

# Evolution of the Kathmandu Valley Cholera Prevention and Preparedness Programme

## SUMMARY

Cholera outbreaks occur almost every year during the monsoon season in Nepal. The 1.3 million people living in the Kathmandu Valley are some of the most affected and vulnerable in the country. The earthquakes in 2015 caused massive population displacement and increased the potential for an outbreak as a result of the widespread destruction of water supply infrastructure and sanitation facilities. A major outbreak was averted by the humanitarian WASH interventions immediately post-quake (Kansakar et al, 2017).

In anticipation of a cholera outbreak in 2016, UNICEF conducted an intensive cholera response and prevention programme in Kathmandu valley in coordination between WASH, Health and Education sectors jointly with the local government. This year no deaths were reported. In 2017, a five-year National Prevention and Preparedness Plan for Acute Gastroenteritis (AGE) and cholera was developed in coordination with local government and endorsed by the national Government. As a result, only 3 cases of cholera were reported in Kathmandu Valley.

In 2018, the cholera prevention and preparedness programme was refined, based on experiences and learnings of 2015 -2017, and scaled up to enhance the capacities of the seven most vulnerable municipalities in the Valley. Two cholera cases were detected in the Kathmandu Valley that year.

This Field Note presents the cholera prevention and preparedness programmes implemented by UNICEF in collaboration with local government and partner organizations between 2015-2018. [Body copy]

## Introduction

Cholera is endemic in various parts of Nepal, including Kathmandu Valley. It is a form of acute, watery diarrhoea, caused by the bacterium *Vibrio cholerae*. Without treatment, the disease can lead to death from severe dehydration within hours

from the onset of symptoms. Cholera can quickly spread in places where drinking water is not protected from faecal contamination such as densely populated urban areas and slums. Rapid detection of and response to cholera cases is needed to control the spread of disease. Kathmandu Valley is one of the fastest growing

urban centres of Nepal. Many people in Kathmandu have limited access to safe drinking water and sanitation facilities. Their vulnerability to water related diseases is further undermined by failures to manage solid and liquid waste or improve environmental cleanliness. Cholera cases are recorded nearly every year in the Kathmandu Valley, with sporadic outbreaks during the monsoon months of May to September.

In the aftermath of the 2015 April and May earthquakes, the world feared a cholera outbreak in Nepal, especially in Kathmandu Valley. The Valley experienced higher population density, due to the displacement of populations from neighbouring districts, and poor hygiene conditions due to limited WASH infrastructure. Between August to September 2015, 76 cases of cholera were confirmed in Kathmandu.

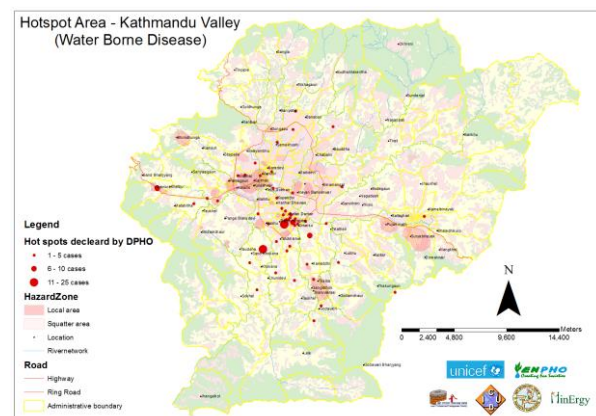
The Government of Nepal, in collaboration with UNICEF and its local partners implemented multi-sectoral rapid responses in 2015 and 2016 to contain the cholera outbreaks. These aimed at increasing the adoption of safe water, sanitary and hygienic practices among communities in Kathmandu Valley. Their success in reducing transmission and lowering mortality led to a continuation of the initiatives in 2017/18. The main objective was to mainstream cholera/acute gastroenteritis (AGE) prevention and preparedness activities into the structure of local government.

In anticipation of a cholera outbreak in 2016, the Government of Nepal had established a cholera sentinel surveillance system to detect and track cholera cases with support from UNICEF and Johns Hopkins University. In 2016, 150, out of a total of 169, cases were detected within the Kathmandu Valley. UNICEF conducted an intensive cholera response programme in coordination between WASH, Health and Education sectors together with the local government. No deaths were reported. From this response and its learnings, in 2017, a five-year National Prevention and Preparedness Plan for

AGE and Cholera was developed and endorsed by the Government. The programme was further implemented by local government of Kathmandu valley with technical assistance from UNICEF and its partners. As a result, only 3 cases of cholera were reported in Kathmandu Valley.

In 2018, the cholera prevention and preparedness programme was refined, based on the experiences and learnings of 2015 to 2017, and scaled up to enhance the capacities of the seven most vulnerable municipalities in the Valley. Under this programme, UNICEF extended its partnerships with NGOs (national and local) and municipalities. Only two cholera cases were detected in the Kathmandu Valley that year. This field note documents the experiences and learnings on cholera response, prevention and preparedness programmes conducted in the Kathmandu Valley.

**Figure 1: Cholera hotspots in Kathmandu Valley**



## Evolution of the Kathmandu Valley Cholera Prevention and Preparedness Programme

In this section, the chronology of the key cholera response programmes by UNICEF and partners is described:

### 2015-2016 WASH Rapid Response Programme

The programme was implemented in areas where cholera was detected. UNICEF Nepal worked with

district and national government to contain the outbreak through a multisectoral effort with WASH, health and education sectors. The programme operated in a 'firefighting modality', in which the WASH programme was focused on clusters of communities where cases were detected. These experiences made UNICEF Nepal and the district authorities realise the importance of prevention and preparedness efforts.

### 2017 Cholera Prevention Programme

Based on learnings of the 2015-2016 response, the 2017 Cholera Prevention Programme was the first step towards active prevention of the disease through WASH interventions and support to local government to prepare for a potential future outbreak.

Cholera hotspot mapping was one starting point for the prevention and preparedness activities. According to the Global Task Force on Cholera Control (GTFCC), cholera hotspots "are relatively small areas most heavily affected by cholera, which experience cases on an ongoing or seasonal basis and play an important role in the spread of cholera to other regions and areas. Cholera transmission can be stopped in these areas through measures including improved WASH and through use of oral cholera vaccines".

Identification of hotspots was an important and strategic way to help focus control programmes on most vulnerable populations, rather than attempting to reach all 1.3 million people in Kathmandu Valley. Cholera hotspot mapping was implemented in all seven municipalities using recent cholera case data to map incidence and mortality, as well as to understand factors promoting cholera transmission in those hotspots. See Figure 1 above.

Enhancing capacities of the concerned district structures: The programme focused on strengthening district and local systems to prevent water related diseases with the intention of

institutionalizing public health risk reduction as part of standard local government action. It worked simultaneously on three key actors in the district structure:

- Local authorities responsible for public health emergencies (District Public Health Office, Water Supply and Sanitation Divisional Offices, municipalities and ward)
- Private service providers, such as private water tankers, community level commercial water distributors, street food vendors
- Communities, schools and individuals of the target communities

An effective coordination platform was established among key actors through a district level WASH cluster, as well as health sector Rapid Response Teams (RRTs). This mechanism helped to strengthen the flow of messages, for example confirmed case prevalence, from the health system to the concerned WASH stakeholders to plan the field-based response. Key actions designed to contribute to effective implementation of the programme in each target municipality, such as citizen-led water quality testing, awareness campaigns and the participation of private sector and community-level water service providers were prioritized.

### 2018 Kathmandu Valley Cholera Prevention Programme

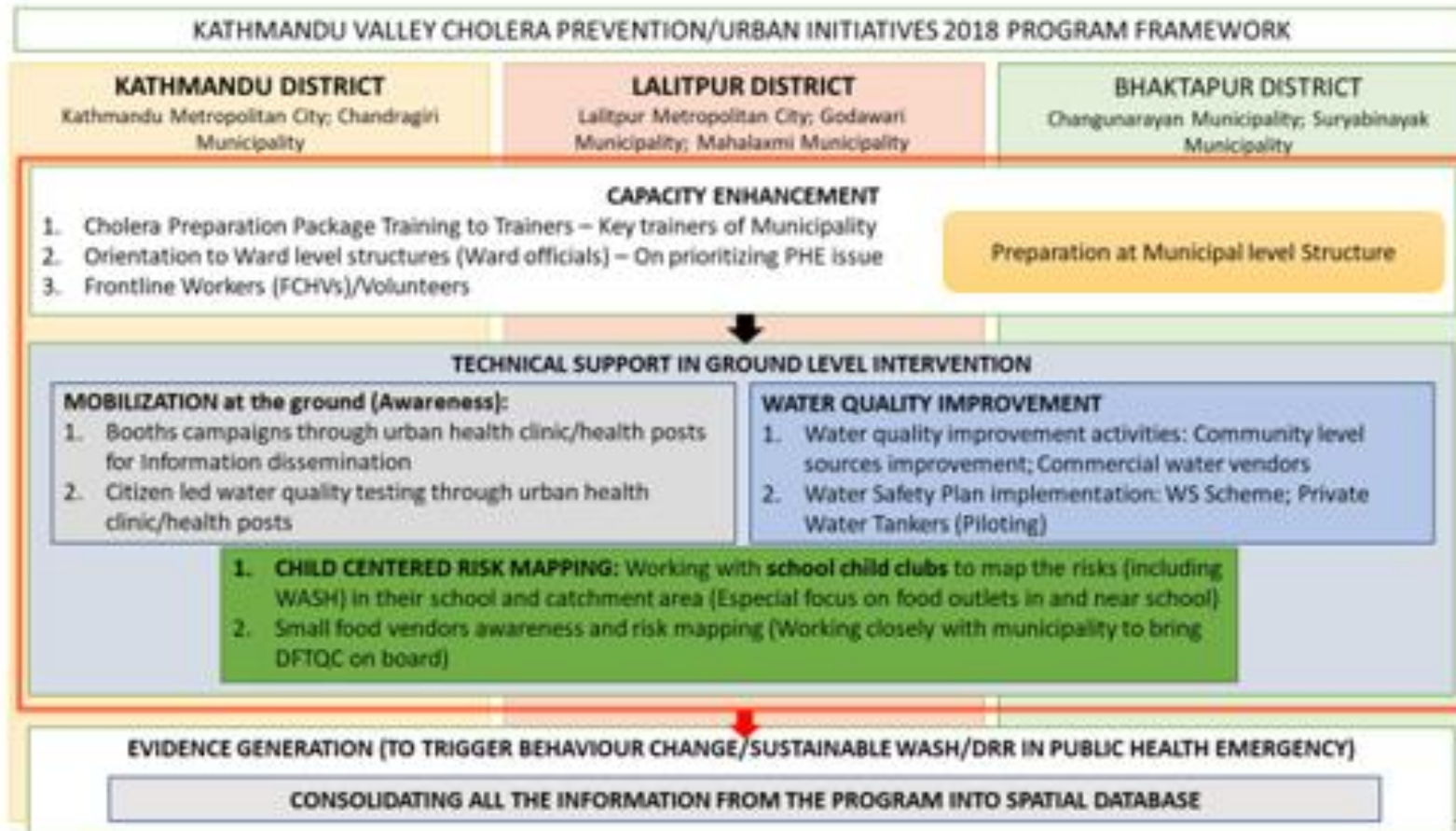
In 2017, the nation was restructured into a federal structure with clearly defined roles for local municipalities. Therefore, the main objective of the 2018 programme was to mainstream learnings and strategies used in the 2017 Cholera Prevention Programme and specifically the significance of prevention and preparedness activities, into the structure of local government through capacity enhancement activities. As illustrated in Figure 2, the programme further included:

- Identification of cholera hotspots
- Enhancing the capacity of municipalities on preparedness and prevention of cholera/AGE outbreaks
- Supporting municipalities to conduct community-level cholera and other water borne disease prevention activities
- Piloting school involvement in mainstreaming disaster risk reduction into local government's agenda through Child-Centred Risk Mapping (CCRM)
- Private sector and community-level service provider participation including citizen-led water quality testing and awareness campaigns
- Piloting water quality improvement in water supply schemes, including active monitoring of traditional sources of drinking water and commercial water vendors
- Develop a spatial database system incorporating all data generated as part of the programme, allowing it to support future planning processes for prevention and preparedness programmes

UNICEF with initial engagement of Johns Hopkins University, the Group for Technical Assistance (Kathmandu, Nepal) and the Government of Nepal, extended its partnerships with a number of NGOs, including Environment and Public Health Organization (ENPHO), Minergy Initiatives, Centre for Integrated Urban Development (CIUD), Urban Environment Management Society (UEMS), Environment and Development Organization (ENDO), Society for Youth Activity (SOYA) and Yuwalaya.

Figure 2 illustrates the programme framework that was followed in 2018.

Figure 2: Kathmandu Valley Cholera Prevention Program Framework



Source: UNICEF Nepal CO / WASH sector

## Prevention and preparedness activities under the 2018 programme framework

This section highlights how UNICEF engaged local government and partners in the 2018 programme:

- Capacity enhancement through Training of Trainers on the Cholera Preparation Package, orientation of ward officials as well as frontline workers, such as Female Community Health Volunteers, (FCHVs), and other volunteers.
- Mobilisation through booth campaigns and citizen led water quality testing
- Water quality improvements through direct improvement activities and water safety planning
- Child-centred risk mapping

Each component is presented in further detail below:

### 1. Capacity enhancement

**System strengthening:** In order to create the necessary enabling environment, the project established close collaboration with seven municipalities, the Kathmandu Metropolitan City and Lalitpur Sub-Metropolitan City, the DPHOs of Kathmandu, Lalitpur and Bhaktapur and NGOs working in the WASH sector. Nine public hearings involving the District Public Health Offices, were implemented in hotspot areas in all seven municipalities.

**Capacity enhancement:** Municipalities received guidance on cholera prevention including:

- 3-day cholera trainings of trainers for key health officials (such as individuals in charge of health posts and public health officers)

- Half day orientations for ward chairpersons on the vulnerability of Kathmandu Valley to outbreaks and how to prioritise potential future emergencies in their workplans

Other capacity development activities included:

- One day orientation sessions for FCHVs and youth volunteers on WASH, water testing, prevention and preparedness for cholera response
- Training for water service providers on water chlorination and testing methods
- Training of local water user groups on pot chlorination in dug wells
- Training on water safety planning for private water tankers and selected community water supply user committees

### 2. Community level Mobilisation

**A door-to-door WASH awareness campaign** was carried out by FCHVs targeting households immediately surrounding suspected or confirmed cases. These households were given an orientation on methods for point-of-use (POU) water treatment, the importance of hand washing at critical times, as well as personal and food hygiene. Chlorine tablets, buckets for water storage and hand washing, and soap and an information sheet for future reference were distributed in low income communities to accompany the messages and allow the community to practice the promoted behaviours.

**Community hygiene promotion campaigns,** targeting food outlets (e.g. restaurants, tea shops, street-food vendors), community groups and schools as well as floating/migrant populations were implemented. Key hygiene messages included household water treatment, safe storage of water at home, handwashing, food hygiene, and basic sanitation. Awareness booths were set up in busy public areas of seven municipalities and volunteers handed out flyers and provided information related to WASH and cholera prevention.

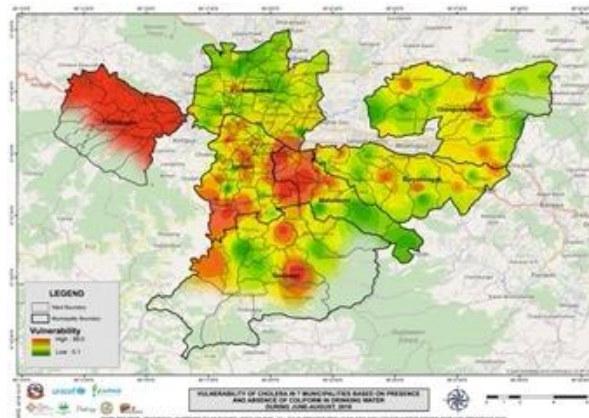
In addition, prevention messages were aired on the radio and were shared via loudspeakers on vehicles. Various other youth-led activities were carried out in cholera hotspots across the seven municipalities of Kathmandu Valley. These included wall comics, flash mobs, forum theatres and slam poetry sessions to promote correct information as well as positive attitudes in relation to sanitary and hygienic practices.

**Citizen Led Water Quality Testing and Awareness Campaigns** were conducted through the Awareness Booths. The public were involved in testing the water they consumed, which increased awareness of safe water and triggered the urge to take immediate action for safe water and positive hygiene behaviours.

### 3. Water quality improvement

**Water quality tests:** Rapid response teams and FCHVs performed residual chlorine and presence-absence faecal coliform tests at water sources in cholera hotspots. The coliform presence/absence (H2S) test kit is a great visual demonstration of water quality as the water turns black if contaminated, often triggering disgust and action. The results of the presence-absence faecal coliform test were 1. used to trigger household water treatment and 2. mapped to illustrate the distribution of contaminated water in the seven municipalities to aid in developing prevention and preparedness activities.

**Chlorination of water sources:** A large variety of water sources, including private mobile water tankers, dug-wells, traditional stone waterspouts, small independent water selling business and government water suppliers were targeted for chlorination. Their operators were trained on water chlorination as well as testing methods. Further 304 dug wells were protected through cleaning and chlorination. The main water utility of Kathmandu (Kathmandu Upatyaka Khanepani Limited, KUKL) was trained to ensure proper dosing of disinfectant to water supplied through their system.



Source: UNICEF Nepal / WASH sector

**Monitoring household water treatment practices:** Water quality tests (residual chlorine testing) showed that often those households using water disinfection to make their water potable were not performing the treatment properly. Knowledge of the proper use of PoU chlorine products and safe storage of drinking water within the household was improved through targeted trainings. Regular monitoring visits observing household practices followed to monitor and reinforce good practices.

**Showcasing of various urban water and sanitation solutions** including rainwater harvesting and groundwater recharge, as well as Water Safety Plans: Kathmandu Valley has an acute drinking water shortage, as result of increased demand and gradual increase of temperatures associated with climate change, among other factors. The supply available is 135 million litres per day (MLD) in the wet season and 90 MLD in the dry season, whereas demand evolves 350 MLD. Rainwater harvesting and groundwater recharge have been demonstrated ways to enhance the quantity of drinking water supplies. Water Safety Plans have been used to improve the quality of supplies. For instance, Water Safety Plan guidelines were drafted for private water tankers, in close coordination with the private tanker association.

### 4. Child-Centred Risk Mapping Child-Centred Risk Mapping (CCRM)

CCRM was conducted in 123 schools in targeted municipalities. More than 2,000 students underwent a 5-day training programme including an orientation on WASH, observation methods (transect walk, taking photographs), collecting water samples, risk and capacity mapping as well as the analysis of water samples. 2,641 water quality samples were tested by the students. Results showed that 52% of samples were contaminated. The risk maps produced were shared with the community and local authorities to determine specific actions for schools, communities, local authorities and other key stakeholders.

**Figure 3: Children participating in water quality testing**



## Outcomes

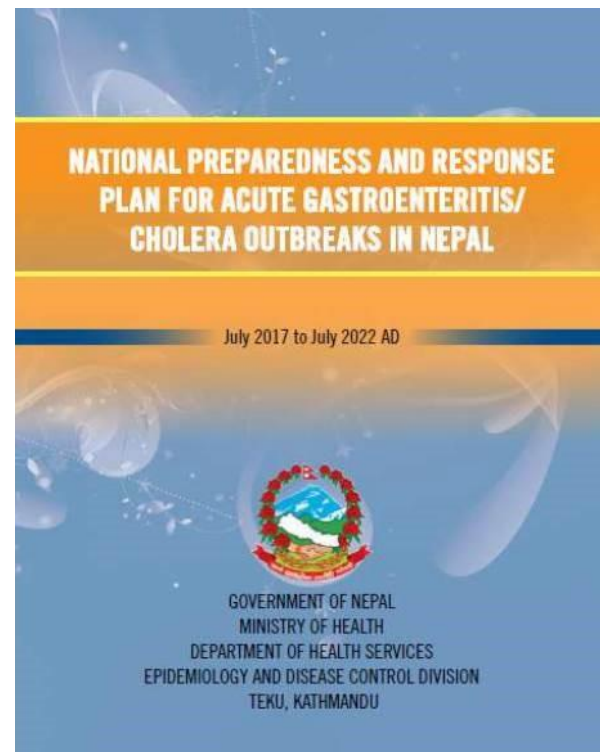
In the 2016 cholera season, 150 cases of cholera were reported in Kathmandu Valley. After the implementation of Nepal's first National Cholera Control Strategy, the number of cholera cases in Kathmandu Valley was significantly reduced in 2017, and in 2018 there were only 2 reported cases. It is difficult to ascertain the extent to which the cholera prevention and control measures contributed to this outcome. However, the programme has significantly contributed to increased awareness of cholera and AGE among communities, government officials, hospital staff and local NGOs in Kathmandu Valley.

The fact that there has been no major cholera outbreak in the Kathmandu Valley cannot be assigned solely to the programme as a direct result, but anecdotal and circumstantial evidence

globally and nationally shows that increased awareness coupled with an improved enabling environment and access often lead to improved hygiene behaviours and environmental hygiene, therefore reducing the risk of a significant cholera outbreak.

The learnings of the response have further been the basis for the currently ongoing, urban COVID-19 response implemented by UNICEF. As specifically hand hygiene awareness is a key factor in combatting both diseases learnings for high density, low resource areas have been used to design the COVID-19 strategy.

**Figure 4: National Cholera Preparedness and Response Strategy**





**Table 1: Achievements of the 2018 Kathmandu Valley Cholera Prevention Programme**

Status	Indicator
Students given an orientation on hygiene promotion to prevent cholera	114,745
People directly reached through hygiene promotion in Kathmandu Valley	78,845
People reached with improved water supply	53,254
People reached with household sanitation facilities	33,519
Number of people reached through the booth campaign	60,471
Number of water quality tests associated with the booth campaign	5,750
Number of water quality tests associated with child-centred risk mapping	2,641
Number of FCHVs and youth volunteers oriented on issues of cholera/AGE	1,231
Number of food vendors reached with information on safe hygiene practices	500
Number of municipality health officials attending a 3-day cholera preparedness training	234
Number of ward representatives oriented on issues of cholera/AGE	229

## Lessons Learned

Key lessons of the cholera responses and prevention programmes described above include:

- High-level political and financial commitments are required to implement national and sub-national level cholera control and prevention programmes and plans.
- Arrangements are needed to hold local governments (municipalities) to account for monitoring water quality at utility level
- A government contingency budget enables a rapid response to an outbreak.
- District and municipality government leadership is essential for successful planning and management of cholera interventions at district and community levels
- Sector-wide approaches and government-led coordination is necessary for continued

implementation of a multi-sectoral strategy for cholera prevention and control

- Child-centred risk mapping is an effective tool and could be incorporated into the school curriculum
- Water source mapping - a reliable system supporting water quality testing and monitoring and national guidelines on water chlorination - should be prioritised as part of municipal level water quality monitoring mechanism
- Regulation of local water vendors is a must to ensure safe drinking water and improved hygiene practices
- Continued efforts are needed to sustain local-to-national surveillance processes and laboratory diagnosis to rapidly detect and confirm cholera outbreaks
- A multi-disciplinary approach (including epidemiological and socio-anthropological research) can identify cholera hotspots, community risk behaviours and practices, as well as community uptake of campaign messages

## Next Steps

- Cholera cases are reported almost every year in Nepal, and climate change will have an additional impact on the prevalence of water borne diseases such as AGE and cholera. Based on lessons learned, the following next steps will reduce the risk of future outbreaks:
- Implementation of National Cholera Prevention and Preparedness Plan by local government
- Implementation and monitoring of drinking water quality standards
- Management of key public health risks including prevention and preparedness activities in district and national Disaster Risk Management Plans
- Identification of the roles and responsibilities for each sector with clear strategies for sector-wide coordination

- Development of local government contingency plans for outbreak prevention and preparedness
- Maintenance and strengthening of the sentinel surveillance system for early detection and timely response for AGE and cholera outbreaks within Nepal's Early Warning and Reporting System
- Preventative maintenance, rehabilitation/replacement of old infrastructure, incl. support to supply chains as well as contingency stockpiles (i.e. fuel, chlorine and spare parts) for water supply and waste treatment systems
- Expansion of child-centred risk mapping in other vulnerable areas of Nepal to help trigger communities, and other stakeholders, on outbreak prevention and preparedness
- Mobilisation of communities in high-risk areas to ensure water quality at household level, water source protection, basic personal and food hygiene, as well as environmental sanitation
- Use of innovations in youth, media and community engagement, with activities such as mobile messages, slam poetries, flash mobs or wall comics to change social norms and behaviours relating to cholera

**Figure 5: Community engagement in preparedness actions**



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## Acknowledgements

The authors would like to thank the public health sections of Kathmandu Metropolitan City, Chandragiri Municipality, Lalitpur Metropolitan City, Godawari Municipality, Mahalaxmi Municipality, Changunarayan Municipality and Suryabinayalk Municipality as well as the District level public health offices and Water Supply and Sanitation Divisional Offices of Kathmandu, Lalitpur and Bhaktapur districts, Kathmandu Valley Water Management Board for their close coordination. Furthermore, the authors wish to thank Centre for Integrated Urban Development (CIUD), Environment and Development Organization (ENDO), Environment and Public Health Organization (ENPHO), Minergy Initiatives, Society for Youth Activity (SOYA), and Urban Environment Management Society (UEMS) for their hard work in on the ground while implementing the Kathmandu Valley Cholera Prevention and Preparedness Programme.

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