NATIONAL PREPAREDNESS AND RESPONSE PLAN FOR ACUTE GASTROENTERITIS/ CHOLERA OUTBREAKS IN NEPAL

July 2017 to July 2022 AD

GOVERNMENT OF NEPAL
MINISTRY OF HEALTH
DEPARTMENT OF HEALTH SERVICES
EPIDEMIOLOGY AND DISEASE CONTROL DIVISION
TEKU, KATHMANDU

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Nepal Goverment
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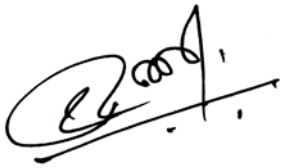
MESSAGE FROM THE DIRECTOR GENERAL

Cholera is an acute intestinal infection caused by ingesting contaminated food or water with the bacterium Vibrio cholera. It quickly leads to severe dehydration and death if untreated. This plan helps the health workers at all levels to clearly understand the case definitions of cholera and manage the outbreaks in a standardized manner with comprehensive approach.

The purpose of this National Preparedness and Response for Acute Gastroenteritis / Cholera in Nepal is, therefore, to enable all the health professionals and partners involved in health and WASH to manage cholera outbreaks in standardized way. The Epidemiology and Disease Control Division initiated to prepare the plan with support from partners in coordination with Task Force for Cholera Control and Steering Committee for Enteric Diseases Control, that would be a step ahead to prevent and control cholera.

Department of Health Services (DoHS) hopes that this plan meets the needs of health workers and the different partners who are participating in Acute Gastroenteritis and cholera cases management.



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The development of this National Preparedness and Preparedness Plan for Acute Gastroenteritis/ Cholera Outbreaks in Nepal 2017-2022 has been a long process of consultation and engagement. Governmental and non-governmental stakeholders and partners have dedicated time and resources to ensure a comprehensive plan. The development process included many meetings and detailed input from all partners and stakeholders. This plan is the product of that lengthy process for which the participants at all levels are highly appreciated for their contributions.

The Epidemiology and Disease Control Division, Ministry of Health takes this opportunity to acknowledge the contribution of the following organizations in the development of this National Preparedness and Preparedness Plan for Acute Gastroenteritis / Cholera Outbreaks in Nepal 2017-2022 and many others who may not have been listed.

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Lastly, I would like to thank all relevant organizations and personnel who supported to develop and finalize the plan.

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Dr. Bhim Acharya
Director

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ACRONYMS

AGE	Acute Gastroenteritis
AWD	Acute Watery Diarrhea
CHD	Child Health Division
DFTQC	Department of Food Technology and Quality Control
DPHO	District Public Health Office
DoHS	Department of Health Services
DWSS	Department of Water Supply and Sanitation
EDCD	Epidemiology and Disease Control Division
EWARS	Early Warning and Reporting System
GTA	Group for Technical Assistance
HMIS	Health Management Information System
IEC	Integrated Information, Education, and Communication
IVI	International Vaccine Institute
KVWSMB	Kathmandu Valley Water Supply Management Board
KUKL	Kathmandu Upathyaka Kanepani Limited
LMD	Logistic Management Division
MoH	Ministry of Health
NHEICC	National Health Education, Information and Communication Centre
NPHL	National Public Health Laboratory
OCV	Oral Cholera Vaccination
OPD	Out Patient Department
PCR	Polymerize Chain Reaction
RRT	Rapid Response Team
WSSDO	Water Supply and Sanitation District Office
UNICEF	United Nations Children's Fund
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization

DEFINITIONS

Acute Watery Diarrhea (AWD): The passage of three or more three loose stools per day or more frequent passage than in normal for the individual.

Suspected Cholera: any person aged 3 years or more with moderate or severe dehydration from 3 or more episodes of acute watery diarrhea per day (24 hours), with or without vomiting.

Probable Cholera: any suspected cholera case with a positive RDT or any death in a person 14 years or older resulting from AGE.

Confirmed Cholera: Any suspected or probable cholera case that has *Vibio cholerae* isolated from their stool by bacterial culture or PCR.

Cholera Outbreak (seasonal): A situation where cases of cholera occur in numbers similar to what has been seen in previous years among a specific population

Cholera Outbreak (emergency): A situation where more cases of cholera occur than are expected in a given area, or among specific group of people, over a particular time period (WHO EWARN).

In case of Nepal, 'more than expected' refers to

i) a 50% increase in the number of cases seen in a district as compared to the average over the last 5 years where hospital facilities are available or

ii) a 10% increase in the number of cases seen in a district as compared to the average over the last 5 years where hospital facilities are not available.

Executive Summary

In order to guide the planning and response process for cholera preparedness and control in Nepal, the following strategy has been developed. This document outlines the current cholera situation in Nepal (as of January 2017) and knowledge surrounding interventions that are relevant in the Nepali context. An in-depth SWOT analysis has been included to shed light on the current strengths and weaknesses of the health and donor systems in Nepal, as well as opportunities for program improvement and threats to its success.

The main objective of this plan is to improve the overall health status of Nepal by reducing the incidence of cholera throughout the country. The plan is based on a series of specific objectives: to prevent the spread of cholera, to reduce mortality from cholera, to ensure a coordinated and collaborative response to cholera outbreaks, and to ensure that a rapid response mechanism is in place in order to successfully stop the spread of disease. Each objective is discussed in detail, with several action items included along with when the activities should be performed and who is responsible for their completion. This is intended to serve as both a guide and a source of accountability for the responsible parties.

It is essential to any successful response program to perform routine, annual monitoring and evaluation. The concluding section of this document outlines performance indicators to be used to measure success and areas for improvement. It also details how this evaluation should be conducted and who is responsible for ensuring it is carried out. The results of this evaluation will be a valuable resource for the Steering Committee for Enteric Diseases and the Task Force for Cholera Control in their annual review of this plan, and coordination for the upcoming cholera season.

Annexes are included at the end of the document to assist in systematic reporting, ensuring proper methods, and to provide standardized health education materials for the cholera response and outbreak analysis.

It is assumed that all humanitarian organizations involved in cholera response in Nepal will contribute to the outlined emergency stockpiles and follow this detailed plan. Moreover, It is hoped that this document will serve as more than just a government action plan, but also as a resource at all levels of the cholera response and for all relevant stakeholders.

1. Background

Cholera: The Disease

Cholera is an acute intestinal infection caused by ingestion of food or water contaminated with the bacteria *Vibrio cholerae.*[1] Globally, it is estimated that there are 1.4 to 4.3 million cases, and 28,000 to 142,000 deaths due to cholera every year.[2] Cholera has a direct negative impact on public health and economic productivity, as well as significant indirect costs affecting the health system, social welfare, tourism, trade, investments, etc. The threat of a cholera outbreak is a major public health concern for governments and the international health community, and a key indicator of lack of social development.[3]

Cholera Epidemiology in Nepal

Nepal is endemic for cholera with the potential for large outbreaks. While 93 percent of households in Nepal use an improved source of drinking water and 72 percent of Nepali's live in households with improved sanitation facilities, open defecation is still practiced in many areas.[4] The country is also at high-risk for outbreaks due to a steady increase in urban population density accompanied by an inadequate supply of safe drinking water and improved sanitation. Perhaps most importantly, Nepal faces flooding and landslides during the rainy season every year which often lead to the breakdown of the already fragile water and sanitation infrastructure. All of these complex factors raise the possibility of cholera outbreaks, which may be challenging to prevent and control.

Outbreaks of cholera are reported in different regions of the country every year, causing the location of outbreaks difficult to predict. However, cases are reliably reported within the Kathmandu Valley every year, making it a priority area for cholera control in Nepal. While many of these cases are only clinically diagnosed (**Table 1**), several outbreaks have been laboratory confirmed.

Table 1: Regional Suspected Cholera Data as Reported in the Annual Report of the Department of Health Services

S.N.	Region Name	Cholera Cases							
		2067-68 (2011)		2068-69 (2012)		2069-70 (2013)		2070-71 (2014)	
		n	%	n	%	n	%	n	%
1	Eastern Region	2101	45.9	488	28.0	939	18.6	824	19.8
2	Central Region	825	18.0	431	24.7	2428	48.2	2616	62.7
3	Western Region	443	9.7	302	17.3	447	8.9	205	4.9
4	Mid – Western Region	863	18.9	115	6.6	525	10.4	54	1.3
5	Far – Western Region	345	7.5	408	23.4	703	13.9	471	11.3
	National	4577	100.0	1744	100.0	5042	100.0	4170	100.0

Source: HMIS, DoHS[5]

Recent laboratory confirmed outbreaks are listed below:

- 2009 – Mid/Far Western Region – 1400 clinical and 109 laboratory confirmed cholera cases (NPHL)
- 2010 – Mid /Western Region – 61 laboratory confirmed cases (NPHL)
- 2011 – Kavre District – 1 laboratory confirmed multi-drug resistant case (NPHL)
- 2012 – Western Region and Kathmandu Valley – 35 laboratory confirmed cases (NPHL)
- 2012 – Eastern Region – 4 laboratory confirmed cases (BPKIHS)
- 2012 – Doti and Dailekh Districts – 24 laboratory confirmed cases (NPHL)
- 2013 – Kathmandu Valley – 4 laboratory confirmed cases (1 from NPHL, 2 from Nepal Medical College and 1 from KIST Medical College)
- 2015 – Kathmandu Valley – 80 laboratory confirmed cases (NPHL)
- 2016 – Kathmandu Valley – 169 laboratory confirmed cases (NPHL)

Early Warning and Reporting System (EWARS)

The EWARS was established by the Epidemiology and Disease Control Division of the Department of Health Services in 1997 in order to strengthen the flow of information on vector-borne and other outbreak prone infectious diseases from the district to the national health departments. This surveillance system is hospital-based and is currently operational in 61 out of 82 sentinel sites throughout Nepal. So far, the EWARS mainly focuses on the daily and weekly reporting of number of cases and deaths (including "zero" reports) of six priority diseases, including acute gastroenteritis (AGE) and Cholera. It equally focuses on immediate reporting (to be reported within 24 hours of diagnosis) of even a single suspected case of cholera, as well as five or more cases of AGE from the same geographic location in a one-week period.

EWARS employs two forms of surveillance: indicator-based and event-based. Indicator-based surveillance is the routine reporting of cases of disease, including notifiable disease surveillance, sentinel surveillance and laboratory-based surveillance systems. This routine reporting is commonly health-care facility-based, with reporting on a weekly basis. Event-based surveillance is the organized and rapid capture of information about events that are a potential risk to public health. This information could be rumors or other ad-hoc reports transmitted through both formal (i.e. established routine reporting systems) and informal (i.e. media, health workers and nongovernmental organizations reports) channels as per need.

EWARS offers a complementary system for the detection of a cluster of conditions or unusual events, with a reduction in workload. In the experience of WHO's Surveillance Medical Officers and their counterparts at the District Health Offices, the system has in the past been effective in tracing rumors or investigating potential outbreaks. Rapid Response Teams (RRTs) can be mobilized on short notice to facilitate prompt outbreak response at the Central, Regional and District level, and can also support the local levels for investigation and outbreak control activities.

Scientific Foundations for the Control of Cholera in Nepal

Antibiotic Resistance

Several studies of *V. cholerae* have shown drug resistance to a number of antibiotics. A brief report in 1996 was the first to discuss antimicrobial resistance and noted reduced sensitivity to nalidixic acid, co-trimoxazole, ampicillin, and cephalexin.[6] Almost 12 years later in 2004, cholera isolated during an outbreak in Kavre district was found to be completely resistant to co-trimoxazole, but sensitive to all other antibiotics tested.[7] Another study conducted that year found resistance to nalidixic acid as well.[8] By 2008, an outbreak in Kathmandu (and later in Saptari and Jajarkot) produced isolates that were 100% resistant to furazolidone in addition to co-trimoxazole and nalidixic acid. [9-13] A later study identified this resistance pattern as early as 2005.[14] Resistance to trimethoprim, sulfamethoxazole, and decreased susceptibility to ciprofloxacin was reported in 2010 and to streptomycin in 2012.[15-16] Multi-drug resistant *V. cholerae* has also been identified in Kathmandu's sewer system.[17] The variation in resistance profile results in the need for continuous monitoring to ensure effective drugs are being used when necessary.[16]

Rapid Diagnostic Testing

Effective surveillance is needed to detect cholera cases during the early phases of an outbreak in order to mount the most effective response. High-quality surveillance depends not only on the ability to detect suspected cases of cholera at the health facility level, but also to confirm that those cases are indeed cholera in the laboratory (stopcholera.org). Establishing a high-quality disease surveillance system is not simple and can be both expensive and difficult, especially in the field with limited laboratory capacity, as is the case in most districts in Nepal. Bacterial culture confirmation of *Vibrio cholerae* has been the historical gold standard for cholera confirmation in Nepal, but it requires a well-equipped laboratory with trained laboratory technicians.[18] When this is not available in the outbreak setting, samples must be transported to a reference laboratory which takes time, delaying the response and diminishing effectiveness of interventions. Fortunately, rapid diagnostic tests can be used to diagnose O1 and O139 *V. cholerae* at the point of care without a lab or technician. In comparison to culture, the rapid diagnostic test is about 90% sensitive and 60-70% specific in the field, but the specificity has been shown to increase to over 99% with the addition of an enrichment step.[19-24] This information highlights RDTs as a rapid, low-cost, simplified method for cholera detection in Nepal.

Oral Cholera Vaccination

Oral cholera vaccine (OCV) is an effective intervention for the prevention of cholera, especially when combined with WASH activities.[25] The WHO currently recommends three killed, whole-cell vaccines that are administered orally. Two of these vaccines, Shanchol and Euvichol, have been used in pre-emptive vaccination campaigns in Nepal. These vaccines have been proven safe, and are recommended for adults aged 1 year and over. Typically, two doses are given, two weeks apart which results in 85% efficacy after 6 months in those greater than 1 year of age, 45% after 5 years for those 1-5, and 65% after 5 years for those over 5.[26-27] This plan recommends a two-dose strategy for pre-emptive campaigns. However, recent evidence suggests that during an outbreak situation, a single dose of cholera vaccine during a reactive vaccination campaign is effective at stopping transmission.[28] It has the added benefit of eliminating many of the logistical concerns that often arise from the delivery of a second dose to the same population. For these reasons, a single dose strategy is recommended for reactive OCV campaigns in Nepal.

2. Analysis of Response Capacity (SWOT)

Strengths and Weakness

	Strengths	Weakness
Surveillance	• Cholera is a reportable disease in the Nepal Early Warning and Reporting System • Most cholera cases were tracked down because of early reporting and early signals • Daily situation reports and weekly bulletins prepared and disseminated to higher authorities (PM's office, MoH, WHO, UNICEF)	• Mapping of epidemics has not taken place systematically, making it difficult to create risk maps for the country • Surveillance reporting is incomplete within the EWARS system and not enough sentinel sites are included in the network (unable to detect cases from peripheral levels) • Electronic reporting system not used at all sites • Irregular zero reporting from sentinel hospitals • Incomplete contact information recorded at sentinel hospitals • Not all health facilities are included in the surveillance system
Laboratory Diagnosis	• Newly developed SOPs were consistently used, resulting in adherence to high standard in culture confirmation • Where appropriate decentralize culture confirmation from national to hospital level • Samples from outside Kathmandu were transported to NPHL properly • NPHL is well equipped for the confirmation of cholera via culture	• Long duration of incubation to conduct enriched RDT test (more than 6 hours) • Timely availability of RDTs and supplies for culture confirmation • Sample transport from peripheral to central level for laboratory confirmation delays response • SOPs do not cover how to proceed with testing outside normal working hours as samples are received 24 hours a day • Untrained personnel performing RDT and culturing • TCBS is not routine in outside Kathmandu valley

	Strengths	Weakness
Field Investigation	• Water samples collected from households during investigation • High percentage of cases are followed up at their homes and data collected 2016 • RRTs are in place at the central, regional, and district levels for outbreak investigation and response	• RRTs are not trained to conduct scientific outbreak investigations • Shortage of qualified human resources (e.g. field epidemiologists)No dedicated statisticians at any level • No implementation of food safety monitoring due to low perceived priority and lack of coordination with concerned authorities
Case Management	• Few deaths have been reported • Antibiotics are readily available in hospitals	• Many patients are discharged from hospital early, instead of remaining for fluid replacement • Health personnel are not trained to handle cases of cholera • Patient details are often not fully / properly recorded • Health education before discharge is not practiced systematically • No clear cut SOPs on patient and contact tracing
Water Supply and Sanitation Infrastructure and System	• Regular chlorination of big water supply systems especially KUKL • Use of field water test kits by response team – easy to use • Coordination with water tanker and other private service providers • Water quality monitoring data as a triggering tool for identifying cholera outbreaks • Initiation of directives/ policy for water tankers	• No water system mapping, which hinders attempts to trace sources of outbreaks in the system • Responsibilities for water chlorination during cholera outbreaks was unclear. • Monitoring mechanism is not systematized to ensure regular quality – for microbiology • Lack of coordination on sharing of water quality testing results among WASH and health sector

	Strengths	Weakness
Cholera Vaccination	• Effective vaccines exist • OCV has been efficiently deployed in the field in a preventative manner in Nepal	• Multiple applications to the stockpile have been denied limiting the ability to deploy vaccine • Financial sustainability for procurement • No national plan or policy on use of OCV in preparedness or response to cholera outbreaks
Communication Campaigns and Social Mobilization for Safe WASH Practices	• Optimal prioritization of at risk populations • Timely expansion of interventions to cover larger areas • Mass media campaigns reached beyond target areas • Mobilization of FCHVs & volunteer networks from affected communities	• Lack of preparedness plan of BCC interventions • Limited time for volunteer training on community mobilization and BCC • Unavailability of a dedicated team for monitoring • No funding sources of the government to initiate immediate response • No stock of IEC materials at municipality and district levels
Leadership and coordination Mechanism	• Under the chairmanship of DoHS DG, technical and strategic direction for cholera control were provided by Steering Committee for Enteric Disease Control and Disaster Health Working Group • Most outbreaks are small and localized making them easier to respond to and contain • Good coordination between EDCD, NPHL, DPHO, defense sectors, municipality and external development partners	• Perception that overall case numbers are small, leading to low priority on government health agenda and little donor support • No monitoring and enforcement of food safety regulation for small restaurants and street food vendors • Public health issues were low priority in municipality • Lack of coordination with food vendors • Instituting a coordination mechanism across concerned sectors • No clear national criteria to declare the cholera outbreak

Opportunities and Threats

	Opportunities	Threats
Surveillance	• EWARS system is already in place in all 75 districts • There is room and political will to expand this system • External agencies are ready to help in strengthening existing surveillance system • Health system of the defense sector could be included in EWARS	• Continued poor surveillance making it impossible to accurately determine disease burden in the country (only 50% of sentinel sites are functional) • Manpower restrictions could limit the EDCDs ability to follow-up with hospitals if the system were expanded • Lack of motivation, dedication and will power from staff working in surveillance system • Lack of experts in strengthening surveillance system
Laboratory Diagnosis	• Successful use of the Rapid Diagnostic Test for cholera in the Kathmandu Valley, with the potential for expansion to other areas of the country • Simple training on RDT procedure for health staff working in periphery	• Lack of adequately equipped labs around the country capable of diagnosing cholera on site • No dedicated budget for purchase of RDTs
Field Investigation	• Rapid Response Teams are a built-in resource of the EWARS system and has been expanded during the 2016 cholera season in Kathmandu • Inclusion of Response Team from the defense sector, volunteers and private organizations in emergency situations	• Lack of funding to support the expansion of RRTs may limit their ability to respond to every cholera case • Denial by some patients to participate in household investigation due to lack of knowledge and/or stigma • Loss to follow-up due to movement • Difficulties identifying actual sources of drinking water due to use of multiple sources
Case Management	• Routine monitoring of antibiotic resistance means changes can be made to treatment recommendations during an outbreak if necessary	• Limited supply of needed medical supplies (such as IV fluids) in rural health facilities • Frequent stock outs of medicines and supplies

	Opportunities	Threats
Water Supply and Sanitation Infrastructure and System	• At home, point of use disinfectant products are available in markets and can be a major message of health information campaigns in at-risk areas • Protection of source of drinking water by DWSS • Many households use standard size black water tanks which could make interventions at these households much easier (e.g. correct concentration of chlorine)	• The cost of these materials is not regulated, and could be a major factor in a household decision to use chlorination at home • Limited availability of hand washing stations in the home
Cholera Vaccination	• Increasing availability of OCV in the market, making it easier to apply to the global stockpile	• Global supply of OCV is limited • Due to lack of funds for direct purchase, the government must rely on donations or successful applications to the stockpile
Communication Campaigns and Social Mobilization for Safe WASH Practices	• Strong partnerships with organizations such as UNICEF means many opportunities to refine materials as new information becomes available in Nepal and globally • Interest by donors in conducting operations research to obtain data on effectiveness of WASH strategies	• Not much data exists on the effectiveness of WASH and behavior change interventions, specifically in the Nepali context
Leadership and coordination Mechanism	• Recent interest of donor organizations in the control of cholera in Nepal due to the 2015 earthquakes and their commitment to support the EDCD in their response and control efforts • Increasing attention to cholera control by the government due to 2016 outbreak and response	• No mechanism for an 'emergency' response, which bypasses the typical approval pathways for rapid interventions at the household and community level • No clear cut mechanism for multi-sectoral coordination

3. Preparedness and Response Plan

This Preparedness and Response Plan details the actions necessary to strengthen the existing surveillance of and response to cholera outbreaks. It describes a series of strategies to reduce the risk of transmission of and mortality due to *Vibrio cholerae*.

3.1 Main Objective

Improve the overall health status of the Nepali population by reducing the incidence of cholera and eliminate cholera deaths in Nepal.

3.2 Specific Objectives

1. To prevent the spread of AGE/Cholera
2. To eliminate mortality from AGE/Cholera
3. To ensure coordinated and collaborative AGE/Cholera preparedness and response
4. To ensure a rapid response mechanism during an outbreak of AGE/Cholera

3.3 Strategies for Preparedness and Response

(1) Prevent spread of AGE/Cholera outbreaks

(1.1) Surveillance and early warning

Hospital Reporting

Passive, hospital-based surveillance of suspected cases of epidemic-prone diseases is being instituted as per standard protocol at all district/Zonal/ regional/central hospitals, which serve as sentinel sites under the Early Warning and Response System (EWARS). Each hospital will report the diarrhea cases registered at emergency and OPD departments to their District (Public) Health Offices and the EWARS focal point at EDCD. In case of an epidemic, daily reporting will be done by phone. D(P)HO staff will visit the emergency and OPD departments and collect aggregated information on a standardized form (**Annex 1**). Rumor verification and data monitoring will also take place at district level. Data will be reported from the D(P)HO to the central level (HMIS); reports from each emergency and OPD department will be consolidated into a central database (EWARS). Reporting from the EWARS sentinel sites will be monitored closely by the EDCD surveillance team to ensure that it is accurate and timely.

In an outbreak situation, EWARS should be expanded to additional health facilities beyond designated sentinel sites. The expansion sites should be decided upon before the monsoon season and districts should have a plan for the expansion at least one month prior.

Female Community Health Volunteers working in the districts should be oriented on reporting deaths from AWD in the community that may not have been treated at a health facility to the DPHO. These messages should be continued throughout the monsoon season and be increased in the event of an outbreak in the district or a neighboring district.

Laboratory Surveillance

Rapid Diagnostic Tests (RDT) will be used as point of care diagnosis at the health facility level. Each district will be provided a stockpile of RDTs to distribute to the appropriate facilities as needed. These stockpiles will be prepared prior to the beginning of the cholera season. Methods on how to preform the rapid test are available in **Annex 2**. If culture facilities are not available in the health facility or district level facilities, samples will be collected and stored in Cary Blair Transport Media and transported to the National Public Health Laboratory (NPHL) as soon as possible for confirmation. No less than 10% of cases should be confirmed at

the hospital or national level. In the event that transport media is not available, stool samples can also be stored on filter paper and sent to the National Lab for confirmation by PCR or other molecular studies (methods for sample collection on filter paper can be found in **Annex 2**). All Laboratory results at the health facility or district level facilities should be reported to EWARS as well as the NPHL.

Antibiotic Resistance

In order to provide the best care possible to cholera patients, antibiotic resistance will be monitored. Any facility that performs cholera culture, whether it be hospital lab or NPHL, should test samples positive for cholera for antibiotic resistance. This should be conducted for up to 10 positive samples every two weeks throughout the outbreak. These results should be sent to EDCD as part of regular cholera surveillance reporting. In the event that a new resistance pattern is seen and national antibiotic recommendations need to be updated, the EDCD will handle the dissemination.

Assessments

Annual assessments of laboratory capacity and training of staff will take place at the district level. DPHOs will report to the NPHL whether their district has the capacity for culturing cholera and whether they have culture materials (TCBS and antisera), transport media, filter paper, and RDTs in stock. Reporting on stocks will take place monthly. Resources will be sent to these districts to full-fill their needs as necessary prior to the cholera season. Stocks will be replenished throughout the season as necessary. Coordination meetings with surveillance stakeholders will take place throughout the season.

Reporting

Situation reports will be published weekly by EDCD. This will be increased to daily during an outbreak. An alert will be issued and investigated as potential cholera by EDCD in the event of an adult death with AWD, or a cluster (>3 cases) of AWD with severe dehydration.

Key Activities for Surveillance and Early Warning
Plan for the expansion of EWARS and ensure it is functional in all its current facilities / sentinel sites
Provide a list of sites for expansion of EWARS for each district in case an outbreak occurs
Coordinate meetings with appropriate NGOs and other partners in surveillance efforts
Conduct training for health facility staff (at minimum annually) at the community and district levels regarding surveillance, case definition, data flow, and outbreak response
Establish outbreak response, rumor verification, and monitoring of data at district level
Orient FCHVs on identifying potential cholera cases and deaths in the community
Publish and disseminate weekly (daily during an outbreak) updates via AGE/ Cholera Situation Reports
Conduct laboratory capacity assessments and distribute RDTs to all DPHOs for confirmation of cases at all levels of the health care delivery system

(1.2) Water, Sanitation and Hygiene (WASH)

Community Level WASH Interventions

Preventive water, sanitation and hygiene (WASH) interventions will be specifically targeted to the household, community

including food vendors, school, work-place and health facility levels. The following list of interventions will be stockpiled at the national level for deployment to districts in need throughout the cholera season: Piyush, aquatabs, soap, hygiene kits, and educational posters and pamphlets.

Specific WASH activities will take place prior to the cholera season in high-risk areas in each district. These include standardized radio messaging on health behaviors and in-person messaging campaigns in any internal displacement camps. The DPHO will also be responsible for ensuring that water treatment, such as aquatabs, are available locally prior to the season, and that solid waste is handled appropriately. DPHO will also encourage construction of household toilets and hand washing facilities and/or adequate maintenance.

Water Supply Interventions

Specific interventions concerning access to drinking water will be established by performing routine analysis of the existing water supply infrastructure, storage, and distribution network. Water supply stakeholders will be invited as key members of the Steering Committee for Enteric Diseases to provide reports on the system prior to the monsoon season. The Department of Water Supply and Sanitation (DWSS) and its district offices will be engaged to provide routine water quality monitoring in the form of free residual chlorine and fecal coliform tests. Any drinking water sources found to be unfit for drinking will be followed up on by the MOH. Resources will be provided to the DWSS laboratory for culturing of *Vibrio cholera.* If any source is found to contain *Vibrio cholerae*, the DPHO will deploy individuals to ensure the source is not used by the public until the issue is solved. Any source found positive for *V. cholerae* by the DWSS, will be confirmed by NPHL.

Key Activities for WASH Response
Chlorinate all piped drinking water systems and water tankers
Regularly monitor systems prior to the season and more frequently during outbreaks, including provision of chlorination materials and training where required
Train on point of use drinking water treatment at the household level in high risk areas
Implement a food safety campaign targeting both food vendors and households through social mobilization and mass media channels
Practice hand-washing with soap through health messaging campaigns at critical times
Ensure proper collection and management of solid waste
Support community led sanitation activities to encourage households and health posts to rebuild/build toilets and hand-washing facilities
Maintain adequate sanitation and hand-washing facilities in households
Pre-position WASH materials at the local level to enable rapid scale-up of interventions in new areas, and continuity in existing areas, in the event of an outbreak
Stockpile adequate WASH equipment and ensure materials are available in Kathmandu to be deployed when necessary

(1.3) Immunization with oral cholera vaccine (OCV)

OCV Strategy

Oral cholera vaccines (OCV) are safe, effective, and acceptable. They present a tool for cholera control that supplements, but vaccine does not replace, existing cholera control measures such as WASH

interventions. Three WHO pre-qualified oral cholera vaccines are available through the Global Stockpile; two are available for direct purchase.

Vaccination of populations can either be pre-emptive, before the cholera season in evidence-based, pre-determined hot-spot areas, or as a reactive action during an outbreak in order to limit and reduce spread of the disease. Reactive vaccination may be carried out in an area at risk for cholera and adjacent to an area with ongoing transmission. Due to the limited amount of vaccine available in the country at this time and limited availability of data on which to base targeting of pre-emptive vaccination, a reactive approach is favored for the country at this time.

Vaccination will be used for:

- Prevention of potential cholera outbreaks where essential services to prevent the spread of *Vibrio cholerae* in the environment (adequate clean water, sanitation and hygiene) and health care are disrupted or destroyed, mobile populations residing in crowded settings, or areas at high-risk for cholera outbreaks. Any pre-emptive OCV campaign should be conducted at least two months prior to the monsoon season with two doses administered two weeks apart.

- Reducing the spread of cholera and limiting mortality in communities neighboring a current outbreak (communities across borders or linked by river systems or water and sanitation systems). A reactive vaccination strategy (vaccination within a 100-meter radius around an index cases) can be applied in outbreak situations with a single dose of OCV.

If possible, a stockpile of vaccine will be created at the national level (ideally, 50,000 doses). This stockpile would be in place prior to the monsoon season and provide doses for reactive vaccination. This stockpile would be replenished as the vaccine was used, and could also provide a buffer in the event more vaccine needs to be obtained for larger outbreaks,

Planning

Detailed micro-planning will take place at the periphery level. Training will be conducted for FCHVs and health workers prior to the start of the season, and refresher trainings will take place as needed. Standard forms will be available in each district. Media will be oriented to the use of the OCV to ensure that a positive message is sent to the public. Radio messaging will also take place at the district level to ensure the population has access to accurate information on when/ where/why campaigns are taking place.

Reporting

Vaccination teams must also use tally sheets (**Annex 3**) to record the number of people vaccinated per day, at each vaccination site by each team. FCHVs will monitor the population for any adverse events post-vaccination and report results to the district level using a standard form (**Annex 4**). Number of new cases that appear in the vaccinated area will also be reported for analysis at the national level.

Incorporation of Health Education

OCV should not be used as a stand -alone intervention. Integrated information, education and communication materials will be distributed along with vaccine and will be available in each district prior to the season (**Annex 5**).

Key Activities for Immunization
Select areas for pre-emptive vaccination if adequate information is available to support a hot-spot or hot-pop
Ensure a stockpile of vaccine is in place prior to the beginning of monsoon season
Distribute integrated information, education, and communication (IEC) materials for OCV and safe hygiene practices, (i.e. hand washing with soap)
Develop a detailed micro-plan for vaccine delivery and ensure it is available and understood at the periphery level
Conduct training for FCHVs and health workers on OCV and hygiene promotion
Ensure availability of guidelines, forms, and IEC materials for OCV campaigns at the district level
Conduct media orientation (at both central and district levels) to mitigate rumor/ negative coverage of OCV campaigns
Air radio/FM messages on OCV campaigns using district level radio stations
Ensure proper documentation and monitoring and evaluation of cholera campaigns by providing standard materials to each DPHO

(1.4) Behavior Change Communication (BCC) and Social Mobilization

Extensive community mobilization and behavior change communication activities are required to prevent and mitigate AGE/ cholera by encouraging safe hygiene practices. Existing networks of partner NGOs and FCHVs in affected districts work with district (public) health offices to come up with a detailed activity plan and will then be mobilized to disseminate key messages and orient households at community level prior to the cholera season. During the cholera season, FCHVs, as the hub of community mobilization, will be given simple communication guideline and then activated to deliver regular interpersonal communication sessions on key health/WASH behaviors, as well as distribute essential health/WASH items such as ORS, zinc, and soap to hot-spots and hot-pops in their district. WASH promotion will also take place during the season at schools and community gatherings.

Key Activities for BCC and Social Mobilization
Develop a detailed activity plan and align with other stakeholders working in health and WASH sectors at the district level
Involve NGO partners working in health and WASH and support them in their promotion of safe hygiene practices
Orient teachers and school children on WASH
Promote WASH through door to door mobilization of FCHVs in the community
Distribute simple communication guidelines on key hygiene behaviors, case detection, and referral to community-level social mobilizers (identified by DPHOs)
Promote key health behaviors during community gatherings

(1.5) Community Level Interventions

Community-based interventions for health, nutrition and WASH can be integrated and promoted into all community-based activities in a variety of sectors through community-based actors to target greater outreach to the communities. The following interventions will be planned:

- Health and hygiene promotion (distribution of brochures)
- Water testing

- Distribution of soap and Piyush at high risk areas
- Miking in high-risk areas
- Active case finding and early detection by FCHVs, including referral to health facilities
- Communication on use of household water treatment and ORS at home

Key Activities at the Community Level
Identify all actors to deliver integrated services: community health workers, village health workers, hygiene promoters, social mobilisers, traditional birth attendants, Red Cross volunteers etc.
Conduct training for community level actors in health education and hygiene promotion, active case finding, early case detection, use of household water treatment and ORS at home, and referral to health facilities
Distribute IEC materials for safe hygiene practices, household water treatment, and messages on when to start home treatment with ORS and/or to seek immediate treatment to the community

(2) Reduce the mortality from AGE/cholera

(2.1) Standardized Case Management

Assessment

Capacity building for identification, case management, reporting, referral, and infection control in health care settings will take place in all levels of health facilities annually. EDCD will coordinate capacity building activities to avoid duplication and ensure that critical gaps are filled prior to the cholera season. The EDCD will work to provide a digital resource center where stakeholders can access forms, guidelines, dehydration algorithms and other materials.

Treatment of Cholera Cases

Cholera is an easily treatable disease. Treatment centers around rehydration. The prompt administration of oral rehydration salts to replace lost fluids (5ml/kg/hour) nearly always results in the patient being cured. All district level health facilities will be activated and medical officers will be trained for treatment prior to the start of the cholera season. In cases of severe dehydration or hypovolemic shock due to diarrhea (**Table 2**), intravenous administration of fluids (Ringers Lactate; **Table 3**) may be required to save the patient's life. These patients should be monitored every 30 minutes. After the first 30ml/kg of fluids have been given the patient's radial pulse should be strong and the patient's blood pressure should return to normal. If the pulse is not strong, IV fluid administration should be continued. Adults should be reassessed after 3 hours and infants after 6 hours of receiving fluids and start ORS (about 5 ml/kg/hr) as soon as patient can drink safely.

Table 2: Assessment of Dehydration

	Plan A	Plan B	Plan C
Observe: Condition Eyes Tears Mouth/ Tongue Thirst	Well Alert Normal Present Moist Normal	Restless, Irritable Sunken Absent Dry Thirsty, drinks eagerly	Lethargic, coma Very sunken Absent Very dry Unable to drink
Feel: Skin Pinch	Goes back quickly	*Goes back slowly	*Goes back very slowly
Decide:	Patient has no signs of dehydration	At least 2 signs, including one '*' sign: Some dehydration	At least 2 signs, including one '*' sign: Severe dehydration

Table 3: Estimation of Ringers Lactate IV for patients with Severe Dehydration		
Age	**First, Administer 30ml/kg in**	**Then give 70ml/kg in**
Infants (<12 months)	1 hour	5 hours
1 year and over	30 minutes	2.5 hours

Antibiotics should be given to any patient with cholera who comes for treatment and the preferred antibiotic is doxycycline (currently circulating strain must be checked for resistance). In the case of resistance to doxycycline, azithromycin should be used. Azithromycin should also be used for pregnant women and children under eight years. By decreasing the duration of diarrhea and stool volume, antibiotic use will result in more rapid recovery and shorter lengths of inpatient stay, both of which contribute to optimizing resource utilization in an outbreak setting. Hydration kits will be deployed to District Public Health Offices for their EWARS sentinel sites well before the typical cholera season, and will be replenished immediately upon use.

For more detailed information on cholera treatment guidelines please refer to the WHO's "The Treatment of Diarrhoea: A manual for physicians and other senior health workers." This document was last revised in 2005 and is available online.

Discharge of Cholera Patients

Suspected cholera patients should remain at the health facility until diarrhea and vomiting have stopped (expected within 24 hours). Even after dehydration is corrected, additional fluids may be needed to compensate for ongoing fluid losses. The patient should be told to return to the health facility if they experience an increased number of stools, loss of appetite, excessive thirst, repeated vomiting, fever, or blood in stool.

Key Activities for Case Management
Annual Training of Trainers (TOT) for AGE/ Cholera management and subsequent training of health workers
Monitor training activities at the district level
Create a Digital Resource Center accessible to all districts and partners through the EDCD
Support supervision, monitoring visits, and quality assurance through standardized practices
Distribute case management guidelines and algorithms for assessing dehydration and managing patients, including the identification and management of dehydration for malnourished children

(2.2) Supplies and Logistics

Stockpile

Medical supplies including Interagency Diarrheal Disease Kits (IDDKs), additional ORS, antibiotics, and other supplies will be strategically pre-positioned by EDCD, WHO and UNICEF at the regional level. There will be an additional stockpile of IDDKs in Kathmandu.

Distribution

Regular tracking and monitoring will take place and each region will receive supplies based on the number of EWARS sentinel sites and expansion sites in that region. Supplies will be distributed no later than one month prior to the monsoon season. Additional supplies will be sent from the national stockpile in Kathmandu as necessary during outbreak situations.

Key Activities for Supplies and Logistics
Map necessary supplies annually to address current needs, including a distribution plan
Procure additional supplies as needed for agreed minimum level preparedness
Ensure timely distribution of available supplies based on need and risk in affected areas
Regularly track and monitor inventory and replenish supplies as needed

(3) Coordination and Collaboration Surrounding Cholera Preparedness and Response

Steering Committee for Enteric Diseases and Task Force for Cholera Control

The Epidemiology and Disease Control Division of the Department of Health Services (EDCD) will take the lead and provide overall coordination and collaboration of AGE/cholera prevention, preparedness, and response activities. They will disseminate timely surveillance information through an AGE/cholera Situation Report to enable rapid response by all stakeholders. The existing high-level Steering Committee for Control of Enteric Diseases will guide the decision making for the control of enteric diseases in Nepal and meet one moth prior to each monsoon season to discuss plans for cholera preparedness and response. This committee will also ensure that all districts have the necessary resources and are aware of reporting mandates. The Task Force for Cholera Control, a sub-committee of the abovementioned Steering Committee is chaired by Director of EDCD and includes representation from the WASH cluster, WHO, UNICEF, GTA, and relevant INGOs/NGOs in addition to the Ministry of Health (MoH). They will be responsible for mapping available resources to identify gaps prior to the season. It will be responsible to ensuring any decisions from the Steering Committee are implemented accordingly. The task force will meet at least monthly during the monsoon season to monitor the response and to ensure a solid and well-coordinated response mechanism for immediate action. The task force will monitor progress of outbreaks and review the prevention, preparedness and response plan on a yearly basis to adjust to prevailing situation, and will tailor the response more frequently during an outbreak if absolutely necessary.

Situation Reports

As a means of rapidly disseminating information on the current cholera situation to all interested parties, the EDCD will publish a weekly situation report during the monsoon season detailing AGE and cholera cases. This report will include information on both suspected and confirmed cases, and include the number of cases reported by each EWARS sentinel site. A map detailing the geographic distribution of cases will also be included in the report to assist in developing response activities. An example of the Situation Report can be found in **Annex 6**. In the event of an outbreak situation, this report will be updated and distributed on a daily basis.

Key Activities for Coordination and Collaboration
Map available resources and existing gaps (funds, supplies, partner contact details, response plans etc.) prior to the season to ensure preparedness
Conduct regular meetings of the Task force for Cholera Control to obtain updates on the AGE/cholera situation, surveillance and control operations, status of essential supplies, and gaps in resources

Key Activities for Coordination and Collaboration, continued
Share information through a weekly AGE/ Cholera Situation Report sent by email from EDCD with a summary of the current AGE/Cholera numbers (daily in the case of an outbreak)
Discuss possible field level (district and below) coordination and collaboration of response through the government health system and other stakeholders to ensure a response can take place as soon as possible

(4) Rapid Response Mechanism

Cholera has the ability to spread quickly, particularly when a contaminated drinking water source is used by a large population. Therefore, it is essential that the government response takes place as soon as possible, and preferably, within 24 hours of a case being reported. Investigations should be conducted whenever a single case meets the clinical definition since the illness is likely to be more widespread than a single case (given the majority of cholera cases are mild or asymptomatic). Previous experience has shown that implementing interventions such as a WASH or vaccination campaign in response to a case of cholera under the current system can take weeks. Therefore, a mechanism will be put in place within the existing government system to ensure the response activities outlined in the national plan can be initiated within this critical 48-hour window. A government official will be selected who has the authority and responsibility to give the "green light" for implementation of community level campaigns to control cholera. Districts should have agreed upon action plans for such campaigns at least two months prior to the start of the season to avoid delays. Stockpiles of necessary supplies at the district, regional, and national levels will be utilized to carry out the response. Plans will be made at the district level for when/where supplies will be retrieved and who will be responsible for delivering them.

Rapid Response Teams

Rapid Response Teams (RRT) should be formed at the central, regional, and district levels. These teams will be trained annually and be on stand-by during the monsoon season to conduct field investigations, deliver interventions, and ensure stool specimens are send to the lab for confirmation. At the central level, the Director of EDCD will serve as the chair, the Chief of the Epidemiology Section will be the focal point, and membership will also contain representatives from the National Public Health Laboratory, Child Health Division, Logistic Management Division and other sections of EDCD. The Regional Director will be the focal point for regional level RRT and the other members will include a medical officer, a malaria/public health officer, a health assistant, a health education officer, a statistics officer, the immunization supervisor, a lab technician and a public health nurse. The district level RRT will be chaired by the Chief of the DPHO, with a health assistant from the DPHO as the focal point. Other members of the district level RRT will include the immunization supervisor, a health education technician, a medical officer, a public health nurse, a lab technician, a statistician, a medical recorder and a family planning assistant.[29]

When RRTs are mobilized, the field team should consist of at least one public health/clinical officer, one lab technician, and one health educator. FCHVs from the municipalities/VDCs can be included as necessary, dependent upon the size of the outbreak. The duties of the rapid response team are to:

- Verify reported cases
- Investigate new cases
- Obtain lab specimens for confirmation
- Identify hot-populations (high-risk groups)
- Investigate water source contamination
- Assess local capacity to respond (case management and community control measures)
- Implement control measures (including WASH and OCV)
- Provide emergency treatment and supplies
- Collect line listing of information on cases for analysis
- Report findings to EDCD

Line Listing and Risk Factor Collection

A line listing should be made available to rapid response teams by EWARS sentinel sites in order to identify cases for household investigation. It is essential that this line listing include identifying information for the patient (name, age, address, telephone number). For each case, the rapid response team should collect and analyze data on the following risk factors:

- Recent travel history
- Contact with persons with diarrhea
- Recent attendance at a crowded event
- Water sources for drinking, bathing, and cleaning kitchen utensils
- Food history (consuming raw fruits, vegetables or juices, eating room-temperature food)
- Occupation

An example of a risk factor data collection form can be found in **Annex 7**.

Key Activities for a Rapid Response
Designate a government official responsible for emergency implementation of response activities
Prepare district level plans for the conduct of community level WASH and reactive vaccination campaigns at least two months prior to the monsoon season
Map where supplies will be retrieved and who will deliver them for rapid implementation of the cholera response
Train RRTs annually on response activities
Collect and analyze data from the line listings and household investigations of all cholera cases

4. Plan of Action

SN	Key Activities	Period			Responsibilities
		Pre-monsoon	During Monsoon	Post-Monsoon	
1	**Surveillance and Early Warning Activities**				
i	Plan for the expansion of EWARS and ensure it is functional in all its current facilities / sentinel sites				EDCD/DPHO/Health Facilities
ii	Provide a list of sites for expansion of EWARS for each district in case an outbreak occurs				EDCD/DPHO/Health Facilities
iii	Coordinate meetings with appropriate NGOs and other partners in surveillance efforts				EDCD/DPHO/I/NGO partners
iv	Conduct training for health facility staff (at minimum annually) at the community and district levels regarding surveillance, case definition, data flow, and outbreak response				EDCD/DPHO/I/NGO partners
v	Orient FCHVs on identifying potential cholera cases and deaths in the community				DPHO/ Health Facilities
vi	Establish outbreak response, rumor verification, and monitoring of data at district level				EDCD/DPHO
vii	Publish and disseminate weekly (daily during an outbreak) updates via AGE/Cholera Situation Reports				EDCD
viii	Conduct laboratory capacity assessments and distribute RDTs to all DPHOs for confirmation of cases at all levels of the health care delivery system				EDCD/NPHL/DPHO/I/NGO partners
2	**WASH Activities**				
i	Chlorinate all piped drinking water systems and water tankers				DWSS/Water vendors/I/NGO partners
ii	Regularly monitor systems prior to the season and more frequently during outbreaks, including provision of chlorination materials and training where required				DWSS/EDCD/District Line Agencies

SN	Key Activities	Period			Responsibilities
		Pre-monsoon	During Monsoon	Post-Monsoon	
iii	Train on point of use drinking water treatment at the household level in high risk areas				DPHO/WSSDO/ Community People
iv	Implement a food safety campaign targeting both food vendors and households through social mobilization and mass media channels				EDCD/DFTQC/DPHO/ Municipalities/I/NGO partners
v	Practice hand-washing with soap through health messaging campaigns at critical times				EDCD/NHEICC/DPHO/ Municipality/Media/I/ NGO Partners
vi	Ensure proper collection and management of solid waste				Municipality/Private sectors/I/NGOs
vii	Support community led sanitation activities to encourage households and health posts to rebuild/build toilets and hand-washing facilities				Municipality/VDC/I/ NGOs/ Community People
viii	Maintain adequate sanitation and hand-washing facilities in households				Municipality/VDC/I/ NGOs/ Community People
ix	Pre-position WASH materials at the local level to enable rapid scale-up of interventions in new areas, and continuity in existing areas, in the event of an outbreak				EDCD/DPHO/WSSDO/I/ NGO partners
x	Stockpile adequate WASH equipment and materials are available in Kathmandu to be deployed when necessary				EDCD/LMD/I/NGO partners
3	**Immunization Activities**				
i	Select areas for pre-emptive vaccination if adequate information is available to support a hot-spot or hot-pop				EDCD/CHD/DPHO/local health facilities/I/NGO partners
ii	Ensure a stockpile of vaccine is in place prior to the beginning of monsoon season				EDCD/CHD/LMD

SN	Key Activities	Period			Responsibilities
		Pre-monsoon	During Monsoon	Post-Monsoon	
iii	Distribute integrated information, education, and communication (IEC) materials for OCV and safe hygiene practices, (i.e. hand washing with soap)				EDCD/CHD/DPHO/local health facilities/I/NGO partners
iv	Develop a detailed micro-plan for vaccine delivery and ensure it is available and understood at the periphery level				EDCD/CHD/DPHO/local health facilities/I/NGO partners
v	Conduct training for FCHVs and health workers on OCV and hygiene promotion				EDCD/CHD/DPHO/local health facilities/I/NGO partners
vi	Ensure availability of guidelines, forms, and IEC materials for OCV campaigns at the district level				EDCD/CHD/DPHO/I/ NGO partners
vii	Conduct media orientation (at both central and district levels) to mitigate rumor/negative coverage of OCV campaigns				EDCD/DPHO/I/NGO partners
viii	Air radio/FM messages on OCV campaigns using district level radio stations				EDCD/DPHO/I/NGO partners/local medias
ix	Ensure proper documentation and monitoring and evaluation (M&E) of cholera campaigns by providing standard materials to each DPHO				EDCD/DPHO/I/NGO partners
4	**Social Mobilization Activities**				
i	Develop a detailed activity plan and align with other stakeholders working in health and WASH sectors at the district level				DWSS/EDCD/DPHO/ WSSDO/I/NGO partners
ii	Involve NGO partners working in health and WASH and support them in their promotion of safe hygiene practices				EDCD/DPHO/WSSDO/I/ NGO partners
iii	Orient teachers and school children on WASH				EDCD/DPHO/WSSDO/ VDC/NGO partners
iv	Promote WASH through door to door mobilization of FCHVs in the community				EDCD/DPHO/WSSDO/ Municipality/VDC/I/NGO partners

SN	Key Activities	Period			Responsibilities
		Pre-monsoon	During Monsoon	Post-Monsoon	
v	Distribute simple communication guidelines on key hygiene behaviors, case detection, and referral to community-level social mobilizers (identified by DPHOs)				EDCD/DPHO/WSSDO/ Municipality/VDC/I/NGO partners
vi	Promote key health behaviors during community gatherings				EDCD/DPHO/WSSDO/ Municipality/VDC/I/NGO partners
5	**Community Level Activities**				
i	Identify all actors to deliver integrated services: community health workers, village health workers, hygiene promoters, social mobilisers, traditional birth attendants, Red Cross volunteers etc.				EDCD/DPHO/ Municipality/VDC/I/NGO partners
ii	Conduct training for community level actors in health education and hygiene promotion, active case finding, early case detection, use of household water treatment and ORS at home, and referral to health facilities				EDCD/DPHO/ Municipality/VDC/Local Health Facilities/I/NGO partners
iii	Distribute IEC materials for safe hygiene practices, household water treatment, and messages on when to start home treatment with ORS and/ or to seek immediate treatment to the community				EDCD/DPHO/ Municipality/VDC/Local Health Facilities/I/NGO partners/FCHVs
6	**Case Management Activities**				
i	Annual Training of Trainers (TOT) for AGE/Cholera management and subsequent training of health workers				EDCD/DPHO/I/NGO partners
ii	Monitor training activities at the district level				EDCD/DPHO

SN	Key Activities	Period			Responsibilities
		Pre-monsoon	During Monsoon	Post-Monsoon	
iii	Create a Digital Resource Center accessible to all districts and partners through the EDCD				EDCD/DPHO/I/NGO partners
iv	Support supervision, monitoring visits, and quality assurance through standardized practices				EDCD/DPHO/I/NGO partners
v	Distribute case management guidelines and algorithms for assessing dehydration and managing patients, including the identification and management of dehydration for malnourished children				EDCD/DPHO/Local Health Facilities/I/NGO partners
7	**Supplies and Logistics Activities**				
i	Map necessary supplies annually to address current needs, including a distribution plan				EDCD/LMD/DPHO/ Local Health Facilities / NGO partners
ii	Procure additional supplies as needed for agreed minimum level preparedness				EDCD/LMD/DPHO/I/ NGO partners
iii	Ensure timely distribution of available supplies based on need and risk in affected areas				EDCD/LMD/DPHO/I/ NGO partners
iv	Regularly track and monitor inventory and replenish supplies as needed				EDCD/LMD/DPHO
8	**Coordination and Collaboration Activities**				
i	Map available resources and existing gaps (funds, supplies, partner contact details, response plans etc.) prior to the season to ensure preparedness				EDCD/LMD/CHD/DWSS/ WHO/UNICEF/DPHO/I/ NGO partners
ii	Conduct regular meetings of the Task force for Cholera Control to obtain updates on the AGE/ cholera situation, surveillance and control operations, status of essential supplies, and gaps in resources				EDCD/LMD/CHD/DWSS/ WHO/UNICEF/DPHO/I/ NGO partners

SN	Key Activities	Period			Responsibilities
		Pre-monsoon	During Monsoon	Post-Monsoon	
Iii	Share information through a weekly AGE/Cholera Situation Report sent by email from EDCD with a summary of the current AGE/Cholera numbers (daily in the case of an outbreak)				EDCD/LMD/CHD/DWSS/ WHO/UNICEF/DPHO/I/ NGO partners
Iv	Discuss possible field level (district and below) coordination and collaboration of response through the government health system and other stakeholders to ensure a response can take place as soon as possible				DPHO/I/NGO partners
9	**Rapid Response Activities**				
i	Designate a government official responsible for emergency implementation of response activities				EDCD/DPHO/Health facilities
ii	Prepare district level plans for the conduct of community level WASH and reactive vaccination campaigns at least two months prior to the monsoon season				EDCD/LMD/CHD/DWSS/ WHO/UNICEF/DPHO/I/ NGO partners
iii	Map where supplies will be retrieved and who will deliver them for rapid implementation of the cholera response				EDCD/CHD/DWSS/WHO/ UNICEF/DPHO/I/NGO partners
iv	Train RRTs annually on response activities				EDCD/DPHO/I/NGO partners
v	Collect and analyze data from the line listings and household investigations of all cholera cases				EDCD/DPHO

5. Monitoring and Evaluation of Surveillance and Response

Conducting routine monitoring and evaluation is important in ensuring an effective and efficient surveillance and response system year after year (WHO). Monitoring and evaluation of the successful implementation of this plan will be led by EDCD at the EWARS sentinel sites and by the DPHOs in coordination with EDCD at periphery level health facilities.

According to the WHO Guide to Monitoring and Evaluation of Communicable Disease Surveillance and Response Systems, monitoring in this context refers to "the routine and continuous tracking of the implementation of planned surveillance activities and of the overall performance of surveillance and response systems," and evaluation refers to the "periodic assessment of the relevance, effectiveness and impact of activities" based on the objectives set forth for those activities. [30] These activities must be implemented in a manner that allows for adjustment of the plan on an annual basis. The Steering Committee for Enteric Diseases, chaired by the Director of the EDCD, will review the results of this evaluation during their post-monsoon session and recommend any necessary revisions to the plan.

Indicators

A series of indicators have been outlined in **Annex 8** and are specified for surveillance, response, and laboratory activities. The EDCD is responsible for collecting data on these indicators and analyzing results for dissemination to the Steering Committee. Explanations of results as well as specific recommendations should be provided.

Timing the evaluations

Evaluations will take place annually during the post-monsoon season after cases have subsided. However, the Task Force for Cholera Control should also perform interim evaluations may be performed to track progress determine whether the program is on target with the goals outlined in this plan and to implement changes if needed. This will be particularly important for monitoring stockpiles of supplies throughout the season. It will also ensure that stakeholders can be held responsible for their activities as outlined in the plan of action.

Key Activities for Monitoring and Evaluation
Track progress of implementation of planned activities
Identify problems in the system in order to institute corrective measures in a timely manner
Track stocks of key resources to avoid delays in response
Ensure that all parties are held responsible and accountable for their defined activities as outlined in the Plan of Action
Collect and analyze data on the outlined indicators
Disseminate results to the Steering Committee
Provide explanations for achievements and failures in the system
Provide specific recommendations for improving the system

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Annexes

ANNEX 1a: Hospital Reporting Form

Hospital	Patient ID	OPD/Eme/ IPD	Name	Age (Year)	Sex	Phone	Name Of Guardian	Date Of Admission	District	VDC	Ward	Village Or Tole

Provisional diagnosis AGE or Cholera	Stool sample collected (Y/N)	Outcome	RDT Performed	Culture Performed	Result RDT	Result Culture	Date of Lab Result	Sample sent to NPHL (Y/N)	Date Sent to NPHL

ANNEX 1b: Variable Definitions

Variable Name	Description	Codes
Hospital	Name of the hospital	Text
Patient ID	Registration number of the patients or if not available registration number as specified in the ER registers	Num
Name of Patient	Name of the patient	Text
Age	age of the patient	Num
Sex	sex of the patient	M/F
Phone	Phone number (mobile) of the patient	Num
Name of Guardian	Name of the father or mother or relatives	Text
Date of Admission	Date of admission in ER or OPD or date of registration in wards	Date
OPD/Eme/IPD	Please select type of patient registration (OPD/IPD/Emergency).	OPD, EME, IPD
District	District of current residence	Coded values
VDC	VDC of current residence	VDC codes
Ward	Number of the ward of the current residence	Num
VillageOrTole	Name of the Village or Tole	Text
ProvisionalDiagnosis	Provisional diagnosis during admission	AWD (Acute Watery Diarrhoea) ; SC(Suspected cholera)
StoolCollected	Was a stool sample collected in admission?	Y/N
Outcome	Outcome of the disease at discharge	1. Treatment; 2.cured;2.referred;3. death;4.Unk
RDT	Was an RDT for cholera performed?	Y/N
Culture	Was culture performed	Y/N
ResultRDT	Result of cholera RDT	Positive/Negative
ResultCulture	Result of Culture for cholera at hospital	Positive/Negative
DateLabResult	Date it was tested in the laboratory of the hospital	Date
DateResultNPHL	Date it was tested in NPHL	Date
Sample sent to NPHL (Y/N)	Was the sample sent to NPHL?	Y/N
DateSentNPHL	The date the sample was sent to NPHL	date

ANNEX 2: Methods for Using the Rapid Diagnostic Test with Enrichment Step

Fecal Specimen Collection Procedure

1 For collection of fecal specimens, the laboratory technician must collect a recently discharged or fresh stool sample from the patient. Prepare necessary supplies including labeled stool container, gloves, plastic spoon, and 2 plastic bags at the time of presentation. Use the plastic spoon to collect 3-4 spoons of stool and place it in the labeled stool container properly. If the stool is watery, use container directly to collect approximately 5 ml of stool.

2 If a diarrheal stool sample is not available, the health facility clinical staff should collect a rectal swab. To collect a rectal swab, take verbal consent, insert swab 1-1.5 inches into the rectum and gently rotate. The swab should be visibly stained with stool. Then insert the swab deep into a tube of APW, break off the tip, and close the cap.

Enriched Cholera RDT

1 Ensure appropriate PPE is worn by health facility staff processing the specimens.

2 Immediately upon receipt of the fecal specimen, dip a cotton-tipped wooden stick in the fecal specimen and place in APW media for **6 hours** (minimum of **5** to a maximum of **18** hours).

APW must be inoculated on the day of fecal specimen collection OR Cary-Blaire must be inoculated from the original specimen.

3 Using a pipette, collect a small amount of specimen-enriched APW from the top of the APW tube. Do not shake the APW tube prior to collection. Add 2-4 drops of the specimen-enriched APW into kit's test tube.

4 Place a Crystal VC dipstick into the test tube and wait for exactly 15 minutes (do not exceed 15 minutes).

5 Read the dipstick at 15 minutes, verifying that the positive control band is visible to ensure quality of the dipstick.

If the specimen is dipstick POSITIVE

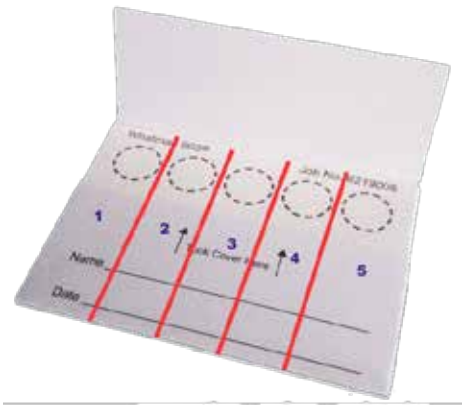
1 Inoculate the first 10 positive specimens at each individual facility into Cary-Blair transport media to be sent for culture. To do so:

1 Dip cotton-tipped wooden stick into the fresh stool/specimen-enriched APW and then **stab** stick into Cary-Blair transport tube. Cotton tip should be inserted to the bottom of the Cary Blair media.

2 Break off the tip of the cotton-tipped wooden stick and close the tube tightly.

If transport media is not available

1 Blot stool directly onto a Filter Paper card (shown at the right) , filling one circle and labeling with patient id, hospital name, and date. (for further molecular studies)



ANNEX 3: Vaccination Talley Sheet

Cholera Vaccination Tally Sheet by Sex

Sheet N°:..................

Team:.. District:..

Date:.. Health Zone:..

Health Area:.. Neighborhood:..

Number of vaccine vials used:

Utilization rate= Number of people vaccinated x100 / Number of doses used   Utilization rate [%]

	Male				Female			
≥ 1yr - 4 yr	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○
	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○
	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○
	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○
	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○
Total 1 - 4 yr								
≥ 5 - 14 yr	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○
	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○
	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○
	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○
	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○
Total 5 - 14 yr								
≥ 15 yr	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○
	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○
	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○
	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○
	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○
Total ≥15 ry								
Grand total								
	Check a circle for a given dose (1 person vaccinated)				1 square = 100 doses administered			

Utilization	Number of doses received	Extra number of doses received	Total received	Number of remaining doses	Number of doses used
Vaccine doses					

Visial vial monitor

Reading				
Interpretation	Can be used		Can not be used	
Number of VVMs with changed color				

ANNEX 4: OCV Adverse Event Following Immunization (AEFI) Reporting Form

Date of report:		Age:	M /F:
> 3 years old: yes/no	Pregnant: yes/no	Immune compromised: yes/no	
District:	Village:	Ward:	

Vaccination target areas			
Dates of vaccines	First:	Second:	
Date AEFI started:		Onset interval:	

History /Complaints:	**I**	**How many times?**		I	**Other complaints?**
Nausea Vomiting	Yes / No I			I	
Diarrhoea	Yes / No I			I	
Abdominal pain	Yes / No I			I	
Fever	Yes / No I			I	
Other:	Yes / No I				
Duration:	I				

On examination:	Temp:	BP:	PR:		RR:

Name of investigator:
Post:
Signature:
Date:

ANNEX 5: IEC Materials

हैजा रोग सम्बन्धि जानकारी लिनुहोस् !!

"हैजा" कस्तो रोग हो ?

हैजा एक छिटै सर्ने सरुवा रोग हो। यदि यसको उपचार समयमै नभएमा यसले ज्यान पनि लिन सक्छ।
हैजा ब्याक्टेरियाबाट हुने रोग हो। वान्ता हुनु, पातलो दिसा हुनु र जीउ शिथिल हुनु यस रोगको लक्षणहरु हुन्।

"हैजा" रोग कसरी सर्छ ?

हैजा रोग दुषित पानी र खानाबाट सर्दछ।

"हैजा" रोग लागेको शंका लागेमा के गर्नु पर्छ ?

हैजाका बिरामीलाई तुरुन्त नजिकैको स्वास्थ्य संस्थामा उपचारको लागि लैजानु पर्दछ। यदि उचित र समयमा उपचार नभएमा बिरामी मर्न पनि सक्छन।

हैजा रोग बाट बच्न के गर्नु पर्दछ ?

हैजाबाट बच्नको लागि स्वच्छ पानी, सफा चर्पीको प्रयोग र साबुन पानीले हात धुनँ पर्दछ।

स्वच्छ पानी सफा हातहरु सफा भाँडाकुँडाहरु

हैजा विरुद्धको खोप दिनु पर्छ। यो खोप प्रभावकारी र सुरक्षित छ।

ANNEX 6: Example Situation Report

Department of Health Services (DoHS)

Epidemiology and Disease Control Division (EDCD)

HOSPITAL-BASED SURVEILLANCE OF CHOLERA AND ACUTE GASTRO ENTERITIS CASES IN THE KATHMANDU VALLEY - DAILY SITUATION UPDATE[1]

Date: as of 28 July 2016

Key points and interventions

- 24 cholera cases were confirmed by the National Public Health Laboratory so far since 30 June, 6 cases in Kathmandu and 18 cases in Lalitpur,
- Four additional cases were diagnosed in Patan hospital,
- WASH and social mobilization activities are taking place in wards 10, 11 and 12 in Thaiba, including door-to-door visit, distribution of PIYUSH, awareness messages.

Table 1: Number of Acute Gastro Enteritis (AGE) and cholera cases reported, by hospital (excludes zero reporting)

Hospitals	Number of Acute Watery Diarrhoea		Number of probable cholera cases[2]		Number of confirmed cholera cases[3]	
	on 27/7	Cumulative (since 1/6)	on 27/7	Cumulative (since 1/6)	on 27/7	Cumulative (since 1/6)
STIDTeku, Kathmandu		224		3		3
Kanti Children Hospital, Kathmandu		35		1		1
Kathmandu Medical College, Kathmandu		77				
Nepal Medical College, Kathmandu		52				
Birendra Army Hospital, Kathmandu		33				
Central Prison Hospital, Kathmandu		2				
Patan Hospital, Lalitpur	6	141	4	22	3	18
KIST Medical College, Lalitpur		73		2		2
Bhaktapur Hospital		121				
Sidhi Memorial Hospital, Bhaktapur						
Dulikhel Hospital						
Total	**6**	**758**		**28**		**24**

1 The cases reported here include the new cases registered in the hospitals during the last 24 hours.

2 Number of cholera cases confirmed by hospitals using Dipstick Rapid Diagnostic Tests or culture confirmed (TCBS and cholera-specific biochemical confirmation).

3 Number of cholera cases confirmed by NPHL, including serology.Please note that the WHO and EWARS case definitions includes children above 5 years, but one year age cut-off is used for the purpose of this active surveillance system.

Figure 1: Number of Acute Gastro-Enteritis cases, probable and confirmed cholera cases (N=22) reported to EDCD as of 28 July 2016

Acute Watery Diarrhoea is not necessarily reported daily by all hospitals and the decreasing trend observed after 8 July can be explained by under-reporting. Cholera cases are still sporadic and are expected in this season.

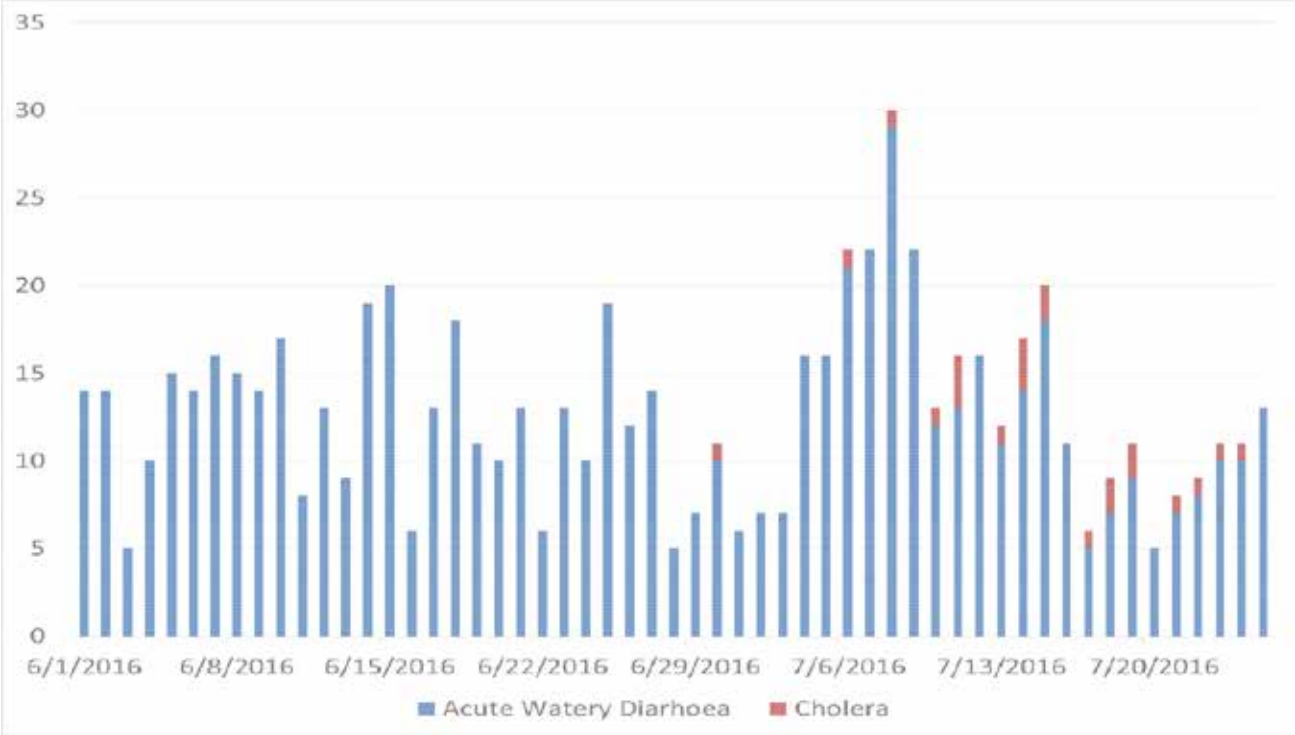


Figure 2: Distribution of cholera and acute watery diarrhoea in the Kathmandu Valley

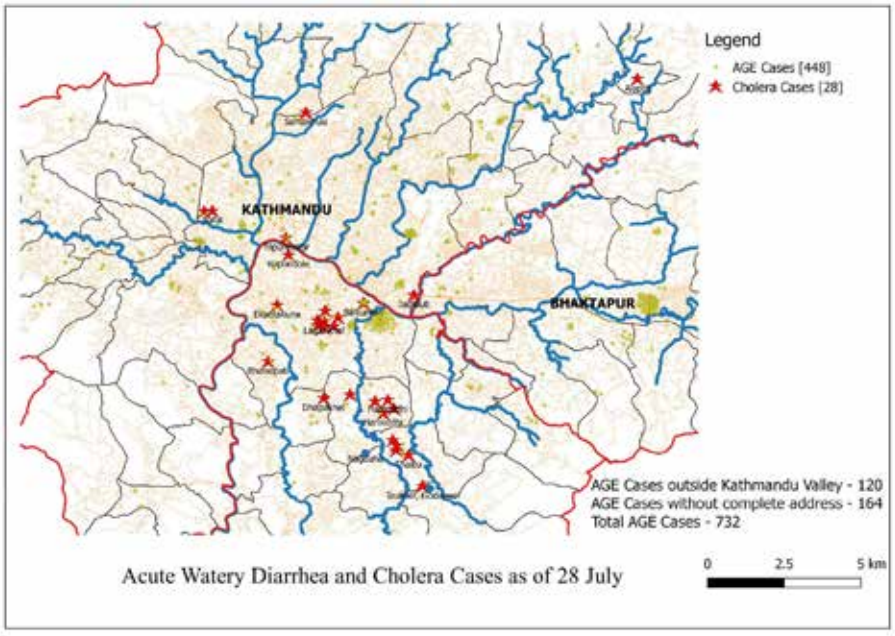


	Table 2: Number of cholera cases reported by area as of 28 July					
District	**Area**	**Week 30**	**Week 29**	**Week 28**	**Previous**	**Total**
Kathmandu	Bafal				2	2
	Tripureshor				1	1
	Samakusi			1		1
	Dacchhi/Alapot		1			1
	Jadibuti (Koteshwor)		1			1
Lalitpur	Lagankhel, Sundhara, Balkumari		2	6		8
	Baisepati			1		1
	Ekantakuna		1			1
	Kupundole		1			1
	Dhapakel		2			2
	Harisiddhi	3	1			4
	Thaiba/Godawari	1	1	2	1	5
Total		4	10	10	4	28

Acknowledgments: this bulletin is prepared by the CTI network, including expert focal points from 11 hospitals of the Kathmandu Valley reporting to EDCD and NPHL and supported by UNICEF, the World Health Organization, Johns Hopkins University, and The Group For Technical Assistance.

ANNEX 7a: Risk Factor Form for Household Investigation

Patient ID	Household ID	Patient Name	Date of Investigation	Investigation Team	District	VDC	Category	Age	Sex	Occupation	Phone

Living Since	Diarrhea Past 2 Weeks	Date Onset	Symptoms	Hospital Admitted	Drinking Water	Cleansing Water	Food Consumed Outside	Travel 1 Week	Travel Place	Primary Water Source	Secondary Water Source

Household Water Treatment	Drinking Water Storage	Storage Changed Recently	Water Quantity	Hand Washing	Water Sample Taken	Toilet	Open Defecation	Soap	Waste	Sludge

ANNEX 7b: Variable Definitions

Variable Name	Definition	Code
Sex	Male	M
	Female	F
DiarrhoeaPast2Weeks	Yes	Y
	No	N
Symptoms	Diarrhea	1
	Vomiting	2
	Abdominal Pain	3
	Fever	4
	Others	5
Hospital Admitted	Yes	Y
	No	N
Drinking Water	Tap	Tap
	Well	Well
	Bottle	Bottle
	Jar	Jar
	Tanker	Tanker
Food Consumed Outside	Yes	Y
	No	N
Travel1Week	Yes	Y
	No	N
Primary Source	Piped water; piped into dwellling; piped to yard	Piped Water
	Public tap/standpipe	Public Tap
	Tube well or borehole; dug well; protected well; unprotected well	Tube Well
	Water from spring; protected spring; unprotected spring	Spring Water
	Rain water	Rain Water
	Tanker truck	Tanker
	Surface water(river/dam); lake; pond; stream; canal	Surface Water
	Irrigation channel	Irrigation Channel
	Stone tap/dhara	Stone Tap
	Bottled water	Bottled Water
	Jar water	Jar Water
	Others	Others
Secondary Source	Piped water; piped into dwelling; piped to yard	Piped Water
	Public tap/standpipe	Public Tap
	Tube well or borehole; dug well; protected well; unprotected well	Tube Well
	Water from spring; protected spring; unprotected spring	Spring Water
	Rain water	Rain Water
	Tanker truck	Tanker
	Surface water(river/dam); lake; pond; stream; canal	Surface Water
	Irrigation channel	Irrigation Channel
	Stone tap/dhara	Stone Tap

Variable Name	Definition	Code
	Bottled water	Bottled Water
	Jar water	Jar Water
	None	None
	Others	Others
Household Water Treatment	Boiled	Boiled
	Add bleach/chorine	Chlorine
	Add piyush/water guard	Piyush/Water Guard
	Strain through a cloth	Cloth Filter
	Use water filter (ceramic/biosand/colloidal filter)	Ceramic Filter
	Solar disinfection	SoDis
	Letting stand and settle	Stand and Settle
	None	None
	Others	Others
Storage Changed Recently	Yes	Y
	No	N
Hand Washing	Yes	Y
	No	N
Toilet	Flush or pour flush toilet	Flush Toilet
	Water seal latrine	Water Seal Latrine
	Pit latrine	Pit Latrine
	Ventilated improved pit latrine	VIP Latrine
	Pit latrine with slab	Slab Pit Latrine
	Pit latrine without slab/open pit	Open Pit
	Composing toilet	Composing Toilet
	Bucket toilet	Bucket Toilet
	No facility/bush/field	None
	Others	Others
Open Defecation	Yes	Y
	No	N
Soap	Yes	Y
	No	N

ANNEX 8: M&E Indicators

Components	Indicator	Numerator	Denominator	Means of verification
Surveillance	Proportion of Steering Committee meetings held (expected monthly)	Number of meetings with minutes	Total number of meetings planned	Meeting minutes
	Routine monitoring of water quality (expected monthly)	Number of reports by DWSS to the Task Force for Cholera Control	Total number of Task Force meetings	DWSS water quality reports Meeting minutes
	Completeness of hospital reporting (including zero reporting)	Number of reports from the hospital	Expected number of hospital reports	Daily / Weekly line listings
	Timeliness of reporting cases to the EWARS system	Average time from hospital admission to EWARS reporting		Daily / Weekly line listings Hospital records
	Timely distribution of situation reports during non-outbreak (expected weekly)	Number of weekly report distributed on time	Total number of non-outbreak reporting weeks	Situation reports
	Timely distribution of situation reports during outbreak (expected daily)	Number of daily report distributed on time	Total number of outbreak reporting days	Situation reports
Response	Number of reported cholera cases that are investigated	Number of cases investigated	Number of cases reported	Situation report
	Presence of all required RRT members on investigations	Number of days with all RRT members present	Total number of days on investigation	Attendance, Outbreak Reporting form
	Number of meetings held by Task Force for Cholera Control (expected bi-monthly throughout the monsoon season)	Number of meetings with minutes	Total number of Task Force meetings planned	Meeting minutes
	Adequate availability of resources for WASH response	Number of districts reporting a shortage of WASH resources	Total number of districts	Stock Book, LMIS Report
	Adequate availability of resources for IEC/BCC response	Number of districts reporting a shortage of IEC/ BCC resources	Total number of districts	Stock Book, LMIS Report

Components	Indicator	Numerator	Denominator	Means of verification
Response	Adequate availability of vaccine	Number of cholera cases for which vaccine was not available	Total number of cholera cases	Stock Book, LMIS Report
	Completeness of risk factor reporting	Number of completed risk factor reporting forms	Total number of cholera cases	Risk Factor Forms Situation Reports
	Need for contingency stocks	Number of requests for additional supplies		NPHL Stock Book, LMIS Report
	Number of districts with established RRTs	Number of district with RRT	Total number of districts	DoHS Annual Report
Laboratory	Timeliness of reporting lab results to the EWARS system	Average time from the sample being sent to NPHL to EWARS reporting the case as confirmed		NPHL registers Situation reports
	Number of samples sent properly to NPHL (analyzable samples)	Number of sample sent properly	Total number of samples sent to NPHL	NPHL registers
	Number of samples received with culture results	Number of culture results available	Total number of samples sent to NPHL for testing	NPHL registers
	Laboratory representation in the steering committee meeting	Number of meetings with NPHL representation	Total number of Steering Committee meetings	Meeting minutes
	Adequate availability of RDTs at the hospital level	Number of hospitals requesting additional RDTs	Total number of sentinel site hospitals	NPHL Stock Book
	Adequate availability of lab supplies at the hospital level	Number of hospitals requesting additional lab supplies	Total number of sentinel site hospitals	NPHL Stock Book
	Adequate availability of lab supplies at the national lab	Number of requests from NPHL for additional supplies		NPHL Stock Book
	Routine documentation of antimicrobial resistance (testing expected for 10 cases every 2 weeks)	Number of antimicrobial disc diffusion tests performed	Expected number of tests	NPHL registers AMR report