trained emergency response team equipped with all logistics in all hotspot districts by 2025 6. Early warning system in action in all hot spots by 2023	IEDCR, CDC, DGHS
2. Nationwide improvement of safely managed water and sanitation services as long term solution	1. Countrywide establishment of safely managed drinking water source especially in hard to reach areas including urban slums, hilly areas, coastal zones etc. 2. Establishment of safely managed sanitation services with emphasis on rural areas, char areas, floating communities.	1. By 2030, universal coverage of safely managed drinking water services. 2. By 2025, 50% and by 2030, universal coverage of safely managed sanitation services. Environmental laboratory is established at central and divisional level by 2025.	DPHE, WASA, MOLGRD&C, CDC, DGHS, IEDCR, BHE, MoHFW.

	3. Establishment of environmental laboratory based monitoring system at the central and divisional level for quality and safety of WASH operations countrywide. 4. Raising awareness on importance of hand washing with running water and soap at critical times. 5. Increase hand washing practice with special focus on pregnant women, mother of under five children and adolescents.	3. By 2025, 80% people can recall slandered critical times of hand washing with demonstration. 4. By 2030, 100% people can recall slandered critical times of hand washing with demonstration. 5. 90% reduction of cholera hospitalization by 2030.	
3. Immunization with OCV with WASH facilities in hotspots and/or high burden/ risk areas by Expanded Program of Immunization (EPI) to control endemic situation and outbreaks as short term measures.	1. Immunization campaigns with OCV in high risk areas through national EPI network in collaboration with MOLGRD&C for strengthened WASH facilities by 2025. 2. Prevent and respond to cholera outbreaks with OCV immunization & emergency WASH package services. 3. OCV procurement, planning and execution through national EPI. 4. Training and logistics supply through national EPI.	1. OCV campaign in City Corporations from 2019 followed by other high risk areas in phase wise manner. 2. Maintain 90% OCV coverage in all identified high burden districts by 2024. 3. Cholera outbreaks are addressed with both the WASH and OCV intervention. 4. 90% reduction of hospitalization due to *V. cholerae* by 2030.	EPI, CDC, DGHS, DPHE, WASA, MOLGRD&C.
4. Establishment of appropriate case management protocol for diarrheal diseases including cholera at all health facilities in	1. Development/customization of case management protocol. 2. Training of service providers on case management. 3. Equitable distribution of drugs and saline to the public health facilities.	1. Trained service providers are managing cases in all facilities by 2025 2. Morbidity due to cholera is reduced by 90%in all districts and City Corporations by 2030.	

accordance with WHO Guidelines (preferably by using the mHealth platform).		3. CFR for cholera and other diarrheal diseases stayed well below 1% in all districts and City Corporations by 2030.	CDC, DGHS & IEDCR, DGHS.
1. Complete interruption of V. cholerae transmission, and rapid detection and interruption of any new outbreaks. 2. Control certification of V. cholerae transmission by the end of 2030 so that cholera is no more a public health problem in Bangladesh.	1. Regular surveillance to identify cases along with appropriate case management and timely intervention with WASH and OCV to contain V. cholerae transmission in the communities.	1. All *V. cholerae* transmission stopped by 2030. 2. Country cholera control certified by end of 2030.	CDC, IEDCR, , EPI, DPHE, WASA with technical support of icddr,b & WaterAid, WHO, UNICEF.

DGHS under the MOHFW will coordinate and guide all activities; Activity leads will implement the relevant activitieswith technical support of icddr,b, WaterAid, UNICEF and WHO

Estimated Budget Requirement for implementation of NCCP

The NCCP outlines development activities from 2019 -30 with a total estimated budget of US$ 3.58 billion. Out of this, OCV budget will be $ 0.43 billion; the WASH budget will be US$ 3.13 billion; for improved water $0.68 billion; sanitation $1.35 billion and hygiene promotion around $1.1 billion. The surveillance budget is estimated to $ 0.02 billion.

1. Introduction

Cholera is a major public health problem in many countries in Asia, Africa and Latin America[1]. Globally 47 countries are recognized as cholera endemic and is a cause of major concern[2]. Cholera is responsible for an estimated 2.9 million cases and 95,000 deaths per year worldwide[1]. Bangladesh is one of the endemic countries with highest burdens of cholera with bi-annual peaks in certain areas of the country[3,4]. An estimated 109,052 cholera cases annually while a population of 66,495,209 is at risk with an annual incidence rate of 1.64/1,000[5]. The cholera cases in high-risk populations and cholera prone areas may exceed 2/1,000 population (ranges 2-5) suggesting that an occurrence of 450,000 hospitalized cases and >1 million infections per year[5].

According to World Population Review (2019), Bangladesh is a large and densely populated country in South Asia, bordering Myanmar, India and the Bay of Bengal. Bangladesh has an estimated population of 168.07 million (2019), up from the 2013 estimate of 156.5 million. This makes Bangladesh the 8th most populous country in the world. The country has a population density of 1,115.62 people per square kilometer (2,889.45/square mile), which ranks 10th in the world. The surface area in Bangladesh is currently at 147,570 km^2 (or 56,977 square miles). The capital and largest city of Bangladesh is Dhaka, which has a population of 14.4 million and a density of 19,447 people per square mile (50,368/square mile). With an estimated population growth rate 0.98%, by 2025, the projected population in Bangladesh will be 178 million with male 50.3% and female 49.7%. With the estimated population growth rate 0.81%, by 2030, the projected population in Bangladesh will be 185 million with male: female ratio 50.2: 49.8 and population density will be 1257.61 per square kilometer[6].

Ninety eight percent of the Bangladeshi populations are ethnic Bengali with the remaining 2% made up from other ethnic tribes. Minorities in Bangladesh include indigenous people in northern Bangladesh and the Chittagong Hill Tracts, which have 11 ethnic tribal groups such as the Chakma, Tanchangya, Kuki, Bawm and Marma. The Mymensingh region is home to a large Garo population, while North Bengal has a large population of aboriginal Santals[6].

Life expectancy in Bangladesh is currently at 73.4 years of age. According to JMP 2017 report, 56% of total population has access to safely managed drinking water while 47% have access to basic services for sanitation. 72.8% of the population over 15 years of age is literate[6].

Bangladesh is vulnerable to environmental disasters due to combined effects of climate change, population growth, population density and urban migration. Drinking water sources are contaminated during frequent disaster such as floods, landslides and cyclones. Latrines overflow and contaminate water sources during these extreme events. Water quality in Bangladesh is affected by environmental pollution from industrial effluents, over-obstruction for irrigation and saltwater intrusion. Barriers to safe drinking water, alongside sanitation, have significant impact on health, nutrition, education, protection and other outcomes for population as a whole.

WASH services in Bangladesh is close to optimum, but the problem is that the country is prone to natural catastrophe like cyclone, flood, tornado, etc. that poses a threat and causing damage to WASH infrastructure with cholera appearance in the population at risk.

This could be successfully overcome with prior OCV vaccination of at-risk population for developing herd immunity against cholera threat. The topography, population density, climate, and environment all these factors justify large scale OCV vaccination in the country.

The Global Task Force on Cholera Control (GTFCC) has launched in 2017, a new global strategy "Ending Cholera - A Global Roadmap to 2030"[2]. The overall objective is to reduce the mortality resulting from cholera by 90% by 2030. With the commitment of the cholera prone countries, technical partners, and donors, as many as 20 countries including Bangladesh will need to make plans to eliminate cholera in their settings by 2030[2, 7].

For long-term sustainable solution of cholera elimination, services with WASH are important. According to Joint Monitoring Program (JMP) for Water, Sanitation and Hygiene, the current status of the population all over the country covered by safely managed drinking water supply is 56%[8] and has plan to increase >85% by 2025, and 100% by 2030. The accessibility to basic sanitation services has a plan to be increased from current level of 47%[8] to > 70% by 2025 and > 100% by 2030. The hygiene practice will be increased from current level of 40%[8] to > 80% by 2025 and >100% by 2030. All these factors are projected in the NCCP 2019 - 2030.

The Goal and Objectives of NCCP

Goal:

The goal is to reduce cholera morbidity and mortality by 90% within 2030 through early case detection and quick response to cholera outbreaks, improved case management and controlling endemic situation.

Objectives:

1. Conduct sustained and efficient surveillance system that is able to predict, detect, and respond to cholera outbreaks in a timely manner.
2. Ensure appropriate cholera case management in all health facilities
3. OCV vaccination in conjunction with WASH in cholera hotspots to complete interruption of transmission, and any new outbreaks.
4. Improve nationwide WASH Services as a long-term solution.

1.1 Situation analysis

Cholera remains in Bangladesh sometimes throughout the years from the ancient period. First six, out of seven pandemics, originated from this region. Mortality due to cholera has been reduced

dramatically but morbidity still remains as a threat for the health system of the country. Surveillance in icddr,b Dhaka hospital, 22 sentinel sites and outbreak response surveillance reveal continued existence of cholera all over the country round the year. Bangladesh has passive reporting and monitoring system for diarrheal diseases from health facilities, but there is provision of active surveillance system for cholera by IEDCR only during outbreak. Limited ongoing cholera surveillance that currently exists in Bangladesh are-

1.1.1 Cholera surveillance in Bangladesh

a. Surveillance on enteric infections including cholera in 22 sentinel sites of the country jointly by IEDCR & icddr,b covering all administrative divisions
b. Surveillance in Dhaka cholera hospital of icddr,b among admitted patients and
c. Investigation of reported/suspected cholera outbreaks by IEDCR.

a. Cholera surveillance in sentinel sites:

Bangladesh has started hospital-based enteric disease surveillance for cholera, Salmonella, Shigella and ETEC since May, 2014, in 10 district level hospitals under the cooperation of IEDCR and icddr,b. In 2016, the surveillance has been extended to more 12 health facilities only for cholera covering all geographical areas from overall Bangladesh. The health facilities included 6 sub-district Hospitals, 13 district hospitals, 2 tertiary level hospitals and one institute named Bangladesh Institute of tropical and Infectious Disease (BITID) in Chittagong. The surveillance sites were Thakurgaon, Naogoan, Habiganj, Narshingdi, Satkhira, Patuakhali, Cox's Bazar, Tangail, Narayanganj, Chuadanga, Meherpur, Comilla, Kushtia district hospitals and Sub-district hospitals were Chaugacha (Jessore), Madan (Netrokona), Chhatak (Sunamganj), Bakerganj (Barisal), Mathbaria (Pirojpur) and Shibganj (Chapai Nawabganj) (Figure:1).

Figure 1: *Twenty two nationwide surveillance sites for cholera in Bangladesh, May, 2014 - December 2018.*

Table 2: Cholera scenario in 22 surveillance sites in Bangladesh (2016- 2018)

Surveillance Sites	Total stool sample tested	Culture Positive, n (%)
Narsingdi	796	8 (1.0)
Habiganj	1,917	97 (5.1)
Cox's Bazar	1,975	144 (7.3)
Naogaon	1,469	53 (3.6)
Patuakhali	1,548	73 (4.7)
Thakurgaon	1,381	18 (1.3)
Satkhira	1,265	24 (1.9)
Dhaka Medical College Hospital, Dhaka	701	23 (3.3)
Uttara Adhunik Medical College & Hospital (UAMC&H), Dhaka	555	27 (4.9)
Bangladesh Institute of Tropical & Infectious Diseases (BITID), Chittagong	1,535	213 (13.9)
Tangail	2,220	110 (5.0)
Narayanganj	1,850	253 (13.7)
Chuadanga	1,525	80 (5.2)
Meherpur	1,711	39 (2.3)
Comilla	871	68 (7.8)
Chowgacha, Jessore	395	15 (3.8)
Kushtia	1,873	79 (4.2)
Madan, Netrokona	366	8 (2.2)
Chhatak, Sunamganj	615	13 (2.1)
Mathbaria, Pirojpur	959	53 (5.5)
Bakerganj, Barishal	265	35 (13.2)
Shibganj, Chapai Nawabganj	673	15 (2.2)
Total	**26,465**	**1448 (5.5)**

b. Cholera surveillance in icddr,b, Dhaka Hospital

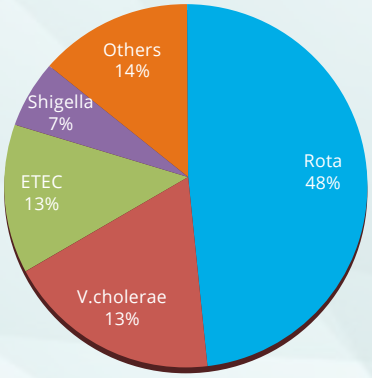


Figure 2: *Enteric pathogens isolation rate of diarrhea patients in icddr,b Dhaka hospital during 2014- 2018*

The icddr,b Dhaka hospital, publicly known as cholera hospital, has well established surveillance system for cholera including other enteric infections. It has been conducting hospital based systemic surveillance since 1979. People in and around Dhaka city suffering from diarrhea prefer getting treatment from icddr,b. Surveillance data revealed that the most common organism causing diarrheal diseases are: Rotavirus, cholera, ETEC, shigella and others. Among the isolated pathogens, 18-20% of the total diarrheal cases are due to cholera (Figure: 2) which can increase up to 40% during the two seasonal peaks, in the autumn and spring[3,4]. Among the existing 50 thanas in Dhaka city most of the cholera cases comes from.

Mohammadpur, Kotwali, Khilkhet, DakshinKhan, Tejgaon, Turag, Jatrabari, Badda, Uttara, Kamrangirchar, Sabujbagh, Lalbagh and Mirpur, (Table: 3).

Table 3: Population based hospitalization rate (per thousand) of cholera cases in Dhaka City at icddr,b hospital (2014-2018).

Name of Thana in Dhaka city	Hospitalization Rate (per thousand)					
	2014	2015	2016	2017	2018	(2014-18)
Mohammadpur	2.8	2.5	2.0	2.9	3.9	2.8
Kotwali	2.3	3.8	1.5	3.8	2.2	2.7
Khilkhet	10.0	1.8	0.7	0.0	1.1	2.7
Dakshinkhan	1.1	1.9	1.1	2.6	5.4	2.4
Tejgaon	3.3	2.6	1.9	1.9	2.2	2.4
Turag	2.8	3.3	1.5	0.9	3.2	2.3
Jatrabari	1.1	1.5	1.1	2.7	2.6	1.8
New Market	1.0	0.0	1.0	1.9	3.7	1.5
Sabujbagh	1.9	0.9	1.1	1.6	1.5	1.4
Lalbagh	2.1	0.8	1.0	1.5	1.5	1.4
Kamrangirchar	1.0	1.0	2.5	0.5	1.5	1.3
Khilgaon	0.6	0.9	2.3	1.7	0.8	1.3
Motijheel	1.1	0.7	0.2	0.9	2.9	1.2
Sutrapur	0.7	2.0	0.0	1.3	1.8	1.2
Mirpur	1.1	0.4	0.3	0.7	3.1	1.1
Shah Ali	1.7	2.1	0.0	0.8	0.8	1.1
Sher-e-Bangla Nagar	1.8	0.7	1.7	1.0	0.0	1.0
Adabor	0.9	0.9	0.5	0.5	2.3	1.0
Kadamtali	0.7	1.2	0.9	0.8	1.5	1.0
Gulshan	1.9	0.0	0.2	1.3	1.3	0.9
Darus Salam	1.8	1.5	0.3	0.3	0.0	0.8
Hazaribagh	0.0	1.3	0.0	1.5	1.0	0.8
Rampura	0.0	0.6	0.6	1.3	1.2	0.8
Badda	2.4	0.4	0.2	0.4	0.3	0.8
Gendaria	1.1	1.0	1.0	0.3	0.3	0.8
Uttara	0.3	0.3	0.3	0.8	1.8	0.7
Demra	0.6	0.4	0.2	1.0	1.0	0.7
Kafrul	0.6	0.8	0.2	0.2	0.7	0.5
Cantonment	0.0	0.7	0.4	0.0	0.4	0.3
Pallabi	0.4	0.1	0.2	0.1	0.2	0.2
Tejgaon Industrial Area	0.0	0.3	0.0	0.0	0.0	0.1

** Population is adjusted yearly with Census 2011, Bangladesh (Source: icddr,b)*

c. Cholera surveillance in suspected/reported outbreaks in the country

From February 2011 to August 2014, IEDCR conducted total 10 outbreak investigations in nine districts of Bangladesh. A total 6,670 AWD cases had been reported and investigated. Rectal swab collected from 192 AWD patients; culture confirmed cholera were isolated from 85 collected samples. Average percentage of cholera detection rate was 44.3%; the range of isolation rate varied from as low as 21.1% to as high as 80% in the areas of collected samples. The district in which outbreaks investigation were done: (1) Bogra, (2) Kishoreganj, (3) Tangail, (4) Dhaka City Corporation (in two thanas), (5) Netrokona (outbreaks persisted for as long as 70 days), (6) Mymensingh, (7) Narayanganj, (8) Chuadanga, (9) Kushtia. In those 10 outbreak investigations, total 10 deaths were reported from 6,670 AWD cases with a CFR of 0.1%, the range was from 0.1% to 0.3% indicating effective management of outbreaks and AWD cases had increased accessibility and availability of treatment facilities for cholera and diarrhea. The following table shows the results:

Table 4: Outbreaks of cholera (culture confirmed) in Bangladesh reported by IEDCR (2011- 14).

Place	Date	Duration (days)	Case #	Rectal Swab	% of V. cholerae positive, n (%)	Death	
						#	CFR %
Bogra Sadar	11-14 Feb 2011	4	22	17	5 (29)	0	0
Kishoreganj Sadar	15-19 Apr 2011	5	84	20	8 (40)	0	0
Tangail Sadar	14-25 Sep 2011	12	314	24	8 (33.3)	0	0
Kalayanpur, DCC	Oct 2011	10	644	65	24 (37)	2	0.3
Maddah Badda, DCC	8-15 Apr 2012	7	1500			0	0
Netrokona 15 Aug	25 Oct 2013	70	1568	41	33 (80)	5	0.3
Mymensingh A. M. College	27 Aug- 2 Sep 2013	7	64			0	0
Narayanganj	6 Oct 2013	7	645	6	3 (50)	2	0.3
Chuadanga Sadar	1-11 Aug 2014	11	1323		36	1	0.1
Kushtia Sadar	21-25 Aug 2014	5	506	19	4 (21.1)	0	0
Total/Average			**6670**	**192**	**85 (44.3)**	**10**	**0.1**

1.1.2 Water, Sanitation & Hygiene (WASH) Status

Cholera is generally transmitted through faecal contaminated water or food which has short incubation period (2 hours to 5 days) and the number of cases rise exponentially leaving a high number of deaths. Environmental factors such as climate variability, temperature, and rainfall play an important role in cholera transmission. Population density, urbanization, force displacement and overcrowding influence cholera transmission. It is also closely associated with the social and behavioral aspects of individuals as well as communities.

Bangladesh has moderate access to WASH services. WASH services significantly alters the spread of cholera, and is one of the most important tools for long-term sustainable cholera control and elimination program. Following table shows the current status of ongoing WASH activities in Bangladesh.

Table 5: Situation of Water, Sanitation and Hygiene (WASH) in Bangladesh (According to JMP report, 2017).

Access & Practice	National		Urban
Population covered with safely managed drinking water services	56%	61%	45%
Population covered with at least basic drinking water services	97%	97%	98%
Population covered with basic sanitation services	47%	43%	54%
Open defecation	<1%	<1%	0%
Availability of a hand washing facility on premises with soap and water	40%	31%	58%

(Source: JMP 2017)

1.1.3 Health Care System

Bangladesh is administratively divided in to 8 divisions, 12 city Corporation, 64 districts, 492 upazilas (sub-district), 328 municipalities, 4,554 unions and 40,986 wards[9]. The health care delivery follows the administrative tiers in the country. The health system of Bangladesh follows the administrative tiers of the country, and is built on six "building blocks" that make up the system. These are: (i) Service delivery; (ii) Health workforce; (iii) Information; (iv) Medical products, vaccines and technologies; (v) Financing; and (vi) leadership and governance (stewardship).

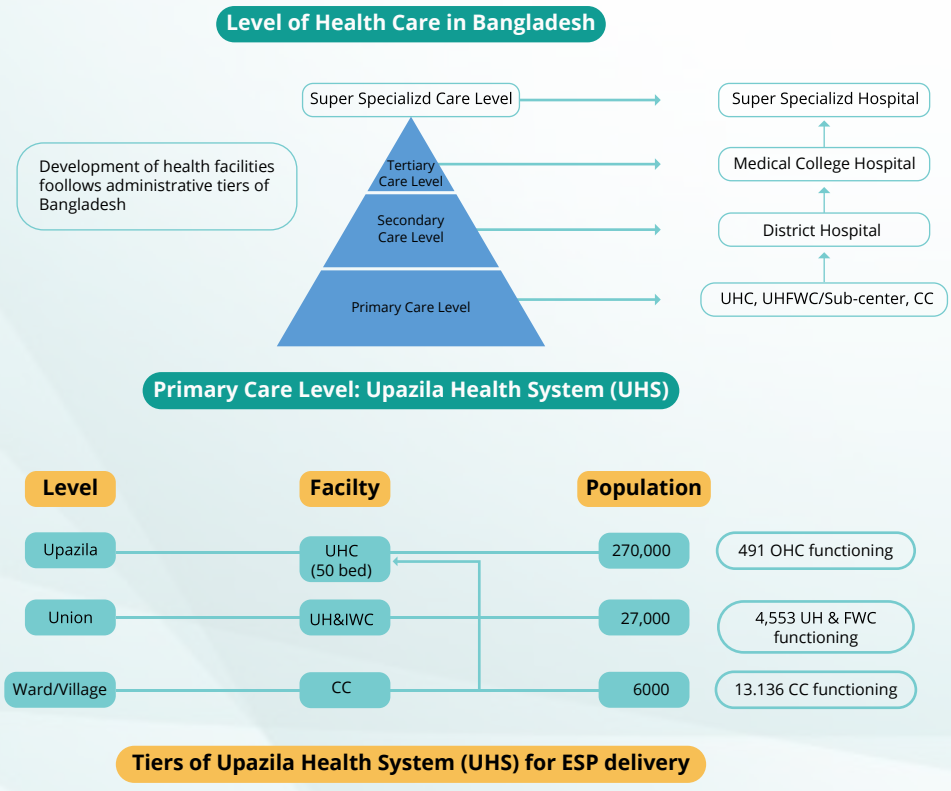


Figure 3: *Level of Health Care in Bangladesh.*

The health care services delivered through primary, secondary and tertiary level health care facilities (Figure: 3). At national level there are Medical College Hospitals and Specialized Hospitals; at divisional level Medical College Hospitals and district hospitals, at district level district hospitals with Medical College Hospital in some districts. At upazila (sub-district) level there is Upazila Health Complex (UHC), at union level Union Health & Family Welfare Center (UHFWC). Union sub-center (USC) and 20 bedded hospitals (Rural dispensaries) in some unions. At village levels there are Community Clinics (CC) for every 6 thousand populations. EPI Service is delivered through outreach sites located in public houses, UHFWCs, USC and CCs EPI service is also available in primary, secondary and tertiary level health care facilities. CC provides only out-patients services. In-patient bed facilities are available at UHC and above-level facilities.

1.1.4 Health Care Delivery

Health care services, including immunization, in Bangladesh are provided by the wings of two ministries; MOHFW and MOLGRD&C. MOHFW is responsible for providing health care services mainly in rural areas through primary health care centers (UHC, UHFWC, USC and 20-bed urban health centers). At urban areas MOHFW provide health services through secondary and tertiary level hospitals (Upazila health complexes, urban dispensaries, district sadar hospitals and medical college hospitals and specialized hospitals). Local Government division of the MOLGRD&C is responsible for providing Primary Health Care services in urban areas e.g. municipalities and city corporations. The urban health services are provided by NGOs supported by two projects (Urban Health Care Service Delivery Project (UHCSDP) and NGO Health Service Delivery Project (NHSDP). Each of the city corporations and municipalities are individual units who have separate health division responsible for supervision and monitoring of health care services in its jurisdictions.

Rural immunization services are delivered by Health Assistant (HA) and Family Welfare Assistant (FWA) of MOHFW and urban immunization services are delivered by government and Nongovernment Organizations (NGOs). Health Assistant (HA) and Family Welfare Assistant (FWA) of MOHFW maintain close contact with household members by door-to-door visit and develop health service related awareness.

Health Engineering Department (HED), a wing of MOHFW has the responsibility of construction, renovation and maintenance of toilets and for ensuring WASH services at upazila and below level health facilities- UHC, UHFWC and CC.

1.1.5 Current Cholera Containment Situation in Bangladesh

Bangladesh has well-established diarrheal diseases recording and reporting system at all government health facilities but due to absence of diagnostic facilities, cholera is not reported separately from those health facilities. Bangladesh is the pioneer of using oral rehydration solution (ORS) in diarrheal diseases and almost all the people in this country know its use to prevent dehydration and deaths from diarrhea. There is oral rehydration therapy (ORT) corner

in each of the primary, secondary and tertiary level health care hospitals, which plays a vital role for correcting dehydration and averting diarrheal deaths including cholera. Moreover, diarrheal treatment is provided to the under five years children through Integrated Management of Childhood Illness (IMCI), which is established in almost all health facilities. As a result, diarrheal deaths have come down significantly. There have been notable achievements in combating diarrheal diseases; these efforts have rendered positive impact on preventing cholera deaths as well. The activities for cholera control to be strengthen during the planned period.

OCV vaccination experience: Bangladesh has experience of using OCV through very limited campaigns in Mirpur, Keraniganj and Kamrangirchar of Dhaka district[10]. From October 2017 to end of 2018, Bangladesh conducted four rounds of OCV campaign for FDMNs in Rohingya camps at Cox's Bazar. Approximately 700,487 doses of OCV used during 1st round in October 10-18, 2017. In that campaign icddr,b provided technical assistance along with other national and international partners.

Second round of OCV was delivered to 200,000 children aged 1-5 years along with OPV from 4-9 November 2017. The 3rd round of OCV campaign was done from 6-13 May 2018 for the newly arrived FDMNs and the host community and a total of 879,273 FDMNs received OCV. In the fourth round, total 428,556 doses of OCV delivered with routine EPI vaccines from 17 November 2018 for a target population of 328,556 of which 224,788 were FDMNs, and 103,768 were surrounding host community.

1.2 Strength, Weakness, Opportunity and Threat (SWOT) Analysis

Table 6: SWOT Analysis

Strength	Weakness	Opportunity	Threat
1. Strong political commitment by GoB. 2. Functional Upazila Health System (UHS). 3. Extensive network of primary care level health facilities. 4. Strong Community Based Health Program. 5. IEDCR for disease surveillance. 6. Strong EPI network. 7. Availability and extensive practice of ORS (Bangladesh is house of ORS.	1. Surveillance and reporting of cholera case is not optimum as not separately done. 2. No lab facility at district & upazila level for cholera diagnosis. 3. No routine reporting of cholera case from peripheral health facilities. 4. WASH services is yet to be optimum. 5. Frequent destruction by natural calamities of WASH infrastructure.	1. IEDCR strengthen for improving surveillance. 2. icddr,b for technical support. 3. GTFCC for fund raising and technical support. 4. Development Partners (DPs) support for technical assistance and oversight.	1. Timely receipt of adequate funding from GTFCC. 2. OCV supply (OCV global supply is limited). 3. Cross boarder transmission of cholera cases.

8. No open defecation. 9. Acute Watery Diarrhea (AWD) case fatality rate (CFR) is in grip. 10. Established and functional reporting system of AWD. 11. Cholera cases and CFR can be estimated from AWD report. 12. Cholera diagnostic facility available centrally at IEDCR and icddr,b. 13. Moderately accessible WASH services.			

2. Strategies for Cholera Elimination

Considering the country's existing capacity and available information, cholera elimination strategies have been designed as short, mid and long term activities. Interventions, such as, mass vaccination campaign with OCV, timely and appropriately case management, establish and strengthen nationwide cholera surveillance system and wide access to WASH resources are the key approaches have been included in this strategic plan to be achieved through an integrated multi-sectoral approach.

2.1 Key Strategic Activities (2019- 2030)

2.1.1 Short term activities (2019-2021)

Target: 25% reduction of cholera burden

- Multi-sectoral coordination mechanism among stakeholders and quarterly meeting on a regular basis.
- OCV demonstration campaign at cholera prone areas in Dhaka city along with strengthened WASH intervention.
- Initiate Rapid Diagnostic Test (RDT) based passive surveillance system for cholera at primary, secondary and tertiary level health facilities.
- Capacity development for cholera detection at all level of health facilities.
- Strengthen culture and Polymerase Chain Reaction (PCR) lab capacity at IEDCR as referral center.

- Identify hotspots/ high risk areas/ populations.
- Strengthen case management for cholera as per WHO guideline preferably through mHealth platform in all health facilities.
- Establish epidemiological unit with Surveillance Focal Point (SFP) at all level of health facilities.
- Establish Early Warning and Response System (EWARS).
- Ensure early detection, reporting and quick response system for cholera outbreaks. Routinely report surveillance data to global partners for monitoring regional and global cholera transmission patterns.
- Develop SOP for emergency outbreak response.
- Develop SOP to provide/strengthen WASH services
- Ensure safe water, sanitation and hygiene practices.
- Establish supervision and monitoring system.
- Ensure vaccine and logistics supply.
- Strengthen water surveillance system to prevent the use of cholera contaminated water.
- Establish awareness development program for all communities through appropriate communication mechanism.
- Program evaluation after the end of the short term activities.

2.1.2 Midterm Activities (2022– 2025)

Target: 50% reduction of cholera burden

- Multi-sectoral coordination mechanism among stakeholders and quarterly meeting on a regular basis.
- Revise strategy as per evaluation report after short term activities.
- OCV campaign along with WASH intervention in all identified cholera prone areas will be continued in phase wise manner.
- RDT based passive cholera surveillance system at primary, secondary and tertiary level health facilities.
- Establish/ strengthen culture facilities and PCR lab capacity at all the public Medical College Hospitals.
- Establish/ strengthen environmental laboratory at central and divisional level.
- Identify hotspots/ high risk areas/ populations.
- Strengthen appropriate case management in all health facilities.
- Establish/Strengthen epidemiological unit with Surveillance Focal Point (SFP) at all level of health facilities.
- Continue early detection, reporting and quick response system. Routinely report surveillance data to global partners for monitoring regional and global cholera transmission patterns.
- Strengthen safe water, sanitation and hygiene practices.
- Strengthen supervision and monitoring system.
- Ensure vaccine and logistics supply.
- Strengthen routine water surveillance system to prevent the use of cholera contaminated water.
- Strengthen awareness development program for all communities through appropriate communication mechanism.
- Strengthen evaluation after the end of the midterm activities.

2.1.3 Long term activities (2025- 2030):

Target: 90% reduction of cholera burden

- Multi-sectoral coordination mechanism among stakeholders and quarterly meeting on a regular basis.
- Revise strategy as per evaluation report after midterm activities.
- Expand appropriate WASH services gradually in all districts.
- OCV campaign along with WASH intervention in the newly identified hotspots and outbreak area.
- Sustainable surveillance system.
- Strengthen advocacy on safe water, sanitation and hygiene practices.
- Evaluation after the end of the Long term.

3. The strategic approaches for NCCP

- Strategic approach 1: Sustainable cholera surveillance system
- Strategic approach 2: Cholera case management
- Strategic approach 3: Oral cholera vaccination
- Strategic approach 4: Increase the access to safe Water, Sanitation and Hygiene intervention.
- Strategic approach 5: Coordination and monitoring through multi-sectoral approach.
- Strategic approach 6: Advocacy Communication and Social Mobilization (ACSM)

3.1 Strategic approach 1: Sustainable cholera surveillance system

3.1.1. Overall gaps in cholera surveillance

- Sustainability of surveillance system- Project based passive sentinel surveillance system including RDT exist for cholera, but sustainability is in question.
- Limited capacity available for cholera diagnosis at central level; no diagnostics facility for cholera at district and sub-district level health facilities.

3.1.2 Activities to strengthen cholera surveillance

1. Establishment of Rapid Diagnostic Test (RDT) for cholera identification to aid proper and timely case management in all public health facilities in Bangladesh and strengthen regular routine reporting.

2. Strengthened Laboratory Facilities

2.1 Strengthen laboratory in all Public Medical College Hospitals with culture capacity.

2.2 Strengthen capacity of IEDCR as National Cholera Surveillance Centre and establish Cholera reference laboratory at IEDCR.

3. Review the sentinel surveillance sites for proper geographical representation of the country and to identify new hotspots.

4. Enhancing Surveillance Capabilities

4.1 Capacity development at all level of health facilities for cholera to ensure early detection, reporting and quick response, including establishment of Early Warning, Alert and Response System (EWARS) at all levels.

4.2 Establishment of epidemiological unit with Surveillance Focal Point (SFP) at all level of health facilities.

5. Ensure regular need based supply of logistics and other resources to support early diagnosis and timely management of cases to stop transmission of cholera in the community.

Table 7: Mechanism for developing nationwide cholera surveillance system.

Indicator	Comment	Source of information
Axis 1: Early detection and quick response to contain outbreaks at an early stage		
Decentralized culture capacity for early detection of cholera in all sentinel surveillance sites.	▪ Not available in the country ▪ RDT available now in sentinel sites; but sustainability is uncertain as IEDCR currently have no fund	IEDCR, icddr,b,
Preposition of RDT & appropriate transport media (Cary Blair) in all sentinel surveillance sites.	▪ Both RDT & Cary Blair media temporarily available in sentinel surveillance sites, but may not continue if fund is not available further. ▪ Samples transported to central labs (IEDCR, icddr,b) using Cary Blair media. ▪ Except for the sentinel sites RDT is not available in all the districts, not even incorporated in the Operational Plan (OP).	IEDCR, icddr,b,
Culture and PCR characterization of isolated *V. cholerae*	▪ Available at IEDCR and icddr,b lab in Dhaka; this may serve the purpose.	IEDCR, icddr,b,
Early Warning/Surveillance system (EWARS).	▪ No EWARS in existence. AWD reporting system exists in all districts & sub-districts of Bangladesh; ▪ Cholera surveillance is ongoing in 22 sentinel sites. Sustainability depends on availability of fund if not supported by OP.	CDC, DGHS, IEDCR, icddr,b,
Axis 2: Multi-sectoral approach to prevent cholera in hotspots		
Identification of cholera hotspots	▪ Data of cholera/diarrhea surveillance aims to identify cholera hotspots	IEDCR, icddr,b,
National Cholera Control Plan aligned with the GTFCC roadmap	▪ Under process	CDC, DGHS
Financing mechanism & availability of funds	▪ National mechanism exists; funding reflection in respective OP is required for availability of funds in Operational Plan.	CDC, DGHS
Axis 3: Effective mechanism of coordination for technical support, resource mobilization and partnership at national level		
Existence of cholera focal point, in-charge of	▪ Director, Disease Control (DC) functions as national focal point;	CDC, DGHS

implementing NCCP & appointed by a high authority	▪ IEDCR & other partners like icddr,b, DPs & NGOs collaborate together	
NCCP integrated into regular program, cross sectoral collaboration and activities are projected in Operational Plan (OP) of CDC, EPI DGHS	▪ Such mechanism exists for National Program on Diarrheal Diseases Prevention, Manag-ment & Control. Cholera to be integrated in this mechanism under National Surveillance System. ▪ NCCP alignment with regular surveillance reporting system under consideration	CDC, DGHS

3.1.2.1 Establishment of Rapid Diagnostic Test (RDT) for cholera identification to aid proper and timely case management in all public health facilities in Bangladesh and strengthen regular routine reporting.

Currently there isn't any provision of identifying cholera at the health facilities at different level. NCCP aims to establish RDT based routine diagnostic facilities at all the public health facilities for immediate diagnosis for the sake of appropriate and timely case management of cholera cases presenting at the facilities. Each year, following the operational definition of cholera case, after the first identified case, every 10th case will be tested with RDT. Based on clinical, and/or RDT findings case management will be initiated immediately. All RDT positive samples will be sent to the nearest public medical college hospital (when established with the facilities) for confirmation by culture and sensitivity testing. SoPs with standard tools for data collection and reporting (e.g., patient line lists, reporting formats etc.) will be developed, concerned personnel will be trained on the use of RDTs, specimen collection, transport, and storage, data collection, reporting procedures, data analysis, logistics management etc. After implementation in the facilities, the activities will be regularly supervised and monitored.

3.1.2.2 Strengthened Laboratory Facilities

3.1.2.2.1 Strengthen laboratory in all Public Medical College Hospitals with culture capacity.

3.1.2.2.2 Strengthen capacity of IEDCR as National Cholera Surveillance Centre and establish Cholera reference laboratory at IEDCR,

All public medical college hospitals will be gradually strengthened with resources for culture capacity to diagnose cholera. This will help the nearest health facilities at district and upazilas. Gradually they will be upgareded with better facilities, initial preference will be on the divisional level hospitals.

In the referral center at IEDCR capacity will be strengthened to conduct PCR for the referred samples from sentinel sites, outbreaks and, if required, even for routine activities as well. IEDCR will participate in external quality assessment program and act as internal quality assessment referral center for medical colleges.

3.1.2.3. Review the sentinel surveillance sites for proper geographical representation of the country and to identify new hotspots.

The existing sentinel sites will be reviewed by IEDCR to identify new hotspot area/population and to have representative surveillance data for action and sharing with all concerned stakeholders. The RDT based diagnostic facilities at the sentinel sites will continue for the first four suspected cases each day for five days in each week and the sample of the positive cases will be sent to the referral laboratory at IEDCR for confirmation. Where on the basis of culture, sensitivity, and PCR findings data will be generated and shared with all concerned. Regular feedbacks to the professionals for case management and containment will be provided to the sentinel sites.

3.1.2.4 Enhancing Surveillance Capabilities

3.1.2.4.1 Capacity development at all level of health facilities for cholera to ensure early detection, reporting and quick response, including establishment of Early Warning and Response System (EWARS) at all levels.

To strengthen the surveillance system in the country, IEDCR will conduct annual review and implementation of guidelines, protocols, and processes, identify potential barriers and implement solutions to effective management of cholera surveillance. IEDCR will ensure logistics for the surveillance system, train the laboratory technicians and surveillance personnel on laboratory techniques, data collection, analysis and reporting.

Rapid response teams at national, district, upazila, district municipalities and City Corporations levels will be strengthened, trained for investigation and containment of outbreaks. At all levels response team members will be trained and emergency preparedness plan will be in place, so that within three hours of notification of any outbreak teams will be in action. All outbreaks are to be notified to IEDCR, so that national team could be always in communication with the local investigating team, and when required can go and intervene in the field.

All cases of an outbreak will be tested with RDT and positive samples will be sent to IEDCR for confirmation and further diagnostic processes.

IEDCR will also establish Early Warning, Alert and Response System (EWARS) for cholera and other infectious diseases of public health importance. EWARS is designed to improve disease outbreak detection in emergency settings. It is essential to detect disease outbreaks quickly before they spread, cost lives and become difficult to control.

3.1.2.4.2 Establish epidemiological unit with Surveillance Focal Point (SFP) at all level of health facilities.

a. Cholera Surveillance Focal Person: The CSFP is responsible for managing all surveillance activities for cholera in his/her assigned geographical area. The surveillance activities include:
Monitoring and ensuring surveillance for cholera.

- Ensuring timely investigation of and respond to cholera case/s and suspected outbreaks.
- Ensuring that all data from cases and outbreaks are properly collected, compiled, analyzed and interpreted for appropriate local action.
- Ensuring that data of passive surveillance, case investigation and outbreak investigation are forwarded timely to IEDCR.

b. Local Surveillance Officer (LSO): To assist CSFP in carrying out his/her surveillance responsibilities in implementing surveillance activities including case investigation, outbreak investigations, case or outbreak response intervention immunization and report to CSFP and IEDCR. The following table lists the CSFPs and LSOs for districts, City Corporations, Upazilas and Municipalities. The surveillance officer will ensure that data of surveillance, case investigation and outbreak investigation are forwarded timely to respective CSFP and IEDCR. The Municipal Medical Officer reports to respective Upazila Health & Family Planning Officer (UH&FPO)/ Civil Surgeon (CS).

c. Hospital Surveillance Officer (HSO): To facilitate and coordinate passive reporting of cholera cases and carry out investigation and other surveillance activities in Hospitals, Residential Medical Officer (RMO) is the hospital surveillance officer in the hospital. HSO is responsible for managing hospital surveillance system and for preparing and submitting cholera 'Weekly Line Listing Form for Hospitals and UHCs' to CSFP. For case-based surveillance HSO is responsible for notification, initiate case investigation, ensure sample collection, storage and sending of specimen to district/ national cholera laboratory (NCL).

d. Cholera Surveillance Medical Officer (CSMO): In every district, one medical doctor will be posted/assigned to provide all cholera surveillance, supervision and monitoring support in his assigned area/areas. He may be freshly recruited by WHO or existing WHO Bangladesh recruited Surveillance and Immunization Medical Officer (SIMO) will take this responsibility. He will closely work with District and upazila managers. National Professional Officer- Divisional Coordinator (NPO-DC) will coordinate his activities as usual. His responsibilities will be-

- Technical assistance to local health authorities in coordinating cholera surveillance activities
- Ensure passive and active surveillance
- Technical assistance to ensure timeliness and completeness of reporting
- Facilitate activities for investigation and reinvestigation of cholera cases
- Necessary orientation/training to relevant personnel to establish/strengthen surveillance network
- Coordinate activities for collection and transportation of specimens
- Technical assistance in case/outbreak response activities
- Analysis surveillance data and provide feedback in district and upazila meetings

Table 8: List of Cholera Surveillance Focal Person (CSFP) and Local Surveillance Officers (LSO), Hospital Surveillance Officers (HSO) for cholera surveillance.

Location	CSFP	LSO	HSO
District	Civil Surgeon	Medical Officer- Cs (MOCS),	
Medical College Hospital/ Specialized Hospital	Resident Physician (RP)		RP
District Sadar Hospital	Superintendent/ CS	RMO	Medical Officer Disease Control (MODC)
City Corporation	Chief Health Officer	Health Officer/Assistant Health Officers/Zonal Medical Officer	RMO
Upazila	UH&FPO	MO-DC	RMO
Municipalities with Medical Officers	Municipal Medical Officer	Municipal Medical Officer	MODC
Other Municipalities where MMO post vacant	Respective UH&FPO	MO-DC of UHC	MODC

3.1.2.5 Ensure regular need based supply of logistics and other resources to support early diagnosis and timely management of cases to stop transmission of cholera in the community. Current sentinel surveillance is running in collaboration with funds from icddr,b, and isn't sustainable. All activities in this NCCP document will be projected in the operational plan of the concerned directors (DC, CDC, IEDCR, EPI, HEB) under DGHS to ensure adequate fund allocation for smooth conduction of all the activities at different level with regular supply of the required logistics.

3.1.3 Timeline of Activities of surveillance system development

Table 9: Timeline of activities for surveillance system development.

Activity	Timeline
1. RDT based Cholera surveillance sites will be established and functional at upazila, districts and medical college hospitals	60% by 2021,100% by 2023
2. Number of Cholera outbreaks will be covered	90% by 2023 and 100% by 2030
3. Routine RDT based diagnostic facility is established in all districts	100 % by 2023
4. Establish cholera culture based lab at all Medical College Hospitals	100 % by 2023
5. Cholera reference lab strengthened/ established at national level	By 2020 at one in IEDCR (strengthen) and one in icddr,b (established)

3.1.4 Surveillance Performance indicators

Regular monitoring of surveillance indicators will identify cholera prone areas where intervention is needed. Surveillance indicators to monitor routinely the cholera situation are listed in the table below.

Table 10: Cholera Surveillance Performance Indicators.

No.	Indicators	Target
1	RDT supply and use in routine & outbreak investigation	100%
2	Completeness of passive reporting from all facilities	≥ 90%
3	Timeliness of passive web based reporting	≥ 90%
4	Suspected cholera cases investigation within 3 hours of notification at local level	≥ 80%
5	Operationally defined cholera stool samples are collected immediately after presenting with symptom	> 80%
6	Stool specimens arriving at laboratory in "good" condition	> 90%
7	Stool samples arriving at laboratory within 2 days after collection	> 80%
8	Stool culture result available within 4 days after specimen received at laboratory	> 80%
9	Cholera alert reported to higher level health authority within 1 hour of verification	> 80%

3.1.5 Special consideration for cholera surveillance Environmental Surveillance:

Cholera is primarily a waterborne disease and monitoring the presence of Vibrio cholerae in specific environmental water sources may identify sources or vehicles of infection and aid with the early detection of cholera transmission in some areas. Considering the presence of cholera in environment, a surveillance system for cholera in environmental samples will be developed with laboratory facilities at national and divisional level.

3.1.6 Estimated Budget for Cholera Surveillance Development

a. **Surveillance system development**
b. **Diagnostic facility establishment cost**

Table 11: Diagnostic Facility (RDT & PCR) establishment cost.

Health Facility	Number	Estimated RDT/Year/ Institute	Total RDT/year	Total cost in USD	Total cost in USD for 10 years	Remarks
Upazila Health Complex	491	250	122750	245,500	2,455,000	For isolation and for culture & sensitivity test.
District Hospital	64	450	28800	57,600	576,000	
Medical College Hospital	64	150	9600	19,200	192,000	
Total	619	850	526150	1,052,300	10,523.000	
*RDT unit Cost- 2 USD						

Health Facility	Number	PCR unit cost ($)	Total PCR cost ($)	Remarks
		PCR unit cost ($)	Total PCR cost ($)	One time cost for launching
Medical College Hospital at Division	8	8000	64,000.00	
IEDCR & icddrb	5	8000	40,000.00	
Total	13		104,000.00	
Grand Total	**18,355**		**$ 140,684.00 BDT 1,18,17,456/-**	

c. Capacity building/Training cost:

A. Total surveillance manpower needed @2/peripheral health facility: 18,342 x 2 = 36,684
B. Total surveillance manpower at MCH & IEDCR, icddr,b @5/facility: 65
C. Total surveillance manpower needed for identification: 36,749
D. Manpower surveillance training cost (for RDT) @2/health facility: 18,342 @ $300.00 x 2 = $11,005,200.00
E. Manpower surveillance training cost (for CS & PCR)@5/facility: 8 + 5 = 13 @ $ 500.00 x 5 = $ 32,500.00
F. Total manpower training cost for surveillance system development (d + e) = $ 11,005,200.00 + $ 32,500.00 = $ 11,037,700.00; BDT 927,166,800/-
G. Operational cost for training: $ 919,000.00; BDT- 77,196,000.00

Grand Total for Training: $ 11,956,700.00; BDT 1,004,362,800/-

Total cost for surveillance system development for cholera control: $ 24,046,700

3.1.7 Implementation Framework: Cholera Surveillance Monitoring and Evaluation

Table 12: Cholera surveillance monitoring and evaluation.

Pillar	Input	Activities	Output	Outcome	Impact
Surveillance	1. Designated surveillance officer, statistician will be employed/ filled in 2. up at upazila level. Statistician will be posted in all tertiary 3. care level hospitals. IT programmer will be employed at central level.	1. Surveillance system will be established from central to peripheral level under IEDCR with collaboration of Disease Control (DC), CDC, MIS, icddr,b & other partners for all diseases with emphasis on cholera and AWD. Disease Control unit of DGHS will prepare proposal in six months by August 2019. 2. Proposal submitted to appropriate authority for approval in Sep 2019. 3. Fund placed within twelve months by Feb 2020. 4. HR Recruitment process initiated by March 2020.	Proposal approval in nine months by Nov 2019. Relevant staffs recruited and placed by another six months- August, 2020.	National disease surveillance system for cholera is in place	Cholera cases reduced by 75% by 2025, and 90% by 2030.
	Reference manuals on surveillance and reporting formats including emergency preparedness, rapid response and outbreak investigation	National surveillance guidelines, manual/SOP, and reporting formats including emergency preparedness, rapid response and outbreak investigation guideline development	Guidelines for National surveillance and Emergency Preparedness, Rapid Response and outbreak investigation is developed by CDC with support from other stakeholders, including IEDCR, icddr,b, WHO and UNICEF by 2019 and disseminated within 2019 to all stakeholders.	Guidelines on Surveillance system, Outbreak investigation, and Emergency Preparedness and Rapid Response are in use at all levels for cholera and other diarrheal diseases. Data are entered in DHIS2 according to plan.	

	Training on disease surveillance including Emergency Preparedness and Rapid Response, outbreak investigation.	Outbreak investigation and Rapid Response team at all levels will be strengthened Training of all relevant staffs in all Health facilities is planned and imparted.	In addition to the surveillance staffs, relevant Doctor, Nurses, Medical Technologist (MT) , all field staffs are trained.		
	Outbreak investigation.	Field investigation occurred within 24 hours of notification of suspected cases.	Reports are generated and communicated, appropriate preventive measures identified and implemented, future guidelines are communicated.	Outbreaks are contained.	
	Logistics	Regular supply of logistics for outbreak investigation and Rapid Response activities	Logistics will be ensured at designated endemic sites		
	Data entry and Reporting	Data will be entered from the peripheral levels through DHIS2 and reports will be disseminated to the concerned stakeholders in time	Surveillance data are timely disseminated to all stake holders Reporting of results within 72 hours of receipt of specimens to health facilities and health district office	Regular follow up of cholera activities at all endemic sites	
	EWARS will be developed and established	EWARS will be incorporated in the DHIS2	Immediate alert system is functioning		
	Community Based Surveillance	Community based screening for cholera cases will be established at community clinic	SOPs for screening and referral will be prepared for CC	Suspected cases are screened at CC and referred immediately to UHC for further management	

	Reference laboratory for cholera at IEDCR	1. Establishment of reference lab for disease surveillanceat IEDCR. 2. National lab guidelines/SOP/training manual developed and disseminated. 3. Laboratory personnel are trained on appropriate laboratory techniques (collection, transportation, culture and sensitivity and/or PCR). 4. Systemic collection of specimen for culture or PCR, results available within 72 hours. 5. Availability of national referral laboratory of necessary technology for PCR characterization of isolated V. cholerae and cholera RDT at local level. 6. Availability of health facilities of RDTs and Cary Blair transport medium, other logistics.	1. Suspected cases will be tested with RDT at local level and systematic samples are collected and transported to laboratory (initially centrally, later to divisional labs when established). 2. Cholera Cases will be confirmed by culture/PCR at national and divisional level. 3. Logistics will be available at health facilities. 4. Reports are generated and disseminated.	Screening and confirmation for cholera is established.	
Management of cholera cases	Management of cholera cases following WHO guideline	1. Case management of cholera cases following WHO guideline. 2. Development of uniform guidelines and training manual for all endemic sites. 3. Conduction of training for relevant staffs at all sites. 4. Regular adequate supply of relevant logistics.	All staffs dealing with patient care will be trained with regular supply of necessary logistics	Nationwide proper management of cholera cases at all levels of health facilities.	

3.2 Strategic approach 2: Cholera case management

The case management of cholera patients will be usually undertaken in all health facilities following WHO guidelines. Routine RDT based testing facility for all public health facilities will be established and will be used in detecting cholera at all levels with laboratory support at all public health facilities and also at the central referral laboratory at IEDCR. Based on clinical, and/or RDT findings case management will be initiated immediately and modified after receiving the test result from laboratory. Use of the mobile platform for managing cholera cases will be explored. 3. Regular assessment of antimicrobial resistance (AMR) pattern will be utilized for patient's care. Uniform guidelines and training manual will be developed. All concerned will be trained and the activities will be implemented with regular supply of adequate logistics at all level.

3.2.1 Budget for cholera case management

a. **Guideline/Training Manual/Module Development**
b. **Training of service providers**
c. **Supply chain management**

3.3 Strategic approach 3: Oral Cholera Vaccination

3.3.1 Implementation Strategy for OCV Deployment

Table 13: Deployment and implementation strategy for OCV.

Input	Activities	Output	Outcome
OCV deployment in conjunction with WASH services according to risk assessment	1. Development of strategic plan for OCV deployment. 2. OCV deployment integrated in national plan. 3. National guidelines/SOP/training manual developed and disseminated to health facilities. 4. OCV training workshop conducted prior to campaign implementation. 5. Rapidity of reactive OCV deployment during outbreaks. 6. Proportion of cholera high-risk areas where OCV pre-emptive campaign implemented.	1. Country registered OCV will be available. 2. Capacity building of vaccinators. 3. Increased OCV coverage	Nationwide OCV vaccination according to risk assessment.

3.3.2. OCV Vaccination Campaign Plan

a. Oral cholera vaccine (OCV) Demonstration Campaign:

A large OCV demonstration along with WASH facilities will be carried out in Dhaka targeting 1.2 million population to gather evidence for targeted mass vaccination which will follow in other hotspot areas of the country in phase wise manner.

Table 14: OCV Campaign plan in high risk districts.

OCV Campaign plan in high risk districts							
Year	1	2	3	4	5	6	Total
	2019	2020	2021	2022	2023	2024	
District #	DCC (Demonstration)	DCC (Part)	4 (including) DCC	6 (Year 4 + Year 1)	6 (Year 5 + Year 2)	5 (Year 6 + Year 3	
Population in Million	1.2	5.45	13.30	21.15	25.40	19.95	86.45

b. First phase (Urban Dhaka) campaign:

High risk Dhaka urban population will be targeted for vaccination in the 1st phase that will be the testimony for conduction of nationwide campaign. Surveillance report of last five years indicate that maximum number of the patients seek treatment in icddr,b, are from the catchment area of Badda, Mirpur, Gulshan, Tejgaon, Mohammadpur, Jatrabari, Dakshin Khan, Sabujbag thana. Data reveals that overall annual incidence of cholera among the population in these areas ranges from 0.8 to 3.2 per 1000 population. Considering incidence rate, geographical location, effective communication, human resource and proper logistics management and based on previous OCV vaccination experience, Dhaka city would be convenient. The campaign will be organized in the rest of Dhaka city consecutively based on cholera incidence rate. About 5.45 million high risk populations will be targeted to vaccinate in the 1st phase.

c. Second phase campaign: **Outside Dhaka (Target Population- 13.30 million)**

After conducting 1st phase vaccination in Dhaka urban area, the high risk population of the hole country will be taken under consideration for vaccination with OCV in a phase wise manner. Priority areas will be selected based on district category risk assessment. Based on current nationwide surveillance in 22 sites' data, hospital burden due to cholera is highest in Chittagong (14%), Narayanganj (12.5%) and Comilla (9%). Estimated population of those districts are over 15 million as 8.4 million people in Chittagong, 6.0 million people in Comilla and 3.2 million people reside in Narayanganj district.

In this manner, the projected districts with high risk of cholera will be covered by OCV vaccination;

in addition WASH interventions will be continued in those districts for long term sustainability.

Recurrent campaign: After each phase of OCV vaccination in one area, it will be repeated at 3 years interval for containment of transmission (**Table: 14**).

In each of the phases, 1st dose of OCV will be given to the target population and second dose will be given to the same target population at least 2 weeks apart. Since the timelines of the cholera control planning is important, depending upon availability, WHO prequalified or domestically licensed OCV will be used. The vaccine will be deployed following Controlled Temperature Chain (CTC).

3.3.3 Program indicators and targets for OCV.

Table 15: OCV Program Indicators and targets.

OCV Indicators	
Indicators	**Targets**
OCV deployment integrated in national plan	OCV integrated in national plan by 2019
Generic Monitoring and Evaluation (M&E) protocol developed	Protocols developed by 2019
OCV training workshop conducted prior to campaign implementation	Training workshop occur prior to OCV campaign 100% of time
Rapidity of reactive OCV deployment during outbreaks	Initiation of OCV reactive campaigns within 1 week following vaccine arrival
Proportion of cholera high risk areas where OCV pre-emptive campaign implemented	OCV pre-emptive campaign implemented in all high-risk areas by 2024
Proportion of campaigns during which all logistics support are available in a timely manner	100%

3.3.4 Budget for OCV

Table 16: Phase wise OCV vaccination implementation plan including budget from 2019 to 2024.

Year		Coverage of vaccination	% of high risk population be covered	No. of at risk population be covered	No. of OCV doses required (2 dose/ person)	Total cost in USD	Total Cost in BDT
Year 1	Year	OCV Demonstration in Dhaka	10	1,200,000	2,400,000	6,000,000	504,000,000
Year 2	2020	Regular in Dhaka		5,450,000	10,900,000	27,250,000	2,289,000,000
Year 3	2021	Cholera endemic areas	20	13,300,000	26,600,000	66,500,000	5,586,000,000
Year 4	2022		30 (Year 4+ Year 1)	21,150,000	42,300,000	105,750,000	8,883,000,000
Year 5	2023		30 (Year 5+ Year 2)	25,400,000	50,800,000	127,000,000	10,668,000,000
Year 6	2024		10 (Year 6+ Year 3)	19,950,000	39,900,000	99,750,000	8,379,000,000
Year 1	6 years		100	86,450,000	172,900,000	432,250,000	36,309,000,000

* OCV cost in USD/dose= 1.85

Operational Cost in USD/dose= 0.65

OCV total cost USD/dose= 2.5

3.4 Strategic approach 4: Increase the access to safe Water, sanitation and Hygiene intervention

Bangladesh has performed well in achieving MDG targets for access to basic water and sanitation services. However, it is a big challenge for the country to achieve SDG targets by 2030, when we have to ensure access to safely managed water and sanitation services. Maintaining quality of services is the big challenge for achieving SDG targets. Water, Sanitation & Hygiene (WASH) service significantly alters the spread of cholera and is one of the most important tools for long-term sustainable cholera control and elimination program. The target is tracked with the indicator of "safely managed drinking water services"- the drinking water from an improved water source that is located in premises, available when needed, and free from contamination. Water chlorination with safe storage vessels testing showed that incidence of cholera infection was reduced by 75% and 58% in the storage container and chlorination groups respectively when compared to the control group. Some examples of water, sanitation & hygiene (WASH) activities that are ongoing in Dhaka City Corporation are:

- Through Dhaka WASA, installation of 5,635 metered pipe water connections covering 643,735 poor people living in the low income community/ slum.
- Through community contracting under the supervision of DNCC, installation of 100 toilets cubicles covering 3,000 urban poor.
- Through DNCC, formation and activation of community groups in zone-2 for solid waste management and awareness for faecal sludge management.
- Through DPHE and DNCC, dissemination of hygiene message (hand washing, MHM, safe excreta disposal, safe water handling) to poor communities targeting 100,000 unban poor of zone-2.
- Through DPHE, installation of safe water supply options like shallow and deep tube well, protected ring well, Pond Sand Filter, Gravity Flow System, Infiltration Gallery, Rain Water harvesting etc. are going on in rural areas of Bangladesh. Through DPHE, installation of water supply system including production tube well, pipeline, treatment plant, house connection etc. are going on in municipality and urban areas of Bangladesh.
- Dhaka WASA is constructing District Metered Area (DMA) to provide potable water to the city dwellers. Construction of 47 DMAs have completed and remaining DMAs will be completed by 2021.
- Dhaka WASA prepared the Sewerage Master Plan. Under Sewerage Master Plan 5 Sewer age treatment plan will be constructed in and around Dhaka city to bring all city dwellers under sewerage network.

The current status of the population all over the country covered by safely managed drinking water supply is 56%[8] and is expected to increase >85% by 2025, and 100% by 2030. The accessibility to improved sanitation is expected to increase from current level of 47%[8] to > 70% by 2025 and > 100% by 2030. We have to ensure 100% safely managed sanitation by 2030 to achieve SDG targets. The hygiene practice will be increased from current level of 40%[8] to > 80% by 2025 and >100% by 2030. All these factors are projected in the NCCP 2019 - 2030.

Climate change, urbanization, population growth, migration and force displacement will likely to increase the risk of cholera in the years to come since living in urban areas is steadily increasing with economic growth of the country as a consequence of industrialization, notably garment sector that has an impact on WASH services. The pressure on infrastructure in urban areas will therefore continue to increase, worsening access to safe water and basic sanitation. The basic WASH package with safe water is minimum requirement to reduce burden of cholera. BHE will take initiatives for an effective countrywide hygiene promotion.

3.4.1 Scheme for safe drinking water

The aim of the scheme is to ensure safe water to protect users from the pathogen that causes cholera aand to strengthen policy, regulatory, and monitoring mechanisms at the national level to support appropriate targeting with consistent and correct use of water. WHO/UNICEF jointly developed tool WASH FIT (Water and Sanitation for Health Facility Improvement Tool), an adaptation of the water safety plan approach. WASH FIT aims to guide small, primary health care facilities in low- and middle-income settings through a continuous cycle of improvement through assessments, prioritization of risk, and definition of specific, targeted actions.

The WHO/UNICEF JMP reported progress on drinking water, sanitation and hygiene update and baselines in 2017. The report introduces and defines the new indicators of safely managed drinking water and sanitation services.

3.4.2 Status on Water, Sanitation and Hygiene in Bangladesh.

Table 17: Water, Sanitation and Hygiene (WASH) progress in Bangladesh (According to JMP Report, 2017).

Access & Practice	National	Rural	Urban
Population covered wth safely managed drinking water supply	56%	61%	45%
Population covered with at least basic drinking water services	97%	97%	98%
Population covered with basic sanitation services	47%	43%	54%
Availability of a hand washing facility on premises with soap and water	40%	31%	58%

Source: JMP 2017

3.4.3 Result Frame Work (RFW) goal level WASH indicators

Table 18: RFW Goal Level WASH indicators.

SL. No.l	Indicator	Means of verification and timing	Baseline & source	Target	
				2025	2030
1	2	3	4	5	6
Goal 1	Population covered by safely managed drinking water services	JMP/BDHS, every 3 years	56%, JMP 2017	80%	100%
Goal 2	Improved drinking water supply available	JMP/BDHS, every 3 years	97%, JMP 2017	80%	100%
Goal 3	Improved Sanitation available and accessible	JMP/BDHS every 3 years	47%, JMP 2017	70%	100%
Goal 4	Rate of open defecation	JMP/BDHS, every 3 years	01%, JMP 2017	0%	0%
Goal 5	At least basic hygiene practice exists	JMP/BDHS, every 3 years	40%, JMP 2017	80%	100%

3.4.4 Targets for WASH intervention

For long-term sustainable solution of cholera elimination, services with Water, Sanitation & Hygiene is important. The current status of the population covered by safely managed drinking water supply is 56%[8] that should be increased to >85% by 2025, and >100% by 2030. The accessibility to improved sanitation should be increased from current level of 47%[8] to > 70% by 2025 and > 100% by 2030. The hygiene practice should be increased from current level of 40%[8] to > 80% by 2025 and >100% by 2030.

The highlights of WASH services for implementation during the period of NCCP are:

- Preparedness for implementation of WASH response through strengthening of chlorination of community water supplies and monitoring water quality in piped network.
- Improved health care facility infrastructure, including WASH in facilities, availability of supplies, infection prevention and control, medical technologies, and decentralized access to health care (Oral Rehydration Points (ORP), in Bangladesh it is called Oral Rehy dration Therapy (ORT) corner that is already well established under running IMCI program), together with better community awareness and mobilization. Early detection and timely and effective case management of cholera reduce the case fatality rate to less than 1%.
- Establishment of WASH and Health Rapid Response Teams as separate entity for field interventions, risk evaluation, and immediate response.

- Maintenance of stocks of WASH supplies (rapid microbial test kits, chlorine tests, water disinfection technologies including chlorine, water tanks, and hygiene kits), and monitoring and enforcing food safety and water quality standards at all levels.
- Specific WASH interventions to prevent disease spread, such as increased use of safe water and effective water treatment at point of use, implemented effectively at large scale without delay.
- Community engagement and community-based interventions promoting hygiene practices.
- Implementation of reactive large-scale mass vaccination campaigns with OCV, to be initiated as soon as cases are confirmed for maximum impact.
- Establishing contingency agreements with governments, agencies and supplies to ensure efficient planning and coordination for effective supply management, including rapid procurement, importation, warehousing and prompt distribution of equipment and other resources for immediate response.

To reach goal of global roadmap to 2030 for cholera control and elimination, the strategic approaches are:

3.4.5 Make Water, Sanitation and Hygiene activities more 'Cholera-Sensitive'.

1. Improve quality of water and sanitation facilities.

It is crucial to improve the quality of water at source, in storage, and at point of consumption- and sanitation facilities to limit transmission of infection. There is also a need to ensure that households that have a piped water supply also have water that is safe for drinking. Awareness campaigns along with social drivers can be effective in meeting these needs.

2. Strengthen implementation of hygiene-related activities.

Hygiene remains the weakest link in the water and sanitation sector. At the strategic level, the 2014 draft National Water Supply and Sanitation Strategy adequately addressed this issue. It is now critical to finalize the draft 2014 Strategy and implement the action plan. The GoB will need to monitor progress of the implementation of the action plan through a high-level inter-sectoral committee. Particular emphasis should be placed on increasing the availability of hand washing stations and ensuring that these are used.

3. Strengthen the health sector response, but also build a non-health, multisectoral response for addressing cholera.

Operationally, this involves identifying interventions within sectors that have the potential to significantly improve WASH services for addressing cholera.

4. Align efforts of the various sectors with the overall goal of reducing cholera deaths.

Individual efforts by MOHFW and other ministries have the desired impact on cholera deaths. The relevant sectors such as health, local government, water and sanitation, education need to act in an integrated way to attain the broader national goal of reducing cholera deaths by 90% by 2030.

To enable this, improving WASH services must remain a high-level policy priority. Promoting interventions with cross-sectoral involvement will be useful. There is now mounting global evidence from diverse sources- including biological, epidemiological, and economic analysis- of a strong linkage between contaminated water and poor sanitation and hygiene with cholera. Over the years, poor water quality with poor sanitation and hygiene has been implicated as the most significant factor in the causal pathway of cholera that incur a significant economic loss.

3.4.6 WASH indicators and improvement target by year in %

Table 19: WASH: Water supply and water quality indicators and improvement target by year in %

WASH: Water supply and water quality indicator	Benchmark (%)	Target (%) by year	
		2025	2030
Proportion of people accessing and using improved and safely managed sources of drinking water.	56% JMP 2017	85%	100%
Proportion of water supply sources that have regular (every alternate year) water quality testing for bacteriological contamination.	NA	85%	100%
Proportion of families adapted water safety plan in managing safe drinking water.	NA	85%	100%
Percentage of health facilities with an improved and safely managed water accessible to all users at all times.	NA	85%	100%
Percentage of schools with an improved and safely managed water sources accessible to all users at all times.	NA	85%	100%

Table 20: WASH: Sanitation indicator indicators and improvement target by year in %

WASH: Sanitation indicator	Benchmark (%)	Target	
		2025	2030
Percentage of household members using safely managed sanitation facilities which are not shared.	56% (JMP 2017) 61% (JMP 2015)	70%	100%
Percentage of population not practicing Open Defecation.	99% (JMP 2017)	100% by 2020	
Percentage of child feces management safely (Under 5 years).	40%	70%	100%
Percentage of schools having safely managed sanitation facilities with running water inside the toilets, gender segregated and at least one toilet for every 50 students. It must be disabled friendly.	24% (with running water, but disable friendly)	70%	100%
Schools having water supply with functional water source.	**WS-96%, *FWS-25%	WS-100%, FWS-60	WS-100%, FWS-100

***WS: Water supply; *FWS: Functional water supply.*

WASH Indicator (Hygiene) target by year in %

Table 21: WASH: Hygiene indicators and improvement target by year in %

WASH: Water supply and water quality indicator	Benchmark (%)	Target (%) by year	
		2025	2030
Proportion of people accessing and using improved and safely managed sources of drinking water.	56% JMP 2017	85%	100%
Proportion of water supply sources that have regular (every alternate year) water quality testing for bacteriological contamination	NA	85%	100%
Proportion of families adapted water safety plan in managing safe drinking water	NA	85%	100%
Percentage of health facilities with an improved and safely managed water accessible to all users at all times	NA	85%	100%
Percentage of schools with an improved and safely managed water sources accessible to all users at all times	NA	85%	100%

3.4.7 Costing and Financing Estimates (Budget) for WASH.

Total upazila: 491
Hotspots: 120 upazila
Average population per upazila: 270,000
Total population in hot spots: 120 x 270,000 = 32,400,000 People= 6,480,000 Family.

Water cost:
Target: 100% water coverage
56% already covered by safe water; rest 44% of 32,400,000 = 14,256,000 people= 2,851,200 Family.
1 water source covers 500 people (100 families) through piped water supply system on premises
# of water supply system required= 28,512.
Fund required per water supply system = BDT 2,000,000/- (US$ 23,800).
Total fund required: BDT 57,024,000,000/-; USD$ 678,857,142 = **US$ 0.68 Billion.**

Sanitation cost: Hardware
Total Family = 6,480,000
30% covered already; rest 70% to cover = 4,536,000;
@ BDT 25,000/- per unit cost = BDT 113,400,000,000/- = US$ 1,350,000,000= US$ 1.3 Billion.

Faecal sludge/ solid waste management

Unit cost = 25, 00,000 BDT required unit = 50

Total cost = BDT 125,000,000, USD 1,488,095

Therefore total cost for sanitation = BDT 113,400,000,000 + BDT 125,000,000, = BDT 113,525, 000,000 = US$ 1,351,488,095 =USD 1.35 Billion.

Hygiene cost: Hygiene activities will be continued till 2030 in two phases, intensive and continuation phase.

Intensive phase: 4 Years

Total population to be covered: 32,400,000 @ US$ 4/person/year = 4x4 = US$ 16/person for 4 years = US$ 518,400,000.

Continuation phase: 7 Years

Total population to be covered = 32,400,000 @ US$ 2/person/year = 2x7 = US$ 14/person = USD 453,600,000 + 30% increase (market price adjustment and population increase) = USD 589,680,000 Total cost for hygiene promotion =USD (518,400,000+589,680,000) =USD 1,108,080,000= USD 1.1 Billion

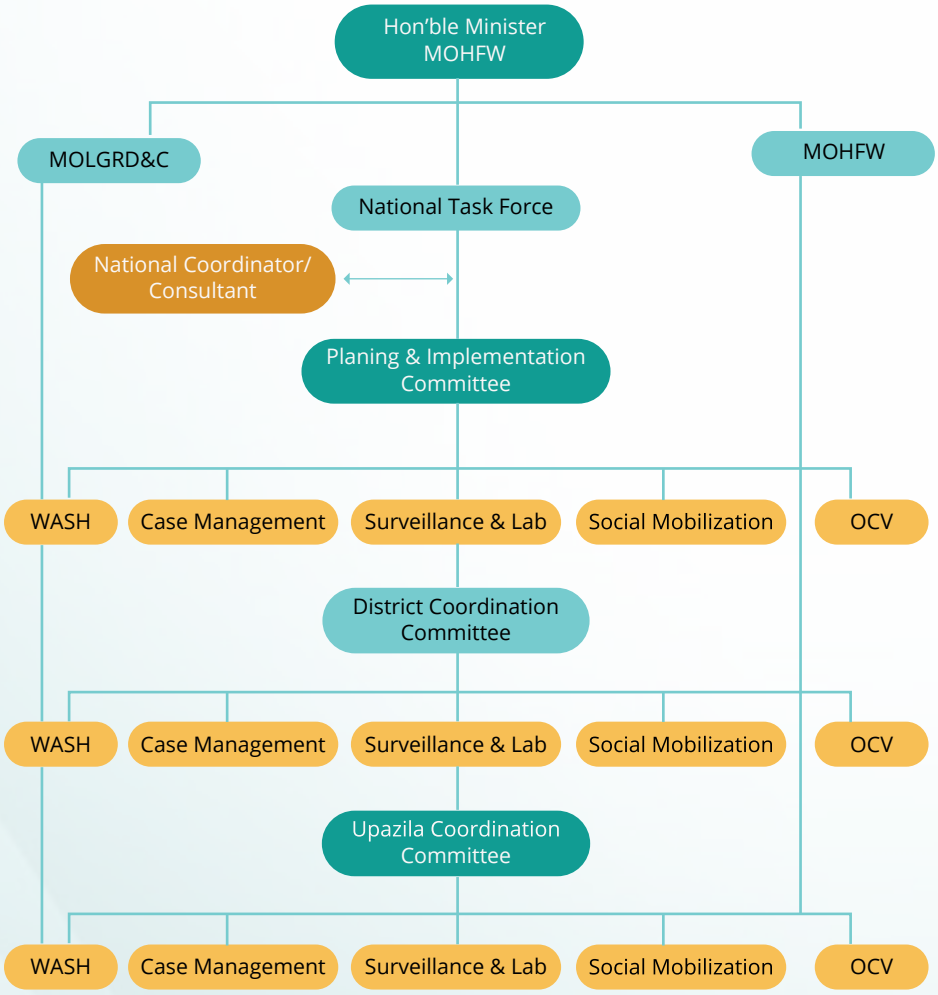
Total projected cost for implementation of WASH component: US$ 3.13 Billion (0.68 + 1.35 + 1.1).

Exchange rate: Rate of US$ and Date: US$ 1 = 84 BDT, Date: April 03, 2019.

3.5 Coordination and monitoring through multi-sectoral approach

Lead will be taken by the MOHFW with support and assistance from other stakeholders including DPHE, WASA, City Corporations & municipalities under MOLGRD&C with involvement of icddr,d, WHO, UNICEF, and other sectors/agencies outside health like Ministry of Education (MOE), WaterAid & other NGOs for planning and implementation. District Coordination Committee will be headed by Deputy Commissioner, and Upazila Coordination Committee by Upazila Nirbahi Officer (UNO).

Cholera Control Plan Governance Structure



Lead will be taken by the Ministry of Health & Family Welfare (MOHFW) with support and assistance from other stakeholders including DPHE, WASA, City Corporation & munucipalities under MOLGRD with involvement of icddr,d, WHO, UNICEF, and other sectors/agencies outside health like MOE, WaterAid & other NGOs for plan implementation District Coordination Committee will be headed by Deputy Commissioner, and Upazila Coordination Committee by Upazila Nirbahi Officer (UNO).

Figure 4: *NCCP Government Structure*

3.5.1 Leadership and Coordination

Under the leadership of MOHFW, the leadership and coordination will ensure the multi-sectoral task is established and program implementation is affected. The coordination framework for cholera control is mentioned below:

Table 22: Coordination Framework for NCCP

Coordination	
National Task Force for Cholera Control	Headed by Minister of Health & Family Welfare. Secretary of Health Division will work as Member Secretary with all inter-sectoral stakeholders including health, local government, CDC, IEDCR, EPI, DPHE, WASA, WHO, UNICEF, icddr,b, WaterAid.
Planning and Implementation Committee	Headed by Director General of Health Services with all inter-sectoral stakeholders including health, local government, CDC, IEDCR, EPI, DPHE, WASA, WHO, UNICEF, icddr,b, WaterAid
Technical Committee	Headed by Director, Disease Control (DC) with all technical specialists from all relevant organization and partners.
Terms of Reference	The committee will work with specific TOR at regular interval, may need to sit more frequently.
District Coordination Committee	Headed by Chairman, Zila Parishad of the district. Civil Surgeon will act as Member Secretary. Other members will be Executive Engineer of DPHE, City Corporations and Municipalities, District Education Officer (DEO), UNOs, UH&FPOs, Sis and co-opt members from relevant department
Upazila Coordination Committee	Headed by Chairman, Upazila Parishad. UH&FPO will act as Member Secretary. Members will be from LGED Engineer, UEO, UP Chairman, local elites and co-opt members from relevant department.

Interventions:

i. Establish a inter-ministerial task force and develop terms of reference for the task force.
ii. Establish legislative framework, communication and implementation strategy, inter-ministrial and inter-sectoral collaboration for healthy environment towards cholera control.
iii. Improve the activities for implementation of health education and promotion at individual and community level.
iv. Identify different target audience and to address cholera control issue.
v. Establish linkage with other Operational Plan (OP) of DGHS for implementation of respective Social & Behavior Change Communication (SBCC).
vi. Establish linkage with print, electronic and social media for community engagement for SBCC.

Legislative framework

Activities:

1. Evidence based advocacy with policy makers for enforcement of legislation for cholera control
2. Conduct advocacy workshop with the Parliamentarian Caucus group
3. Awareness building for legislation on pollution and controls in industrial areas
4. Establish inter-sectoral collaboration that influence cholera control and elimination

Collaboration for cholera control and elimination: Important stakeholders & key output areas:

Table 23: Collaboration for cholera control and elimination: Important stakeholders & key output areas

Stakeholders	Key strategic areas
MOHFW	Provide overall policy directions, financial commitment, support to the Ministers and stakeholders, and review and monitor Bangladesh's national and global commitments in cholera elimination. Provide national coordination with other sectors to facilitate cholera elimination, regulate standards of health services, facilitate cholera prevention, early case detection and quick response, treatment services, conduct cholera surveillance, mass media campaigns.
Ministry of Local Government, Rural Development and Co operatives (MOLGRD&C)	Lead initiatives to promote Healthy Settings Programs through Healthy City Projects which holistically address establishing city dwellers friendly environment, enforce food safety, support Healthy Schools and Healthy work place initiatives; and integrate healthy lifestyle education and cholera screening in urban primary health care facilities.
Ministry of Education (MOE)	Support for curricular inclusion on healthy lifestyle, food safety, WASH promotion, participate in scaling up of preventing water borne diseases.
NGOs	Participate in policy lobby, provide cholera control and elimination support services, and engage in prevention of specific risk factors and prevention programs such as projects related to promotion of WASH intervention.

Advocacy and Coordination

Advocacy and coordination is essential to have SBCC activities aligning with cholera elimination policies and guidelines, promoting linkage with different health care services.

Activities:

1. Collaborate with relevant sectors and organizations for comprehensive planning and implementation of Lifestyle and Health Education and Promotion programs.
2. Conduct workshops with stakeholders at National, Divisional, District and Upazila levels to facilitate smooth implementation of activities of cholera control and elimination.

3. Coordinate interventions with other National and Sectoral interventions conducted by other departments and organizations.
4. Advocate to reduce cholera high risk behaviors
5. Procurement of Service Package to conduct advocacy meeting, seminars and other awareness raising activities on Cholera and Water borne diseases.
6. Inter-sectoral & Multisectoral advocacy and coordination meeting with other OP's
7. Promotion of quality essential health-care services at public hospitals to achieve the Universal Health Coverage (UHC).

3.5.2 Program indicators and targets for leadership and coordination

Table 24: Leadership and Coordination Indicators for NCCP

Leadership and Coordination Indicators	
Indicators	**Targets**
National Plan for Cholera Control developed and disseminated	Plan developed by 2019, disseminated by 2019
Resources: funds receive versus those request (breakdown by donor and by sector)	Funding available for 100% components of the plan
Functional National Cholera Task Force (NCTF) in place	Terms of Reference (TOR) of NCTF finalize and 1st meeting of NCTF by 2019
Number of meetings held by coordination bodies (NCTF, subcommittees and technical working groups, etc)	Quarterly and/or need based
Proportion of sectors (Health Sectors, WASH authorities, etc.) engage in coordination bodies meetings	At least 90%

Planning and Coordination

Prevention and containment of cholera requires integrated and well-coordinated efforts among stakeholders at different levels of both public and private sectors. For planning and coordination of activities, the following committees are being developed with their respective terms of reference (TOR):

- National Task Force for cholera control
- Emergency Response Committee (ERC) for cholera at all level
- National level
- Divisional level
- District level
- Upazila level

National Cholera Task Force (NCTF)

It is the highest policy formulation body at national level comprising Hon'ble Ministers of MOHFW, Secretaries and high officials of Ministry of Health and Family Welfare and related Ministries. It also includes top executives of concerned UN bodies, professional bodies and different stakeholders.

Chairperson

Hon'ble Minister, Ministry of Health & Family Welfare

Co-chairperson

Hon'ble State Minister, Ministry of Health & Family Welfare

Member Secretary

Secretary, Health Service Division, Ministry of Health & Family Welfare

Members

(Not according to warrant of precedence):

1. Joint Secretary- Planning Wing, MOHFW
2. Joint Secretary (WHO & Public Health)
3. Joint Secretary, LGRD&C
4. Joint Secretary, Finance
5. Joint Secretary, MOE
6. Director General, Directorate General of Health Services
7. Director General of Family Planning
8. Director General, Department of Environment
9. Director (Disease Control) and Line Director, Communicable Disease Control (CDC), DGHS
10. Chairman, Bangladesh Food Safety Authority
11. Managing Director, Dhaka Water Supply and Sewerage Authority (WASA)
12. Chief Engineer, Department of Public Health Engineering (DPHE)
13. Chief Health Officer, Dhaka North City Corporation
14. Chief Health Officer, Dhaka South City Corporation
15. President/Secretary General, Bangladesh Medical Association
16. Public Health Specialist (by name)
17. Immunization and Vaccine Management Specialist (WHO GTN Trained) (by name)
18. Executive Director, icddr,b and Dr. Firdausi Qadri, icddr,b
19. Country Representative, World Health Organization (WHO)
20. Country Representative, UNICEF
21. Country Representative, Water Aid
22. Co-opt member

Terms of reference

- Approval of the Strategy, Action Plans and Guidelines for prevention and control of cholera.
- Decision/Approval on proposals/recommendations sent by National Technical Committee.
- Oversee implementation status of National Strategy Action Plans and Guidelines for prevention and control of Cholera.
- Review and approve budgets for the different activities outlined in Action Plan.
- Meet every six month and at shorter intervals if required.
- Co-opt member(s) if and when necessary.

Emergency Response Committee (ERC) for cholera control

It is the highest multi-sectoral and multidisciplinary executive technical body at Directorate level headed by Director General of Health Service (DGHS) and Director, Communicable Disease Control, DGHS as Member Secretary. Representatives from relevant stakeholders, leaders of professional body and executives of UN organizations have been included in this committee. This committee has incorporated eminent personality(s) from different sectors.

Chairperson

Director General of Health Services

Co-chairperson

Additional Director General (Planning and Research) of Health Services

Member Secretary

Director (Disease Control) and Line Director, Communicable Disease Control (CDC), DGHS

Members

(not according to warrant of precedence)

- Director (Hospitals), DGHS
- Line Director, MNC&AH, DGHS
- Director, Institute of Epidemiology, Disease Control & Research (IEDCR)
- Director, Institute of Public Health (IPH)
- Director, National Institute of Preventive and Social Medicine (NIPSOM)
- Director, Primary Health Care
- Representative from World Health Organization (WHO)
- Representative, UNICEF
- Representative from icddr,b
- Coordinator, Core Working Group
- Co-opt member

Terms of Reference

- Develop and periodical review of Strategy, Action Plans and Guidelines for prevention and control of cholera in case of outbreak for consideration of NTF
- Propose budgets for the different activities outlined in Action Plan
- Monitor and evaluate implementation status of Strategy, Action Plans and Guidelines
- Coordinate with other Directorates and sectors involved in the Action Plan;
- Meet every 3 month and when the country situation requires
- Co-opt member(s) if and when necessary

Core Working Group (CWG) for Cholera Control

Coordinator

- Director, Disease Control & Line Director, Communicable Disease Control, DGHS

Members

(not according to warrant of precedence)

- DPM, AMR, Viral Hepatitis & Diarrhea, CDC, DGHS
- PSO, Department of Microbiology, IEDCR
- Assistant Professor/ Representative, Department of Microbiology, IPH & NIPSOM
- DPM/Representative from Hospital Management Service, DGHS
- NPO (Epidemiology), WHO/ Representative
- Representative, IDD, icddr,b
- Assistant Professor/ Representative, Dept. of Microbiology BSMMU
- Assistant Professor/ Representative, Dept. Microbiology, DMC
- Representative, Dhaka- WASA
- Competent Representative, Water AID
- Competent Representative, UNICEF
- Co-opt member

Terms of Reference

- Develop and periodical review of Strategy, Action Plans and Guidelines for prevention and control of Cholera for consideration to NTF
- Monitor and evaluate implementation status of Strategy, Action Plans and Guidelines
- Coordinate with other Directorates and sectors involved in the Action Plan
- Meet every month and when the country situation requires
- Secretarial support of the NTF will be provided by this committee
- Co-opt member(s) if and when necessary

3.6. Advocacy Communication and Social Mobilization (ACSM)

3.6.1 Communication:

A Core Communication Committee will be formed under the leadership of the Director, Disease Control. Bureau of Health Education, UNICEF, BTV, Bangladesh Betar and other Stakeholders, engaged in developing health related IEC materials, will be included in this committee. The committee will develop need based different types of IEC materials on cholera during outbreaks and also during OCV vaccination campaigns. The committee will develop public awareness regarding WASH intervention. The committee will take initiative to include cholera and WASH in primary/secondary education curriculum. All IEC materials will be used after approval of IEC Technical Committee of MOHFW.

3.6.2 Advocacy and social mobilization

Bangladesh has made commendable success in health sector. Strong political commitment from the government, effective service delivery, multi-sectoral SBCC, supply chain, collaboration with government and non-government organizations (NGOs) have contributed in this achievement. Almost all the people of the country are well aware of the use of ORS during diarrhea and more than 99% children have access to first vaccine i.e. BCG. As a result, infant and under five and maternal mortality reduced significantly. Bangladesh has achieved most of the health related MDG goals before its time limit. In the process of cholera control program, comprehensive advocacy and social mobilization program will be taken to develop awareness among all populations. The process includes:

a. Community engagement:

The key access of child immunization and other health intervention is related to engagement of community people. Community key persons like public representatives, religious leaders, youth club, school teachers, local journalists and community leaders played a vital role in developing public awareness and success of the programs. Currently community people have been engaged in Community Based Health Care (CBHC) programs through Community Clinic (CC). Each CC has one community group and three community sub-group. During last HNP sector program (HPNSDP: 2011-2016) 11 number of positive lessons have been learned in implementing different SBCC activities which can be used to control cholera. These experiences will be applied to control cholera.

b. Media Engagement:

Previous experience reveals that media (both print and electronic media) media plays important role in widespread public awareness development on health programs. Mass media campaign, using radio and TV including government and private channels have been proved to be an effective approach to disseminate messages to the maximum number of population. This approach will be used for cholera control.

c. Coordination:

To strengthen the SBCC activities a strong platform can be formed through closer interactions

with different professional groups and committees like BCC Working Group, the HPN Coordination Committee which help integrating and harmonizing different SBCC initiatives across health and beyond health sector. Establishing linkages with all relevant factors including NGOs, and the private sectors to increase service coverage would be effective way for use in cholera control activities.

d. Advocacy:

Intensive communication campaigns can break religious conservatism and negative barriers on health related issues. Repeated dissemination of messages through workshops and campaigns to targeted stakeholders could increase the service demand. As part of policy advocacy IEM unit can take initiatives to update current communication strategy in line with the Comprehensive Social and Behavior Change Communication Strategy (CSBCCS) prepared by MOHFW.

The Operational Plan (OP) of CDC with cholera control activities to be revised align with Global Roadmap. Accordingly, in light with recently developed and approved Comprehensive Social and Behavioral Change Communication Strategy 2016 by MOHFW, bringing positive changes in people's lifestyle to improve health in cholera free environment would be the key strategic focus of the IEC OP that can be used also for reaching Global Roadmap targets of cholera deaths reduction by 90% by 2030.

3.6.3 Program indicators and targets for social mobilization

Table 25: Social mobilization Indicators for NCCP

Social Mobilization Indicators	
Indicators	**Targets**
National social mobilization plan developed and disseminated	Plan developed by 2019 & starts implementing from early 2020
Availability of all necessary logistical support for social mobilization	Necessary logistical support available 80% of the time in high risk areas
Training programs takes place for health promotion personnel	100% of planned training occur by 2020 in areas at increased risk of cholera
Implementation of social mobilization campaigns in high risk areas before OCV and WASH interventions	Evaluation occurs for 75% of social mobilizations campaigns
Implementation of social mobilization campaigns during outbreaks	100% outbreaks supported by social mobilization
Monitoring and evaluation surveys of social mobilization campaigns conducted	100% outbreaks supported by social mobilization

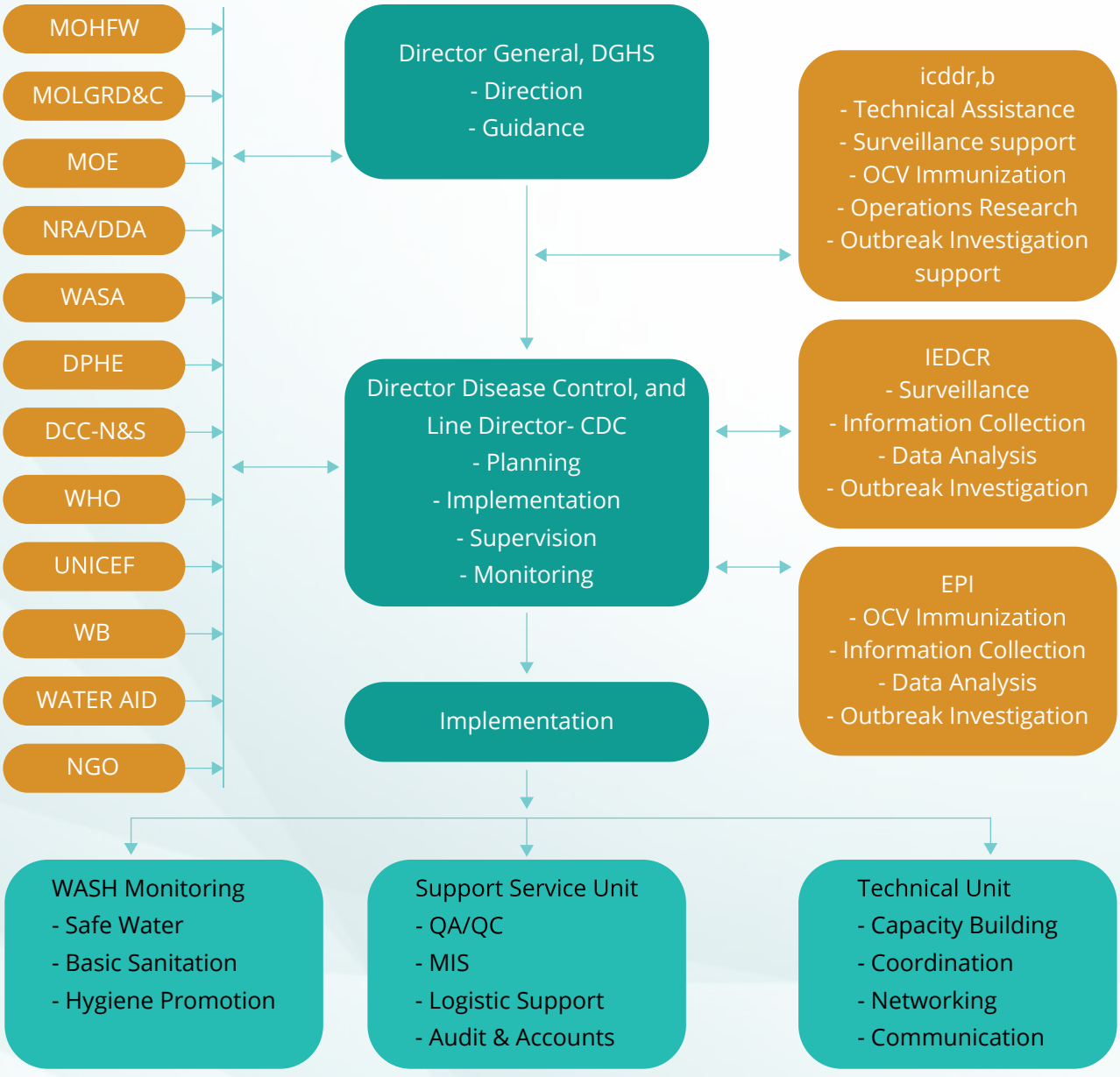
4. Implementation of National Cholera Control Plan for Bangladesh (NCCP)

4.1 Inclusion in Sector Wide Plan

The program will be included in the revised OP 2017-2021 of Communicable Disease Control unit of DGHS. WASH section will be included in budget of Local Government division of MOLGRD&C.

4.2 Implementation Framework

The following chart shows the implementation framework of national cholera control plan for Bangladesh. The chart also shows the individual responsibility of the stakeholders. The CDC, DGHS is the implementation focal point of the NCCP.



4.3 Implementation Targets and Activities for cholera control

Table 26: Implementation Targets and Activities for cholera control

Area	Targets	Proposed Activities	Lead Partners
Cholera Surveillance, OCV vaccination and WASH Intervention	* Cholera surveillance expansion * WASH intervention promotion * Use cholera expertise and tools to identify high-risk districts	* WASH promotional activities * Using data on unvaccinated targets to drive decision * Lab facility at district level * Micro-planning, technology platforms	DPHE, CDC, WASA, BHE, IEDCR and icddr,b, WHO, UNICEF, Water Aid
	* Use cholera resources to help build capacity to vaccinate - unreached targets - under- vaccinated targets	* Enhance supportive supervision in health care facilities * Channel SIMOs toward cholera specific surveillance system strengthening activity * Engaging in capacity building efforts focused on surveillance, OCV in trainings * Align cholera response activities in WASH with OCV immunization coverage improvement	EPI, CDC, IEDCR, icddr,b
	* Deliver other health interventions in national immunization schedule to cholera affected districts/hotspots where vaccination is ongoing	* Broad applicability: * Harmonize cholera vaccination and guidance in the country * Joint micro-planning for integrated OCV campaign processes * Identify concrete	IEDCR, CDC, EPI, icddr,b
Joint Planning	* Collaborate for joint planning of WASH & OCV	* Broad applicability: * Harmonize WASH and OCV campaign calendars at district level * Micro-planning for OCV campaign processes and WASH promotion * Identify concrete activities from joint WASH activities and OCV campaigns that will implement decrease deaths	MOHFW, MOLGRD&C, DGHS, DPHE, CDC, EPI, IEDCR, icddr,b, DCC, WHO, UNICEF, Water Aid

	* Maximize Joint Working Group platforms to conduct joint planning and commitments	* Ensure targeted agendas to plan, prioritize, and monitor progress on agreed upon targets/ milestones	
	* Ensure coherence of WASH promotion and immunization outreach activities and accountability framework	* Monitor performance * Track resources required * Can be done in conjunction with overall planning process including campaign microplan development	
Outbreaks Response	* Emergency WASH intervention * Align processes to ensure cholera outbreak surge personnel systematically build national capacity to strengthen WASH and immunization systems	* Ensure surge personnel have the skills required * Include national capacity building into TORs of cholera surge staff * Develop and disseminate messages and create effective demand generation strategies * Integrate specific recommendations on WASH and OCV campaign plans * Consider how to deliver other immunizations during outbreak response activities * Link integrated cholera outbreak detection and response to emergency WASH operations	DPHE, CDC, EPI, IEDCR, icddr,b, DCC
Strengthening Health Care Systems	* Identify select districts where cholera-funded staff and resources can be used for targeted HSS interventions	* Involve cholera-funded staff in identifying needs, HSS Global Roadmap application process, supporting implementation, etc. * Identify how best to coordinate these activities through existing and/or new mechanisms	MOHFW, MOLGRD&C, DGHS, Directorate General of Family Planning (DGFP), CDC, IEDCR
Monitoring and Supervision	* Ensure cholera supervision visits are linked with WASH promotion and immunization support plans, supportive supervision, and follow-up	* Bring culture of using data and evidence to drive decisions * Include government staff counterparts in supervision / monitoring visits by cholera staff	CDC, IEDCR, icddr,b, DPHE

Political advocacy	* Align advocacy efforts for immunization strengthening and cholera elimination * Align cholera resources to facilitate broad ownership for WASH and OCV immunization results and accountability	* Integrate cholera elimination and immunization system strengthening message into GTFCC roadmap in country * Ensure that cholera task force / executive committee meetings include WASH and OCV immunization advocacy * Implement strategies for engagement of community and religious leaders, community-based organizations, and professional organizations * Ensure civil society and NGOs are utilized to support cholera elimination advocacy	MOHFW, MOLGRD&C, MOE, DPHE

4.4. Potential risk and mitigation plan

While Bangladesh remains optimistic in achieving a 100% reduction in cholera deaths, there are a few risks that have been recognized. These risks and their mitigation strategies are discussed below:

Risk 1: Lack of Adequate Financing

Resource mobilization activities are available according to implementation plan. However, there stands a risk of failing to raise adequate funds to implement the multi-sectoral plan. The realization of this risk will lead to poor implementation of cholera control plan with other sectors having less funds or nothing at all to execute their activities.

Mitigation Activities

Each sector will cost their activities within the GTFCC framework specifically indicating what is required to implement their activities. These costing will be emphasized in the resource mobilization meeting/s and the risks of raising less funds will be shown.

Risk 2: Insufficient Quantities of OCV vaccines

As countries jump on board to kick out cholera by 2030, the GTFCC highlight the need for an estimated 44 million, 59 million and 76 million doses of OCV for 2018, 2019 and 2020 respectively. The production capacity for OCV was only at 25 million doses in 2017. As Bangladesh plans to introduce cholera as a preventive measure as opposed to a mitigation measure, the required number of OCV doses will sky rocket. With the global picture, the country may not receive the desired number of OCV doses and thus fail to reach their intended target.

OCV need of Bangladesh: Total 86.45 million from 2019 to 2024; 6.65 million in 2020, 13.30 million in 2021, 21.15 million in 2022, 25.40 Million in 2023, 19.95 million in 2024.

Mitigation Activities

The OCV team will work closely with the GTFCC and partners like Gavi to plan ahead for the number of vaccines required in a specific period of time. Based on this partnership, vaccine request and distribution strategies will be developed to ensure 100% vaccine coverage.

Risk 3: Cross Border Cholera Transmission

Bangladesh borders in three sides- west, north and east with India and a small side in South East with Myanmar. Bay of Bengal is on south side of Bangladesh. These countries suffer from cholera and pose a threat of cross contamination across borders.

Mitigation Activities

Collaboration and strengthening will be done with border security, communities and government structures like health facilities. Yearly training will be held for cross border staff and regular OCV vaccination will be given to populations around borders that pose a threat.

4.5 Monitoring Framework

In line with the GTFCC, the Bangladesh monitoring framework is designed under 3 axes. The GTFCC has the aim of reducing cholera deaths by 90%, and Bangladesh cholera control plan runs parallel to that of GTFCC. Being a state of good political atmosphere, the country is optimistic to achieve the implementation targets it has set to eliminate cholera by 2030. Moreover, Bangladesh does not face any crises and experiences relative peace and a safe political atmosphere. These attributes are a prerequisite to the elimination of cholera.

Table 27: Overview of outcome indicators

Axis	Indicators	Outcome indicators			
		Baseline	2021	2025	2030
Axis 1: Early case detection and response to contain outbreaks	Outbreaks severity measured by number of cholera deaths	NA	Reduce outbreaks deaths by 30%	Reduce outbreaks deaths by 50%	Reduce outbreaks deaths by 100%
Axis 2: Prevention of cholera morbidity by multi-sectoral interventions in cholera hotspots	Number of currently endemic districts that eliminate cholera as a threat to public health	21 districts remain affected by cholera	30% districts eliminate cholera	70% districts eliminate cholera	All 21 districts eliminate cholera

Axis 3: An effective mechanism of coordination for technical support, resource mobilization locally and internationally	Number of fully funded multi sectoral cholera control plan aligned to the Global Roadmap	Absence of fully funded multisectoral cholera elimination plan	Development of multisectoral cholera elimination plan with secured fund	Efficient implementation of multisectoral plan	All districts implemented multisectoral plan
Impact: Reduction of cholera deaths	Reduction of cholera deaths	NA	Reduce outbreaks deaths by 30%	Reduce outbreaks deaths by 50%	Reduce outbreaks deaths by 100%

In line with the implementation timeline, progress towards these indicators will be monitored every 3 years from 2022 t0 2030. Monitoring systems including activity logs and registers will be closely and regularly reviewed and reported. Additionally, process evaluations and impact studies will provide scientific accuracy in determining the effect of the multi-sectoral cholera control plan for Bangladesh.

4.6 Implementation Timeline

The commitment to eliminate cholera is shown by Bangladesh, and therefore the country has 10 years to implement the multi-sectoral plan across the three axes of Global Roadmap. The efforts and achievements made in the control of diarrheal diseases, measles control, polio eradication, and Maternal and Neonatal Tetanus elimination (MNTE) and WASH implementation activities already set a strong foundation to implement the activities to contain cholera as outlined in the multi-sectoral strategy. The Bangladesh government remains committed in eliminating cholera and setting this multi-sectoral plan in motion.

Table 28: Implementation timeline for NCCP

2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2019-30
2019: 1. Preparatory activities and establishment of plan: 2. Bangladesh commits to eliminate cholera by 2030. 3. Launch multi-sectoral cholera elimination plan. 4. Resource mobilization meeting. 5. Establishment of cholera				**Integrated Rollout:** 1. OCV + WASH capaign: initially in high burden hotspots, and gradually moving to medium to low burden areas. 2. Strengthening cholera case management			1. Health systems strengthening activities to improve surveillance and case management of cholera cases through regular supervision and monitoring activities. 2. Maintenance and repairs on cold chain equipment and WASH infrastructure.			

control focal point. 6. Revision & finalization of M&E tools for WASH, OCV, surveillance, social mobilization, and case management. 7. OCV registration. **2020:** 8. Surveillance system establishment/ implementation. 9. Integrated demonstration project: OCV & WASH. 11. Gradual implementation of OCV mass vaccination. 12. Impact study of integrated project. **2021:** 13. OCV campaigns gradual expansion plan, other hotspot.	and its implementation nationally. 3. Roll out of M&E tools in all sectors. 4. Implementation of BCC strategy. 5. Monitoring and evaluation of cholera outbreaks. 6. Improvement of WASH in communities, schools, and health facilities. 7. Process evaluation studies conducted.	3. Reinforcement of BCC (Behavior Change Communiction) strategy. 4. Rigorous evaluation of the impact of the multi-sectoral plan in cholera incidence. 5. Dissemination meeting to the local and international audience. 6. Development of process for certification of cholera free Bangladesh.

4.8. Program Evaluation

The progress of the cholera control plan will be evaluated after the end of short, mid and long term activities i.e. 2023, 2026 and 2031 respectively. For this purpose, nationwide evaluation survey will be carried out by third party as per WHO guideline. Result of the survey will be disseminated in high level dissemination program. Based on the evaluation report, the program will be reviewed and intervention will be applied for improvement, if needed. This evaluation will guide to reach the elimination goal by 2030.

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Annex 1: Use of Rapid Diagnostic Tests in Cholera Surveillance

Introduction

To effectively stop the spread of Cholera, it is necessary to rapidly detect all suspected Cholera[1] cases, at all levels and to undertake testing for cholera according to a systematic protocol based on the national testing strategy. The National Testing Strategies has been formulated by Communicable Disease Control, DGHS in consultation with the Institute of Epidemiology Disease Control And Research (IEDCR), icddr,b, and the International Federation of Red Cross and Red Crescent Societies (IFRC).

These recommendations should be considered based on the cholera situation in each upazila health complex, District hospital and Medical Colleges and Hospital:

- Communities without ongoing Cholera Outbreak
- Communities with Probable Cholera Outbreak

This document only addressed recommendations for Rapid Diagnostic Test (RDT) use. It does not include recommendations for other testing methods including confirmatory testing. RDT is not a Cholera Confirmatory test can only be used to detect probable cholera cases.

In all situations testing with RDT should be:

- performed by trained individuals
- in accordance with the manufacturers' instructions

Use of RDTs in communities without ongoing Cholera Outbreak

In communities without ongoing cholera outbreaks, surveillance aims to detect cholera transmission rapidly. It also triggers timely investigation and response aimed at containing the outbreak at an early stage. RDTs can be used to detect a probable cholera outbreak which increases the timeliness of Outbreak investigation and response.

Recommendations

- In communities ***without*** ongoing cholera outbreaks cases of Acute Watery Diarrhea with sign of dehydration should be tested as below.
  - Upazila health complex will test the ***first 3 -7 cases*** of Acute Watery Diarrhea with signs of dehydration every week and ***not more than 3 cases per day***,
  - District Hospitals will test the ***first 8 -10 cases*** of Acute Watery Diarrhea with signs of dehydration every week and ***not more than 3 cases per day***,
  - Medical College and Hospital and Infectious disease hospitals will test the ***first 8-10 cases*** of Acute Watery Diarrhea with signs of dehydration every week and ***not more than 3 cases per day***.
- During testing Acute Watery Diarrhea with severe dehydration should be prioritized.

[1]Suspected Cholera Cases: In area without declared Cholera Outbreak - patient aged 2 years and older presenting with acute watery diarrhea and severe dehydration or dying from acute watery diarrhea. In areas with declared Cholera Outbreak – any person presenting or dying with acute watery diarrhea

- Cholera suspects cases and RDT results should be reported daily to the health authorities through DHIS-2.
- RDT results should be interpreted by health authorities to detect a probable cholera outbreak.
- A series of suspected cholera cases should be classified as a probable outbreak when the number of persons with positive RDTs among tested suspect cholera cases (within 2 weeks) achieves or surpasses the thresholds shown in the table below.

Detection of a probable cholera outbreak

Number of suspect cholera cases tested by RDT	Number of suspect cholera cases tested positive by RDT	Interpretation
Among 3 to 7 cases tested	At least 3 RDT+	Probable cholera outbreak detected
Among 8 to 10 cases tested	At least 4 RDT+	
Among 11 to 14 cases tested	At least 5 RDT+	
Among 15 to 17 cases tested	At least 6 RDT+	
Among 18 to 21 cases tested	At least 7 RDT+	

• There is a probable cholera outbreak as soon as the minimum number of suspect cholera cases tested positive by RDT has been reached (taking into account the number of suspect cholera cases tested).

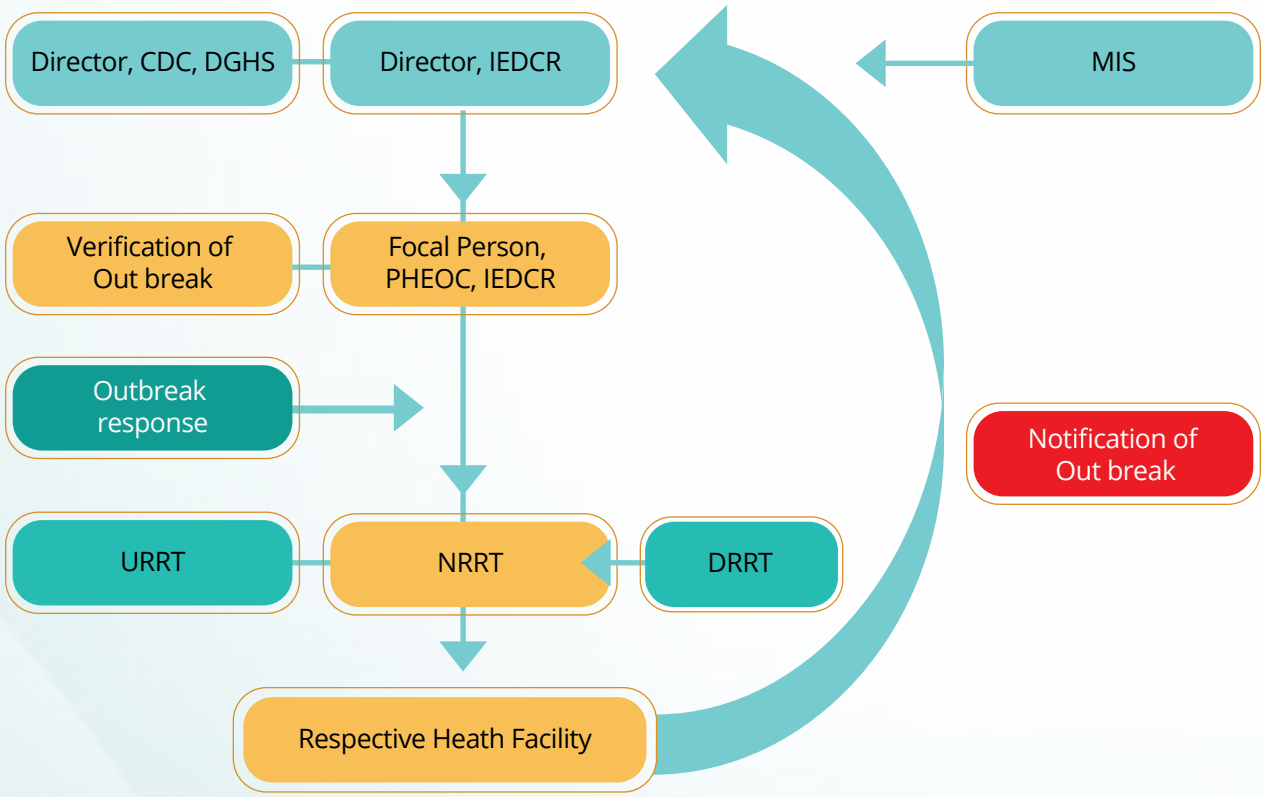
Introduction

Assess	Findings		
Condition*	Normal	Irritable/Less active*	Lethargic/comatose*
Eyes	Normal	Sunken (recent)	-
Mucosa	Normal	Dry	-
Thirst*	Normal	Thirsty*	Unable to drink*
Skin turgor	Normal	Poor*	-
Pulse*	Normal	-	Uncountable/absent*
Dehydration	No Sign	Some: ≥2 with at least 1*sign	Severe: Some DH with at least 1*sign

Communities with ongoing probable Cholera Outbreak

In communities with the ongoing probable cholera outbreak, surveillance aims to monitor cholera incidence trends to inform tailored and well-targeted interventions aimed at containing and eventually interrupting cholera transmission.During probable or confirmed outbreaks each health facility should test the first three (3) cases of Acute Watery Diarrhea with signs of dehydration with RDT every day. During testing Acute Watery Diarrhea with severe dehydration should be prioritized.

If communities have probable cholera outbreak. Outbreak Investigation will commence under the leadership of IEDCR.Acute Watery Diarrhea /Cholera outbreak investigation and response: Respective health facility will notify to CDC, DGHS and IEDCR for probable disease outbreak. In addition, Management Information System (MIS) can also send a red flag if the number of RDT positive cases exceeds the probable outbreak threshold. National Rapid Response Team (NRRT) of IEDCR will investigate the existence of outbreak. In the meantime, Upazila Rapid Response Team/District Rapid Response Team (URRT/DRRT) will do line list of suspected cases with name, location, age, gender, mobile number, and symptoms (with date of onset). With the support of local health authority, NRRT will explore source of infection and provide recommendations to control according to their findings of investigation.



RDT Testing kit Requirements.

Health facilities	Number	RDT Test/ week	Total Yearly requirement
Upazila Health Complex	495	495*7 = 3465	3465 * 52 = 180,180
District Hospitals	64	64*10 = 600	600 *52 = 31,200
Medical Colleges	40	40*10 = 400	400*52 =20,800
Total			**232,180**

Annex 2: Identification of the Priority Areas for Multisectoral Interventions for Cholera Control in Bangladesh

Acknowledgments

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Preamble

The following report summarises the work conducted during a 3-month consultancy, including 2 months in Bangladesh, to identify Priority Areas for Multisectoral Interventions (PAMIs) for cholera control in the country. The work has been conducted hand-in-hand with:

- the Communicable Disease Control (CDC), Directorate General of Health Services (DGHS).
- the Institute of Epidemiology, Disease Control and Research (IEDCR).
- the Management Information System (MIS).
- the International Centre for Diarrheal Disease Research, Bangladesh (icddr,b).
- and the epidemiology team of the Global Task Force on Cholera Control (GTFCC).

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Identification of PAMIs is an essential step towards the control of cholera in the country, in complement to the National Cholera Control Plan. This report aims to be added as an appendix to the National Cholera Control Plan (NCCP) and to support future discussions of the national multiyear implementation plan.

Executive Summary

Cholera “hotspots” or Priority Areas for Multisectoral Interventions (PAMIs) are geographically limited areas where cultural, environmental, and socioeconomic conditions facilitate the transmission of disease and where cholera persists or reappears regularly. Targeting cholera PAMIs will help to focus interventions proposed in the National Cholera Control Plan on the most at-risk populations and effectively control and eliminate cholera.

An analysis was conducted between November 2022 and February 2023. The PAMIs were selected based on the previous five years’epidemiological data (Jan 2018-Dec 2022), at the upazila or thana level. For each unit, population was estimated from the 2011 census, conducted by the Bangladesh Bureau of Statistics, excluding the Forcibly Displaced Myanmar Nationals who have access to specific health facilities.

The identification of PAMIs was done separately for the country and Dhaka city, using two different data sources and two different methods. For the country analysis, we analysed DHIS2 data to calculate the incidence and the persistence of diarrhea cases above 5 years old, admitted in public facilities, as a proxy of cholera risk. The indicators were defined as follows:

- **Incidence:** total number of diarrhea cases reported per 100,000 person-years over the analysis period.
- **Persistence:** percentage of weeks with at least ten diarrhea cases reported in DHIS2 among the total number of weeks over the period.

For Dhaka City, incidence and persistence of cholera cases above 5 years old were calculated based on icddr,b Dhaka Hospital data and DHIS2 and were defined as follows:

- **Incidence:** estimated number of cholera cases reported per 100,000 person-years over the analysis period.
- **Persistence:** percentage of weeks with at least one positive cholera test (culture) reported among the total number of weeks over the period.

Using these two indicators, a numerical priority index for each administrative unit was determined.In addition, geographical and contextual factors were considered. Using the INFORM Sub national Risk Index 2022, several vulnerability factors were choosen including access to WASH services, population density, presence of displaced populations, areas prone to river floods, areas prone to high soil salinity and areas affected by cyclones. The IEDCR-icddr,b data from the 22 sentinel sites were also analysed. The incidence and persistence of cholera cases in their catchment areas informed the PAMI discussions.

National cholera experts discussed the initial list of PAMIs in a workshop and validated a final list of PAMIs, classified into 4 risk levels. The Cholera outbreak investigation report, additional aggregated diarrhea data sources and media monitoring were reviewed to classify units with uncertain risk.

Out of the 495 upazilas and 30 thanas (after merge), 144 geographical units were identified as PAMIs with 53 and 91 upazilas or thanas with a very high and high risk of cholera respectively. The very high risk units represent 10% (n=53) of the upazilas/thanas of the country, including a population of 18,443,471 (11% of the estimated national population in 2022) and covering 25% of the registered diarrhea cases during the studied period (Table 1). The 91 units, identified as high risk, represented 17% of the units (N=91), included a population of 27,761,695 (17% of the estimated population in 2022) and covered 24% of diarrhea registered cases.

Table 1: Summary table of key parameters stratified by priority category

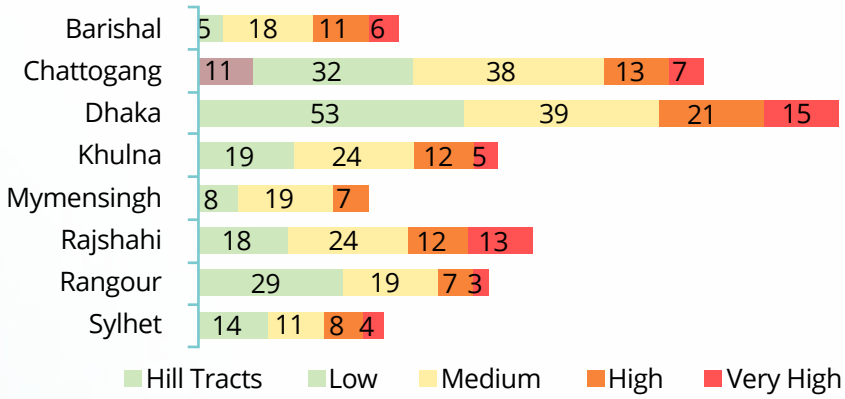
categories	Units*	Rel. % of the units	Cumulative % of units	Est. Population	Rel. % of the Population	Cumulative % of Population	Diarrhea Cases**	Cumulative % of the cases
Very High	53	10.1	10.1	18,443,471	11.2	11.2	432,279	25.3
High	91	17.3	27.4	27,761,695	16.9	28.1	410,352	49.3
Hill Tracts	11	2.1	29.5	729,360	0.4	28.6	6,822	49.7
Medium	192	36.6	66.1	63,663,380	38.8	67.3	637,570	87.1
Low	178	33.9	100.0	53,642,452	32.7	100.0	220,974	100.0
Total	**525**	**100**		**164,240,358**	**100**		**1,707,997**	

* 19 units are not represented as merged under 5 upazilas/ thanas

** Data from DHIS and icddr,b Dhaka Hospital (estimations)

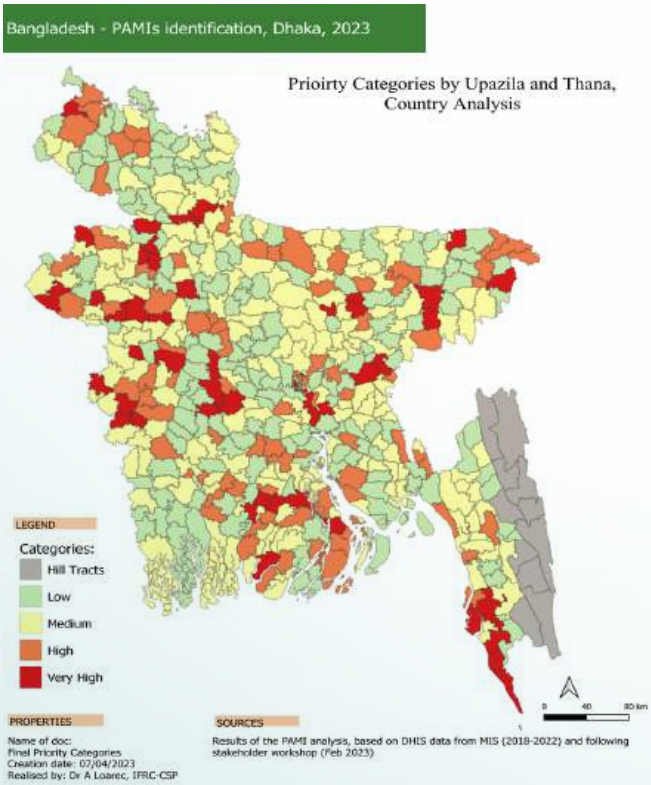
Fifteen very high risk units are located in Dhaka division, thirteen in Rajshahi, seven in Chattogram, six in Barishal, five in Khulna, three in Rangpur, and four in Sylhet division (Figures 1-2).

Figure 1: Distribution of the priority categories and number of administrative units, stratified by division, Bangladesh, 2023.



In addition, the hill tracts, at the border with Myanmar, have been identified as having a vulnerable population for a cholera outbreak, related to the limited access to health and WASH services. The area consists of 11 upazilas and includes a population of 729,360 pe ople (<1% of the national population).

Figure 2: Final Maps of the administrative units of Bangladesh and Dhaka city by priority category, PAMIs, February 2023



Prioritising and targeting these areas with cholera prevention and response interventions is expected to reduce the burden of cholera and the cholera epidemic spread. The multiyear plan will be discussed, considering the new list of PAMIs and the identified vulnerability factors. Review of PAMIs will be conducted regularly by analysing surveillance data and contextual situations to further guide decisions, in line with the National Cholera Control Plan.

Contributing Partners

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