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Research Article

Study on current community access to and practices on water, sanitation and hygiene in selected villages of Chargawa block, Gorakhpur, Uttar Pradesh, India

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ABSTRACT

Background: More than 90% of deaths from diarrhoea in under five children is caused by unsafe WASH practices. Adequate hygiene practices have been recognised to decrease the diarrhoeal incidence by 30–40 percent. 748 million people still depend on unimproved sources of drinking water almost a quarter of which depend on untreated surface water, and 2.5 billion people need to improve sanitation, including one billion who practice open defecation. Yet to date, the water, sanitation and hygiene (WASH) element has received minute attention and the potential to link efforts on WASH and NTDs has been mostly untouched. This study was planned to identify current levels of community access to and practices related to water, sanitation and hygiene facilities.
Methods: Cross sectional survey of 200 households conducted in selected villages of chargawa block through multistage sampling. Data were collected using pre-designed questionnaire.
Results: 66% of our responder's were female, 86% of household are male-headed. The burden of collecting water is mostly with women & girls (89%). 51% of people still rely on the unprotected hand pump as a source of water for drinking. Majority of the population defecates in the bush/backyard/field (79%). Hand washing with soap and water during key times is practiced by 21% of the respondents, and hand washing with water only is practiced by 67%.
Conclusions: The study shows that access to safe drinking water & WASH practices in the rural villages is still a big everyday challenge. This study provides baseline information's for future interventions in this community.

Keywords: Water, Sanitation, Hygiene, WASH

INTRODUCTION

Diarrhoea alone causes the demise of 760,000 under five children each year (11 percent of all child mortality).[1] More than 90% of deaths from diarrhoea in under five children is caused by unsafe or poor water, sanitation, and hygiene (WASH) practices.[2] If mothers followed basic hygiene practices and ensured better access to safe water and satisfactory sanitation level this could greatly shrink under five deaths and advance child nutrition. Studies proved that after a period of exclusive breastfeeding in the initial six months of life, children 6-17 months of age show an rise in the incidence of diarrhoeal illness that correlates with the start of complementary feeding.[3] In developing countries, children 6-11 months of age experience an average of three episodes of diarrhoea.[4] The primary cause of diarrhoea in children was unsafe water only, but recent studies also points to unsafe food.[5] WHO noted that every year unsafe food kills 1.2 million people over five years of age are from Asia and Africa.[6] This figure evident of contamination levels in complementary foods consumed

by young children and highlights the concern of food hygiene as a critical practice to address. Adequate hygiene practices have been recognised to decrease the diarrhoeal incidence by 30-40 percent.[7,8] A meta-analysis conducted in developing nations concluded that hand washing can decrease the risk of diarrhoea in the general population by 42-44 percent.[7] A latest observational study in Bangladesh found that diarrhoea followed less frequently in families where people washed at least one hand after defecation and before cooking food. The study recommended that washing hands before cooking food is mainly important to avoid diarrhoea in children.[9] Drinking water treatment and safe storage in the home have been shown to decrease the risk of diarrhoea by 30-40 percent.[10] Comparatively little proof currently exists about the benefits of good food hygiene practices. The Alive and Thrive study in Bangladesh concluded that hand washing with soap before children's nourishment supports normal growing in children.[9,11]

There has been major improvement in the Water, Sanitation and Hygiene (WASH) area since 1990, the MDG baseline year. Yet, 748 million people still depend on unimproved sources of drinking water almost a quarter of which depend on untreated surface water, and 2.5 billion people need to improve sanitation, including one billion who practice open defecation.[12] The 2013 update report from the WHO/UNICEF Joint Monitoring Program for Water Supply and Sanitation (JMP) highlights the continuing gaps in global coverage levels. WHO recently released a global strategy 2015 -2020 on water, sanitation and hygiene for speed up and supporting progress on neglected tropical disease. Yet to date, the WASH element has received minute attention and the potential to link efforts on WASH and NTDs (Neglected tropical diseases) has been mostly untouched.[13] With this outlook, this study was planned to get baseline information on water, sanitation and hygiene and practices in the selected areas. Specifically, the objectives of the study were to identify current levels of community access to and practices related to water, sanitation and hygiene facilities. That will allow the development of programme's behavioural change and communication for development activities.

METHODS

Cross sectional survey of 200 households conducted in selected villages of chargawa block through Multistage sampling using both probability and non-probability sampling. Chargawa is the field practice area of our department & most populous block of district Gorakhpur, eastern part of Uttar Pradesh with 2, 21000 population with 27 sub centres and 60 villages. Using simple random sampling we selected 7 sub centres, covering 35 villages. Again using simple random sampling we selected 2 villages from each sub centres. From each village 14 household are selected using non probability sampling. The sample size was calculated using epi info software using population survey tools with a confidence limit of 10%, Confidence level of 95% with design effect of 2 times of sample size was 192. We slightly increased the population to get a round figure of 200. We used the Questionnaire used by UNICEF for WASH strategy.[14] Questionnaire was modulated to suit our study settings. Data entry is done in Excel, used for encoding data sets. The data generated was then transferred to the SPSS software (latest trail version) for analysis. From SPSS, the data were exported to Graphpad prism trail version for graphing, tabulation and to facilitate interpretation (Figure 1).

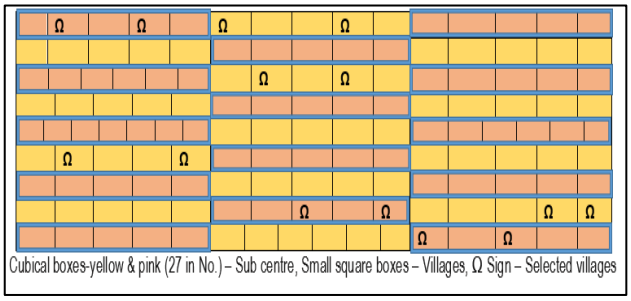

Figure 1: Selection of villages from chargawa block, Gorakhpur (comprise of 27 sub centres).

Operational definitions

According to WHO/UNICEF 2013 article on WASH, an improved water sources are water piped into the residence, from a human-powered drill or from a water tower.[15] Unimproved water source is water from a dam or pool, stagnant water from a river, stream or rainwater tank. Households with improved sanitation status have a pour-flush latrine, or ventilated improved pit latrine. Households with unimproved sanitation status have no latrine or toilet facility. Good hygiene practices include the use of hand-washing and bathing facilities, with the availability of soap and other detergents in the house. Poor hygiene practice includes having no hand-washing and bathing facilities or detergents in the house, or washing hands with water but no soap or other detergents.

Additional we classified hand pump/dug well as protected and unprotected according to guidelines given by WHO factsheet 2.2 on water, sanitation and health hygiene report.[16]

RESULTS

Demographic Profile

The age of the respondents was restricted for household members to 12 years and above due to the nature of the questions. Younger household members may not completely understand the questions. Most of the families is patriarchal by leadership with 85.5% male-headed household. 66% of our responders are female and almost

half of them are having elementary level education. (Table 1).

Household Water Supply and Practices.

The burden of collecting water is mostly with women (68%), followed by girls at 21%. Women and girls are traditionally in charge for collecting water. The water points are closer to the dwelling places. They are within 500-meter radius of their homes (100%) of the surveyed households. The distance is a major indicator of time that respondents allot to collecting water from the water sources. Given that water is quite near to all of the respondents, they spend within 15 minutes in collecting water. At least 40% collects drinking water from protected hand pumps, but a larger section of the population takes from unprotected hand pump (51%) and public taps and piped line at 13% and 3% respectively as shown in table 2. Water treatment is not very common in the rural locations with only 12% of the population practicing, for those treating their water, chlorination is the most common method, scoring 50%. There are portions of the population using traditional cloth filtration (42%). For the 88% that disclosed that they do not treat water says they are used to the water (70%). 12% of families is not treating water because they believe that the water is safe. 9% states their lack of knowledge of how to treat as a reason for not treating water before use. Another 9% disclosed that they do not treat water because of the cost of treatment for not treating. More than half of the household population has access to more than 75 litres of water per day. It means that the other half only accesses up to 75 litres per day (Table 2).

Water for domestic use such as cooking, laundry and hygiene (cleaning, dishwashing, bathing) is taken almost similar from the same sources. Most people fetch water for domestic use from unprotected hand pumps and surface water (Figure 2).

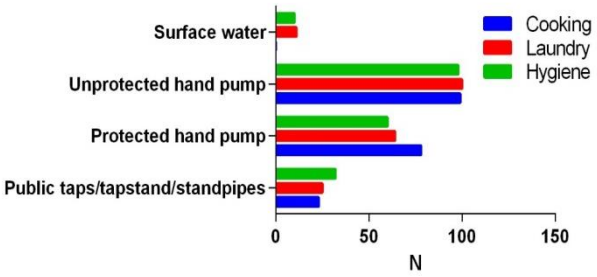

Figure 2: Sources of water for domestic use.

Table 1: Demographic characteristic of responder's/survey.

Variables	Frequency	Percent %	95% CI
Respondents by Gender			
Female	132	66	
Male	68	34	(59.43- 72.57)
Total	200	100	(27.43- 40.57)
Household Head			
Male	171	85.5	(80.62- 90.38)
Female	29	14.5	(9.62- 19.38)
Total	200	100	
Educational attainment of respondent			
Can't read/Write	45	22.5	(16.71- 28.29)
Elementary Level (Class 1- 5)	94	47	(40.08- 53.92)
Junior high (Class 6- 9)	40	20	(14.46- 25.54)
Senior High (class 10 - 12)	13	6.5	(3.08- 9.92)
Can read/write without formal education	8	4	(1.28- 6.72)
Total	200	100	

Sanitation practices

In rural locations access to sanitation facilities is still very low. Only 21% of the households owns family latrines while the 79% uses different defecation practices. For the households having latrines, 62% of those facilities were constructed by the local authority/government (Figure 2). This is followed by the latrines constructed by self (31%). most of the families who own latrines state that they access the facilities within the 50-meter radius (98%). Only a minimal portion of the population walks farther than 50 meters to access latrines (Figure 3).

Table 2: Household water supply and practices.

Variable	Frequency	Percent %	95% CI
Responsible for water collection			
Adult women	129	64.5	(57.87- 71.13)
Girls	50	25	(19- 31)
Men and Women	21	10.5	(6.25- 14.75)
Total	200	100	
Drinking water source			
Piped line	6	3	
Public taps/tap stand/standpipes	13	6.5	(0.64- 5.36)
Protected hand pump	79	39.5	(3.08- 9.92)
Unprotected hand pump	102	51	(32.73- 46.27)
Total	200	100	(44.07- 57.93)
Observation cleanliness of water containers			
Clean	80	40	(33.21- 46.79)
Not Clean	56	28	(21.78- 34.22)
Some Clean, others Not	64	32	(25.54- 38.46)
Total	200	100	
Observation covering of water containers			
Covered	132	66	
Not covered	56	28	(59.43- 72.57)
Some covered, Others not	12	6	(21.78- 34.22)
Total	200	100	(2.71- 9.29)
Observation: withdrawing water from storage			
Dipping hand with any available cup	122	61	
Tilt & Pour into a Cup	68	34	(54.24- 67.76)
Using an exclusive Water Scooper	10	5	(27.43- 40.57)
Total	200	100	(1.98- 8.02)
Water treatment practice			
No	176	88	(83.5- 92.5)
Yes	24	12	(7.5- 16.5)
Total	200	100	
Common water treatment practice			
Cloth Filtration	10	41.66	(21.94- 61.38)
Chlorine	12	50	(30- 70)
Water filter	2	8.33	(-2.73- 19.39)
Total	24	100	
Reason for not treating water			
Water is safe	22	12.5	(7.61- 17.39)
It is expensive	16	9.09	(4.84- 13.34)
Do not know how to treat	15	8.52	(4.4- 12.64)
We are used to the water already	123	69.88	(63.1- 76.66)
Total	176	100	

For the 79% that does not have latrines, all defecates in the bush/backyard/field. The most common and dominant reason why people do not have latrines is its cost (56%) as shown in Figures 2. Others reveal that having a latrine is not a priority (21%), some say there is a lot of land on which to defecate (14%), and defecation is not an issue (9%). Among the 122 responder's Baby faeces are usually thrown in the garbage pit 40%. Other unsafe practices, which comprise of 56% pose public health risks to the rest of the population. Only 44% of these practices is considered safe, which include garbage pit & toilet. 44% of people of community disposing solid waste in to garbage pit followed by composting (26%).

Disease morbidity, mortality, management and prevention

Acute encephalitis syndrome/Japanese encephalitis is endemic in Gorakhpur. Every year seasonal epidemic occurs and reported as the highest number of cases reported here.[17] Majority of the population perceives that mosquito bite (79%) is the main cause of malaria though there are also some misconceptions. Others believe that

this is due to the presence of bushes and grasses (13%) while 12% do not have any idea. Knowledge about malaria prevention co-relates with respondent's knowledge on the causes of malaria as shown in Figure 3. Many a household believes that using bed net is the main preventive measure against malaria followed by Elimination of mosquito breeding. Figure 3 specifies how families manage diarrhoea. Multiple answer was given by responders. A majority of the population give ORS to their family members with diarrhoea followed by a health care visit and self-medication. Few takes herbs and rest don't take any action. The most popular belief about the cause of diarrhoea is the consumption of dirty or contaminated food followed by dirty water. Few belief that diarrhoea is caused by witchcraft and rain. For diarrhoea prevention, Figure discloses that more number of responses recorded for covering the food followed by preparing the food properly, there are beliefs that prayers and consulting traditional healers can prevent diarrhoea too (Figure 4).

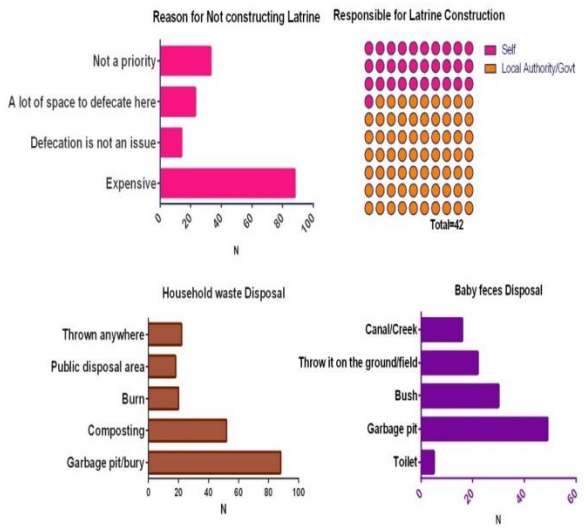

Figure 3: Sanitation practices followed in their community.

Handwashing practice

The respondents were asked about the key times they usually wash their hands. Multiple response was given, but overall handwashing practices with soap is registered very low. Hand washing after defecation was the popular response (16%), followed by after handling rubbish (9.5%). Only 1% of people washes their hand with soap before eating. Agents used for hand washing are shown in Figure 4. Hand washing with water only is the most common standing at 67.5% though there are a considerable number of people who wash hands only with water and soap (20.5%). When asked why people do not practice hand washing using soap, people reason that Soap is expensive (44%) and water alone cleanses the hands (36%). Others disclose that this is due to negligence, people do not have the habit of washing hands with soap for several generations and washing with soap is time wasting. Based on the observation the study can reveal that 90% of the households do not have visible washing facility. There is a small percentage of respondents who keeps water and soap near/within latrines (10%). During the interviews, however, no one was observed to have washed their hands with soap after latrine use. One factor is the timing of home visit. Unlike in camp settings, where one can easily observe people using latrines, it is rather difficult in community settings to do so. For protection and privacy issues, observation of respondents using latrines and washing their hands after use was not carried out (Figure 5).

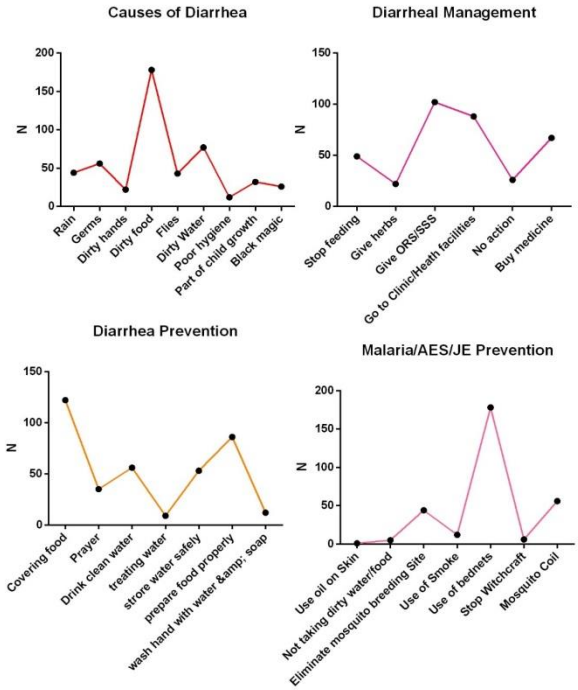

Figure 4: People's belief/knowledge and practices regarding disease morbidity and mortality.

Health and hygiene messages

Regarding health and hygiene messages, the respondents were asked if they heard messages in the last three months before the survey was conducted. The sources of health and hygiene messages cited by government health workers is the number one source for message passage to respondents (28%). This is followed by leaflets/posters (18%), Community Health Volunteers (16%), clinics and hospitals (16%), community events (14%) and radio (16%). Respondents were also asked about their most preferred channels to receive hygiene messages. Popular responses to top the bill is home visits (38.5%), followed by pictures/poster, radio, TV and mobile.

Classification according to operational guidelines

Table 3 shows 100% of water sources are improved but they are unprotected (Table 4) according to guidelines set by WHO for hand pump/dug well.

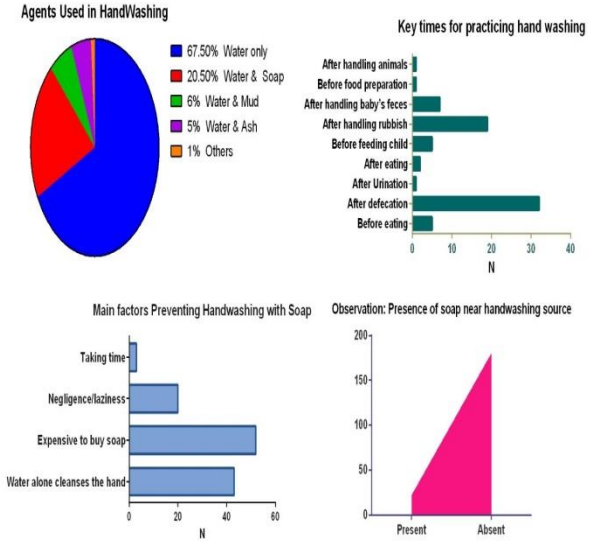

Figure 5: Hand-washing practices.

Table 3: Classification of improved and unimproved drinking-water and sanitation facilities adopted by the JMP.[18]

	Number of household having access to improved sources N (%)		Number of household having unimproved sources N (%)	
Water	200	100	0	0
Sanitation	42	21	158	79
Hygiene	41	20.5	159	79.5
Total	283	47.16	317	52.83

Table 4: Classification of protected and unprotected water sources according to WHO guidelines.

	Protected water sources N (%)		Unprotected water sources N (%)	
Drinking	98	49	102	51
Cooking	101	50.5	99	49.5
Laundry	89	44.5	111	55.5
Hygiene	92	46	108	54

DISCUSSION

The baseline study was conducted from April -September 2015 in 14 villages, 200 household (14 household from each village). The study shows that access to safe drinking water in the rural villages is still a big everyday challenge. In most of the household, the source of the water for drinking and domestic purpose was self-constructed hand pump, which is considered as the traditional method of obtaining water in rural parts of India,[19] but unfortunately most of the hand pumps are not fulfilling the standards set by WHO. Most of them are not lined with concrete (only with brick), depth of the dug well is small and the irrigation of split or surplus water are not directed properly. Improper irrigation leading to collection of water near water source, which serve as source of water contamination and mosquito breeding sites. This condition pose a major hazard to public health and help to spread diseases. Most of the Indian mark hand pump constructed by government are repair and need technical assessment. The issue of poor maintenance and sustainability is common and a failing point for most of the constructed water facilities. These water sources can be upgraded to provide clean safe water. This should be inspected regularly and any necessary repairs carried out immediately. It is essential to possess a stock of spares in the community, and for one or two persons to be trained in pump repairs for each pump installed.[20] Before a new or upgraded hand pump is used, it is very important to disinfect thoroughly with chlorine solution.[21] There is no single and uniform solution to the issues of sustainability, but it is recommended that implementing partners should invest more time in designing more sustainable approaches to the water point provision.[22] Active community involvement in all phases of the work is vital to the sustainability of activities.[23] Putting water and sanitation facilities will not save people from diseases. These facilities can even put people at further risks or add to their vulnerabilities, if people are not aware or responsible for the proper use and maintenance of these facilities.[24]

Hygiene promoters have a daunting task of mobilising communities to adopt health and hygiene promoting behaviours.[25] For instance, despite the presence of water and sanitation facilities and the high knowledge on disease transmission, there still persists high cases of diarrhoea. The study shows that even people who are washing hands and have access to water and sanitation facilities including health and hygiene messages, are still contracting diarrheal diseases. There might be other intervening factors beyond those facilities and practices. It is worth noting that Hygiene Promotion Guideline being developed can be a good source of information to aid in the implementation of hygiene promotion activities. Disconnect is between knowledge and practice. Work in reducing this disconnect is crucial for improving WASH among ordinary citizens. In promoting certain hygiene behaviours and practices, a conglomeration of strategies and approaches is needed. A campaign on hand washing with soap can be done not just during the Global Hand washing Day but can be integrated into the regular activities.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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