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**LOCAL ACTION WITH INTERNATIONAL COOPERATION TO IMPROVE AND  
SUSTAIN WATER, SANITATION AND HYGIENE SERVICES**

**Lessons from cholera response  
in Kathmandu Valley, Nepal**

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*The first recorded cholera epidemic in Nepal took place in 1823, followed by a series of epidemics occurring in the Kathmandu Valley in 1831, 1843, 1856, 1862 and 1887. Kathmandu Valley still witnesses cholera and other water borne disease cases almost every year. In 2015 and 2016, cholera cases for the valley was highest with 76 and 150 confirmed cases respectively along is with huge caseload on Acute Watery Diarrhoea (AWD). WASH Situation of the Valley especially of City Centres comes with lots of challenges owing to the complexities of urban set-up and thus the city centres are the potential hotspots in context to outbreak vulnerabilities. Based on lesson learned in 2016 cholera response, this paper presents a way forward for minimizing the occurrence of cholera and AWD which includes developing a system for cholera prevention and outbreak response.*

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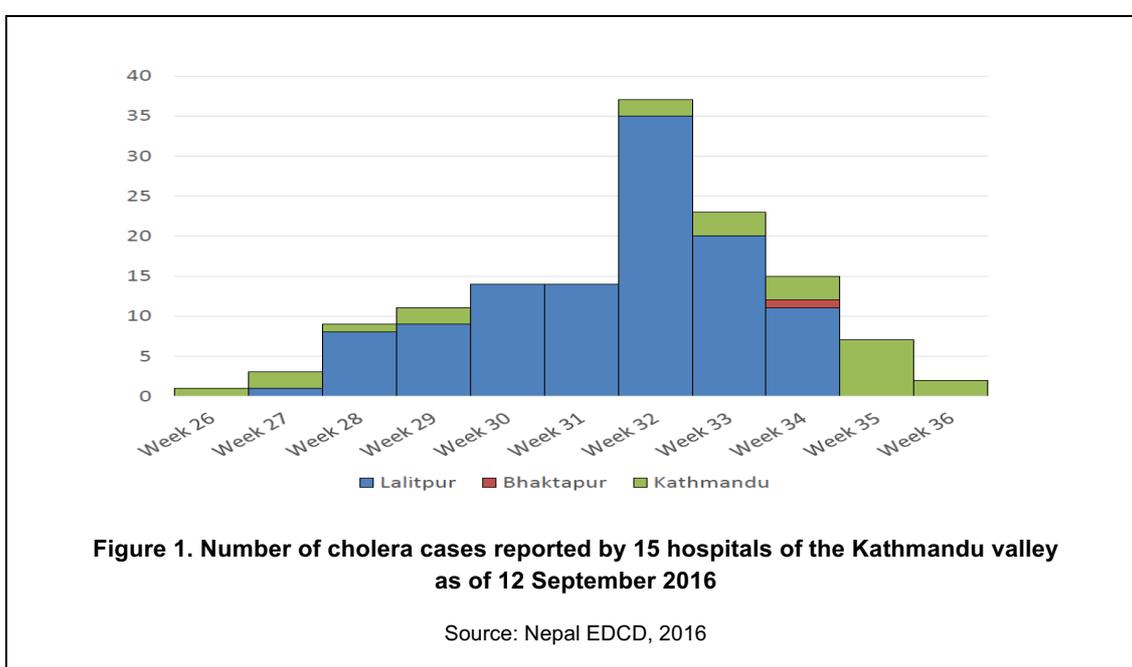
**Background**

Nepal is one of the 10 least urbanized countries in the world. However, it is also one of the top ten fastest urbanising countries (Bakrania, 2015). The Kathmandu Valley is the most populated urban region and one of the fastest-growing urban agglomerations in South Asia accounting for 24 per cent of the total urban population in Nepal (Muzzini & Apericio, 2013; MoUD, 2015). The urbanization out grows the slow paced development by many folds, resulting in poor quality of even the basic life sustaining services. WASH services is one of the crucial ones of these. In Nepal, issues of urban sanitation is still in shadows' amidst the much essential need for the provision of basic sanitation services as constructing toilets throughout the Nation. Due to the lack of adequate wastewater treatment facilities, more than 95% of the sewerage ends up into the rivers without any form of treatment (UNHABITAT, 2011). Aged old infrastructure of water supply systems further aggravates the issue as these system come with lots of room for improvement and decreased reliability on recommended Free Residual Chlorine (FRC) from household level taps. The water quality study conducted to understand water quality from the taps and sources by Environment and Public Health Organization (ENPHO) in 2005 showed that 38% of samples (total sample=181) were found with microbial risk (Yashoda Shrestha and ENPHO, 2005). Water borne diseases outbreak such as Cholera and mass diarrhoea are common in the valley.

On 25th April 2015, earthquake with an intensity of 7.8 magnitude hit Nepal which was followed by 7.3 magnitude on 12<sup>th</sup> may 2015. Kathmandu Valley was badly damaged by the two major earthquakes and the following series of aftershocks. The net total value of damages and change in economic flows to the water and sanitation sector, estimated to be NPR 11.4 billion at pre-disaster prices (PDNA, 2015). This led to many people in the Kathmandu valley vulnerable to water borne diseases due to poor hygiene condition, particular in higher population density in urban setup. During the immediate aftermath of the April and May earthquake, many WASH humanitarian agencies were on the ground providing emergency WASH intervention with vigilant potential water borne diseases outbreak such as Cholera and diarrhea. The reported cases of Cholera was only 76 cases between August to September 2015 and none of the urban Internally Displaced People (IDP) camps were reported any confirmed cases of Cholera in 2015. However, 2016, was regarded as the

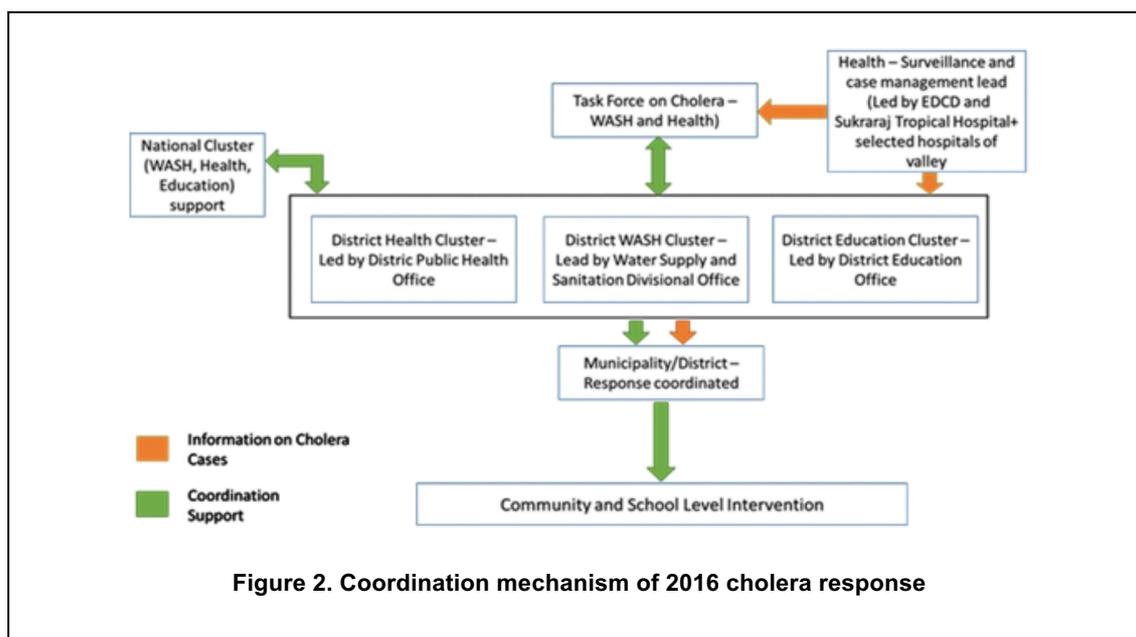
crucial year for Kathmandu valley in terms of public health emergency. In 2016, UNICEF Nepal, under the leadership of district level Health and WASH line agencies, and with its implementing partners, mainly Nobel Compassionate Volunteers and Environment and Development Organization (NCV-ENDO) and other WASH agencies in the district, supported the response activities through close involvement in coordination, planning and implementing critical WASH interventions on the ground to prevent further spreading of the deadly communicable disease. The 2016 pilot case for Cholera was reported in early June 2016. Figure 1 shows the cholera cases reported from week 26 to week 36.

This articles aims to document the lesson learnt from the WASH interventions conducted during cholera response 2016 in Kathmandu, to be taken forward as major recommendation to all the relevant sectors that have key roles to play for Cholera preparedness and response, WASH being the major one of them. This articles aims to document the lesson learnt from the WASH interventions conducted during cholera response 2016 in Kathmandu, to taken forward as major recommendation to all the relevant sectors that have key roles to play for Cholera preparedness and response, WASH being the major one of them.



### Coordination for the response

Figure 2 shows the coordination mechanism for cholera response in 2016. This was adopted from the emergency coordination clusters that were activated during earthquake response. The coordination mechanism was also found to be quite effective during the cholera response. The Epidemiology and Disease Control Division (EDCD) of the Ministry of Health (MoH) with support of its partners, UNICEF, John Hopkins University, and the Group for Technical Assistance, established sentinel surveillance system for acute watery diarrhoea (AWD) and cholera. This health surveillance system was effective in tracking the cases. Information of the cases were shared by EDCD to Central level task force on Cholera with key agencies on WASH and Health, as well as to the district level line agencies for the WASH and Health. District level line agencies discussed within the respective clusters. As the cases were on rise, eventually education cluster was also brought on-board. These clusters functioned under the guidance from the national level clusters. At district level, overall broad level decision was made regarding the agencies involved and modality of implementation to be adopted. Going down to municipal level, as per the guidance from central and district, detailed intervention was planned together with the WASH and Health agencies active in the ground.



However, sector specific responsibilities during outbreak response needs to be clear and well documented, in order to avoid duplication and ensure sustainability in long run rather than firefighting mechanism. This was one of the important lessons learnt.

### WASH interventions and lessons learned

WASH intervention was intensively targeted in Lalitpur district where as high as 118 out of the total 150 cases from the valley were reported (EDCD, 2016). Together with the WASH intervention, simple checklist survey was also conducted to comprehend the effectiveness of interventions being targeted at the ground. It is to be understood that the evaluation was done only after the interventions were conducted on the ground. Following points summarises the WASH interventions and lessons learned that were conducted as part of response:

#### Household and community level awareness campaigns

Awareness raising on safe WASH practices was the major component of the interventions. Household level interventions through door to door programme and community level interventions through information booth campaigns, focus group discussions, awareness rallies, usage of loud speakers were focused on to disseminate the key WASH messages.

**Door to door campaign with effective stimuli/catalyst:** At the time of response, immediate behaviour change is crucial and lifesaving. Door to door campaign was coupled with simple water quality test using presence and absence technique (e.g., H<sub>2</sub>S test method). This was done with the objective of triggering the families through visual display of the black colour formed (proxy indicator for faecal contamination) of their tested water and this indeed was found to be an effective triggering tool. The evaluation revealed that even after the intervention through awareness campaigns, 9% of the sampled populations admitted to have cases with water borne disease which implied that people receiving messages were not serious on taking intended action communicated by these messages. Thus, WASH response targeting behavioural change need to include the components that would help trigger the behaviour change. Use of H<sub>2</sub>S test at the initial phase was one of the triggers. However, it couldn't be continued as it required follow-ups and therefore use of simple triggering tool is recommended.

**Private sector participation:** High numbers of floating populations and migrant population challenged the overall interventions and necessitated repeated interventions. There is a net rural-urban migration of 29 per cent and the Kathmandu Valley has the largest net inflow of urban migrants (Muzzini & Apericio, 2013). And in Nepal labour migrants are mostly from rural areas (Sharma et al, 2014) which makes them more vulnerable from WASH context. Lessons learned from this particular intervention substantiate the need to integrate WASH related information and services as right to the workers/labours of any company, industries, small shops, and businesses, etc.

**Focus on water treatment at household level:** 25% of sampled population was found not be using any water treatment prior to drinking. This finding also indicated majority of those that use water disinfection as water treatment for drinking are not even aware of proper way to disinfect water. For example, chlorine solution such as Piyush was dosed differently than what is prescribed. The result showed that Free Residual Chlorine Test was done for 97 sampled households with only 47% showed positive results and still half of the HHs using Piyush are not effective or insufficient. It was surprising to see that 30% of water samples from the households who were treating the water were found to be contaminated showing ineffectiveness of treatment options. This data, is not alarming, if we consider the scenario of developing country. However, can be viewed as being critical one, as Lalitpur Sub-Metropolitan City is one of the fast growing sub-metropolitan cities and in neighbouring to the capital city, and its subsequent level of impact in case of outbreak. Thus, emphasis on promotion of household level water treatment options needs to prioritize among the relevant sector of Health and WASH.

### **Message outreach through media mobilization**

Usage of loudspeaker message dissemination and FM/Radios were used to outreach the larger populations. These were the most common media that was being used in developmental activities. However, in this case failed to outreach 100% of the population of the targeted areas. This could be due to the dynamic urban setting of the area being intervened. This implies that either alternative or additional media needs to be considered in the urban set up. The data thus provides scope on researching on the appropriate media in urban settings that could be one or could be combination of more than one to reach diverse population which is the characteristics of urban.

### **Assurance of quality water through water service providers**

As the caseload was high for the district, apart from the household level awareness on purification of water prior to consumption, separate intervention was initiated to ensure safe water supply at the water supply service provider's level. *Kathmandu Upatyaka Khanepani Limited (KUKL)*, the only utility body supplying water to the city centres was requested through district level and central forums to be vigilant and ensure proper dosing of disinfectant to water being supplied through their system. However, Supply from KUKL is only intermittent and the communities from the city centres as well as from the areas which was not catered by KUKL, were depended on diverse other sources like – private mobile water tankers, conventional dug-wells, traditional stone water spouts, small independent water markers. In the response of 2016 following initiatives were taken to address different sources:

1. Private water tankers were capacitated on chlorination of the water they serve;
2. Dug-wells were chlorinated through bucket chlorination technology that last as long as a week to two weeks based on the water quality. After that buckets needs to be re-dosed again; and
3. Training on Chlorination were provided to the owners of small independent water selling business.

Even though these immediate initiatives were taken which definitely contributed to case management, however the key towards “sustainability” to these actions were missing in Cholera response of 2016. None of the dug-wells showed positive result for FRC presence during evaluation study. And on top of that water quality from these sources had not been tested for very long time. Until Kathmandu gets water from the brand new scheme of Melamchi water supply scheme which is still under construction, these sources are there to be used regularly. Thus, the lesson that could be learned from this is that water source mapping needs to be in place and mechanisms should be developed to ensure continued water quality from them.

### **Information dissemination through school level intervention**

Under the request of District Public Health Office (DPHO), district level Education Office with support from UNICEF coordinated the dissemination of WASH messages and IEC materials to each and every students of the district. The action was rather impulse driven for the year 2016. Students are the important change agent, imparting right knowledge to them in right way and at the right time will contribute their share on the much required preparedness against such water borne disease.

### **Key success factors**

Despite adopting the firefighting modality, the entire response was consider a success due to the following key success factors:

- Leadership of the National level and District level government authorities.
- Leadership and Coordination role played by the concerned municipal body.
- Effectiveness of the health surveillance system.
- Good coordination between the sectors especially Health, WASH, Education.
- Immediate dispatch of Communications materials and Disinfectants.
- Active WASH and Health agencies in the ground ready to respond.
- Timely and focused interventions by all involved.

## **Conclusion and the way forward**

Based on lessons learned, following way forward is being proposed to reduce the risk of cholera outbreak in future:

1. There's clear need for the comprehensive district level preparedness plan and its implementation as part of regular program to prevent potential public health emergencies. The document needs to clearly spell out the roles and responsibilities of each sector and clear strategies needs to be in place for the common as well as sector wise coordination mechanism.
2. The overall response was completely carried out without budget allocation from the government side. Even though their leadership role was one of the key to drive the response, there's need for the dedicated budget allocated from the government for the preparedness and response in case of outbreak such as cholera outbreaks.
3. As the cholera cases are reported almost every year, public health emergencies needs to be mainstreamed into District level Disaster Risk Management Plans for the valley and through this safe WASH behaviour needs to be mainstreamed into regular program of WASH, Health, Education, and other concerned sectors.
4. Complexities of Urban WASH is always there and these yearly outbreaks are the indicators that things are not in place. Thus, there's immediate need of long term solution to address the issues of WASH in Urban context.
5. Innovative ways on usage of media to particularly focus the dynamics of urban set-up needs to be researched. For example, use of mobile messages could be one of the suitable broader outreach media.
6. Contingency plan in case of outbreak needs to be in place. The document needs to clearly spell out the roles and responsibilities of each sector and clear strategies needs to be in place for the common as well as sector wise coordination mechanism.
7. There's need for the mechanism to be in place that ensure Water Quality at service and household level, water source protection, basic personal and food hygiene, environmental sanitation at all level.
8. A comprehensive Cholera study for the Kathmandu valley on the cause and prevention of outbreak to understand and design a clear and effective future program on public health emergency in the valley.

To conclude there is a need to “develop system for cholera prevention and outbreak response and to extend the benefits over a longer time frame to reduce diarrheal disease incidence”. There's a saying that “Experiences is the teacher of all things”, the lessons learned from 2016 cholera response provides valued recommendations for the years to come. The way forward needs to consider the aforementioned lessons learned and one of the effective ways is to package the entire preparedness activities formulated based on lessons learned into Disaster Risk Management Plan at district as well as at National Level.

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## Note

The views expressed in this paper are those of the authors and do not necessarily reflect the views of the government/organizations they work for.

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