



**Formative Research Report on
“Hygiene Promotion through Routine
Immunization in Nepal”**

2015



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Mothers and guardians of Pilot district

Executive Summary

Introduction

Diarrhoeal diseases are among the leading causes of child mortality and morbidity in Nepal. The possible reasons as to why Nepali children continue suffering from enteric diseases including diarrhoea may be the significant lack of basic determinants for better health, such as access to safe water, proper hygiene practices and basic sanitation services. Tackling Diarrhoeal diseases requires a comprehensive package of protective, preventive and curative interventions.

The strength of the Nepal “National Immunization Programme”, and the potential introduction of vaccines for enteric diseases, including the rotavirus vaccine, in the coming years, offer opportunities for a comprehensive approach to reducing Diarrhoeal diseases in the country, in which preventive interventions such as hygiene and sanitation promotion are implemented alongside, and not separate to, protective interventions such as vaccines. A formative research was conducted in 2014 to initiate the development of the hygiene promotion approach.

Objective

The main purpose of this formative research was to understand current hygiene practices and their determinants, and to prioritize key hygiene behaviours for addressing through the routine immunization programme.

Methodology

The study design was descriptive cross-sectional exploratory formative research using qualitative and quantitative methods. In total, 303 mothers were included in the study from the four districts (Bardiya, Jajarkot, Myagdi and Nawalparasi) representing various ethnic groups and educational backgrounds. From each district (considering stratification) at least two Village Development Committees (VDCs)¹ and one municipality² were randomly-selected for the study. All health institutions, Immunisation (EPI) clinics/sessions, FCHVs and health staff from these VDCs/municipalities were also identified as participants.

Desk review of existing literature on formative research and hygiene promotion approaches was conducted as the preliminary part of the study. This was followed by the development of quantitative methods (observation – household, immunization session) and qualitative methods (In-depth interview, FGD, KII, Behavioural picture, video recording of key behaviours) of data collection.

Quantitative data were first coded, entered and analysed in SPSS and were presented in tables with frequencies and percentage across different variables. Similarly, qualitative data were analysed by preparing the secondary matrix table.

Results

Socio-demographic Characteristics

The age of the mothers ranged from 15 to 40 years of age with majority (49.5%) belonging to the age group 20-24 years. The majority (93.1%) of mothers belonged to Hindu religion. About 36 % belonged to Janajati, followed by Brahmin/Chettri (29.7%) ethnic groups.

Most of the respondents i.e. 83.2% were literate. Half (50.8%) lived in urban area and the rest lived in rural areas. The study found that two fifths of the households (41.3%) had monthly

¹ Sub-district administrative unit in rural areas of Nepal

² Sub-district administrative unit in urban areas of Nepal

income of more than 10000 rupees (\$100 USD) and a quarter (25.4%) of households had 1000 to 5000 rupees (\$10 to 50 USD).

During observation it was found that 10 percent households did not have toilets in their house. Of those family members who don't have toilets, one third (31.8%) used the paddy field followed by open field (22.7%), indiscriminately (9.1%), street (4.5%) and other (31.8%) (forest, bushes, bank of river).

It was observed that among those who had a toilet (274), sixteen percent toilets had no water. More than half (55.1%) had soap inside/nearby the toilet while 44.9 percent did not. Soap was more likely to be available inside or near the toilet in the urban area and association was found to be statistically significant ($p < 0.001$).

It was observed that piped water was common in Myagdi, and tube wells with hand pumps were common in both urban and rural areas specifically in Nawalparasi and Bardiya. Piped water and tap water in yard were a major source in Jajarkot as well as in Nawalparasi, Bardiya, Myagdi. It was observed that only one third of the mothers (31.7%) had treated the water before drinking but only 18.2% mothers serve their child with treated water.

Hygiene behaviors and behavioral determinants

During the observation it was found that 17.5 percent had no any hand washing station.

Only 15.5% used soap and water to wash hands before cooking, only 16.8 % wash hands with soap before feeding, 70% wash hands with soap after defecation, 52.8 % wash hands with soap after cleaning child bottom and 28.1 % wash hands with soap after touching dust/dirt.

Almost half (44.6%) of participants used visibly dirty clothes to clean the kitchen. Most of the participants (90.4%) appeared to cook their food thoroughly. During observation almost half stored leftover food in the kitchen and among those 56.8% stored food in a container with a lid; the rest used a container without a lid. Only 23.8% mothers was serving utensils using soap or ash before feeding to child. Similarly, 24.4% reheat their foods by maintaining adequate temperature. Literacy was found to be significantly associated with cleanliness of kitchen and thoroughly reheating of foods before feeding to child ($P < 0.05$).

Most mothers reported open defecation as a major health hazard.

Behavior outcomes

In most (68%) of the households solid waste was observed in the backyard/compounds. It was observed that most of the households (75.6%) have appropriate places to collect the faecal sludge. They dispose liquid waste in the kitchen garden (51.7%), throw indiscriminately (22.5%), or in the stream/river.

Regarding the solid waste collection and separation mechanisms, it was observed that 65.7% do not have a solid waste collection container or a 68.3 % don't have mechanism for separating organic and plastic waste. It was observed that compost pit (*malkhat*) was commonly (39.8%) used as a means of solid waste disposal.

Hand washing with soap after defecation was considered as a good behaviour. Therefore, having hand washing materials outside the toilet was seen as a preferred behaviour by mothers. Similarly, cleanliness of toilet to keep odour and flies away and washing away child faeces and dung in the toilet were considered as the proper behaviours to be followed at home.

Mothers preferred reheating of food, and covering of water storage containers with lid or utensils was considered as a good behaviour. To purify water, they considered proper boiling of water as essential.

Motives that facilitate the participants to wash their hands with soap had to do with how dirty their hands were, and the need to have clean hands. In rural areas, soap is rarely available to use for hand washing at critical times and households do not have proper hand washing stations. Barriers to maintain hygiene and sanitation were lack of cleaning materials, lack of containers, unavailability of soap, lack of water, no hand washing station, distance to toilet, distance to compost pit and no liquid disposal.

Most of the mothers were concerned about their child health, therefore, nurture was observed as the most common motivation factor.

Immunization

Only four out of six (67.2%) immunization sessions observed were conducted in places with toilets available; in these half had water in the toilet but only 16.4% had soap available for hand washing. Drinking water was available in 64.2% of the immunization settings but only a few had treated water.

More than half of the settings (71.6%) were outreach sessions that were not conducive for using Information, Education and Communication (IEC) materials or Audio Visual aids. Radio jingles are the preferred means of communication by all the participants. Similarly, as an interpersonal communication medium, FCHVs are desired means for getting health information and messages to the mothers and local people.

Willingness of FCHVs

FCHVs showed their willingness to participate in the hygiene promotion activities through the immunization sessions but they wanted some monetary incentives as well as recognition. They also demanded effective training and refresher training in order to be able to play their role effectively.

Conclusion and Recommendation

The study highlights the water and sanitation status along with the key hygiene behaviors of mothers and the possibility of integrating the hygiene promotion activities into routine immunization. Despite the frequent diarrheal diseases outbreaks throughout the country, efforts in improving the WASH status are not adequate and the hygiene behaviors of the mothers are still below optimal level. It was noted that physical barriers like shortage of gas/firewood as well as attitudinal barriers like baby's preference of cold milk, hinder to maintain optimum level of food hygiene. There is a positive indication that the community is being aware of diarrheal diseases, its causes and treatment. However, it was observed that some children below five year of age were suffering from diarrhea. The study helps in generalizing the prevailing hygiene behaviors of mothers in respect to their child's health and possibility of integration of hygiene promotion activities in routine immunization.

Following recommendations are made by the study;

- The WASH stakeholders need to advocate with the government to include the hygiene promotion activities in the policy and program integration into routine immunization by supplementing each other, so as to improve child's health.
- While designing the hygiene package, delivery time should be considered, promotional activities need to be conducted in a group and the sessions needs to be designed to suit both the outreach and institutional settings.
- 11 am to 2 pm is the preferred time for attending immunization sessions and it is recommended that a short hygiene promotion session should be conducted just before conducting the immunization when mothers gather in group.

- Health messages in the form of radio jingles and interpersonal communication mobilizing FCHVs should be prioritized as the major channels for delivering health messages by the program designer.
- A joint coordination and communication mechanism between the WASH stakeholders, District health offices and peripheral health facilities need to be established to successfully implement the hygiene promotion activities in routine immunization.
- The study documented that ‘nurture of child’ is the key motivating factor for mother to practice proper hygiene behaviors. Mother’s attitudinal behaviours are the major barriers in performing hygiene behavior. Hence, the key hygiene messages that include promotion of using soap and water for handwashing, water treatment, proper solid waste management, proper use of latrines, etc need to be incorporated in the hygiene promotion package reflecting the strong association and linkage with child’s health.

Acronyms

AHW	Auxiliary Health Worker
ANM	Auxiliary Nurse Midwives
ARI	Acute Respiratory Infection
AV	Audio Visual
BCC	Behaviour Change Communication
CHD	Child Health Division
cMYPA	Comprehensive Multi Year Plan of Action
df	Degree of Freedom
DHO	District Health Office
DILO	Day in Life Analysis
DoHS	Department of Health Services
EPI	Expanded program on Immunization
FGD	Focus Group Discussion
FCHV	Female Community Health Volunteer
GTA	Group for Technical Assistance
IDI	In Depth Interview
IEC	Information, Education and Communication
INGO	International Non Governmental Organization
JE	Japanese Encephalitis
KII	Key In-depth Interview
MCHW	Maternal and Child Health Worker
MILO	Moment In Life Analysis
MNT	Maternal and Neonatal Tetanus
MoHP	Ministry of Health and Population
MR	Measles Rubella
NDHS	Nepal Demographic Health survey
NGO	Non Governmental Organization
NIP	National Immunization Program
ORS	Oral Rehydration Salt
PHN	Public Health Nurse
RHD	Regional Health Directorate
SN	Staff Nurse
SPSS	Statistical Package for Social Sciences
TSU	Technical support Unit
TV	Television
UK	United Kingdom
VDC	Village Development Committee
VPD	Vaccine preventable Diseases
WASH	Water Sanitation and Hygiene
χ^2	Chi –Square

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CHAPTER I

1. Background

1.1. Project overview

Diarrhoeal diseases are preventable, yet globally, diarrhoea remains a leading cause of death among children under five. This resulted in the deaths of over 801,000 children in 2010 alone. In the same year, 2,190 children under five lost their lives to diarrhoea in Nepal. Tackling Diarrhoeal diseases requires a comprehensive package of protective, preventive and curative interventions.

Nepal has made some progress on reducing the child mortality (from 1990 to 2011) but Water, Sanitation and Hygiene(WASH) related infectious diseases including Diarrhoea, Typhoid, Hepatitis-A, Worm infestation, gastro-intestinal infection, Trachoma, Malaria, ARI, Skin diseases are the top leading preventable diseases reported in Nepal. Diarrhoeal diseases remain the second leading causes of child mortality. The possible reasons as to why Nepali children continue suffering from enteric diseases including diarrhoea may be the significant lack of basic determinants for better health, such as access to safe water, proper hygiene practices and basic sanitation services.

The strength of the Nepal “National Immunization Programme”, and the potential introduction of vaccines for enteric diseases, including the rota virus vaccine, in the coming years, offer opportunities for a comprehensive approach to reducing Diarrhoeal diseases in the country in which preventive interventions such as hygiene and sanitation promotion are implemented alongside, and not separate to, protective interventions such as vaccines. Such an approach has not been practiced in low-income countries that have introduced the rotavirus vaccine so far.

The pilot project was conducted by the Ministry of Health and Population in collaboration with WaterAid and key health stakeholders in Nepal to define, test and implement a simple and scalable hygiene promotion package for implementation within the national immunization programme. The approach will be tested in four districts, with a view to nationwide scale up if successful. The collection and analysis of qualitative and quantitative data on key indicators and other information obtained from formative research will inform the design of the hygiene promotion strategy and package, which will be tested and then integrated into the routine immunization programme.

Desk Review

Enteric diseases burden

Enteric diseases are endemic in Nepal. Diarrheal diseases have long been recognized as a major public health challenge in Nepal. Cholera occurs in sporadic cases and several outbreaks have been reported in the recent years in different parts of the country. Notably major outbreaks occur every 1-3 years but locations vary. In 2009, major cholera outbreak occurred in mid/far western Nepal (67,000 reported diarrhea cases) leading to 370 deaths. This was followed by another diarrheal outbreak in mid-west Nepal in 2010. Recently in 2014, 1500 cholera cases were reported in Rautahat district, central Nepal. Existing situation of water supply, sanitation and personnel hygiene is favorable for potential outbreak of enteric diseases in Nepal.

Water, Sanitation and Hygiene status

Nepal remains one of the countries with a high prevalence of open defecation with sub-optimal Water, Sanitation and Hygiene (WASH) status. Despite continuous efforts in the country, water

supply and sanitation continue to be inadequate. 82% of households in Nepal have access to an improved source of drinking water. However, only thirty-eight percent of households have an improved toilet facility that is not shared with other households. Majority of households (82%) do not treat drinking water, and rural households (87%) are particularly likely not to do so compared to urban households (54%). 36% of households still use bush or open field for defecation. About 48% of households had soap and water at hand washing stations at their households, while 14% of households did not have water or any other cleansing agents (soap, ash or mud).

Hygiene Promotion, routine immunization delivery approach

National Immunization Programme is one of the most successful priority programs of Nepal. Routine immunization programmes have been successfully carried out in Nepal since its inception, three decades ago. The national immunization coverage of all antigens increase substantially compared to the previous years. In 2013/14, total of 42 districts achieved more than 90% coverage for DPT3 and 31 districts for all antigens. In addition, several successful large campaigns have been implemented to control or eliminate various vaccine preventable diseases such as polio, measles and Japanese Encephalitis.

At present, National Immunization Program provides vaccine against 12 diseases under the leadership of Immunization Section of Child Health Division. More than 52,000 FCHVs and 4,500 health workers are mobilized for conducting successful immunization programs that allow the opportunity in reaching more people with health promotional messages. Noting the major diarrhea outbreak in 2009 that killed hundreds by a single outbreak, the integration of hygiene promotion activities in the routine immunization program is justifiable.

Rationale

Nepal does not have optimal Water Sanitation and Hygiene status. Considering the need of the improving the WASH status, integration of hygiene promotion activities in conjunction with other public health program is needed. Immunization sessions in Nepal are regularly conducted in the fixed time with the greater participation of community people (mothers and guardians). Immunization sessions can be the best to address the missed opportunity of integrating hygiene promotion into vaccination programmes.

The formative research attempts to identify the possibilities of hygiene promotion through routine immunization in Nepal. The study will include observation of immunization sessions regarding the feasibility of integrating the hygiene promotion activities, and further assess the key hygiene behaviours of mothers and guardians in terms of Hand washing with soap at critical times, food hygiene, water treatment and storage, sanitation and child faeces management and solid and liquid waste management.

It is hoped that the study will provide the vivid portrait of WASH status of community, key hygiene behaviours of mothers and provide basis for hygiene package designing and implementation of hygiene promotion activities through routine immunization. Furthermore, the study will provide a basis for advocating at the policy level to support in planning and implementation of program at the grass-root level.

1.2. Organization of the research

The Formative research on “Hygiene promotion through Routine Immunization” is part of a first of its kind pilot project in four districts: Bardiya, Jajarkot, Nawalparasi and Myagdi. Group for Technical Assistance (GTA) was commissioned by the Ministry of Health and Population, Child Health Division/DOHS, Nepal and WaterAid to conduct the formative research in a few selected municipalities and VDCs of the pilot districts.

GTA worked independently but in close coordination and collaboration with the project Technical Support Unit (TSU) under Child Health Division/MoHP and WaterAid. CHD and WaterAid UK provided the technical guidance on the protocol development and in designing the research tools (observation checklist (immunisation setting, household), in depth interview guideline, FGD Guidelines (FCHVS and mothers) and key informant interview questionnaires), as well as on the report of the findings. Coordination with each district’s health office was established before starting the actual work.

1.3. Background on study area

The formative research was conducted in four districts - Bardiya, Jajarkot, Myagdi and Nawalparasi representing Terai and Hill districts in consultation with Child Health Division. The districts, Myagdi and Nawalparasi lie in the western region of Nepal – Nawalparasi, being the terai district and Myagdi situated in the hilly region. Similarly, Bardiya and Jajarkot represent the mid-western development region and lie in terai and hilly region respectively. The details of the study districts are given in the table below:

Table 1: Background information on the study districts

S. N.	Description	StudyArea(Districts)			
		Bardiya	Jajarkot	Myagdi	Nawalparasi
1.	Total population	426,576	71,304	113,641	643,508
2.	Total number of households**	83,147	30,468	27,727	128,760
3.	Total number of households without Toilets**	51.33%	56.14%	18.57%	38%
4.	Total Number of household with toilet-by type**				
	(a) Flush toilet(Public sewerage)	1.2%	0.96%	0.67%	1.03%
	(b) Flush Toilet(Septic tank)	18.5%	16.47%	51.65%	45.55%
	(c) Ordinary toilet	28.6%	26%	28.85%	14.83%
	(d) Not stated	0.2%	0.38%	0.24%	058%
5.	Total number of VDCs	31	30	41	73
6.	Total number of Municipalities	1	0	0	1
8.	Total number of Government Health Institutions*				
	(a) Hospital	1	1	1	1
	(b) Primary Health Care Center	3	2	1	5
	(c) Health Post	8	7	12	18
	(d) Sub-Health Post	22	25	27	53
9.	Total number of Immunization Session*	190	251	109	343
10.	Total number FCHVs*	841	270	369	713
11.	Number of diarrhoeal reported among all age group	26,025	5,840	5,577	23,341
12.	Immunization coverage				
	(a) BCG	75	110.7	86.1	78.8
	(c) DPT 3	76.2	106.0	89.8	84.8
	(d) Polio	76.2	106.0	89.8	84.7
	(e) Measles	75.7	103.8	85.9	83.1

* DoHS Annual Report 2011-2012, DoHS/MoHP, Government of Nepal, 2013

** National Population and Housing Census 2011 (National Report), Central Bureau of Statistics/GoN, 2012

The map of the study districts are shown in the map of Nepal below;

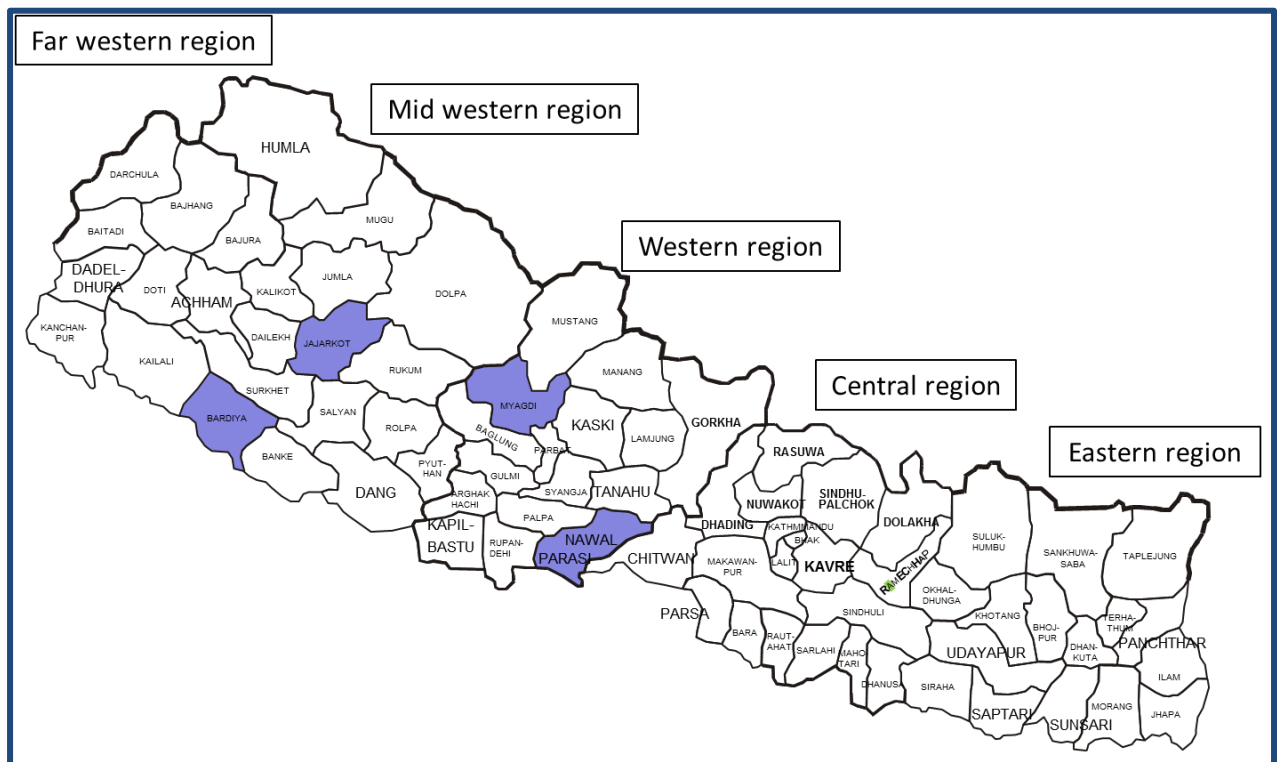


Figure 1: Map of Nepal showing the study districts

The table below showed the exact location of the study sites.

Table 2: Location of Study Sites

Area (Districts)	Municipality/ VDCs
Mid-Western Terai Bardiya District	Gulariya Municipality Taratal VDC Baniyabhar VDC
Mid-Western Hill Jajarkot	Khalanga VDC Ramidanda VDC Bhagwatitol VDC
Western Hill Myagdi	Arthunge VDC Jhin VDC Pakhapani VDC
Western Development Region Terai Nawalparasi	Ramgram Municipality Mukundapur VDC Naram VDC

1.4. Objectives of the formative research

The objectives of the formative research were to:

- a. Assess current hygiene behaviours and their determinants (physical, social, biological and psychological), and document differences by geography (hill, terai, rural, urban) and by socio-demographic variability.
 - i. Hand washing with soap at critical times
 - ii. Food hygiene practices
 - iii. Hygienic use of sanitation facilities including faeces management (including child faeces)
 - iv. Water treatment and storage practices
 - v. Solid and liquid wastes management
- b. Prioritize adversely practiced hygiene behaviours in the project area by conducting a mapping exercise, and identify barriers for performing safe hygiene practices.
- c. Identify the most promising motivators for change in behavior, i.e. the aspirations and desires most likely to be effective in promoting change in behavior.
- d. Assess current immunization practices and their determinants (access and utilization of immunization services, perceived opportunities/ challenges)
- e. Document current routine immunization session delivery approaches and propose possible entry points for hygiene promotion during immunization sessions at health institutions or outreach sessions.
- f. Identify the most appropriate means of communication for hygiene promotion, to inform the design of the promotion package.

Chapter II

2. Methodology

2.1. Study design

The study design was descriptive cross-sectional exploratory formative research.

2.2. Conceptual framework

The conceptual framework provided below sets out the variables included in the formative research. It shows how the independent variables -socio-demographic status, WASH, immunization related knowledge and practice of primary respondents- influence the outcome variable i.e. the delivery of hygiene promotion through routine immunization. The framework also shows the relationship of intermediate variables with the outcome variable.

Independent Variables			Intermediate Variables
<i>Mothers/Guardians having child <12 months</i>			
Socio-demographic status	Knowledge	Practice	<ul style="list-style-type: none"> • Social norms (<i>attached with hygiene behaviors</i>) in the district • Prevalence of enteric diseases • Skills and capacity of FCHVs & their interest • Skills and capacity of health workers • Routine immunization coverage in the district • Immunization settings • Communication channels
<ul style="list-style-type: none"> • Age • Education • Religion • Ethnicity • Number of children • Age of children • Source of income • Household settings 	<ul style="list-style-type: none"> • Hand washing at critical times • Food hygiene • Water treatment & storage • Solid and liquid wastes management • Sanitation & feces management • Diarrhoeal diseases • Routine immunization 	<ul style="list-style-type: none"> • Hand washing (<i>after defecation, before cooking, before eating & child feeding, after cleaning child's bottom, after using dust & dirt</i>) • Food hygiene (<i>during preparation, cooking, re-heating, storage, child feeding</i>) • Water treatment & storage • Sanitation • Feces management <i>including child feces</i> • Solid & liquid wastes management 	
Factors determining hygiene promotion through routine immunization			

Figure 2: Conceptual Framework

2.3. Sample size and sampling strategies

All VDCs and municipalities in the four pilot districts were listed. VDCs/ municipalities were stratified by routine immunisation coverage and sanitation coverage.

Initially, the municipalities and VDCs were categorized into 4 strata based on immunization coverage (DPT3 >90%) and sanitation coverage (availability of toilet in above 60% households) which is as below;

	High immunization (a)	Low immunization (b)
High sanitation (c)	ac	Bc
Low sanitation (d)	ad	Bd

Out of four strata, only two: High immunization – High sanitation (ac) and Low immunization – Low sanitation (bd) was included in the study.

Based on the stratification, at least two VDCs and one municipality were randomly-selected for the study from each district. All health institutions, EPI clinics/sessions, FCHVs and health staff from these VDCs/municipalities were also identified as participants.

Name of district	Sample size			
	Household	FGD (mothers/ FCHVs)	KII	Immunisation sessions
Bardiya	100	6	5	30
Jajarkot	65	6	4	12
Myagdi	61	6	4	6
Nawalparasi	77	6	6	19
Total	303	24	19	67

2.4. Data Collection Methods

An initial desk review of literature was followed by quantitative methods of data collection (observation: immunization session observation, and key hygiene behaviour were observed at household level) and qualitative methods (In-depth interview (IDI), Focus Group Discussion (FGD), Key Informant Interview (KII), motivational exercises, behaviour pictures prioritization)

Quantitative Methods

Structured observation of immunization session:

67 immunization sessions were observed in total. Enumerators observed the settings using a checklist to collect information on Session time and setting, infrastructure and arrangement of the session, client flow (amount of mothers and arrival timing), interaction among mothers, FCHVs and vaccinators, and availability and feasibility of health promotion activities.

Structured observation of behaviours at household level:

In each selected household, one enumerator observed the entire routine of mothers for a day from early morning to evening. The observer noted down and recorded all the key hygiene behaviours of mothers using a checklist. In total, 303 household observations were made.

The household observation checklist was used to collect information on hand washing with soap and water at critical times (after toilet use, before cooking, before feeding/eating), food hygiene behaviours (food storage and reheating), water treatment and storage, sanitation and child faeces management infrastructure and practices, and solid and liquid wastes management.

Qualitative Methods

In-depth Interview (Mothers)

Following the household observation, an in-depth interview was conducted in all 303 households with the mother in relation to the motives and barriers behind the observed behaviours, using in-depth interview guidelines. The latter portion of the in-depth interview consisted of a behavioural categorization and prioritization exercise. The in-depth interview was used to collect information on the mother (e.g. age, level of education), knowledge on hygiene and diarrhoea, and motives and barriers for practicing hygiene behaviours.

Key informant interviews (District and Health Facility)

Key informant interview was conducted with 4 District Health Officers, 4 immunization officers, 3 Cold chain officers and 2 Health education technicians using interview guidelines. A total of 4 KII were conducted i.e. one in each DHO. A total of 15 KII were conducted in health facilities with HF in-charge and vaccinators in each of the selected municipalities and VDCs. The KIIs were used to collect information on the hygiene and sanitation scenario in the district and municipality/VDC, immunization delivery approaches, immunization sessions and vaccinators, disease burden, communication channels, and views of the proposed approach of hygiene Promotion through routine immunization.

Video recording (Immunization session and Households)

Thirty video clips were recorded by the locally recruited research assistants using camera and/or smart phone devices, capturing activities at the immunization session and the key behaviours of mothers at home. Video recording was conducted during the immunization sessions to observe and record the settings to assist in the preparation of the hygiene promotion package. Similarly, video recordings were conducted in households to record the key behaviours of mothers and validate the findings of the observations.

Focus group discussions (Mothers and FCHVs)

FGDs with mothers were conducted after observation of immunisation sessions. In total, 12 FGDs (three in each district – one in each municipality and VDC) were conducted with 80 mothers with a child younger than 1 year. Each FGD had between six and eight participants. To avoid the facilitator leading the discussion and creating bias, the discussion began with general questions such as *“how do you spend your day time during winters?”* This was followed by indirect questions such as *“what works do you do at community level?”*

The FGDs with mothers were supported by the following tools:

- Moment in life Analysis (MILO)
- Story telling (Motive exercises)
 - o 5 motive exercises were conducted in a FGD for identifying the hygiene behaviours with the emotional drivers. The emotional drivers were: affiliation, attraction, disgust, status/respect, nurture, purity and fear of disease.
- Barrier mapping exercises

12 FGDs were conducted with 105 FCHVs, mainly in the health facility. FCHVs of the selected municipality and VDCs were informed about the FGD through the health facility..These FGDs were conducted to understand the FCHVs’ perception about mothers practice of key hygiene behaviours, motives to practice the behaviours, barriers to practicing good hygiene behaviours, motives of mothers for immunizing their child, preferred communication channels for receiving information, willingness of FCHVs to conduct hygiene promotion programs, and views regarding the proposed approach of hygiene promotion through routine immunization.

2.5. The study team

The study team was comprised of a team leader supported and assisted by a research coordinator and data manager. Two field supervisors worked under the team leader and coordinator to monitor and supervise the entire field activities. 14 research assistants were hired with a background of a completed Bachelor's degree in Public health and relevant work experience.

Guidance and support was received from the project Technical Support Unit, WaterAid UK, and the Child Health Division/MoHP throughout the study.

2.6. Developing data collection guidelines

A Standard Operating Procedures (SOP) was developed as a preliminary part of developing the data collection tools. The SOP guided the entire project sequentially from protocol development meetings to data management. Data collection guidelines were developed through a series of conference calls and consultation meetings among the CHD, WaterAid UK, WaterAid Nepal, TSU and GTA team. Since the formative research comprised of both qualitative and quantitative tools for data collection, special emphasis on covering all hygiene behavioural aspects was made while developing the guidelines.

2.7. Pre-test, Training and Fieldwork

The research tools were revised at various stages of feedback and following a stakeholder consultation meeting. To assess the validity and reliability of the research tools, the tools were pre-tested in Lalitpur district (a non-project district with similar conditions and settings to the study context). The testing was carried out within a small sample population attending the Immunization session at Dhapakhel Health Post, Lalitpur. Following pretesting, the questionnaires, guidelines and techniques involved during interviews and observation were revised.

After pre-testing, a three-day training course was conducted for research assistants and field supervisors at the end of October 2014. This provided an overview of the project, tools and techniques for data collection, rapport building techniques, logistics arrangements and other relevant information. The last day of the training comprised of a mock test in which researchers practiced the use of the tools.

Field work was conducted throughout November 2014. Research assistants were divided into four groups with rotational supervision by the field supervisors, coordinator and Team leader. The entry point of the field work was the DHO, followed by healthcare facility visits. Immunization session observation, FGDs with mothers, FGDs with FCHVs, identifying and listing the eligible mothers and household observation with in-depth interviews were conducted simultaneously.

2.8. Data Management, analysis and interpretation

Qualitative data obtained from KII, FGD and IDI were recorded using a digital tape recorder and notes. Data were then transcribed and translated into English, and then analyzed using secondary matrix tables. The secondary matrix table contained the answers to guidelines and the verbatim text to show the answer given by the participants. A secondary matrix table was then developed with respect to each district, then coded and analyzed to be included in the report.

Similarly, quantitative data obtained from household and immunisation session observation were recorded in questionnaires in the field. Later on, these data were coded, entered and analyzed in SPSS and were presented in tables with frequencies and percentages across different variables.

CHAPTER III

3. Characteristics of Respondents

3.1. Background characteristics of primary respondent

The primary respondent of the study was mothers with a child aged less than one year. In total, 303 mothers were included in the study from the four districts representing various ethnic groups and educational background. Table 1 shows that half of the primary respondents were aged 20-24 years followed by 29.1% of mothers belonging to age group 25-29 years. The majority (93.1%) of mothers belonged to the Hindu religion. About 36% belonged to the Janajati group (indigenous people living in terai and hills), followed by Brahmin/Chettri (29.7%) ethnic groups. Most respondents (83.2%) were literate. 50.8% lived in urban areas and the rest in rural areas. The study found that two fifths of the households (41.3%) had a monthly income of more than 10,000 rupees (>US\$100), and a quarter (25.4%) had an income of 1,000 to 5,000 rupees (US\$10-50). Only 4% had a monthly income of less than 1,000 rupees (<US\$10) and 6.3% did not know their monthly income. Among 303 mothers, 100 (33%) of respondents were from Bardiya district followed by Nawalparasi with 77(25.4%), and from Jajarkot and Myagdi with 65(21.5%) and 61(20.1%) respectively. Out of 394 children below 5 years of age, 308 children were aged less than one year

Table 4: Background Characteristics of Household respondent (Mothers)

Percentage distribution of background characteristics of mother in terms of age, religion, ethnicity, education, residence and district.

Background characteristics	Frequency (n=303)	Percent (%)
Age		
15-19	31	10.3
20-24	150	49.5
25-29	88	29.1
30-34	25	8.2
35-39	6	2.0
40 and above	3	1.0
Religion		
Hindu	282	93.1
Buddhist	6	2.0
Muslim	12	4.0
Christian	3	1.0
Ethnicity		
Dalit	38	12.5
Janajati	109	36.0
Madhesi	42	13.9
Muslim	8	2.6
Brahmin/Chhetri	90	29.7
Others	16	5.3
Education		
None	51	16.8
Informal	24	7.9
Primary school (upto 5 grade)	69	22.8
Secondary school (upto 10 grade)	82	27.1
Higher secondary (upto 12 grade)	52	17.2

University	25	8.3
Residence		
Urban	154	50.8
Rural	149	49.2
District		
Bardiya	100	33.0
Jajarkot	65	21.5
Myagdi	61	20.1
Nawalparasi	77	25.4
Total	303	100.0

3.2. Background characteristics of FGD participants

56% mothers participating in the FGD were aged 20-24 years, while most (50.5%) FCHVs were aged 40 years and above. There was no significant difference in the ethnic background of the participants in both groups and a common trend was seen in the number of participants belonging to respective districts and residence. However, all participating mothers had a child under one year, whereas none of the FCHVs had a child below one year of age.

Table 5: Background Characteristics of FGD Participants

Percentage distribution of the age, ethnicity, number of children below one year, belonging district and residence of the both the FGD participants-mothers and FCHVs

Background characteristics	Mothers		FCHVs	
	Frequency(n=80)	Percent (%)	Frequency(n=105)	Percent (%)
Age				
15-19	11	13.8	0	0
20-24	45	56.3	8	7.6
25-29	19	23.8	18	17.1
30-34	2	2.5	8	7.6
35-39	3	3.8	18	17.1
40 yrs and above	0	0	53	50.5
Ethnicity				
Dalit	5	6.3	7	6.7
Janajati	44	55	46	43.8
Madhesi	7	8.8	5	4.8
Muslim	16	20	0	0
Brahmin/Chhetri	8	10	40	38.1
Others	0	0	7	6.7
Number of children<1 yr				
1	80	100	0	0
2	0	0	0	0
Residence				
Urban	27	33.8	35	33.3
Rural	53	66.3	70	66.7
District				
Bardiya	20	25	27	25.7
Jajarkot	21	26.3	27	25.7
Myagdi	20	25	26	24.8
Nawalparasi	19	23.8	25	23.8

Total	80	100	105	100
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Daily routine of mothers

A Day in Life Analysis was conducted to list out the daily activity of the mother during the day of immunization sessions, to identify the barriers to practice behaviours along with immunization session attendance and to identify the preferable time for conducting the hygiene promotion activities.

In the DILO exercise, mothers responded that the usual waking time is 5:30am, followed by their daily chores. The daily chores includes going to toilet, sweeping the house and compounds, taking bath, fetching water and preparing tea. Their busiest time is between 7am and 9am when they clean the dishes, buy groceries and prepare food for the family.

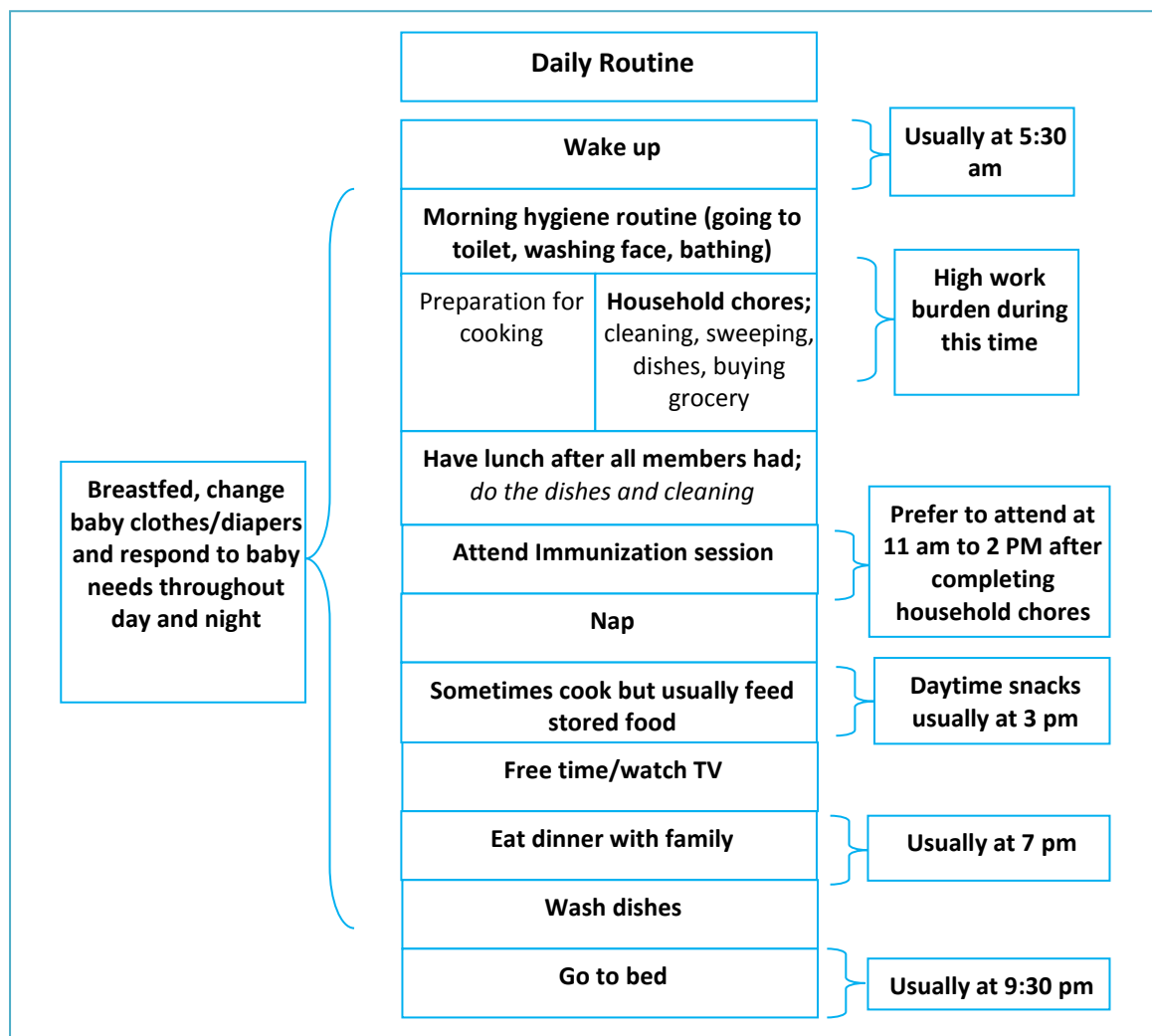


Figure 3: Day in Life analysis of mothers in FGD

During the daytime, mothers like to take a nap together with their child and sometimes cook, but they usually give their children stored food that had been cooked earlier during the day time. Their free time to socialize and watch TV or meet friends is between 3 pm and 5 pm. After this, they again begin preparing dinner while watching TV at the same time, and have dinner with all family members usually between 7 pm and 8 pm. After cleaning the kitchen and dishes, they usually go to bed between 9 pm and 10 pm. Mothers on average cooked 3 times a day and reheat

the remaining food at least once. Children are frequently breast fed up to 6 months of age throughout the day and even at night. Children aged 6 months and above are fed them as per demand. Breastfeeding the baby, changing the baby’s clothes/diapers and responding to every baby need is done throughout the day and night.

The immunization sessions are run in the same time throughout the country, so there were no differences reported in the daily routine of mothers while attending the immunization session on the immunization session day.

Preferred immunization session time

Mothers from all caste groups only attended the sessions after having lunch and cleaning the kitchen and dishes. Generally, they attend the session around 11am until 2 pm and they preferred this time as the most favorable because it is only the leisure time for them. A mother in Bardiya responded, “*attending the sessions after completing household activities is better*”. Since they sometimes have to queue for a long time, they suggested that there should be an adequate number of health workers to respond to their vaccination needs quickly and effectively. One of the mothers said “*We have to wait for more than an hour, sometimes, the vaccinator arrives late, and other times, only one vaccinator cannot handle the crowd*”.



Mother waiting for her turn to vaccinate her child at Mukundapur, Nawalparasi

Barriers and motives to attending immunization sessions

Mothers were asked to list out the general barriers they encounter and motives to attending the immunization session. Some of the barriers and motives listed at the discussion are presented in the table below:

Barriers
<ul style="list-style-type: none"> • Long waiting time in immunization session because of few staff • No session held during Dashain/Tihar.
Motives
<ul style="list-style-type: none"> • Immunization session is conducted once or twice in their area, so if they missed the monthly session, they have to wait a whole month for vaccination • Children will have increased immunity against diseases • Children will not suffer from disability and dysfunction. • Free of cost for vaccination

CHAPTER IV

4. Hygiene behaviour and behavioural determinants (barriers/motives)

4.1. Hand washing

During the observation it was found that majority of the households (82.5%) had at least a place for hand washing (hand washing station) while 17.5% did not have any such places. The households responded for not having hand washing stations due to their lower financial status. A mother in Jhin, Myagdi responded, *“The government should provide soap and materials to construct hand washing stations; rich people can construct not one, but many stations but we the poor people have no money to construct one.”*

It was observed that most households (74.8%) had a hand washing station in the household compounds followed by just outside toilet (30.4%), inside toilet (12%) and inside kitchen (9.2%). Likewise, majority of hand washing station had availability of water in the household compounds (74.7%) and just outside toilets (30%). Similarly, two third (66.3%) of the households had availability of soap in the compounds while 33.7 percent households had soap available in hand washing stations just outside toilets.

Table 6: Location of Hand washing station

	Location of Hand washing station (n=250):		Water available in Hand washing station (n=233)		Soap Available in Hand washing station(n=193)	
	Multiple Response		Multiple Response		Multiple Response	
	n	%	n	%	n	%
Inside toilet	30	12	28	12	15	7.8
Just outside Toilet	76	30.4	70	30	65	33.7
Inside kitchen	23	9.2	18	7.7	23	11.9
In the household compounds	187	74.8	174	74.7	128	66.3

*Multiple responses (some households had more than one hand washing stations)

Hand washing at critical times

It was observed that majority (70.3%) of the mothers practiced hand washing before cooking, while 53.1% did not wash their hands before feeding the child. Likewise, majority of mothers (82.8%) washed their hands after defecation while two third (70.6%) washed their hands after cleaning child’s bottom. Similarly, more than two third (74.3%) mothers washed their hands after touching dust and dirt

Table 7: Hand washing practice at critical times (n=303)

	Before cooking		Before feeding child		After defecation		After cleaning child bottom		After touching dust/dirt	
	N	%	N	%	n	%	n	%	n	%
Yes	213	70.3	142	46.9	251	82.8	214	70.6	225	74.3
No	90	29.7	161	53.1	52	17.2	89	29.4	78	25.7
Total	303	100	303	100	303	100	303	100	303	100

It was observed that soap and water were used to wash hands after defecation (70%) and cleaning child bottom (52.8%). Only water (29.4%) was used to wash hands before feeding child, before cooking (54.5%) and after touching dust/dirt (43.6%). As mentioned by one of the mother’s in Myagdi district, *“I usually wash my hand with soap and water only after defecation. Other times, I prefer to wash with water only.”*

Table 8: Materials used for hand washing

Materials used	Before cooking		Before feeding child		After defecation		After cleaning child's bottom		After touching dust/dirt	
	N	%	N	%	n	%	n	%	n	%
Soap and water	47	15.5	51	16.8	212	70.0	160	52.8	85	28.1
Ash and water	1	0.3	2	0.7	5	1.7	3	1.0	8	2.6
Water only	165	54.5	89	29.4	34	11.2	51	16.8	132	43.6
Didn't wash hands	90	29.7	161	53.1	52	17.2	89	29.4	78	25.7
Total	303	100.0	303	100.0	303	100.0	303	100.0	303	100.0

Hand washing with soap at critical times

The observed hand washing with soap practices of mothers at critical times by education, ethnicity, residence, and districts are shown in the below table. As mentioned by one of the respondents from Jajarkot "it is difficult to wash our hands due to the lack of proper water facility".

Table 9: Hand washing with soap at critical times (Mothers)

Frequency and percentage distribution of hand washing with soap at critical times by education, ethnicity, residence and district; Frequency (percent)

Background characteristics	Total respondents (n=303)		Before cooking (n=47)		Before child feeding (n=51)		After defecation (n=212)		After cleaning child's bottom (n=160)		After touching dust and dirt (n=85)	
	n	%	n	%	n	%	n	%	n	%	n	%
Education												
None	51	16.8	1	2.0	3	5.9	24	47.1	20	39.2	5	9.8
Informal	24	7.9	3	12.5	2	8.3	15	62.5	9	37.5	4	16.7
Primary school (upto 5 grade)	69	22.8	15	21.7	9	13.0	50	72.5	36	52.2	16	23.2
Secondary school (upto 10 grade)	82	27.1	12	14.6	16	19.5	62	75.6	48	58.5	22	26.8
Higher secondary (upto 12 grade)	52	17.2	13	25.0	15	28.8	43	82.7	33	63.5	26	50.0
University	25	8.3	3	12.0	6	24.0	18	72.0	14	56.0	12	48.0
Ethnicity												
Dalit	38	12.5	2	5.3	7	18.4	25	65.8	17	44.7	6	15.8
Janajati	109	36.0	22	20.2	23	21.1	84	77.1	59	54.1	41	37.6
Madhesi	42	13.9	6	14.3	5	11.9	24	57.1	22	52.4	6	14.3
Muslim	8	2.6	2	25.0	1	12.5	3	37.5	3	37.5	3	37.5
Brahmin/Chhetri	90	29.7	13	14.4	13	14.4	65	72.2	52	57.8	25	27.8
Others	16	5.3	2	12.5	2	12.5	11	68.8	7	43.8	4	25.0
Residence												
Urban	154	50.8	26	16.9	30	19.5	104	67.5	79	51.3	54	35.1

Table 9: Hand washing with soap at critical times (Mothers)

Frequency and percentage distribution of hand washing with soap at critical times by education, ethnicity, residence and district; Frequency (percent)

Background characteristics	Total respondents (n=303)		Before cooking (n=47)		Before child feeding (n=51)		After defecation (n=212)		After cleaning child's bottom (n=160)		After touching dust and dirt (n=85)	
	n	%	n	%	n	%	n	%	n	%	n	%
Rural	149	49.2	21	14.1	21	14.1	108	72.5	81	54.4	31	20.8
District												
Bardiya	100	33.0	18	18.0	21	21.0	66	66.0	45	45.0	24	24.0
Jajarkot	65	21.5	10	15.4	10	15.4	42	64.6	39	60.0	15	23.1
Myagdi	61	20.1	9	14.8	14	23.0	48	78.7	37	60.7	28	45.9
Nawalparasi	77	25.4	10	13.0	6	7.8	56	72.7	39	50.6	18	23.4
Total	303	100.0	47	15.5	51	16.8	212	70.0	160	52.8	85	28.1

Handwashing agents

Handwashing with water only was a common practice observed in all the study locations. As one mother mentioned, “we usually spend our time in fields (farm) and there is neither soap nor water, so washing hands with water if available is the common practice, if not, we eat without washing”. The infrequent use of soap and water for washing hands at key times was commonly observed across all study locations. Mothers claimed to wash their hands with soap and water after defecation and after cleaning the child’s bottom because they feel disgust and are aware of disease like diarrhoea.

Table 10: Handwashing agents at critical times (Mothers)

Percentage distribution of cleaning agents used for washing hands at critical times as per residence

Cleaning Agents	Before cooking (n=213)		Before child feeding (n=142)		After defecation (n=251)		After cleaning child's bottom (n=214)		After using dust and dirt (n=225)	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
	Soap and water	19.4	24.8	28.0	44.8	83.7	86.7	73.6	76.0	29.0
Ash and water	0.9	0.0	1.3	1.5	0.8	3.3	0.9	1.0	1.9	2.5
Mud and water	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	2.5
Water only	79.6	75.2	70.7	53.7	15.5	10.0	25.5	22.1	69.2	49.2
Total	100	100	100	100	100	100	100	100	100	100

4.1.1. Motives and Barriers

Motivational factors

Handwashing with soap before cooking and before feeding was rare but more common after defecation and cleaning child’s bottom.

Factors facilitating participants to wash their hands with soap had to do with how dirty their hands were, and the need to have clean hands.

Table 11: Summary of motivating factors for hand washing with soap

Motivators for Hand washing with soap			
<i>Emotional drivers</i>	<i>Motives</i>	<i>Comments</i>	<i>Remarks</i>
Nurture	Child will be healthy if we give him/her food with clean hands	<p>“We need to give food to baby with clean hands to keep child healthy.”</p> <p>“Children are the future, so I try to keep their hands clean.”</p> <p>“Soap kills the germs on our hands and prevents us from [getting]Diarrhoea, common cold”</p> <p>“To prevent from disease one must wash hands with soap and water.”</p>	Frequently expressed in discussion in all districts
Disgust	Dirty hands look disgusting	<p>“If we don’t wash our hands properly it feels disgusting and unsatisfying”.</p> <p>“Soap will clean all the dirt”</p>	Expressed by some participants
Attraction	Clean hands look nice and attractive.	If we wash hands with soap and water, our hands as well as nails will look nice.	Expressed by few FGD participants

A list of seven emotional drivers was compiled to identify the motivating factors for hand washing. After discussion, a tally sheet was prepared. The tally of emotional drivers as discussed in the FGDs is given below:

Table 12: Emotional drivers for Hand washing with soap		
Emotional Drivers	Frequency	Percent
Nurture	47	58.8
Disgust	13	16.3
Attraction	10	12.5
Affiliation	6	7.5
Status/respect	4	5
Total	80	100

Barriers

While discussing the practice of hand washing with soap at critical times, mothers identified some of the barriers to this practice. A summary is given below.

Table 13: Summary of barriers for hand washing with soap

Barriers for Handwashing with soap			
<i>Factors</i>	<i>Descriptions</i>	<i>Comments</i>	<i>Remarks</i>
Physical Barriers	In rural areas, soap is	“Who will look for soap	Frequently expressed in

	rarely available to use for hand washing at all critical times	while working in the field?” “The government should provide soap and materials to construct hand washing stations; rich people can construct themselves but we the poor people have no money for it.”	discussion at rural areas of Jajarkot and Myagdi
Socio-cultural	People follow their age old tradition of using water only for handwashing	“I usually wash my hand with soap and water only after defecation. Other times, as usual, I prefer to wash with water only.”	Frequently expressed in the discussion in all the districts

4.2. Food Hygiene

Based on the observation, about half of the HHs had visible dust and dirt, flies and water pooling in the kitchen. Just below half (44.6%) of participants used visibly dirty cloths to clean the kitchen. Almost five out of six (83.2%) households used visibly clean utensils for preparing food.

16.5% of the participants used fingers to taste food and the majority (75.2%) did not wash their hands when potentially contaminated with dust/dirt during cooking. It was observed that during cooking mothers were found to be doing multitasking which often led to cross contamination of foods. The multi-tasking activities observed were feeding animals, sweeping and wiping kitchen, washing utensils, using toilet, washing clothes, cleaning child bottom, breastfeeding, and firewood collection.



Mother feeding *lito* to her child at Mukundapur, Nawalparasi

Based on the general observations followed by cooking time period and/or boiling point, generalization on whether thorough cooking of food was practiced or not was done. Most of the participants (90.4%) appeared to cook their food thoroughly. During observation, almost half (53.5%) of them stored leftover food in the kitchen and among those, 56.8% stored food in a container with a lid; the rest used a container without a lid. Most mothers (57.8%) did not wash utensils before feeding the child. It could be observed on the video of mother in Bardiya district where the mother was feeding water to her child in the glass with visible dust particles in it.

More than half of the mothers had leftover and/or stored food, but only 48.6% of mothers reheated stored/leftover foods before serving to child. However, it was observed that only 23.8% of the mothers re-heated the food maintaining the adequate temperature (i.e. observed thorough reheating and/or to boiling point).

Table 14: Observed Food hygiene practices in households

Percentage distribution of food hygiene practices at households

Setting characteristics	Yes		No	
	Frequency	Percent	Frequency	Percent
Cleanliness of Kitchen (n=303)				
Use of visibly-dirty cloths to clean the kitchen	135	44.6	168	55.4
Visible cleanliness of utensils before preparing food	252	83.2	51	16.8
Separation of raw and cooked food in the kitchen	255	84.2	48	15.8
Washing of raw foods	257	84.8	46	15.2
During cooking (n=303)				
Fingers used for tasting	50	16.5	253	83.5
Hands washed when contaminated during cooking	75	24.8	228	75.2
Adding of additional raw food ingredients without cooking	46	15.2	257	84.8
Thorough cooking	274	90.4	29	9.6
Food storage				
Leftover/stored food observed in home/kitchen (n=303)	162	53.5	141	46.5
Food stored in containers with a lid (n=162)	92	56.8	70	43.2
Food stored in containers with tight lid and no visible flies/ no dust-dirt (n=92)	69	75.0	23	25.0
Child feeding				
Utensils washed before child feeding (n=303)	128	42.2	175	57.8
Use of soap and water to clean utensils (n=303)	39	12.9		
Use of ash and water to clean utensils (n=303)	33	10.9		
Reheating of stored/leftover food before serving to child (n=183)	89	48.6	94	51.4
Thorough reheating of food (n=89)	74	83.1	15	16.9
Food re-heated and maintained adequate temperature (n=303)	74	24.4	229	75.6

Literacy was found to be significantly associated with cleanliness of kitchen but district and place of residence was not found to be significantly associated with cleanliness of kitchen. District, place of residence and educational status was not significantly associated with thorough cooking of foods.

	Cleanliness of kitchen (Clean) (n=303)		Thorough cooking of foods (n=303)	
	n	%	n	%
District				
Bardiya	50	50	93	93
Jajarkot	29	44.6	58	89.2
Myagdi	27	44.3	49	80.3
Nawalparasi	47	61	74	96.1
	$\chi^2 = 5.281, df=3, p=0.152$		$\chi^2 = 10.928, df=3, p=0.012$	
Residence				
Urban	79	51.3	141	91.6
Rural	74	49.7	133	89.3
	$\chi^2 = 0.081, df=1, p=0.776$		$\chi^2 = 0.462, df=1, p=0.497$	

Education				
None	9	17.6	50	98
Informal	9	37.5	23	95.8
Primary school	32	46.4	59	85.5
Secondary school	47	57.3	72	87.8
Higher secondary school	38	73.1	45	86.5
University	18	72	25	100
Test applied in Two groups (None as Illiterate and others as literate)	$\chi^2 = 26.469, df=1, p<0.001$		$\chi^2 = 1.782, df=1, p=0.182$	
Total	153	50.5	274	90.4

Only 10.9%, 12.9%, 22.8% and 29.3% of the respondent in Myagdi, Jajarkot, Bardiya and Nawalparasi respectively stored/leftover food in container with tight lid and no flies/no dust-dirt but the association was not found to be significant. The place of residence and educational status was not found to be associated with stored/leftover food in container with tight lid and flies/no dust-dirt.

	Cooked stored/leftover food in container with tight lid and no flies/no dirt-dust (n=92)	
	N	%
District		
Bardiya	21	22.8
Jajarkot	11	12.0
Myagdi	10	10.9
Nawalparasi	27	29.3
	$\chi^2 = 4.827, df=3, p=0.185$	
Residence		
Urban	37	40.2
Rural	32	34.8
	$\chi^2 = 1.449, df=1, p=0.229$	
Education		
None	5	5.4
Informal	6	6.5
Primary school	18	19.6
Secondary school	17	18.5
Higher secondary school	14	15.2
University	9	9.8
Test applied in Two groups (None as Illiterate and others as literate)	$\chi^2 = 2.012, df=1, p=0.156$	

Through reheating of food was found to be significantly associated with educational status of the respondents but the through reheating of foods before feeding to child was not found to be associated with district and place of residence.

	Thoroughly reheating of foods before feeding to child(n=183)	
	n	%
District		
Bardiya	25	13.7
Jajarkot	18	9.8
Myagdi	16	8.7

Table 17: Association of various food hygiene behaviours with district, residence and Education

	Thoroughly reheating of foods before feeding to child(n=183)	
	n	%
Nawalparasi	30	16.4
	$\chi^2 = 6.998, df=3, p=0.072$	
Residence		
Urban	37	20.2
Rural	52	28.4
	$\chi^2 = 0.153, df=1, p=0.183$	
Education		
None	8	4.4
Informal	6	3.3
Primary school	22	12.0
Secondary school	23	12.6
Higher secondary school	16	8.7
University	14	7.7
Test applied in Two groups (None as Illiterate and others as literate)	$\chi^2 = 4.103, df=1, p=0.043$	

4.2.1. Motives and Barriers

Motivating factors

During FGD, mothers reported to that they exclusively breastfed their baby aged below six months, and providing children with weaning foods after six months, commonly ‘*jaulo*’ (a porridge made with rice, pulses, turmeric powder, water, salt and vegetables) and ‘*lito*’ (roasted rice, maize, or millet flour with ghee and sugar) .

Table 18: Summary of motivating factors for practicing good food hygiene

Motivators for Food hygiene			
Emotional drivers	Motives	Comments	Remarks
Nurture	Exclusive breastfeeding, proper weaning food and avoidance of unhygienic food makes the baby healthy.	<p>“Till 6 months, baby must be exclusively breast fed. After that lito ,jaulo, eggs, bal vita (distributed by FCHVs) need to be fed for proper growth and development. unhygienic food must be avoided as far as possible”</p> <p>“It feels good to see a healthy baby.”</p> <p>“I never feed leftover food because I know it will be contaminated by flies and my child will suffer from diarrhoea if it is fed to him.”</p> <p>“Stale/ spoiled food causes diseases.”</p> <p>“Consuming stale/cold food cause disease like vomiting, Diarrhoea, fever, pneumonia, cold and cough, dysentery”</p> <p>“If food is cooked by covering the <i>bhada</i> (dish), it gets cooked fast and disease causing flies and insects cannot get into it.”</p>	Frequently expressed in discussion in all districts
Affiliation	Practice of feeding hot food to child is	People say that food should be taken hot and	Expressed few times

Table 18: Summary of motivating factors for practicing good food hygiene

Motivators for Food hygiene			
<i>Emotional drivers</i>	<i>Motives</i>	<i>Comments</i>	<i>Remarks</i>
	common	well cooked.	in the discussion
Disgust	Proper storage, keeping away from flies	“It is disgusting to consume flies in food.”	Expressed few times in the discussion

The emotional drivers in relation to food hygiene as expressed by mothers show that majority of the mothers follow good food hygiene to care for their child and prevent.

Table 19: Emotional drivers for food hygiene

Emotional Drivers	Frequency	Percent
Nurture	76	95.0
Affiliation	2	2.5
Disgust	2	2.5
Total	80	100

Barrier Mapping

To identify barriers for performing key food hygiene behaviours, mothers participating in the FGDs were provided with a certain scenario, given ‘cooking food’ as the ‘moment’, and asked to list down the factors hindering this task.

Mothers were asked to keep in mind the home cooking settings in which they prepare their child’s food. During this period, they were provided with the action points listed below to discuss among themselves and identify the barriers to performing such actions at their kitchen, at home, and in the community/society. These are listed below.

Table 20: Barrier mapping of the key actions when cooking at home

Key actions during cooking and feeding time		Barriers			
		Physical	Social / cultural	Biological	Attitudinal
1	Cooking food thoroughly, washing serving utensils immediately after cooking, re-heating leftover food appropriately during day time on the same day in which the food was cooked, storing leftover food in a container with tight lid (to protect from flies/dust)	Having to collect firewood Lack of cleaning materials No tight lid (only cover)	Restrictions on cooking during menstruation, meaning that someone other than the mother does the cooking* Perception that food stored near stove is safe	Perception that the child has strong constituency and is able to digest any food The traditional household set up allows animals (cats, dogs, goats) to enter the kitchen.	No time/busy schedule

Table 20: Barrier mapping of the key actions when cooking at home

Key actions during cooking and feeding time		Barriers			
		Physical	Social / cultural	Biological	Attitudinal
2	Hand washing with soap before cooking, before feeding child and after touching household/ kitchen surfaces or dust/dirt. HWWS after defecation during the cooking period, after cleaning child’s bottom (if child has defecated during the cooking period).	Need to buy a soap No water No hand washing station	-	-	Use water only most often because it is more convenient
3	Boiling /treating water before serving to child. Boiling milk when serving to child.	Shortage of gas Need to clean more number of baby’s utensils repeatedly	-	-	Boiling water is time-consuming Boiled water is tasteless The baby loves cold milk
4	During cooking and feeding you needed to use the toilet and/or your child defecated; what would be the most prominent barrier to performing these two actions.	Distance to toilet Lack of Water	-	-	-
5	Cooking and feeding resulted in waste water and solid waste. What would you do with it? What would be the most prominent barrier at your home to disposing of both wastes?	Lack of containers Distance to compost pit No liquid disposal system	-	-	Throw it in kitchen garden, it will be manure

*Note: The restrictions includes in eating (holy foods, meat and meat products), touching, entering and other actions (entering kitchen, temple/pray room, and attending school)

CHAPTER V

5. Use/Cleanliness of Sanitation facilities and Child Faeces disposal

5.1. Sanitation and faeces management

During observation it was found that majority of households (90.4%) had toilets and 9.6% did not. Nearly half of the households (48.9%) had permanent water-sealed toilets (pour flush) followed by closed (with slab) simple pit latrine (40.9%), open (without slab) simple pit latrine (8.8%) and others (1.5%). Among those who had a toilet (274), almost all households (97.8%) used the toilet. Among those households who used the toilet, 91.8% of toilets were used by all household members. 8.2% of toilets were not used by all members. Of those family members who did not use the household toilets (n=22), one third (31.8%) used the field, followed by open space (22.7%), indiscriminately (9.1%), street (4.5%) and others (31.8%) (bush, forest and river banks).



A simple pit latrine with slab at Baniyabar, Bardiya

Pour flush and simple pit latrines with slab were found to be commonly used in almost all the districts. However, open (without slab) simple pit latrines were common in Bardiya. Although the study showed that various defecation practices exist in villages, these are usually not applicable to children; as stated by one of the respondents during the household interview that “*if the child goes to the toilet the environment will be good, but the child often defecated in the clothes which makes it difficult to manage the faeces*”.

Table 21: Sanitation and faeces management

Background characteristics	Availability of toilet		Type of toilet				Toilet in use	
	Yes	No	Pour flush	Simple pit latrine with slab	Simple pit latrine without slab	Others	Yes	No
District								
Bardiya	85.0	15.0	48.2	30.6	21.2	0	97.6	2.4
Jajarkot	87.7	12.3	50.9	49.1	0	0	100	0
Myagdi	98.4	1.6	38.3	60	1.7	0	100	0
Nawalparasi	93.5	6.5	56.9	30.6	6.9	5.6	94.4	5.6
	$\chi^2 = 9.245, df=3, p=0.026$		$\chi^2 = 47.664, df=9, p<0.001$				$\chi^2 = 6.438, df=3, p=0.092$	
Residence								
Urban	89.0	11.0	67.2	22.6	10.2	0	95.7	4.4
Rural	91.9	8.1	30.7	59.1	7.3	2.9	100	0
	$\chi^2 = 0.780, df=1, p=0.337$							
Total	90.45	9.55	48.95	40.85	8.75	1.45	97.85	2.2

Availability of water and soap in sanitation facilities

It was observed that of the 274 households with a toilet, the majority (84.3%) of toilets had presence of water inside/nearby the toilet, while 15.7% of toilets had no water. One fifth (22.6%) of the toilets observed were visibly dirty (visible faeces, flies and odor) whereas half of the toilets (53.6%) were somewhat clean (no visible faeces). However, nearly a quarter (23.7%) of households had fully clean toilets (i.e. no flies, no smell and no visible faeces). Regarding the presence of soap inside/nearby toilet, more than half (55.1%) had soap inside/nearby toilet while 44.9% did not. Nearly half (47.8%) of the households disposed of child faeces in the toilet, while more than half (52.2%) did not do so.

Water was mostly available inside or nearby the toilet in Myagdi and Nawalparasi districts, but less frequently so in Bardiya and Jajarkot. More than half of the households of Bardiya, Myagdi and Nawalparasi had soap inside or nearby the toilet while only 42.1% of toilets in Jajarkot had soap inside toilet.

Water access had a similar pattern in both urban and rural areas. Soap was more likely to be available inside or near the toilet (hand washing station outside toilet) in urban areas, and this association was found to be statistically significant ($p < 0.001$). The toilets in Nawalparasi were observed to be clean in comparison to all other districts whereas 38.8% of the toilets in Bardiya were found to be dirty. Similar patterns were observed regarding cleanliness in the rural and urban areas.

Table 22: Availability of water and soap inside or near toilet

Background characteristics	Availability of water inside or near the toilet		Availability of soap inside or near the toilet		Toilet cleanliness		
	Yes	No	Yes	No	Fully clean	Somehow clean	No
District							
Bardiya	78.8	21.2	54.1	45.9	22.4	38.8	38.8
Jajarkot	75.4	24.6	42.1	57.9	15.8	73.7	10.5
Myagdi	91.7	8.3	61.7	38.3	16.7	61.7	21.7
Nawalparasi	91.7	8.3	61.1	38.9	37.5	48.6	13.9
	$\chi^2 = 10.724, df=3, p=0.013$		$\chi^2 = 6.021, df=3, p=0.111$		$\chi^2 = 33.403, df=6, p < 0.001$		
Residence							
Urban	83.9	16.1	66.4	33.6	29.2	48.2	22.6
Rural	84.7	15.3	43.8	56.2	18.2	59.1	22.6
	$\chi^2 = 0.028, df=1, p=0.868$		$\chi^2 = 14.177, df=1, p < 0.001$		$\chi^2 = 4.992, df=2, p=0.082$		
Total	84.3	15.7	55.1	44.9	23.7	53.65	22.6

Child faeces management

As observed from the result, it can be seen that education was considered to be of high importance with regards to the faeces management, as illiterate people were less likely to dispose of child faeces in the toilet ($p < 0.001$). Additionally, education has a significant impact on the visibility of human faeces and animal faeces in the compound. Therefore, the study suggests that education plays a significant role in child faeces management and disposal practices, but not in terms of animal faeces management. People in urban areas were found to be more likely to

dispose of child faeces in the toilet ($p < 0.05$). Further, human faeces were more visible in rural areas ($p < 0.001$).

Table 23: Faeces Management and disposal

Percent distribution of child faeces management and disposal in toilet

Background characteristics	Child faeces disposed of in toilet		Visible human Faeces in compound		Visible animal Faeces in compound	
	Yes	No	Yes	No	Yes	No
Education						
None	14.7	85.3	40	60	60	40
Informal	47.6	52.4	12.5	87.5	62.5	37.5
Primary school (upto grade 5)	36.5	63.5	17.4	82.6	55.1	44.9
Secondary school (upto grade 10)	53.2	46.8	6.1	93.9	40.2	59.8
Higher secondary (upto grade 12)	63.5	36.5	3.8	96.2	25	75
University	72	28	0	100	11.5	88.5
Test applied in Two groups (None as Illiterate and others as literate)	$\chi^2 = 17.048$, $df=1$, $p < 0.001$		$\chi^2 = 33.015$, $df=1$, $p < 0.001$		$\chi^2 = 5.808$, $df=1$, $p = 0.016$	
District						
Bardiya	40	60	14	86	52	48
Jajarkot	43.9	56.1	20	80	41.5	58.5
Myagdi	61.7	38.3	4.9	95.1	42.6	57.5
Nawalparasi	48.6	51.4	15.6	84.4	35.1	64.9
	$\chi^2 = 7.070$, $df=3$, $p = 0.070$		$\chi^2 = 6.331$, $df=3$, $p = 0.097$		$\chi^2 = 5.287$, $df=3$, $p = 0.152$	
Residence						
Urban	55.5	44.5	14.3	85.7	31.8	68.2
Rural	40.1	59.9	13.4	86.6	55.7	44.3
	$\chi^2 = 6.450$, $df=1$, $p = 0.011$		$\chi^2 = 0.047$, $df=1$, $p = 0.828$		$\chi^2 = 17.575$, $df=1$, $p < 0.001$	
Total	47.8	52.2	13.85	86.15	43.75	56.25

Case Study 1: Child faeces and mothers' response

“Our baby is small; we do not know when it will make a mess”. Mothers throughout the study districts were concerned about managing their child’s faeces. They usually try to make the child defecate in the potty, but on many occasions, the child defecates where s/he is sitting or sleeping, usually in their clothes. It is easier for mothers to dispose of child faeces when these are in the potty, but the child defecates in their clothes, they usually wash away the faeces in the common tap; “it is our common practice, we usually clean baby clothes here”, a mother in Nawalparasi quoted. If the baby urinates or defecates in the compound, the faeces are washed away with water and swept towards the kitchen garden.

One-third of KII participants mentioned that open defecation was practiced in the village. People of both urban and rural area were aware of the harm that open defecation could cause. A FGD mothers from Myagdi mentioned *“having a toilet alone is not sufficient, its proper use and cleanliness is a must; defecating outside will keep the area dirty and spread diseases”*.

Similarly, another mothers’ FGD participant from Nawalparasi mentioned that *“it is necessary to have a toilet in each house because the house which did not have any toilet affected the houses that had toilet too”*. It can be seen that it



Mother in Bardiya washing child’s urine and sweeping the compound

was important for all people to use the toilet for self-benefit as well as benefits to those around them.

5.1.1. Motives and Barriers

Although some VDCs have been declared as Open Defecation Free (ODF) as part of the Total Sanitation Campaign in the context of improving sanitation status, open defecation has not stopped entirely, and some people still use open spaces and forests as expressed in the FGDs. As responded by a mother in Myagdi, *“though our VDC is ODF declared, we need to spend one month in field during our harvesting season and we do not have toilet there, so, we use one area around field for defecation and cover it with soil later.”* The drivers and motives to follow good sanitation practices by mothers are listed below.

Motivators for sanitation and Faeces management			
Emotional drivers	Motives	Major Comments	Remarks
<i>Disgust</i>			
Disgust	Filthy environment is disgusting, and pollutes the environment, which is home to annoying flies and mosquitoes.	<p>“It feels disgusting to see faeces in the surroundings”</p> <p>“A polluted and filthy environment brings disgusting flies and mosquitoes”</p> <p>“Open defecation and urination brings foul smells”</p>	Frequently expressed in all discussions in the districts

		“Flies move around the faeces, and it is very unacceptable to see the flies around our baby’s face”	
Nurture	Sanitation and childhood illness are interlinked; disease transmission is accelerated in dirty environment.	“If sanitation is not maintained, child suffers from diseases like cold/cough, diarrhoea, worm infestation, dysentery etc. We must then go hospital and spend large amounts of money”. “One must throw faeces in the toilet in order to prevent disease.” “Sanitation and disease are two sides of the same coin.”	Frequently expressed in all discussions in the districts
Attraction	Cleanliness makes the environment attractive	“Throwing the child faeces in the toilet helps to keep surrounding good looking.” “Compound without dirt and faeces looks clean and attractive”	Sometimes expressed in discussions
Status/respect	Seeing faeces around our household is humiliating	“By keeping our environment clean we feel proud.” A person who is clean is admired.	Sometimes expressed in discussions

Mothers said that the environment should be kept clean and the faeces should be managed properly in order to prevent diseases. Mothers in a Nawalparasi FGD added, “*healthy mind lives in a health environment*”, “.....it’s disgusting to see someone’s residence and compound dirty”.

Emotional Drivers	Frequency	Percent
Disgust	36	45
Nurture	23	28.8
Attraction	11	13.8
Status/Respect	6	7.5
Purity	4	5
Total	80	100

Barriers

Some of the barriers in relation to child faeces management and maintaining environmental sanitation were the lack of resources and following the age-old tradition of defecation in open spaces.

Table 26: Summary of barriers for practicing good sanitation and faeces management

Barriers for sanitation and Faeces management			
<i>Factors</i>	<i>Barriers</i>	<i>Comments</i>	<i>Remarks</i>
Physical Barriers	No toilet, or poorly-constructed toilet	<p>“Though our VDC is declared ODF, not all the people have a toilet”</p> <p>“the toilet is very dirty and cannot be properly locked”</p> <p>“Lack of water and cleaning agents means that foul smell persist and children do not want to use it”</p>	Frequently expressed in discussion at rural areas of Jajarkot and Myagdi
Socio-cultural	Old people do not like to use toilets	<p>“grandfather says he suffocates inside the toilet and prefers open space”</p> <p>“child often defecates in their clothes, so we just need to wash the clothes with faeces in the tap, and there is no need to dispose of faeces in the toilet”</p>	Frequently expressed in the discussion in all districts

5.2. Household Water Treatment and Storage

Most (42.6%) households used tube wells with hand pump (residence and/or communal pump) as source of water for general use and drinking at home followed by piped water in residence (29.7%), piped water to tap in yard/plot (21.8%), protected spring (4.6%), surface water (0.7%) and others (0.7%).

Source of Water	Frequency	Percent
Piped water in residence	90	29.7
Piped water to tap in yard/plot	66	21.8
Tube well with hand pump	129	42.6
Protected spring	14	4.6
Surface water	2	0.7
Others	2	0.7
Total	303	100

It was observed that piped water was common in Myagdi, and tube wells with hand pumps were common in both urban and rural areas specifically in Nawalparasi and Bardiya districts. Piped water and tap water in yard were the major source in all the study districts.

Table 28: Source of water in respect to district and place of residence

Percent distribution of source of drinking water by district and residence							
Background characteristics	Type of source of drinking water						Total
	Piped water in residence	Tap water in yard	Tube well/hand pump	Protected spring	Surface water	Others	
District							
Bardiya	16	8	76.0	0	0	0	100
Jajarkot	30.8	44.6	0	20	3.1	1.5	100
Myagdi	72.1	24.6	0	1.6	0	1.6	100
Nawalparasi	13	18.2	68.8	0	0	0	100
Residence							
Urban	37.7	18.2	41.6	1.9	0	0.6	100
Rural	21.5	25.5	43.6	7.4	1.3	0.7	100
Total	29.6	21.85	42.6	4.65	0.65	0.65	100

Method of water treatment

It was observed that only one third of the mothers (31.7%) treated water before serving to child while majority (68.3%) did not.

Among those who did treat the water (n=96) before serving to the child, 83.3% boiled and 16.7% filtered the water. People preferred drinking natural flowing tap water and spring water directly, rather than boiling it and thereby making it bland as the mothers in Jajarkot respond,

“We love the taste of cool water, we only boil the water during winter and when we are sick”, implying that people tend to drink the water hot only during winters and when sick.



A boy in Jajarkot enjoys cool water directly from the tap

Case Study 2: Khalanga prefers unpurified water

An in-depth interview was conducted with a 23 year-old mother of one who lives in Khalanga, Jajarkot district with her joint family. She has completed her higher secondary education at Khalanga and runs a shop with her husband at the *bazaar*. She is well aware of hygiene and sanitation issues and concerns. They even have local FM radio at their area through which health promotion messages are often delivered. In addition, FCHVs are also active and are well appreciated by the community. Khalanga has public piped water distribution. It is common in this area to drink water directly from taps and use for other purposes as well. She is no exception; although she is aware of the recent outbreaks and problems related to drinking unpurified water, she prefers to use it without boiling. She even adds that *“we usually boil the water during the cold winter period”*. Although she is aware of water purification and the outcomes of using unpurified water, communicated both through FM radio and FCHVs mobilization, due to the prevailing cultural practice, she is confident in using the local water for daily purposes.

Water storage and serving to children

It was observed that 50% of households stored water in a pot/gagri, 37.3% store in bucket and the rest in other containers (barrel and bottles). 60% of the households cover the container properly with lid and/or utensils, and 44.6% of the water containers were found to be visibly clean. It was observed that only 43.2% mothers served water to their child, and among them, only 18.2% served the treated water (*boiled water and stored in the container with tight lid*) to the child.



A Mother feeding her child with untreated water while having meal at Ramgram, Nawalparasi

5.2.1. Motives and Barriers

Table 29: Summary of emotional drivers and motives for water treatment and storage

Motivators for water treatment and storage			
<i>Emotional drivers</i>	<i>Motives</i>	<i>Major Comments</i>	<i>Remarks</i>
Nurture	To prevent our child from water borne diseases, water purification should be done.	<p>“We must consume treated water to prevent oneself and child from disease and to keep baby healthy.”</p> <p>“Consuming untreated/polluted water causes diseases”</p> <p>to our child in order to prevent from illness”</p> <p>“Polluted / dirty water is harmful to baby and all of us”</p>	Frequently expressed in all discussions in the districts
Disgust	Dirt, flies, uncovered and foul smelling containers contaminate the stored water	<p>“Uncovered water containers can be dirty and flies can enter in them”</p> <p>“If we use unclean utensils to draw water from containers, the water will be dirty.”</p> <p>“dirty and smelly containers pollute the stored water”</p>	Frequently expressed in all discussions in the districts

Purity	Clean water is related to our health	“Clean and pure water is good for health”	Sometimes expressed in the discussions
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As expressed in the discussion, although many prefer to drink the water directly from the source, boiling water was the most preferred water treatment method. The participants in FGD responded that the health facilities promote water boiling (*ek bhulko umalnu*) as water purification method and mothers believe that boiling kills germs and is safe.

Emotional Drivers	Frequency	Percent
Nurture	33	40.1
Disgust	30	37.5
Purity	13	16.2
Affiliation	5	6.2
Total	80	100

Barriers

Time taken to prepare materials to boil the water and the common practice of drinking water without purification were mentioned as some of the barriers for water treatment.

Barriers for water treatment and storage			
Factors	Descriptions	Comments	Remarks
Physical Barriers	Time taken to collect, prepare firewood and stove	<p>“Boiling takes time”</p> <p>“we need to prepare firewood and <i>chulo</i> (stove), it is time consuming”</p> <p>“We have small <i>gagri</i> to store water which is insufficient for the whole day”.</p>	Frequently expressed in discussions at all districts
Attitudinal	Water treatment makes the water bland	<p>“We love the taste of cool water, we only boil the water during winter and when we are sick”</p> <p>“We all drink the water from the tap, we have been drinking since long, we have pure water here”.</p>	Frequently expressed in discussions in all districts, mainly in hilly rural regions

5.3. Solid and Liquid Waste Management

In most (68%) of the households, solid waste was observed in the backyard/compounds. It was observed that most households (75.6%) have appropriate places to collect the faecal sludge (safety tank and/or bore hole). 69% of households did not have a separate container for collecting waste water. Waste water disposed of in the kitchen garden (51.7%), thrown out indiscriminately (22.5%), or in the stream/river. Stagnant water was not commonly observed near the house.



Drinking water source (Hand Pump) with waste water collection pit at Gulariya, Bardiya



Solid waste thrown from the backside of a house in Arthunge, Myagdi

In terms of solid waste collection and separation, it was observed that 65.7% did not have a solid waste collection container, and 68.3% did not have a mechanism for separating organic and non-organic (e.g. plastic) waste. It was observed that a compost pit (*malkhad*, a place where animal dung is collected) was commonly (39.8%) used as a means of organic solid waste disposal. Inorganic wastes are generally thrown indiscriminately (20.1%) and/or in open space (16.7%)

Table 32: Waste disposal according to place of residence and districts

Waste disposal	Place of residence				Districts								Total	
	Urban		Rural		Bardiya		Jajarkot		Myagdi		Nawalparasi			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Garbage pit	36	18.1	35	16.4%	13	9.7	22	22.4	18	25.0	18	16.5	71	24.1
In the kitchen garden	32	16.1	43	20.1	15	11.2	29	29.6	13	18.1	18	16.5	75	25.5
Throw indiscriminately	25	12.6	34	15.9	16	11.9	20	20.4	7	9.7	16	14.7	59	20.1
Open space	27	13.6	22	10.3	17	12.7	12	12.2	9	12.5	11	10.1	49	16.7
Compost pit	42	21.1	75	35	58	43.3	13	13.3	8	11.1	38	34.9	117	39.8
Others	37	18.6	5	2.3	15	11.2	2	2.0	17	23.6	8	7.3	42	14.3
Total	199		214		109		134		98		72		413	140.5

*=Multiple response

5.3.1. Motives and Barriers

Table 33: Summary of motivating factors for solid and liquid waste disposal

Motivators for solid and liquid waste management			
<i>Emotional drivers</i>	<i>Motives</i>	<i>Comments</i>	<i>Remarks</i>
Disgust	Mosquitoes and flies in house and compounds are annoying	“liquid wastes thrown around the household make the compound slippery and dirty” “water puddles in the compound attracts annoying flies and mosquitoes”	Very frequently expressed in all discussions in the districts
Attraction	Household compounds should be kept neat and clean	“Separation of wastes keeps the environment neat and clean” “wastes thrown in kitchen garden will decompose there and will not pollute the environment”	Frequently expressed in all discussions in the districts
Nurture	Improper management of waste makes a breeding place for disease causing flies and transmits diseases	“baby plays in the ground too, if there will be waste, he might play with that too and get sick” “mosquitoes and flies live in liquid wastes, we should not throw the liquids indiscriminately”	Frequently expressed in all discussions in the districts
Affiliation	<i>Malkhad</i> is generally used for collecting garbage	“we separate the plastic wastes, while throw other garbage in the <i>malkhad</i> ”	Less expressed in the discussion

Most mothers expressed that the unmanaged solid and liquid wastes disposal is the major cause of diarrhoeal diseases, which need to be stopped. Other emotional drivers include affiliation, purity, disgust and attraction.

Table 34: Emotional drivers for solid and liquid wastes management		
Emotional Drivers	Frequency	Percent
Attraction	21	26.3
Disgust	21	26.3
Nurture	17	21.3
Affiliation	14	17.5
Status/respect	7	8.8
	80	100

Barriers

Lack of proper waste disposal containers and the general practice of the community to throw indiscriminately are the barriers for the proper solid and liquid waste disposal.

Table 35: Summary of barriers for waste management

Barriers for waste management			
<i>Factors</i>	<i>Descriptions</i>	<i>Comments</i>	<i>Remarks</i>
Physical Barriers	Lack of containers and proper disposal system	“we generally throw the garbage into our kitchen garden” “the liquid waste will flow slowly to the kitchen garden, in the meantime, it gets dried too”	Frequently expressed in discussion at all the districts
Socio-cultural	Community dumping site is easy to use	“everybody throws by the hill, we too prefer the same”	Frequently expressed in discussion in all the districts, especially in the hilly rural regions

CHAPTER VI

6. Common diseases including Diarrhoea

6.1. Common diseases

Based on the annual reports of District Health Offices (DHO), the top ten diseases were reviewed among which Acute Respiratory Tract Infections (ARIs), diarrhoea, skin diseases and worm infestations are the common diseases among the children. Based on the observation and IDI, 29.7% mothers responded that their child was suffering from some form of diseases that includes ARI (13.5%), diarrhea (7.9%), skin diseases (3.3%) and other diseases like fever, eye infection and worm infestation (4.9%).

6.2. Diarrhoea

6.2.1. Disease Status

Based on the KII with the DHO and IDI with mothers, they responded that the incidence of diarrhoea has plunged in recent years, with few episodes seen among the children below five years. However, diarrhea was observed among some of the children in the visited households (Table 3). Among 394 number of children observed in 303 households, 8.1% had diarrhea in the last two weeks period. 6.8% of the observed children suffering from diarrhea belong <1 year of age while 12.8% belong to 13-59 months of age. The number of diarrhea cases was observed mostly in Jajarkot (19.2%) and Bardiya district (10.6%).

Districts	Children			Diarrhea cases in two weeks period					
	<1 yr	13-59 months	Total	<1 yr		13-59 months		Total	
				n	%	n	%	n	%
Bardiya	99	33	132	8	8	6	18.1	14	10.6
Jajarkot	65	13	78	10	15.3	5	38.4	15	19.2
Myagdi	59	22	81	2	3.3	0	0	2	2.3
Nawalparasi	75	18	86	1	1.3	0	0	1	1.1
Total	308	86	394	21	6.8	11	12.8	32	8.1

6.2.2. Beliefs and perception

As discussed in the FGDs, most mothers have some awareness of diarrhea, its causes and actions needed to prevent and treat diarrhoea. The awareness programs and the FCHVs work on raising awareness on preventive measures against diarrhoea and its treatment is noteworthy. ‘*Jhadapakhala*’, ‘*Cherpate*’ are some of the common words used locally for diarrhea that implies loose watery stool passed more than three times in a day. “*Small children do get ‘cherpate’ often, but it has been decreased in recent years, even if it occurs, we give them ‘jeevanjal’ (ORS)*,” a mother in Bardiya district responded. However, some cultural beliefs among a few mothers still exist in the community, for example in Khalanga, Jajarkot district, a mother responded “*my child usually gets diarrhoea in couple of months, but I know it is due to cold*”.

6.2.3. Causes of diarrhoea

Mothers were asked about the causes of diarrhoea during the FGDs and in-depth interviews. Three-fourth of the mothers responded that the major causes of diarrhoea were said to be related due to waste and faecal contamination, with the major vector being flies. Ingesting food with dirty hands contaminated by waste and faecal matter was also identified as the cause for diarrhoea. The indirect routes mentioned for the causation of diarrhoea were contaminated water sources and raw food when ingested without purification and treatment. In addition, a few mothers mentioned the cause of diarrhea to be taking cold food, and/or if their baby catches cold.

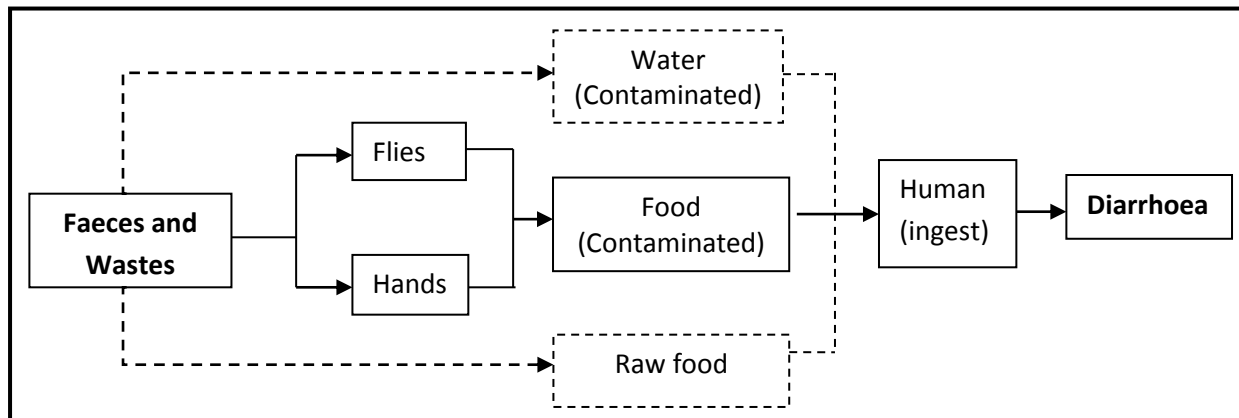


Figure 4: Routes mentioned for the transmission of Diarrhoea by FGD participants

6.2.4. Treatment of Diarrhoea

Oral Rehydration Solution (*JeevanJal*) was the preferred choice for the treatment of Diarrhoea as responded by more than three-fourth of the mothers in FGDs. Almost all of the mothers in the four districts mentioned *jeevanjal* as the treatment for diarrhoeal diseases as it is easily available and distributed by FCHVs. As mentioned in the FGD, other traditional methods were also practiced by few numbers of mothers, such as visiting the traditional healers for treatment is still in practice in Naram VDC. FCHVs in Naram VDC, Nawalparasi responded that the community perception is slowly improving regarding treatment procedures against communicable diseases: “...people do visit *dhami/jhakri* (traditional healers) for treatment, and the *dhami/jhakri* also asks them to visit the health facility, then they go to the health post for treatment”. People also follow traditional treatment using salt and water solution (homemade ORS), and drinking ginger water for treating diarrhoea.

CHAPTER VII





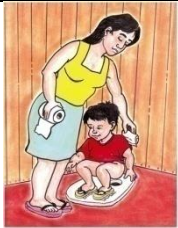
7. Behavioral Pictures Categorization Findings

At the latter part of the in-depth interview, mothers were shown a group of pictures and asked to categorize them as ‘good’ or ‘bad’; relevant comments were also noted for categorization. 22 behavioral picture cards were used altogether. Once the individual cards were shown and the responses were noted down, mothers were given all the 22 cards together and asked to prioritize the behavioral pictures on a scale of 1 to 5, with 5 being the highest level (‘the best’), and 1 being the lowest level (‘the worst’) in regards to the importance to their child’s health (pile sorting exercise).

To categorize the card as ‘good’ or ‘bad’ for the child’s health, the card having 90% and above score in the respective column with 90% ranking scale in 5 or 1 scale was categorized as the top ranking ‘good’ pictures and top ranking ‘bad’ pictures respectively.

Similarly, the cards acquiring 65% to 90% score were considered as ‘majority good’ or ‘majority bad’ behavioral pictures. The cards having lower than 65% score were considered as controversial cards.

The scores of the individual behavioral pictures are shown below:

Code	Picture	Description	Categorization			Prioritization				
			Good	Bad	Not sure	1	2	3	4	5
1		Hand washing with water only	62.5	37.5	-	28.8	11.3	20.0	12.5	27.5
2		Hand washing with soap and water	100.0	-	-	-	-	-	3.8	96.2
3		Hand washing with soap and water after defecation	92.5	5.0	2.5	3.8	1.3	7.5	17.5	70.0
4		Hand washing materials outside toilet	87.5	8.8	3.7	10.0	2.5	11.3	27.5	48.8
5		Washing child Faeces in the toilet	93.8	1.2	5.0	2.5	3.8	5.0	7.5	81.3

6		Open defecation	6.2	92.5	1.3	85.0	10.0	-	-	5.0
7		Cleanliness of toilet	92.5	6.2	1.3	5.0	3.8	8.8	20.0	62.5
8		Dirty household environment	8.8	88.8	2.4	78.8	13.8	1.3	3.8	2.5
9		Cleaning, washing and defecating in common river	12.5	85.0	2.5	80.0	12.5	1.3	2.5	3.7
10		Toilet joined to river	17.5	80.0	2.5	70.0	12.4	5.0	6.3	6.3
11		Washing away Faeces in toilet	92.4	3.8	3.8	6.2	3.8	6.2	16.3	67.5
12		Uncovered food with flies	10.0	88.7	2.3	70.0	18.8	1.3	5.0	5.0
13		Covered food	95.0	5.0	-	3.8	3.8	-	5.0	87.4
14		Cleanliness of serving utensils	41.3	52.5	6.3	35.0	13.8	16.3	7.5	27.5
15		Reheating of stored food	80.0	17.5	2.5	11.4	6.3	19.0	10.1	53.2

16		Feeding non-reheated stored food	12.5	81.3	6.3	70.0	16.3	7.5	-	6.3
17		Uncovered water containers	15.0	83.8	1.2	57.5	26.3	6.3	2.5	7.5
18		Covered water containers	93.8	5.0	1.3	5.0	-	10.0	1.3	83.8
19		Drinking unpurified water	31.3	62.5	6.3	45.0	20.0	7.5	15.0	12.5
20		Water treatment	93.7	6.3	-	7.5	-	5.0	12.5	75.0
21		Throwing wastes haphazardly	20.0	76.3	3.8	66.3	11.3	3.8	5.0	13.8
22		Separation of wastes	96.3	2.5	1.3	3.8	-	7.5	12.5	76.3

Top ranking ‘good’ pictures



8. Hand washing with soap (100%)

13. Covered food (95%)

22. Separation of wastes (96.3%)

These three pictures represent good hygiene practice. The behavioral picture of hand washing with soap was undoubtedly the most popular choice representing ‘good’ behaviour, with all mothers responding it as the good picture. “*Soap kills germs (kira)*”, “*our hands get clean and dirt free...*” were some of the reasons given for this selection. Similarly, covered food items scored 95% of positive responses making them the preferred ‘good’ behaviors by the mothers in order to avoid flies and dust/dirt. Since mothers responded that flies, mosquitoes and other insects are attracted to wastes, and their baby might play with the garbage and solid wastes, 96.3% considered separation of wastes to be good choice of behavior.

Top ranking ‘bad’ pictures



5. Open defecation (92.5%)



8. Dirty Household environment (88.8%)



12. Uncovered food with flies (88.7%)

Most mothers identified open defecation as a major health hazard, providing a breeding and feeding site for flies transmitting diarrhoea. A few consider it as an act of shame. This is also supported by a dirty household environment, and 88.7% of mothers identified uncovered food as a bad behaviour. Nevertheless, some mothers considered open defecation in the fields as a way of fertilizing the soil.

Majority good pictures



3. Handwashing with soap after defecation (92.5%)



4. Handwashing materials outside toilet (87.5%)



5. Washing child Faeces in toilet (93.8%)



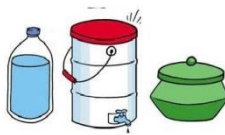
7. Cleanliness of toilet (92.5%)



11. Washing away Faeces in toilet (92.4%)



15. Reheating of food (80%)



18. Covered water containers
(93.8%)



20. Water treatment (93.7%)

Handwashing with soap after defecation was considered as a good behavior as according to the mothers, “*hands contaminated with faeces is disgusting and causes allergies and diseases*”. Similarly, having handwashing materials outside the toilet was seen as a preferred behaviour by mothers. Likewise, cleanliness of toilet so as to keep odour and flies away, washing away child faeces in the toilet were considered as the proper behaviours to be followed at home.

Mothers usually did not prefer cold food as far as practicable, and to keep water free from dust/dirt, insects and protect from spilling, they prefer to cover it with lid or dishes. Hence, reheating of food and properly covered water storage containers were considered as good behaviours. In addition, to purify water, they considered proper boiling of water as essential.

Majority bad pictures



9. Cleaning, washing and defecating in common river
(85%)



10. Toilet joined to river
(80%)



16. Feeding non-reheated food
(81.3%)



17. Uncovered water containers (83.8%)



21. Throwing wastes haphazardly (76.3%)

As responded by a mother in Nawalparasi, “*Our health and child’s health depend on the type of water and food we consume*”; 85% considered cleaning, washing and defecating in the same river to be a bad behaviour. Disposing of Faeces directly into the river will pollute the water source, and waste disposal in the open pollutes the environment around it, hence, both of these behaviours were not preferred by majority of mothers. Similarly, feeding non-reheated food to their child and keeping the water storage uncovered were not desired and acceptable behaviours. Though the picture (16) was supposed to show feeding non-reheated food, some mothers categorized them as bad for other reasons (dirty environment, child sitting on floor while eating).

The controversial pictures

1. Handwashing with water only (62.5%)



14. Cleanliness of serving utensils (52.5%)



19. Drinking non treated water (62.5%)

There are a few behaviors which are categorized as controversial due to the reason that they have not been categorized by majority of respondents as ‘good’ or ‘bad’ behaviours i.e. below 65% of the respondents categorized them as good or bad.

Most mothers responded that they often wash their hands with water only, but with soap generally after defecation, therefore only 62.5% categorized this behaviour as a bad behaviour. Similarly, only 52.5% of mothers thought it is necessary to wash the dishes. This picture implying the cleanliness of serving utensils demanded explanations of the image due to its lower clarity. Similarly, 62.5% responded that drinking water directly from the source without treating is not a good behavior; others responded that they practice drinking water directly from tap, so it is common and good to follow. Though 63% mothers rank ‘Hand washing with water only’ as good behaviours, only 28% link with child’s health. Hence, the behavior was categorized as controversial.

This exercise was conducted to prioritize the behaviors that the mothers considered its importance in regards to the child’s health. The commonly advised behavior by FCHVs, elders, health workers and the social media to wash their hands with soap and water made the behavior picture to be best behavior of choice.*hands should be washed with soap and water before eating... after using dust and dirt... after playing in the field...* Similarly, to protect child from food contaminated by disease causing flies and to avoid the attraction of flies and strong odor, mothers prefer to cover their cooked food and manage wastes respectively...*it’s disgusting to see flies all over the food...wastes have strong odor, it attracts flies and insects... baby might play with the garbage and might even insert the wastes in mouth...* Hence, they categorized these behaviors as best in regards to their child’s health. The common practice that mother followed at home are considered controversial like hand washing with water only and drinking non treated water directly from source as majority considered them good but few linked them with child’s health.

CHAPTER VIII

8. Immunization Services

8.1. National Immunization delivery approach

The National Immunization Programme (NIP) is a high priority programme (P1) for the Government of Nepal. The Immunization section under the Child Health Division leads all immunization-related activities at national level. The Regional Health Directorate (RHD) monitors district performance and conducts supportive supervision. District Health Offices are responsible for implementation of the immunization programme at the district level and below.

National immunization program is guided by;

- a. Nepal Health Sector Support Program- II (NHSP IP II): NHSP-2 focuses on increasing access and utilization of essential health care services, with a particular to reduce disparities between the wealthier and the poor, vulnerable and marginalised populations. It has given high priority for immunization.
- b. Comprehensive Multi Years Plan of Action (2011- 2016): The comprehensive multi-year plan (cMYP) is the guiding document for national immunization program. The cMYP aims to achieve the immunization related goals expressed by the Government of Nepal in various policy documents, the Millennium Development Goals (MDGs), Global Immunization Vision and Strategy (GIVS) and World health assembly (WHAs) resolutions.

8.2. Delivery approaches

The national immunization delivery approach was similar throughout all districts. At present, the National immunization Program vaccinates against 10 diseases. The delivery approaches are all planned through local micro-planning involving the HWs and community. Immunization services are provided by following three approaches:

- Static clinic through HF
- Outreach clinic: It is the major delivery outlet of the immunization program. They are conducted in fixed date, pace and time.
- Mobile clinic: It is still in practice in remote areas

There are around 16,000 immunization sessions conducted every month nationwide by community health workers (VHW, AHW, MCHW). Currently, each VDC has 3-5 clinics per month based on the local micro – planning. In addition, immunization services are also provided through private, NGO/INGO clinics and medical colleges especially in municipalities (DoHS, 2013/14).

In addition, for the accelerated control of Vaccine Preventable Diseases (VPD), the campaign approach is being implemented (Polio campaign, MR campaign, MNT, JE).

Type of Vaccine Number of Doses Recommended Age

Immunization Schedule		
BCG	1	At birth or on first contact with health institution
OPV	3	6, 10, and 14 weeks of age
DPT - Hep B-Hib	3	6, 10, and 14 weeks of age
Measles	1	9 months of age
TT	2	Pregnant women (2 doses of TT)
JE	1	12-23 months of age

*DoHS Annual Report 2069-2070, DoHS/MoHP, Government of Nepal, 2014

The expected number of immunization sessions in the four districts in a given month was 75, but the actual sessions observed was 67. This variance was due to some of the sessions being conducted before the study team reached the field. The number of outreach sessions varied from one to five in a month. Overall, routine immunization sessions were conducted as per micro-planning with only a few exceptions. In Naram VDC of Nawalparasi, three sessions should have been held on the 6th day of the month, yet no sessions were conducted as they have been cancelled. Similarly, there were no observed mobile clinics in the study district.

8.2.1. Immunization status

National Immunization status of antigens (three years)

National coverage of DPT-HepB-Hib 3 is more than 90% and measles coverage has stagnated at 87% for the past three years. Coverage of both antigens is on an increasing trend compared to previous years. The JE coverage is on an increasing trend (Figure 5).

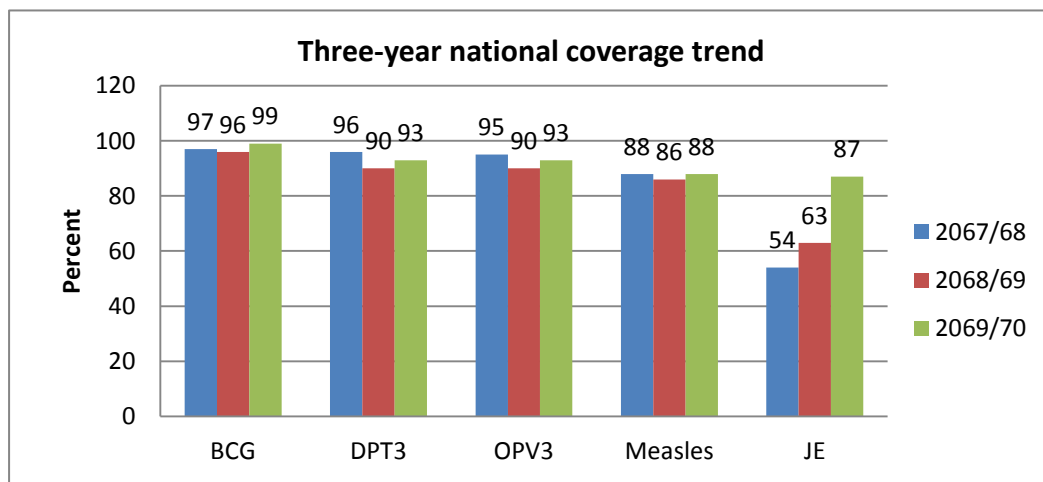


Figure 5: Three-year national coverage trend of antigens

The immunization status of children below 1 year was collected from the four districts. The DoHS annual reports for the past three years show decreasing trend of measles coverage in Jajarkot though it is still above 100% at present. Nawalparasi has a stagnant level at 83%, while the coverage in Bardiya and Myagdi districts is gradually increasing (Figure 6).

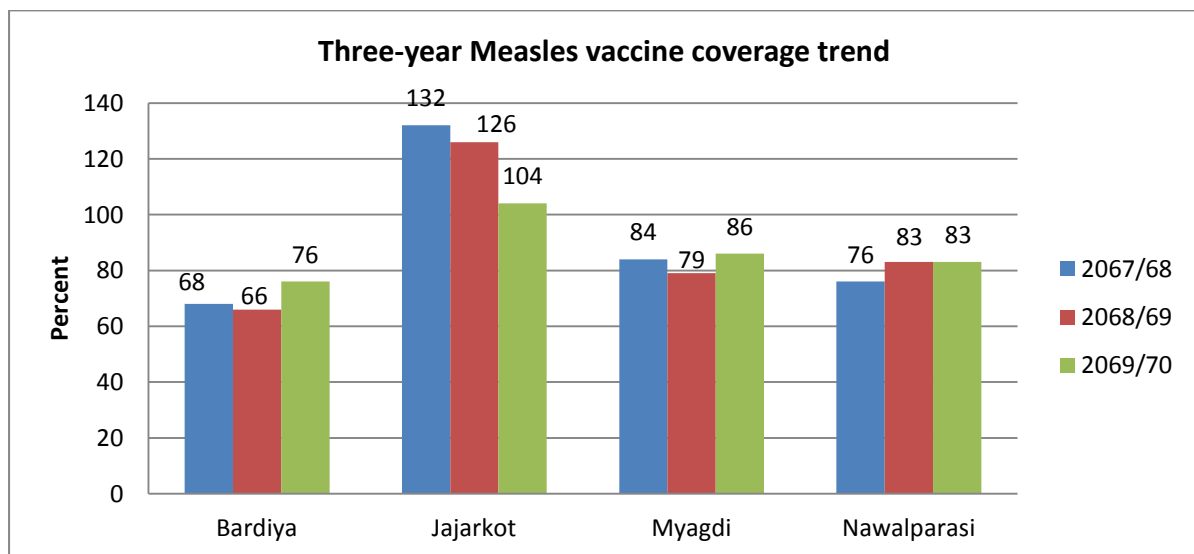


Figure 6: Three-year coverage trend of Measles vaccine

Observed immunization status of children in the four districts

There were 308 children aged below one year in the 303 households. Among them, the vaccination card (known as Child Health card) of 249 children (82.17%) was observed in the four districts. Based on their age and the time for completion of individual vaccination, it was observed that the coverage of BCG, DPT3 and OPV3 was 100% in Jajarkot, Myagdi and Nawalparasi districts, with only a few unimmunized children (1.6% unimmunized children for OPV) in Bardiya district. Regarding measles coverage, Jajarkot had 100% while Bardiya, Myagdi and Nawalparasi districts had 98%, 99.2% and 97.5% coverage respectively. Mothers whose children were not fully-immunised responded that due to their schedule they have yet to take their child to immunization clinic for measles vaccination, which they will do sooner or later.

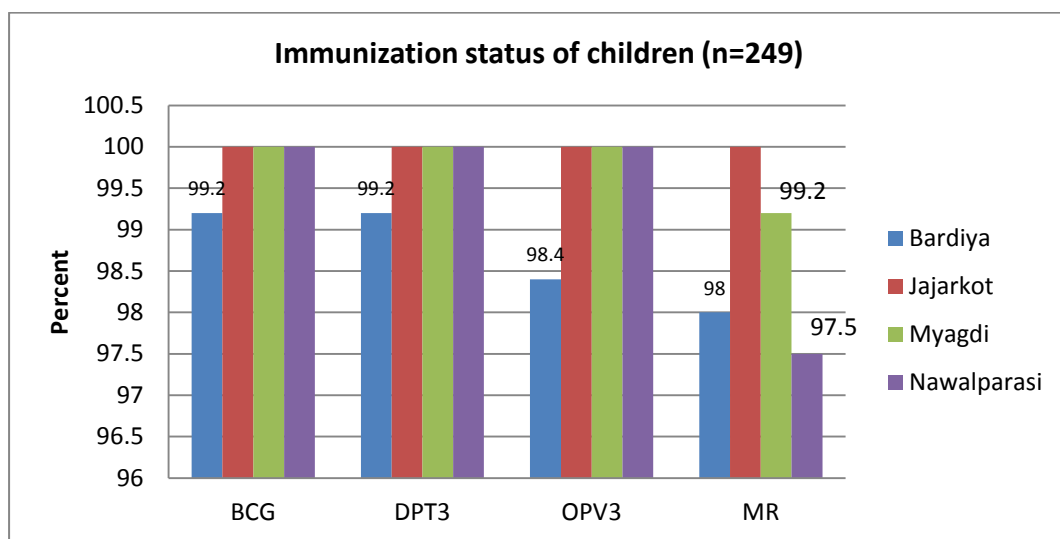


Figure 7: Observed immunization status of children

8.2.2. Immunization sessions

During the observation of the immunization sessions, it was found that most of the sessions were held by Auxiliary Health Workers (AHW), Auxiliary Nurse Midwife (ANM) and Staff Nurse (SN). The mean time of opening of the session was 10.50AM and closing of session was at 2.24 PM. As mentioned in the KII with health workers, apart from during the Dashain and Tihar festivals, the immunization sessions are conducted regularly throughout the year.

Immunization Sessions Settings

Static clinics are conducted in healthcare facilities; therefore the space, furniture and equipment are optimally available. Outreach clinics are conducted in private houses, open spaces, community buildings or schools, with the space and furniture locally managed, therefore varying from place to place. All immunization sessions are conducted by vaccinators and are often supported by local FCHVs.



Vaccination at outreach clinic at Gulariya, Bardiya

Out of 67 sessions observed in the four districts, only 28.4% of sessions were conducted in institutional settings and 71.6% were outreach sessions. The institutional indoors settings were in a room/balcony (63.2%), outdoors (Compound/lawn, 7.5%), and the rest in birthing centres. Immunization sessions in outreach sessions were held at FCHVs houses (39%), school compounds (14.6%), social leaders’ houses (10.4%) and other settings (local clubs, compounds of temples and private houses).

Only four out of six (67.2%) immunization sessions had toilets available and half had water in the toilet, but only 16.4% had soap available for hand washing. Drinking water was available in 64.2% of the immunization settings but only a few had treated water.



Vaccination at MCH clinic, Gulariya, Bardiya

More than half of the settings were not conducive for using AV aids. Due to lack of electricity in the facility the AV aids are difficult to be used and there were no proper seating or waiting arrangements in the outreach sessions. The health facility staff preferred FCHVs as a means for delivering promotional messages through group discussion, demonstration, use of flip charts and posters. The session

conducted was to cover 3-4 wards, so it is accessible for most mothers. 91% of the sessions were within half hour walking distance from households.

8.1.1. Vaccinators

The vaccinators are generally the AHW and/or ANM of the health facility. They are regular staff members of the health facilities, and are responsible for registering the patients, general health check-ups and counselling to the clients, and visit the community during the outreach sessions. Health facility can also have temporary staff recruited by VDC and/or district as vaccinators. According to District Health Chiefs, the positions of the VHW and MCHW have been upgraded to ANM and AHW throughout the country but their job description remains the same.. Therefore the promoted AHW and ANM will be responsible for vaccinating children, while FCHVs voluntarily attend the sessions (although this is not mandatory). There are however, too few vaccinators to attend a group of mothers attending sessions at once. Sometimes it is troublesome for vaccinators to conduct the sessions alone. A vaccinator in Jamuwad, Nawalparasi, said, *“It is really hard while we have to work alone during sessions. We have to decide whether to update the register or prepare vaccination; Mothers are always in a hurry.”*

At maximum, 5 vaccinators were present in a single session while there was at least one vaccinator present to conduct the session. Similarly, 4 FCHVs (observed maximum number) were present in a single session, while a few sessions do not have any presence of any FCHV. In almost half (43.3%) of the session sites, the space available could feasibly accommodate more than 20 people. During the sessions in Bardiya and Nawalparasi districts, technical staff (VHW, ANM, staff Nurse) were busy immunizing the child and in most areas FCHVs helped by organising the queue, telling mothers when to attend the next session, and in some cases they provided messages on nutrition and personal hygiene (hand washing steps and promotion of hand washing with soap especially before feeding and after defecation).

The interaction level between the vaccinators and FCHVs and the mothers/guardians was found to be fair (counseling and interaction on immunization only). Almost half of the sessions were found to be crowded. Mothers seemed to be always in a hurry; message should therefore be mother-friendly to grab their attention and necessity. In the queue most of the mothers/guardians were patient. Each mother spent a minimum of five minutes and a maximum of 60 minutes, with an average of 18.8 minutes at the sessions.

8.1.2. Role and willingness of FCHVs

Recognizing the importance of women's participation in promoting health of the people, GoN



FCHVs attending the FGD session at Pakhapani, Myagdi

initiated the Female Community Health Volunteer (FCHV) Program in FY 2045/46 (1988/1989) in 27 districts and expanded to all 75 districts of the country in a phased manner. FCHVs are selected by members of Mothers' Group for Health (MG-H) with the help of local health facility staff. The major role of the FCHV is to promote

health and healthy behaviours of mothers and community people to promote safe motherhood, child health, family planning, and other community based health services. FCHVs distribute condoms and pills, ORS packets, and vitamin A capsules, treat pneumonia cases, provide iron to pregnant women and refer complicated cases to the health institution. They also educate community people on healthy life style and use of health care services (DoHS, 2013).

FCHVs are involved in numerous health promotion activities in the community. 12 FGDs were conducted with FCHVs in the four districts, to ascertain their willingness to participate in the hygiene promotion activities through the immunization sessions. Overall, FCHVs showed a high degree of willingness to conduct hygiene promotion activities, providing that monetary incentives are provided, that due recognition/credit is given to them, and that they receive effective training and refresher training in order to be able to play their role effectively.

In the present context, not all FCHVs participate in the immunisation sessions, but those who are active participate in all the sessions. Although their participation is voluntary, they attend the session and mobilize mothers and children to attend the session.

Table 37: Summary of FCHVs participation and willingness to conduct hygiene promotion in immunization sessions

Immunization Sessions			
Factors	Descriptions	Comments	Remarks
Practices	Although they are volunteers, FCHVs are actively involved in gathering the mothers and child and bringing them for vaccination	<p>“We regularly attend the immunization session although it is not mandatory”</p> <p>“We emphasise the importance of regular immunization for children. We call mother regularly saying that complete vaccination is essential.”</p> <p>“We go for house to house visits to call mother to immunize their child.”</p>	Mostly expressed during the discussions in all the districts
Motives	Sense of service and satisfaction behind their voluntary contribution	<p>“We request mothers to immunize their child regularly to prevent disease from occurring.”</p> <p>Self-satisfaction is what we get, we are doing a good job.”</p>	Expressed by majority of the FCHVs in the discussion
Barriers	Irregular sessions	<p>“Routine immunization sessions occur infrequently”</p> <p>“Lack of human resources (Vaccinators)”</p> <p>“No recognitions and/or credits provided sometimes”</p>	Frequently discussed in the terai districts
Willingness and recommendations	FCHVs are highly motivated, they expect recognition and benefits to some extent for the contribution they made	<p>“Highly interested and eager to conduct hygiene promotion activities but if we get recognition, training, incentives, and refreshments for self and for participants, it would be easier.”</p> <p>“We will attend the training only if <i>Makai Bhatta</i> (pediem and refreshments) is provided. What will we get by listening only?”</p> <p>“We will be able to conduct promotion activities just after immunization activity as mothers will be busy with their child during immunization. Usually after 2pm”- Jajarkot</p> <p>“The best time might be either before or after immunization session.”</p> <p>“Health workers must provide us with training and information.”</p> <p>“Separate rooms must be made available for the immunisation session and the hygiene promotion activities.”</p>	Highly emphasized during the discussion in all the districts

8.1.3. Hygiene promotion through routine immunization

Most sessions do not include health promotion activities. However, there are opportunities to conduct the health promotion activities during the session involving both the vaccinators and the FCHVs. As stated in KIIs, all the DHO appreciated the approach of hygiene promotion through routine immunization so as to utilize a usually-missed opportunity. The DHO of Nawalparasi stated that, *“Hygiene promotion through Immunization is possible and an innovative approach, but there are lots of challenges”*.



KII session with DHO at DHO, Nawalparasi

It was observed that there is lack of human resources, and in such context staff members working alone cannot provide vaccination to children as well as promote hygiene effectively. The tendency of mothers to leave the session immediately after their child has been vaccinated has also been documented. All participating vaccinators accepted the concept as practicable and doable; nonetheless, they agreed that effective implementation and sustainability will be highly determined by the adequate number of health workers being mobilized. Health workers considered the FCHVs involvement crucial as they are responsible to bring mothers to the immunization sessions.

Similarly, the DHO in Myagdi said, *“routine immunization will be the acceptable means to deliver hygiene message because for the mother child is important; when she comes to session for vaccinating the child, she will be totally devoted to them.”*

FCHVs in FGDs showed their strong willingness to participate in the hygiene promotion activities. A FCHV from Nawalparasi quoted, *“Immunization clinic and/or outreach clinic will be the best place to provide new information to mothers and guardians.”*

DHO, health facility in-charge and mothers all agreed that immunization sessions are an acceptable and desirable means for hygiene promotion. A mother in Bardiya responded *“We just spend our waiting time talking with our friends; we would love to receive any additional information that will benefit our child”*.

CHAPTER IX

9. Communication Channels

9.1. Available sources

Households receive information on new products (cosmetics, electronics, etc) through different means and media. Radio was the preferable and most common available source of information on new products and messages. FCHVs and health workers were the primary source for receiving health messages. The other mentioned means of communication are newspapers, TV in the available areas, neighbors, street drama, miking, Information, Education and Communication materials distribution and *katuwal* (messenger). “we have *katuwal* here, we call him ‘*peon* (*helper*)’, he gives us very reliable information” (mothers and FCHVs, Jajarkot). “Now we have local FM here, and we love to hear and get all information from it”(a mother in Khalanga, Jajarkot).

Some of the major means of communication are listed below based on the number of times they were mentioned by mothers.

Means of communication	Frequency	Percentage
Radio	303	100
FCHVs/mother’s group meetings	285	94
Newspaper	75	24.7
Health workers	75	24.7
TV	88	29.04
<i>Neighbors</i>	12	3.9
<i>Katuwal</i>	11	3.6
Street drama	22	7.3
Miking	82	27.06
IEC materials	85	28.05

9.2. Preferable means of communication

Mothers were asked about their preferred means of communication for receiving health information. The mentioned responses are listed below based on the number of times they were mentioned by mothers. Radio jingles (100%) and the FCHVs (90.75%) were the top preferred means of communication for receiving health information. Similarly, TV (36.3%), IEC materials (29.7%), information from health workers (21.45%), miking (19.8%) and street drama (5.9%) were the other preferred means of communication.

Radio jingles are the preferred means of communication by all the participants. As the messages are repeated often, they love to hear it. Mothers during IDI at Jajarkot added,

“Even small children remember and sing; jingles repeated frequently in radio are easy to remember”. “....yes, jingles are good, it would be even better if it is in our lokbhaka (local language).”

Similarly, as an interpersonal communication medium, FCHVs are desired means for getting health information and messages by the mothers and local people.

“FCHVs are our friends...., they are active too and always share any new information or program”, a mother in Bardiya responded in IDI.

Means of communication	Frequency	Percentage
Radio	303	100
FCHVs/mother's group meetings	275	90.75
TV	110	36.30
IEC materials	90	29.7
Health workers	65	21.45
Miking	60	19.8
Street drama	18	5.9

CHAPTER X

10. Discussion, Recommendations and Conclusion

10.1. Discussion

The study highlights the water and sanitation status along with the key hygiene behaviors of mothers and the possibility of integrating the hygiene promotion activities into routine immunization.

Despite the frequent diarrheal diseases outbreaks throughout the country, efforts in improving the WASH status are not adequate and the hygiene behaviors of the mothers are still below optimal level. Regarding hand washing, majority of the households had hand washing stations, but only some households had soap at the hand washing stations. It was observed that hand washing with water only before cooking, before feeding child and after using dust and dirt was common. Soap and water was mostly used only after defecation and after cleaning child's bottom. The study also documented that most of the mothers did not wash utensils before feeding the child. Storing leftover food in tight containers and thorough reheating of the leftover food were practiced only by a few mothers. It was noted that physical barriers like shortage of gas/firewood as well as attitudinal barriers like baby's preference of cold milk, hinder to maintain optimum level of food hygiene.

Though most of the households had toilets, those family members, who did not have toilets, used the field and open space for defecation. Children and old people in Bardiya and Jajarkot still prefer open spaces for defecation. Many people in rural areas of Bardiya and Jajarkot districts don't have access to water and soap in the toilet that hinders in maintaining the cleanliness of the toilet. The soap was more likely to be available inside or near the toilet in the urban area and association was found to be statistically significant. Many people still prefer non-treated water. Piped water and tap water in yard were the major source of water and it was observed that only one third of the mothers had treated the water justifying that boiling or water treatment makes water taste bland. Mothers are often concern about household cleanliness; waste water is dumped in the kitchen garden and compost pit (*malkhat*) was commonly used as a means of solid waste disposal.

There is a positive indication that the community is being aware of diarrheal diseases, its causes and treatment. However, it was observed that some children below five year of age were suffering from diarrhea during the two weeks period. “*Jeevanjal*” is readily available, and some are following traditional homemade ORS as the treatment against diarrhea. Three-fourth of the mothers stated that faeces and wastes are the major causes of diarrhea.

The study further tried to assess the information on motivating factors for mothers to perform hygiene behaviors. It was found that mothers were closely associated and concerned about their child's health. They always wish for their baby's good health. Despite their busy schedule from morning to evening, mothers attend the immunization session regularly for baby's sake. Nurture was the key emotional driver for mother's behavior. It was documented that mothers were willing to allocate their additional time to involve in activities that will benefit their child.

National immunization Program of Nepal is renowned for its successful implementation and vaccination coverage throughout Nepal. The study also recognized the role that the vaccinators and FCHVs play in conducting the routine immunization regularly and successfully. The district health managers promote the approach of integrating hygiene promotion activities during routine immunization, and mothers express their willingness to attend the session and the hygiene promotional activities. “*Vaccination will increase the immunity against diseases, prevent*

disability and dysfunction, and free vaccinations” were the motives to drive mothers for the immunization of their children. However, long waiting time in immunization session, conducted once or twice in their area, they have to wait a whole month for vaccination, and no sessions held during Dashain/Tihar were barriers. Most of the immunization sessions were outreach sessions, held mainly in FCHVs houses, local clubs, school compounds, social leaders’ houses as well as in the compounds of temples and private houses. FCHVs had shown their strong willingness to participate in the hygiene promotion activities through the immunization sessions but they wanted some monetary incentives as well as recognition/credit. Mothers’ also preferred FCHVs and radio as the desired means of communication.

Looking at the study findings on hygiene status and the feasibility and appropriateness to include the promotional messages in the routine immunization, the possibility of integrating hygiene promotion into routine immunization is grandiose. Routine immunization can be the best possible medium to reach the maximum number of mothers and guardians in a single event to promote hygiene messages. The approach need to be urgently addressed by the policy level for its integration and upgrading the water, sanitation and hygiene status.

10.2. Recommendations

Based on the study findings, the study proposes the following recommendations:

- **Strategic and policy level recommendation:** Nepal is frequently affected by diarrheal diseases outbreak. To address the disease burden, different vertical programs are being carried out in the country. The WASH stakeholders need to advocate with the government to include the hygiene promotion activities in the policy and program integration into routine immunization by supplementing each other, so as to improve child’s health.
- **Things to consider when designing and implementing the package:** The study assessed that mothers are willing to devote their additional time for hygiene promotional activities in the immunization sessions. However, mothers are observed to be generally in hurry and after vaccination they tend to return back home early. While designing the hygiene package, delivery time should be considered, promotional activities need to be conducted in a group as mothers prefer group involvement, moreover, the messages should be easy to understand and in local language, as a good number of mothers attending the sessions will be illiterate. In addition, majority of the immunization sessions are conducted as outreach session in FCHV’s house, local clubs, under tree, etc. The use of audio-visual aids at all sites might not be possible. Hence, the hygiene session needs to be designed to suit both the outreach and institutional settings.
- **Preferred Immunization session time and hygiene promotion activities:** In Nepal, immunization sessions are generally conducted from 10 am in the morning to 3 pm. The study observed that the peak flow of mothers is during 11 am to 1 pm. The mothers preferred time for immunization session ranged from 11 am to 2 pm. The hygiene promotion activities should be planned either before the session or after completing the session. However, due to children crying (after immunization due to pain) and the mothers being in hurry, it is recommended that a short hygiene promotion session should be conducted just before conducting the immunization when mothers gather in group.
- **FCHVs mobilization and radio jingles as desired means of communication:** Mothers prefer radio and FCHVs as reliable and acceptable means of communication to deliver health messages. Health messages in the form of radio jingles and interpersonal communication mobilizing FCHVs should be prioritized as the major channels for delivering health messages by the program designer.

- **Capacity of FCHV and training needs:** Effective involvement of FCHVs in hygiene promotion activities during immunization session is crucial. Government of Nepal identifies FCHVs program as the foundation program at the periphery level, so the work assigned to the FCHVs are diverse and comprehensive. Though FCHVs are aware of basic WASH activities, FCHVs come from different background – young/old, educated/non-educated, hence, the basic comprehensive training package need to be designed for FCHVs that includes basics of WASH, tools and techniques to use and the detailed process of implementation. Like mothers, tools designed for FCHVs need to be in local language and user friendly.
- **Coordination mechanism:** Routine immunizations are conducted regularly on the fixed date. For the hygiene promotional activities to run smoothly alongside the immunization session, a joint coordination and communication mechanism between the WASH stakeholders, District health offices and peripheral health facilities need to be established. This can be done by identifying a focal person at district to monitor all the hygiene promotion activities of the district and similarly a focal point need to be established at the peripheral level to monitor and implement the activities at the immunization sessions.
- **Hygiene promotional messages:** From the study, the findings show that the mothers at the community still practice lower level hygiene behavior. Hand washing with water only before cooking, before child feeding and after touching dust and dirt is common among all the mothers in the districts. Soap and water is used mostly after defecation and after cleaning child’s bottom. Cleanliness of serving utensils, covering leftover food with tight lid and thorough reheating practice of leftover food is observed at minimum. Availability of toilet is not sufficient; maintaining the proper cleanliness of the toilets is the major challenges in most districts which need to be encouraged. The mother’s behavior of boiling water only during winters and when sick need to be improved. The study documented that ‘nurture of child’ is the key motivating factor for mother to practice proper hygiene behaviors. Mother’s attitudinal behaviours are the major barriers in performing hygiene behavior like preparation for boiling water, taking cold milk, etc. Hence, all the above messages need to be incorporated in the hygiene promotion package reflecting the strong association and linked with child’s health.

10.3. Conclusion

Initiatives have been taken to address the enteric diseases burden in the country; yet, diarrhoeal disease remains endemic in the country with frequent major outbreaks affecting a large population. Initiatives to address the significant lack of access to safe water, proper hygiene practices and basic sanitation services need to be strengthened. Integration with the successful public health programs like routine immunization will bridge in closing the gap between high immunization status of children and sub optimal hygiene and sanitation status.

The study helps in generalizing the prevailing hygiene behaviors of mothers in respect to their child’s health and possibility of integration of hygiene promotion activities in routine immunization. The progress in improving child’s health by launching successful full child immunization concept should not be undermined by the degraded WASH status at the community level. WASH activities and routine immunization should complement each other in improving child’s health. Hence, there is urgency for advocacy at the policy level to mainstream WASH activities in routine immunization by establishing strong coordination and linkage between various related stakeholders.

References

1. Ministry of Health and Population (MOHP) Nepal, New ERA and Macro International Inc. (2007) Nepal Demographic Health Survey 2006, Kathmandu, Nepal. Ministry of Health and Population, New Era, and Macro International Inc
2. Ministry of Health and Population (MOHP) Nepal, New ERA and Macro International Inc. (2012) Nepal Demographic Health Survey 2011, Kathmandu, Nepal. Ministry of Health and Population, New Era, and Macro International Inc
3. Department of Health Services (DoHS), Ministry of Health and Population (MoHP) (2013), Annual Report 2011-2012, DoHS/MoHP, Government of Nepal
4. Department of Health Services (DoHS), Ministry of Health and Population (MoHP) (2014), Annual Report 2012-2013, DoHS/MoHP, Government of Nepal
5. Epidemiology and Disease Control Division (EDCD), National Public Health Laboratory (NPHL), Department of Health Services (2014) Cholera Outbreaks in Nepal, EDCD/NPHL/DoHS, Government of Nepal (Unpublished)
6. Central Bureau of Statistics (CBS), Government of Nepal (GoN) (2012), National Population and Housing Census 2011, CBS/GoN
7. Velleman Y, Greenland K and Gautam O P (2013), An opportunity not to be missed, Share/UKaid/LSHTM,/WaterAid, March 2013
8. WaterAid (2010), Access to water, sanitation and hygiene for people living with HIV and AIDS, A WaterAid in Nepal publication, September 2010
9. USAID (2006), Formative Research Report Hygiene and Health, USAID/Indonesia, September 2006
10. SNV (2011), Formative research of sanitation behaviors in Pemagatshel district, Rural Sanitation and hygiene programme, SNV, December 2011
11. Greenland K et al (2013), The context and practice of handwashing among new mothers in Serang, Indonesia: a formative research study, BMC Public Health 2013, <http://www.biomedcentral.com/1471-2458/13/830>
12. Pun SB, Maharjan R, Shrestha D, Pokharel D, Shah Y, et al. (2013) An Outbreak of *Vibrio cholerae* in 2012, Kathmandu, Nepal. <http://esciencecentral.org/journals/an-outbreak-of-vibrio-cholerae-in-2012,-kathmandu,-nepal-tpms.1000115.php?aid=14246>