



Prevalence and Associated Risk factors of diarrhea in under-five children among health extension model and non-model kebeles in Getta District , Southern Ethiopia: A Community Based Comparative Cross-Sectional study

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ABSTRACT

INTRODUCTION: Worldwide diarrheal disease is the second leading cause of death in under-five year's children. In Ethiopia diarrhea kills half million under-five children every year second to pneumonia. Poor sanitation, unsafe water supply and inadequate personal hygiene are responsible for 88% of diarrhea occurrence; these can be easily improved by health promotion and education. The Ethiopian government introduced a new initiative health extension programme in 2002/03 as a means of providing a comprehensive, universal, equitable and affordable health service. As a strategy of the programme; households have been graduated as model families after training and implementing the intervention packages.

OBJECTIVE: To assess the Prevalence and Associated Risk factors of diarrhea in under-five children among health extension model and non-model kebeles in Getta District, SNNPR.

METHOD: A community based comparative cross-sectional study design was employed. Multi-stage sampling technique was employed to select 365 model and 365 non-model households. Data was collected using structured questionnaire and checklist by trained data collectors. Each questionnaire was coded, entered and cleaned using epi data version 3.1 and SPSS version 23 statistical packages were used for data analysis. Binary and Multivariate logistic regression was computed to describe the functional independent predictors of childhood diarrhea.

RESULT: A total of 718 (363 household from Health Extension Model Kebeles and 355 from Non-Model Kebeles) participants were enrolled in the study making a response rate of 98%. The prevalence of diarrhea in under-five children among model and non-model kebeles were 9.9 % (95% CI: (6.9, 13.2)) and 23.7% %, (95% CI: (19.4, 28.2)), respectively. The independent predictors of childhood diarrhea revealed in the study were being non-model for the health extension program (AOR=2.545; 95%CI: 1.553-4.172), absence of latrine (AOR=3.074; 95%CI: 1.612-5.860), improper child stool disposal (AOR=2.195; 95%CI: 1.323-3.643), maternal history of diarrhea (AOR=2.316; 95%CI: 1.287-4.168) and unimmunized children for Rota vaccine (AOR=2.449; 1.483-4.043).

CONCLUSION AND RECOMMENDATION: - The prevalence of childhood diarrhea was high among non-model families. The variation in the level of diarrheal morbidity was well explained by the effect of health extension program (being non-model), absence of latrine, improper child stool disposal, maternal history of diarrhea and child immunization for Rota vaccine. The district health office should do better to improve services i.e. vaccination, latrine presence at household level and proper utilization, proper refuse disposal and the model household training need to be scaled up in order to decrease under-five diarrheas in the community.

KEY WORDS: Risk factors, Under-five diarrhea, Health extension program, Model and non-model Kebele, Getta district

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TABLE OF CONTENTS

ABSTRACT.....	i
ACKNOWLEDGMENT.....	ii
LIST OF TABLES.....	v
ACRONYMS/ABBREVIATIONS.....	vii
1.INTRODUCTION.....	1
1.1BACKGROUND.....	1
1.2STATEMENT OF PROBLEM.....	3
2.LITRATURE REVIEW.....	5
2.1 MAGNITIDE OF DIARRHEA MORBIDITY.....	5
2.2FACTORS ASSOCIATED WITH UNDER FIVE DIARRHEAL MORBIDITY.....	6
DEMOGRAPHIC AND SOCIO-ECONOMIC FACTOR.....	6
2.2.2 ENVIRONMENTAL FACTORS.....	7
2.2.3 BEHAVIORAL FACTORS.....	8
2.3 CONCEPTUAL FRAMEWORK.....	10
2.4SIGNIFICANCE OF THE STUDY.....	11
3.OBJECTIVES.....	12
3.1 General Objective.....	12
3.2 Specific Objectives.....	12
4.METHODS AND MATERIALS.....	13
4.1 Study Area.....	13
4.2 Study Period.....	13
4.3 Study Design.....	13
4.4 Population.....	13
4.4.1 Source population.....	13
4.4.2 Study population.....	13
4.4.4 Study unit.....	13
4.5 Inclusion and Exclusion Criteria.....	13
4.6 Sample Size Determination Techniques.....	14
4.7 Sampling Techniques.....	14
4.8 Variables.....	16

4.8.1	Dependent variable	16
4.8.2	Independent variables	16
4.9	Data Collection Tool and Procedures.....	16
4.9.1	Data collection tool.....	16
4.9.2	Data collection technique.....	16
4.10	Operational Definition.....	17
4.11	Data Analysis Procedure	18
4.12	Data Quality Management	18
4.13	Ethical Consideration	19
5	RESULTS	20
5.1	Socio-Demographic Characteristics.....	20
5.2	Diarrhea Prevalence	22
5.3	ENVIRONMENTAL CONDITIONS.....	23
5.4	Household water access, treatment and safe storage.....	26
5.5	BEHAVIORAL CONDITIONS	27
5.6	Bivariate and Multivariate Logistic Regression Analysis Results.....	29
5.6.1	Multivariate Logistic Regression Analysis Result	30
6	DISCUSSION	31
7	CONCLUSION AND RECOMMENDATION.....	34
	REFERENCE.....	35
	ANNEX.....	38
	QUESTIONNAIRE IN ENGLISH	38
	QUESTIONNAIRE IN AMHARIC	44

LIST OF TABLES

Table 1 Sample size calculation for the second objective for the study on diarrheal disease in Health Extension model to non-model kebeles of Getta woreda, South Ethiopia, 2018.....	14
Table 2 Socio demographic characteristics in health extension model and non-model Households of Getta district, Southern Ethiopia, 2018.....	21
Table 3 Under-five diarrhea prevalence in Health Extension model and non-model kebeles of Getta district, Southern Ethiopia, 2018	22
Table 4 Treatment taken by Mothers/care givers to stop diarrhea in Health Extension model and non-model kebeles of Getta district, Southern Ethiopia, 2018.	23
Table 5 Households latrine ownership, type of latrine, years of latrines constructed and latrine utilization practice in health extension model and non-model households of Getta district, Southern Ethiopia, 2018	23
Table 6 Household latrine conditions in Health Extension model and non-model kebeles of Getta district, Southern Ethiopia, 2018.....	24
Table 7 Households hand washing presence and practice in Health Extension model and non-model kebeles of Getta district, Southern Ethiopia, 2018	25
Table 8 Households solid and liquid waste management in in Health Extension model and non-model kebeles of Getta district, Southern Ethiopia, 2018	26
Table 9 Household water supply conditions in Health Extension model and non-model kebeles of Getta district, Southern Ethiopia, 2018.	26
Table 10 Household domestic water supply conditions in health extension model and non-model kebeles of Getta district, Southern Ethiopia, 2018.	27
Table 11 Child health characteristics in health extension model and non-model kebeles of Getta district, Southern Ethiopia, 2018.....	28
Table 12 bivariate and multivariate logistic regression analysis result in model and non-model kebeles of Getta district, Southern Ethiopia, 2018	29

LIST OF FIGURE

Figure 1 Conceptual Frame work showing the relation between risk Factor and Prevalence (adopted and modified(26–28)) 10

Figure 2 Schematic presentation of sampling procedure of the study on two weeks diarrhea Prevalence and risk factor in Health Extension Model and Non Model Households of Getta woreda, Southern Ethiopia, 2018..... 15

ACRONYMS/ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
AOR	Adjusted Odd Ratio
CHIS	Community Health Information System
CI	Confidence Interval
CSA	Central Statistical Agency
EDHS	Ethiopian Demographic Health Survey
GOE	Government Of Ethiopia
HEP	Health Extension Program
HEW	Health Extension Program
HH	House Hold
KM	Kilo Meter
MDG	Millennium Development Goal
ODF	Open Defecation Free
OR	Odd Ratio
ORS	Oral Rehydration Solution
PPS	Population Proportion to Size
SDG	Sustainable Development Goal
SNNPR	Southern Nation, Nationality and People Region
WHO	World Health Organization
UNICEF	United Nation Children's Fund

1. INTRODUCTION

1.1 BACKGROUND

Childhood mortality rates in general and infant mortality in particular, are often used as broad indicators of social development or as specific indicators of health status. According to 2017 SDG report significant progress has been made in reducing child mortality. In 2015, the mortality rate for children under age 5 worldwide was 43 deaths per 1,000 live births a 44 per cent reduction since 2000. This translates to 5.9 million under-5 deaths in 2015, down from 9.8 million in 2000. But despite progress in every region, wide disparities persist. Sub-Saharan Africa continues to have the highest under-5 mortality rate, with 84 deaths per 1,000 live births in 2015 about twice the global average (1) .

Globally, there are nearly 1.7 million cases of childhood diarrhea disease every year. In 2016 worldwide, Diarrhea kills 2,195 children every day, more than AIDS, malaria, and measles combined. Diarrheal diseases account for 1 in 9 child deaths worldwide, making diarrhea the second leading cause of death among children under the age of 5(2).

Sub-Saharan Africa, the region with the highest under-five mortality rate in the world, 1 child in 12 in sub-Saharan Africa dies before his or her fifth birthday – far higher than the average ratio of 1 in 147 in high-income countries. Southern Asia has the second-highest under-five mortality rate in the world – about 1 child in 19 dies before age five ,Compared to the richest children, the poorest children are 1.9 times as likely to die before age 5(2).

The geographical distribution of the burden of child mortality is also changing. In 2015, about 80 per cent of these deaths occurred in South Asia and sub-Saharan Africa, and almost half occurred in just five countries: the Democratic Republic of the Congo, Ethiopia, India, Nigeria and Pakistan(3)

Despite these, Diarrhea is one of the major contributors to deaths for under age 5 children in Ethiopia. It contributes to more than one in every ten (13%) child deaths in Ethiopia. The prevalence of diarrhea increases after age 6 months, from 8% among children under age 6 months to 23% among those 6-11 months, when complimentary foods and other liquids are introduced. Prevalence remains high (18%) at age 12-23 months, which is the time when children begin walking and are at increased risk of contamination from the environment and the prevalence of diarrhea is higher for children in households with unimproved sanitation than for children in households with improved sanitation(4).

About 88% of diarrhea-associated deaths are attributable to unsafe water, inadequate sanitation and insufficient hygiene. Rotavirus is the leading cause of acute diarrhea and causes about 40% of hospitalizations for diarrhea in children under 5. Most diarrheal germs are spread from the stool of one person to the mouth of another. These germs are usually spread through contaminated water, food, or objects. Water, food, and objects become contaminated with stool in many ways: People and animals defecate in or near water sources that people drink, contaminated water is used to irrigate crops. Food preparers do not wash their hands before cooking. People with contaminated hands touch objects, such as doorknobs, tools, or cooking utensils(2).

In effect Ethiopia introduced the HEP_ as HEP is one of the strategies adopted by the government of Ethiopia (GOE) with a view to achieving universal coverage of primary health care among its rural population by 2009, in a context of limited resources. The overall goal of HEP is to create a healthy society and to reduce maternal and child morbidity and mortality rates by providing a comprehensive, universal, equitable and affordable health service for the rural population on the basis of promotive, preventive and basic curative services. The programme was provided as a 16 packages focusing on health promotion and education supported by demonstration targeting households, particularly mothers and women through house to house visits(5).

As a strategy of this programme, households have been graduated as model families; female and male household's heads were selected and given basic training on the 16 health extension packages for 96 hours. The graduated model families were expected to demonstrate practical changes in the use of health service program, environmental health, personal hygiene and serves as models to other community members. The strategy is based on the diffusion theory processed by which an innovation is communicated through certain channels over time among members of a social system(5).

1.2 STATEMENT OF PROBLEM

It is estimated that in 2015, 1.7 million cases of diarrhea occur every year, causing 526,000 deaths among children under 5 years of age worldwide, making these diseases the second leading cause of death in under-five year children worldwide(2).

In Ethiopia Diarrhea is one of the major contributors to deaths for under age 5 children, it contributes to more than one in every ten (13%) child deaths in Ethiopia and the prevalence of diarrhea is slightly higher for children in households with unimproved sanitation than for children in households with improved sanitation (4).

In Ethiopia, the coverage of water, sanitation and hygiene is very low compared with other African countries as a result the prevalence of communicable diseases is very high and millions of Ethiopians still lack improved water and basic sanitation facilities, and very few people regularly wash their hands with soap and water at critical times. According to a recent report by the JMP, Ethiopia is among the 45 countries in the world with sanitation coverage of under 50% and one of 27 countries in the world where more than a quarter of the population still practice open defecation(6).

Overall, 6% of Ethiopian households use improved toilet facilities (16% in urban areas and 4% in rural areas). More than half (56%) of rural households use unimproved toilet facilities. More than one-third (35%) of toilet facilities are shared in urban households, whereas only 2% of rural households share their toilet facilities with other households. One in three households in Ethiopia have no toilet facility (39% in rural areas and 7% in urban areas) which makes the prevalence of diarrhea slightly higher for children in households with unimproved sanitation than for children in households with improved sanitation(4).

Human excreta, faeces including that of children, contain all sorts of micro-organisms from parasite eggs to viruses. They can be transmitted by faeco-oral pathways, notably prevented by the safe disposal of faeces, proper latrine utilization is one the best. Studies conducted in different parts of Ethiopia showed that diarrheal diseases are higher among non- users of latrine insufficient safe drinking water supply and improper faeces disposal(7–10)

Safe drinking water and basic sanitation are crucially important to the preservation of human health. Water-related diseases like diarrhea are the most common causes of illness and death among the poor developing countries(6).

Besides this according to the 2016 report of the woreda district revealed that there were about 4,795 diarrhea cases (36.6 %) out of all under five children cases (morbidity).

2. LITRATURE REVIEW

2.1 MAGNITUDE OF DIARRHEA MORBIDITY

It is estimated that in 2015, 1.7 million cases of diarrhea occur every year. 88% of these diarrheal diseases are attributed to unsafe water supply, inadequate sanitation, and poor hygiene. Overall child mortality could be reduced by 55% with the provision of safe water, sanitation and hygiene(2).

According to EDHS 2016 reports, Diarrhea is one of the major contributors to deaths for under age 5 children in Ethiopia. Based on the report diarrhea contributes to more than one in every ten (13%) child deaths in Ethiopia. The prevalence of diarrhea increases after age 6 months, from 8% among children under age 6 months to 23% among those 6-11 months, when complimentary foods and other liquids are introduced. Prevalence remains high (18%) at age 12-23 months. The prevalence of diarrhea is lower among children whose mothers have more than a secondary Education than among children whose mothers have a secondary or less education (7% versus 11% or higher) The survey also reveals that diarrheal prevalence is highest among children with unimproved sanitation 12.1% compared with improved sanitation 7%. SNNPR and Gambella regional state accounts for highest diarrhea prevalence when compared with other regions (13.9% and 14.5% respectively)(4).

A comparative cross sectional study conducted among model and non-model families in Sheko district (6.4% and 25.5% respectively) (11), a cross sectional study conducted in Tiko-Cameroon reported the prevalence of diarrhea was 23.8% and children under 24 months were highly affected(10).

A study conducted in different parts of Ethiopia revealed that the prevalence of diarrhea was high in a condition of Absence of latrine facilities (Farta district (8), Bahirdarzuria district(12), Shebedino district (13), Somalia Region (7), Afar Region (9), Dejen district(14) ,Lack of hand washing practice at critical times (Sebeta town(15), Bahirdarzuria district (12), Debrbirhan town(16), Dejen district(14) , Adama town(17), Afar region (9), Somalia Region(7), Sheko district (11), Shebedino(13), unimproved water source for drinking purpose (Bahirdarzuria district(12) , Shebedino district(13) , Somalia Region(7) , In Afar Region(9)) and Improper refuse disposal (Dejen district (14), Benshagul Region(18), Sheko district(11), Somalia Region(7) and Shebedino district(13)).

2.2 FACTORS ASSOCIATED WITH UNDER FIVE DIARRHEAL MORBIDITY

Many literatures have shown that how the various socio-demographic, socio-economic and behavioral and environmental risk factors associated with diarrhea in children under the age of five years in developing countries (7–23)

DEMOGRAPHIC AND SOCIO-ECONOMIC FACTOR

A cross-sectional study conducted in Senegal reveals that diarrhea prevalence in under-five children was slightly higher among girls than boys (27.6% and 24.4%, respectively). The analysis stratified by age group also showed a higher prevalence of diarrhea in the oldest age group (24–59 months), while the lowest diarrhea prevalence was observed among children under 12 months, Mother's unemployment (AOR, 1.62, 95% CI (1.18–2.23) and households with more than one child under the age of five (AOR = 2.86, 95% CI (1.70–4.80) are significantly associated with diarrheal disease(19). Another cross sectional study conducted in Cameroon revealed that higher rates of diarrhea prevalence were seen in children from households with two or more siblings (AOR, 2.86, 95% CI (1.70–4.80); and whose mothers'/caregivers' mother's unemployment (AOR, 1.62, 95% CI: (1.18–2)(10).

In Ethiopia, 2016 DHS also revealed that the prevalence of diarrhea is lower among children whose mothers have more than a secondary education than among children whose mothers have a secondary or less education (7% versus 11% or higher)(4).

A cross sectional studies conducted in different parts of Ethiopia revealed that the prevalence of diarrhea were higher in a conditions of , if two or more under five children present in the household,(Bahirdar zuria district (AOR: 2.31, 95% CI (1.46, 3.65)(12)),Benshangul Region (AOR = 1.73, 95% CI (1.03, 2.93)(18)),Kersa district (AOR = 1.74, 95% CI (1.33 - 2.28)(20), Age of the child between 12-23 months , (Debrebirhan town,(AOR = 2.53, 95% CI: 1.07 - 5.93)(16), Benshangul Region (AOR = 1.9, 95% CI (1.2, 3.6)(18)), Amhara region (AOR 3.31 95%CI : (2.07–5.29)(21), Farata district (AOR: 3.1, 95% CI (1.16, 8.15)(8) Kersa district ,(AOR= 2.25, 95% CI (1.5-3.36)(20)), Maternal education (Cannot read and write), (Debrebirhan town (AOR 2.61, 95% CI (1.28 - 5.08)(16)), Benshangul Region (AOR = 9.16, 95% CI (5.79, 14.48)(18)), Amhara region(AOR, 1.44 95% CI(0.87–2.38)(21), Hawassa (AOR 2.65, 95% CI (1.11,6.27)(22),Somalia region (AOR 3.02, 95% CI (1.56, 5.83)(12), Sheko district (AOR: 1.74, 95% CI (1.03, 2.91) (7)and Sebeta town (AOR: 3.09; 95% CI (1.24 – 7.68))(15); Higher birth order, (Benshangul Region (AOR = 6.1, 95% CI

(3.1,12.2))(18) , Jijiga district (AOR = 6.1, 95% CI (3.1,12.2))(12), Monthly Family income less than 500 ETB (City administration of Bahirdar (AOR: 2.27, 95%CI (1.44 - 3.57))(23), Amhara region (AOR 1.63 95% CI (1.12–2.36))(21),sheko district (AOR: 1.75, 95% CI: (1.06, 2.88))(11),Maternal age >35 yrs. (Debrebirhan town (AOR 0.39, 95% CI (0.19 - 0.78))(16), unemployment of mothers (jijiga district (AOR 1.25 95% CI: (0.85, 1.84))(12).

2.2.2 ENVIRONMENTAL FACTORS

Child hood diarrheal illness is mainly associated with environmental factors. Globally, close to nine in ten of the diarrheal disease burden has been estimated to be linked to poor water, sanitation, and hygiene provision(6).

Across sectional study conducted in Senegal revealed that use of unconventional bag (open bag) for storing household solid waste (AOR = 1.75, 95% CI (1.00–3.02)); evacuation of household domestic wastewater in public street (AOR 2.07, 95% CI (1.20–3.55)) were significantly associated with diarrhea in under five children(19). Another cross sectional study conducted in Cameroon also showed that number of risk factors found to be significantly associated with diarrhea duration trekked to fletch water, quality of water used for drinking, quality of water use for cooking, cleaning of kitchen utensils and laundry, quality of the environment in which the children lived, the caregiver’s knowledge of safe source of water and type of container use for the storage of water were significant at $p < 0.001$ while age of the children, and child’s toilet facility were statistically significant at $p < 0.05$ (10).

In Ethiopia the prevalence of diarrhea is slightly higher in children in households with unimproved sanitation than children in households with improved sanitation. Forty percent of children under age 2 had their last stool disposed of safely, and either by using a toilet or latrine or having the stool rinsed or put in a toilet or latrine. In contrast, 44% had their stool disposed unsafely, either left in the open (26%) or thrown into garbage (18%). Children’s stools are less likely to be disposed of safely in households that use open defecation (14%),as compared with improved sanitation (50%), Children’s stools are more likely to be disposed safely in urban households (61%) than in rural households (37%) and the percentage of children whose last stool was disposed of safely ranges from 29% in Somali to 62% in SNNPR(4).

A cross sectional studies conducted in different parts of Ethiopia revealed that the prevalence of diarrhea were higher in a conditions of , absence of functional latrine facilities, (Bahirdar zuria district (AOR: 3.00, 95% CI (1.95, 4.58)(10)),Benshangul Region (AOR 3.5, 95% CI (2.4, 5.2)),(18) Afar Region (AOR 2.278, 95% CI (1.045, 4.965))(13), Dangla district (24) (AOR 0.036; 95% CI (0.006–0.233)), Jijiga district (AOR 4.16 , 95% CI (2.94, 5.89))(12), Presence of faeces in the compound (Debrebirhan town (AOR = 3.13, 95% CI: (1.51 - 6.48))(16), Amhara region (AOR: 1.88, 95% (1.15 - 3.06)(21), Afar Region (AOR 11.391, 95% CI = (2.100, 61.787))(13),use of unimproved water source for drinking purpose (Bahirdar zuria district (AOR: 2.59, 95% CI (1.71, 3.93))(10), Afar Region(AOR 2.449, 95% CI (1.264, 4.744))(13), Jijiga district (AOR 1.60, 95% CI (1.14, 2.24))(12), southern part of Ethiopia (AOR 1.98, 95% CI(1.16- 2.23)),(25) Improper refuse disposal (Dejen district (AOR 1.58, 95% CI (1.10,2.26))(14), Benshangul Region (AOR 2.05, 95%CI (1.36, 3.10))(18), Dangla district (AOR 0.143; 95% CI: 0.020–0.998)(24) Jijiga district (AOR 3.0, 95%CI (1.88, 4.79))(12) Kersa district ,(AOR 2.22, 95%CI (1.20 - 4.03))(20),Sheko district (AOR: 3.19, 95% CI: (1.89, 5.38))(7).

2.2.3 BEHAVIORAL FACTORS

Behavioral factors remain a risk factor in the epidemiology of diarrheal diseases. A study conducted in Cameroon shows that the odds of diarrhea was 19.4% times less among those who used boiled water prior to its utilization than those who did not use(8) .

A community based cross sectional study conducted in Senegal revealed children from households who didn't treat water for drinking purpose were 1.69 times more likely to have diarrhea as compared to households who treat water (AOR = 1.69, 95% CI: 1.11–2.56)(19), similar finding was observed in southern part of Ethiopia (AOR: 2.25, 95% CI:1.43- 3.56)(25).

A study conducted in different part of Ethiopia revealed that the prevalence of diarrhea were higher in a conditions of Absence hand washing at critical times (Dejen district (AOR: 1.61, 95% CI (1.04, 2.84))(14), Debrebirehan town, (AOR = 0.51, 95% CI: 0.29 - 0.87)(16), Adama town (AOR 2.2; 95%CI (1.0-4.7))(17), Amhara Region (AOR 1.70 95%CI (1.20– 2.40)), Afar Region (AOR 16.511, 95% CI (3.304, 82.509))(13), Farta district (AOR: 1.6, 95% CI: (1.08, 2.28))(9), Jijiga district (AOR 2.59, 95% CI (1.86, 3.60))(12) , Sheko district (AOR: 2.21, 95% CI: (1.41, 3.46))(7), Poor water handling (Amhara Region (AOR: 1.78,

95%CI (1.17 - 2.70))(21), Hawassa (AOR 0.12, 95%CI (0.04, 0.39))(22), Dangla district (AOR , 18.478; 95% CI: (4.692–72.760))(24), Jijiga district AOR, 15.795%CI (3.02, 82.5))(12) and Deberehan town (AOR 0.32, 95% CI: (0.16 - 3.08))(16) ,Early initiation of complementary feeding(< 6 month) (Amhara region (AOR 6.81 95%CI (4.52–10.25))(21), Inadequate water access (Afar Region (AOR = 1.535, 95% CI = (1.004, 2.346))(13), Maternal history of diarrhea (Jijiga district (AOR 2.79 95%CI (1.27, 6.15))(12) and Hawassa (AOR 2.79, 95%CI (1.27, 6.15))(22), Child Immunization for Rota vaccine (Farta district, (AOR: 1.75, 95% CI: (1.11, 2.77)) (9)and (Dangla district (AOR 0.037; 95% CI: 0.006–0.243)(24).

2.3 CONCEPTUAL FRAMEWORK

Diarrhea occurrence is influenced by the interplay of many risk factors. The most common are shown in the diagram below.

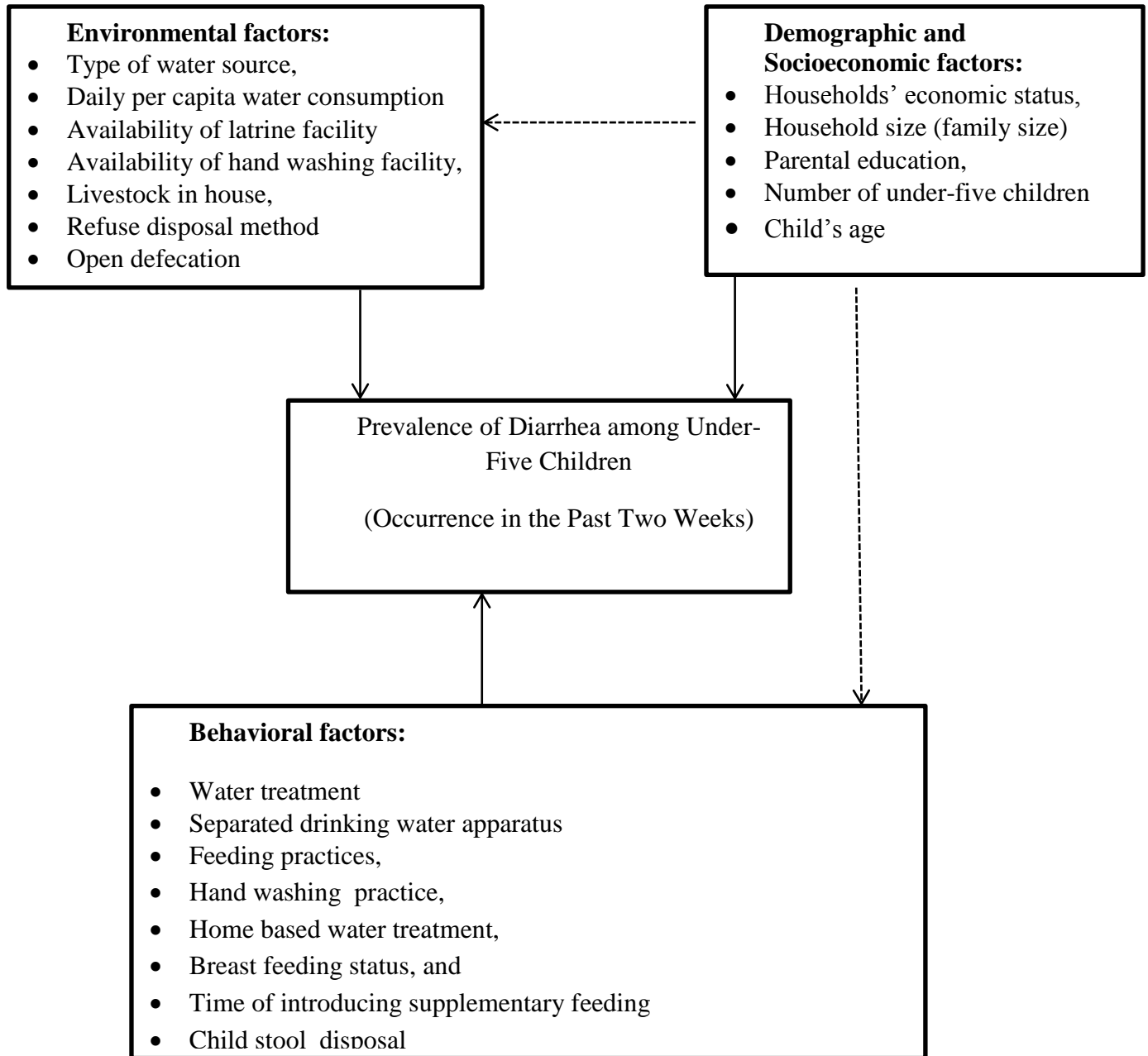


Figure 1 Conceptual Frame work showing the relation between risk Factor and Prevalence (adopted and modified(26–28))

2.4 SIGNIFICANCE OF THE STUDY

The cause of child mortality and morbidity in developing countries is multi-factorial. The child's survival depends on the interaction of socio-economic, behavioral and environmental factors. Understanding childhood morbidity and identifying the causes of diarrhea is very crucial for the effective implementation of child health intervention programs for policy formulation and the general assessment of resource requirements and intervention prioritization.

A number of reasons for the occurrence of diarrhea have been identified or hypothesized. These include unimproved sanitation facilities, unimproved water for drinking water, improper refuse disposal, hand washing practice at critical times, absence of functional latrine and so on.

In effect, Ethiopia introduced a new initiative, Health Extension program (HEP), in 2002/03 as a means of providing a comprehensive, universal, equitable and affordable health service for the rural population on the base of promotive, preventive and basic curative services. The HEP is implemented within the community to deliver basic health services based on the diffusion model, which states that community behavior is changed gradually and step by step(5).

One major component of the HEWs' role is identifying, supporting and training of selected families for 96 hours to be 'models' to the community. When it has been determined that the families have successfully implemented 75% of the program package (recently changed to 100%), they are then certified as 'model families.' Upon graduation, the families are given certificates as official acknowledgement of their accomplishments and they continue working with HEWs as role models within the community (5).

Therefore, the finding of this work helps to appreciate the basics of Model status in the prevention of diarrhea, the effect of full implementation of the health extension package at a household level on childhood diarrhea morbidity in model and non-model households, what changes can come after the Model verification which in turn plays a major role in the proper planning and monitoring of sanitation & hygiene activities and programs that contribute for diarrhea prevention.

3. OBJECTIVES

3.1 General Objective

- To assess prevalence and associated risk factors of diarrhea in under-five children among health extension model and non-model kebeles of Getta District, SNNPR, 2018.

3.2 Specific Objectives

- To determine prevalence of diarrhea in under-five children among health extension model and non-model kebeles of Getta District, SNNPR, 2018.
- To identify factors associated with diarrhea in health extension model and non-model kebeles of Getta District, SNNPR, 2018.

4. METHODS AND MATERIALS

4.1 Study Area

The study was conducted in Getta district, one of the 15 administrative woredas of gurage zone, SNNPR regional state. It is bordered by silte zone in the north, Cheha woreda in east, endegagh woreda in the south east. Quante is the capital city of Getta woreda and it lies 97 KM from zonal capital city of Wolkite and 272KM from capital city of Addis Ababa. It has 16 rural administrative kebeles, 8 kebeles are health extension model kebeles and 8 kebeles are health extension non-model kebeles. According to 2016 EDHS estimation, the total population of the district was 89621, of which 13993 are under-five children.

4.2 Study Period

The study was conducted from March 01-26, 2018.

4.3 Study Design

Community Based Comparative Cross-Sectional study was conducted.

4.4 Population

4.4.1 Source population

All households that have at least one under-five children in the district (Health extension model and non-model kebeles)

4.4.2 Study population

All households who had under-five children in selected Kebeles in Health extension model and non-model kebeles households in Getta district

4.4.3 Sample Population

Under-five children in selected households in Health extension model and non-model kebeles of Getta district

4.4.4 Study unit

Mothers/caregivers in selected households in Health extension model and non-model kebeles of Getta district

4.5 Inclusion and Exclusion Criteria

Inclusion Criteria: - Households that had at least one under-five children in the Health extension model and non-model kebeles households of Getta woreda.

Exclusion Criteria: - Critically ill or suffering mothers/care givers during data collection.

4.6 Sample Size Determination Techniques

The sample size is calculated by epi-info version 7 statistics software.

Using the assumptions from a study conducted in Shebedino district (24) and Hawassa (22).

Table 1 Sample size calculation for the second objective for the study on diarrheal disease in Health Extension model to non-model kebeles of Getta woreda, South Ethiopia, 2018.

Variables	Proportion of outcome among exposed group	Proportion of outcome among non-exposed group	AOR	Power	CI	Sample size	Sample size*DE*10 % non-response rate
Kebele by status(model and non-model)	39.6	24.7	2	80	95 %	332	730
Drinking water collection container have cover	90.1	9.8	0.12	80	95 %	54	118
Drinking water storage have cover	97.6	2.4	15	80	95 %	54	118

Among sample size determined for both objectives the larger sample size calculated for objective one which was 730 (365 from Health Extension model and 365 non-model kebeles) was selected for the study.

4.7 Sampling Techniques

Multistage sampling technique was employed for the study. Since the study is comparative, the study participants were selected from both Health Extension model and non-model kebeles based on the woreda health office list of kebeles by their model status.

In the first stage, based on WHO recommendation 40% of the kebeles i.e. 03 Health Extension model and 03 Health Extension non model kebeles was included in the survey by simple random sampling method.

Then after, the sample was allocated to each selected kebeles based on their population size. Since the woreda is implementing Community Health Information System (CHIS), health post family folder was used to retrieve information on population of under-five children. In the second stage using health post family folder, I identified all households with under-five children as sampling frame; household with under-five children was selected by systematic random technique.

Interval (K^{th}) for selecting households was determined by dividing the number of households with the sample size allocated for each kebeles. After determining the K^{th} interval, the first household was selected randomly. The next households were identified systematically by adding cumulatively K^{th} intervals to the first selected household. If two or more under-five children were present in the household a child with a recent diarrheal, if no child with diarrhea, the youngest child was considered to be eligible for the study to collect information on the child's demographic and health characteristics. Since the youngest group are more vulnerable to main explanatory variable(9).

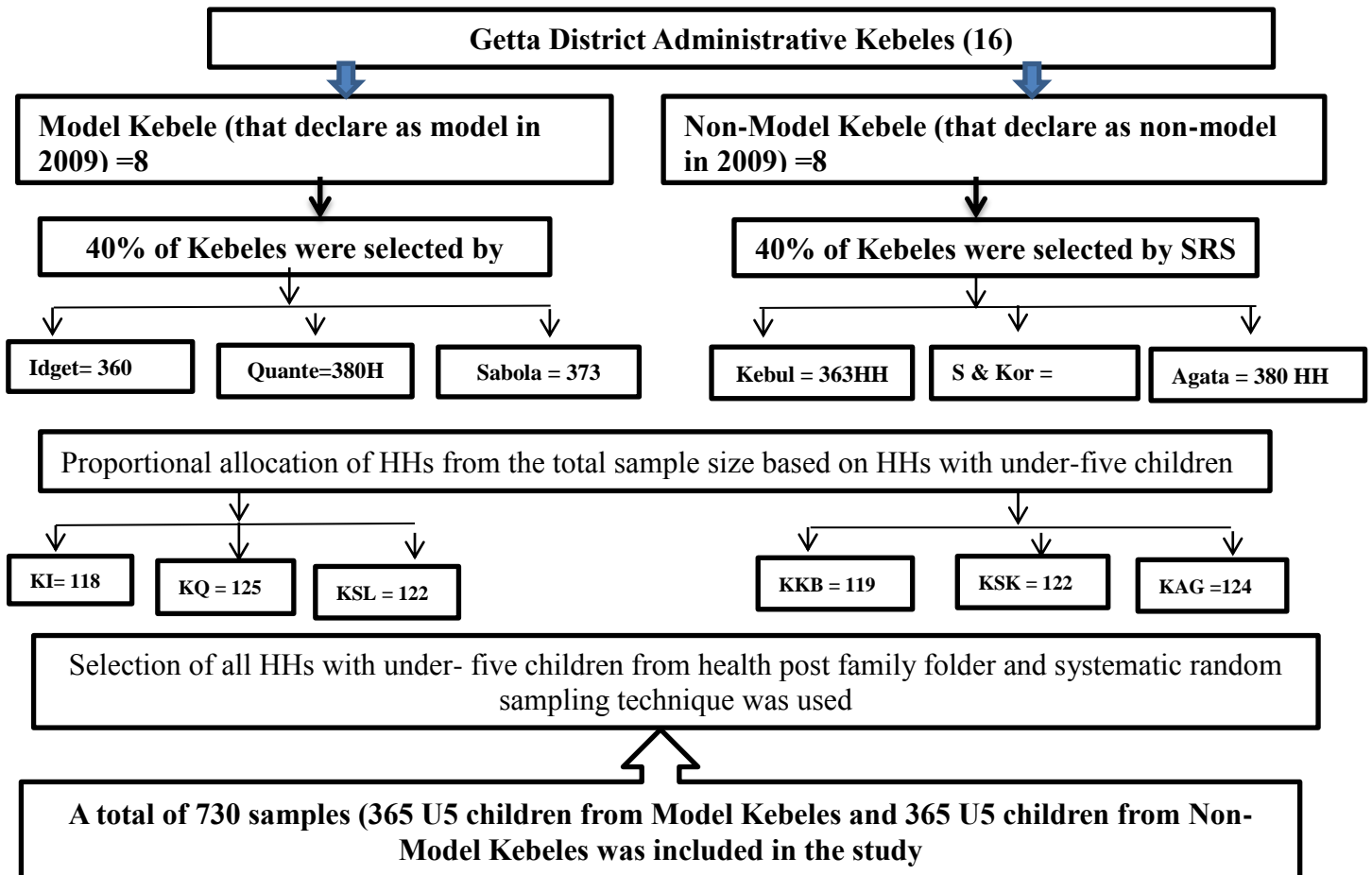


Figure 2 Schematic presentation of sampling procedure of the study on two weeks diarrhea Prevalence and risk factor in Health Extension Model and Non Model Households of Getta woreda, Southern Ethiopia, 2018.

4.8 Variables

4.8.1 Dependent variable

Occurrence of diarrheal morbidity in a child two-week preceding the survey (Yes or No)

4.8.2 Independent variables

Socio-economic and demographic factors: age, sex of the index child, family monthly income, occupation, educational status of the mother/caregiver, education status of the father, marital status and number of under-five children in the household.

Environmental factors: availability of latrine, open defecation, latrine cleanness, hand washing near latrine, type of water source, time taken to water source, amount of daily water consumption and way of solid and liquid waste disposal.

Behavioral factors: type of water storage container, water storage covering practice, time of hand washing, method of drinking water drawing from storage, water treatment at household level, exclusive breast feeding, duration of breast-feeding, time of introducing supplementary feeding, immunization practice, way of child feeding and child faeces disposal method.

4.9 Data Collection Tool and Procedures

4.9.1 Data collection tool

Data was collected by using structured questionnaire and observation checklist. The instrument contains socioeconomic, environmental and behavioral factors as well as information on index child.

4.9.2 Data collection technique

Data was collected through interviewer administered technique using structured questionnaire and observation checklist for environmental factors. In the households the information on diarrheal morbidity was obtained by asking the mother or caretaker whether any <5 children in the household had diarrhea in the last two-week period. An observational checklist was used to observe the presence of latrine super structure, walking path to latrine, presence of fresh feces in the latrine, presence of water container, presence of water in the container, and presence of feces around the compound and presence of faeces on the seat, floor, wall or block of latrine.

Data was collected by 9 trained female diploma nurses and public health professionals who work in other area (other than study area) and speak both Amharic and gurage. The reason for selecting female data collectors was to simplify the communication during data collection

since most female in the study area might prefer to communicate with female health workers than male. Supervision was conducted during the entire data collection period by the investigator and supervisors who are degree holder health professionals who speak gurage language.

4.10 Operational Definition

1. **Model family:** household head/caregiver, which had taken basic training for 96 hours and graduated on the 16 health extension packages.
2. **Non-model family:** household head/caregiver, which had not taken basic training on the 16 health extension packages.
3. **Diarrhea** is defined as a the presence of diarrhea (three and more loose or liquid stools per day) among under-five children in the house within two weeks period prior to survey, as reported by the mother or care givers was considered as childhood diarrhea.
4. **Hand washing at critical time:** if a mother/ caregiver practiced all simple hand washings after latrine visit, after cleaning child buttock, before food preparation, before eating, before child feeding.
5. **Home based water treatment** defined as methods employed for the purposes of treating water in the home using boiling, filtration, and chlorination.
6. **Proper refuse disposal:** is a way of disposal of refuses which includes burning, burying in pit or store in a container, and disposed in designed site.
7. **Proper waste disposal** defined as a way of disposing refuses which included burning, burying in a pit or storing in a container, and disposing in the designed site whereas disposing in open fields was considered as an improper disposal method
8. **Unimproved water sources:** Unprotected dug well, unprotected spring, or drum, surface water (e.g., river, stream,)
9. **Improved water sources:** Piped water connection to household, public taps or Stand pipes, protected dug well, protected spring
10. **Index child:** refers to a child who was included in the study from a household to have Information on the demographic and health characteristics, and also to calculate the prevalence of diarrhea.

4.11 Data Analysis Procedure

Each questionnaire was coded, Data was entered and cleaned by the investigator by using epi data version 3.1 and exported to SPSS version 23 statistical for analysis. Different frequency tables and descriptive summaries were used to describe the study variables. Frequency distribution was performed to compare the morbidity of diarrhea in health extension model and non-model kebeles.

Binary Logistic regression was performed to assess the strength of association between each independent variable and the outcome variables to identify candidate variables that had P value less than 0.25. Multiple logistic regression was done to see which of the independent variables are important predictors of diarrheal disease in both health extension model and non-model kebeles. Adjusted odds ratio and confidence interval was used or reported in each logistic regression analysis. In all multi variable analyses Stepwise model was used. Adjusted odds ratios with 95% confidence interval was calculated using a logistic regression model to control for confounding factors and P value < 0.05 was used to declare statistically significance. The Hosmer and Lemeshow goodness - of - fit statistic was used to assess whether the necessary assumptions for the application of multiple logistic regression were fulfilled

4.12 Data Quality Management

To assure the quality of the data different activities were conducted prior to data collection, during data collection, during data entry and data analysis. The questionnaire was translated first to Amharic language to make data collection process simple and translated back to English language to check its consistency. Training was given for data collectors and supervisors for two days on the study instrument and data collection procedure. The training mainly focused on interviewing techniques, and emphasis was also given for questions that need careful attention and observation. Classroom lecture and field practice was included in the training to have a common understanding specifically on the observation checklist.

Pretesting was done in Gummer woreda, Gurage zone by selecting 02 kebeles (1 Kebele from Health Extension model and 1 from Non-Model Kebeles) on the data collection instrument before conducting the study to the quality of the data in 5% (38 households with under-five children). Based on the result of the pretest modifications was made on the data collection tool.

During data collection time, the data collectors explained the purpose and objectives of the study to the respondents. Regular supervision was done during the field work. A close supervision, and on spot decisions was conducted during data collection. Each data collector checked the questionnaires for completeness before leaving each study participant. All filled questionnaires were reviewed at the end of the day for omissions, clarity and consistency by the supervisors and the principal investigator.

4.13 Ethical Consideration

Prior to data collection appropriate letter of clearance was obtained from Jimma University institute of health. Formal letter of permission was produced from administrative bodies of the woreda to kebeles. Letter of cooperation from kebeles administrators was also be obtained.

Participation in the study was on voluntary bases and respondents were informed about the right not to participate or withdraw at any time. Confidentiality was also assured for the information provided since the name of the information provider was not stated on the questionnaire rather coding system was applied. Finally verbal consent was secured from every study participant included in the study during data collection time after explaining the objectives of the study.

5. RESULTS

5.1 Socio-Demographic Characteristics

Of the total of 730 participants planned to participate in the study, A total of 718 (363 household from health extension model kebeles and 355 from health extension non-model kebeles) participants with at least one under-five child were enrolled in the study making a response rate of 98%. The respondents' age ranged from 15-49 years with mean age of 31.14 and 32.53 with standard deviation of ± 7.483 and ± 7.582 for model and non-model kebeles respectively.

In this study almost all of the respondents were biological mothers of the index child for both groups (352 (97%) model and 346 (97.5%) non-model households). Regarding religion more than half of the total study population for both group (221 (60.9%), from model and 201 (56.6%), from non-model households) were Muslim. Majority of the mothers, 251(69.1%) among model and 257(72.4%) among non-mode households did not have formal education and 193(53.2%) from model households and 197(55.5%) from non-model were housewives. The family size of the total respondents in the study area ranged from 1 to 9 people with mean of 5.45 and 5.49, standard deviation of ± 1.888 and ± 1.784 for model and non-model kebeles respectively. Both in model and non-model kebeles more than half of the respondent (200 (55.1%) and 179 (50.4) respectively) have family size ≤ 5 and during the data collection time and the majority, 141(38.8%) in model and 109(30.7%) in non-model kebeles of surveyed households had monthly income of 1001-2000 ETB (Table 2).

Regarding child sex, 183(50.4%) from model and 178(50.1%) from non-model were male, and 101(27.8%) from model and 100(28.2%) from non-model were in the age group 12-23 months.

Table 2 Socio demographic characteristics in health extension model and non-model Households of Getta district, Southern Ethiopia, 2018.

Socio-demographic Variables	Categories	Model Kebele		Non-Model Kebele	
		No	%	No	%
Mothers/Caregiver age (in Years)	15-24	77	21.2	64	18
	25-34	156	43	144	40.6
	>35	130	35.8	147	41.4
	Total	363	100	355	100
Number of under-five children in the HHs	One	236	65	250	70.4
	Two	119	32.8	96	27
	More than two	8	2.2	9	2.5
Total	363	100	355	100	
Marital status of the mother/caregiver	Married	337	92.8	333	93.8
	Others	26	7.1	22	6.1
	Total	363	100	355	100
Educational level of the mother/caregiver	No Formal Education	251	69.1	257	72.4
	Primary Education(1-8)	86	23.7	66	18.6
	Secondary Education (9-12)	15	4.1	18	5.1
	More than Secondary Education	11	3	14	3.9
	Total	363	100	355	100
Educational level of the father	No Formal Education	135	40.1	144	43.2
	Primary Education (1-8)	147	43.6	115	34.5
	Secondary Education (9-12)	40	11.9	43	12.9
	More than Secondary education	15	4.5	31	9.3
	Total	337	100	333	100
Ethnicity of the mother/caregiver	Gurage	322	88.7	308	86.8
	Others	41	11.2	47	13.2
	Total	363	100	355	100
Occupation of the mother /caregiver	House wife	193	53.2	197	55.5
	Farming/Livestock	138	38	132	37.2
	Others	32	8.8	26	7.3
	Total	363	100	355	100
Average net income of the spouse	Less than 500ETB	36	9.9	59	16.6
	501-1000 ETB	109	30	94	26.5
	1001-2000 ETB	146	40.2	109	30.7
	2001 ETB and Above	72	19.8	93	26.2
	Total	363	100	355	100
Living time of the family in that area in yrs.	<6 Month	1	0.3	3	0.8
	6-12 Month	10	2.8	10	2.8
	1-2 Years	30	8.3	36	10.1
	More than 2 Years	322	88.7	306	86.2
	Total	363	100	355	100

5.2 Diarrhea Prevalence

The prevalence of diarrhea among health extension model kebeles was 9.9% (36), (95% CI: (6.9, 13.2)) whereas in health extension non-model kebeles the prevalence was 23.7 % (84), (95% CI: (19.4, 28.2)). Of these diarrheal cases 26(72.7%) for model and 66 (78.6%) (90.4%) children experienced diarrhea for less than 5 days (Table 3).

Table 3 Under-five diarrhea prevalence in Health Extension model and non-model kebeles of Getta district, Southern Ethiopia, 2018

Variables	Categories	Model Kebele		Non-Model Kebele	
		No	%	No	%
Under five diarrhea occurrence two weeks preceding the survey	No	327	90.1	271	76.3
	Yes	36	9.9	84	23.7
	Total	363	100.0	355	100.0
Days of diarrhea persist	<=5Days	26	72.2	66	78.6
	>5Days	10	27.8	18	21.4
	Total	36	100.0	84	100.0
Type of diarrhea that the child had	Watery diarrhea	20	55.6	52	61.9
	Bloody and Mucus/Dysentery	16	44.4	32	38.1
	Total	36	100.0	84	100.0
Duration of stool pass per day	Three	13	36.1	40	47.6
	More than Three	23	63.9	42	50.0
	I don't Know			2	2.4
	Total	36	100.0	84	100.0
Mother/caregiver history of diarrhea	No	312	86.0	301	84.8
	Yes	51	14.0	54	15.2
	Total	363	100.0	355	100.0

5.2.1 Action Taken to stop diarrhea

The measure/action taken to stop diarrhea was giving him/her cereal based fluids (31(86.1%) for model and 73(86.9%) for non-model kebeles. Increase feeding and giving ORS were also among the measure taken (Table 4).

Table 4 Treatment taken by Mothers/care givers to stop diarrhea in Health Extension model and non-model kebeles of Getta district, Southern Ethiopia, 2018.

Variables	Categories	Model Kebele		Non-Model Kebele	
		No	%	No	%
Take him to the health institution	No	29	80.6	64	76.2
	Yes	7	19.4	20	23.8
	Total	36	100.0	84	100.0
Give him ORS	No	10	27.8	24	28.6
	Yes	26	72.2	60	71.4
	Total	36	100.0	84	100.0
Increase feeding	No	6	16.7	15	17.9
	Yes	30	83.3	69	82.1
	Total	36	100.0	84	100.0
Give him cereal based fluids	No	5	13.9	11	13.1
	Yes	31	86.1	73	86.9
	Total	36	100.0	84	100.0

5.3 ENVIRONMENTAL CONDITIONS

5.3.1 Hygiene and Sanitation Practices

The majority of respondents in both model 318 (93.3%) and non-model 261(88.2%) households had private latrine. Of these, 280(82.1%) among model and 256(86.5%) among non-model households were traditional pit latrine without slab, and 22(6.1%) from model and 59(16.6%) from non-model households didn't have latrine (Table 5).

Table 5 Households latrine ownership, type of latrine, years of latrines constructed and latrine utilization practice in health extension model and non-model households of Getta district, Southern Ethiopia, 2018

Variables	Categories	Model Kebele		Non-Model Kebele	
		No	%	No	%
Availability of latrine	No	22	6.1	59	16.6
	Yes	340	93.9	296	83.4
	Total	363	100.0	355	100.0
ownership of the latrine	Privately Owned	318	93.3	261	88.2
	Shared with Neighbors	23	6.7	35	11.8
	Total	341	100.0	296	100.0
Type of latrine in the HHs	Pit Latrine without Slab/ Open Pit	280	82.1	256	86.5
	Pit Latrine with Slab	61	17.9	40	13.5
	Total	341	100.0	296	100.0
Years since latrine constructed	<6 Month	23	6.7	62	20.9
	6 Month up to 2 Years	145	42.5	104	35.1
	2-3 Years	119	34.9	81	27.4

	>3 Years	54	15.8	49	16.6
	Total	341	100.0	296	100.0
Open Defecation status after latrine construction	No	330	96.8	247	83.4
	Yes	11	3.2	49	16.6
	Total	341	100.0	296	100.0
Reason for practicing open defecation	Pleasurable	2	15.4	2	3.7
	Comfortable	1	7.7	4	7.4
	Latrine is not Hygienic	8	61.5	32	59.3
	At Journey Time	1	7.7	9	16.7
	We Share Latrine With Others	1	7.7	7	13.0
	Total	13	100.0	54	100.0

5.3.2 Latrine condition

The main defecation area with the absence of latrine for both groups were forest (14(63.6%) for model and 32(54.2%) for non-model kebeles) and the main reason for practicing open field defecation was the expensiveness of the cost of latrine construction (11(50%) for model and 34(57.6%) for non-model kebeles) (Table 6).

Table 6 Household latrine conditions in Health Extension model and non-model kebeles of Getta district, Southern Ethiopia, 2018.

Observation checklist	Categories	Model Kebele		Non-Model Kebele	
		No	%	No	%
Footpath of the latrine free from barriers	No	14	4.1	18	6.1
	Yes	327	95.9	278	93.9
	Total	341	100	296	100
Availability of faeces around pit latrine or seat or floor of the latrine	No	320	93.8	253	85.5
	Yes	21	6.2	43	14.5
	Total	341	100	296	100
Availability of faeces in the wall or block of the latrine	No	305	89.4	254	85.8
	Yes	36	10.6	42	14.2
	Total	341	100	296	100
Availability of Faces in the compound	No	321	94.1	249	84.1
	Yes	20	5.9	47	15.9
	Total	341	100	296	100
Latrine privacy structure(presence of roof & wall)	No	42	12.3	62	20.9
	Yes	299	87.7	234	79.1
	Total	341	100	296	100
Defecation status if latrine is not Available	Open field	8	36.4	25	42.4
	Forest	14	63.6	32	54.2
	Open Bodies of			2	3.4

	Water/River				
	Total	22	100	59	100
Reason to practice open defecation	Material to Construct latrine is not available	7	31.8	16	27.1
	Cost of Latrine Construction is Expensive	11	50	34	57.6
	Because it is Pleasurable	3	13.6	5	8.5
	Because it is Comfortable	1	4.5	4	6.8
	Total	22	100	59	100
HHs shared with domestic animals	No	351	96.7	346	97.5
	Yes	12	3.3	9	2.5
	Total	363	100	355	100

5.3.3 Observation Checklist Result

5.3.3.1 Hand washing facilities status

Regarding availability of hand washing facility, 92(27%) households from model households and 172(58.1%) households from non-model Kebele had no hand washing facilities near to the latrine (Table 7).

Table 7 Households hand washing presence and practice in Health Extension model and non-model kebeles of Getta district, Southern Ethiopia, 2018

Observation checklist	Categories	Model Kebele		Non-Model Kebele	
		No	%	No	%
Availability of hand washing facility	No	92	27.0	172	58.1
	Yes	249	73.0	124	41.9
	Total	341	100.0	296	100.0
Availability of water in hand washing facility	No	99	39.8	62	50.0
	Yes	150	60.2	62	50.0
	Total	249	100.0	124	100.0
Availability of soap, detergent or ash placed	No	154	61.8	93	75.0
	Yes	95	38.2	31	25.0
	Total	249	100.0	124	100.0

5.3.3.2 Solid & Liquid Waste Disposal

Regarding the mechanism of household waste disposal, 81(22.3%) households from model and 145 (40.8%) households from non-model kebeles dispose their solid waste in unimproved way while 133(36.6%) from model and 230(44.5%) from non-model kebeles dispose their liquid waste improper way (Table 8).

Table 8 Households solid and liquid waste management in in Health Extension model and non-model kebeles of Getta district, Southern Ethiopia, 2018

Observation checklist	Categories	Model Kebele		Non-Model Kebele	
		No	%	No	%
Solid waste disposal area	Unimproved	81	22.3	145	40.8
	Improved	282	77.7	210	59.2
	Total	363	100.0	355	100.0
Liquid waste disposal area	Improper	133	36.6	230	64.8
	Proper	230	63.4	125	35.2
	Total	363	100.0	355	100.0

5.4 Household water access, treatment and safe storage

5.4.1 Household water access

As shown in the table below, 252(74.9%) from model and 238(64.2%) from non-model households have access to improved water source (Table 9).

Table 9 Household water supply conditions in Health Extension model and non-model kebeles of Getta district, Southern Ethiopia, 2018.

Source of water for drinking	Categories	Model Kebele		Non-Model Kebele	
		No	%	No	%
Improved water source	No	91	25.1	127	35.8
	Yes	272	74.9	228	64.2
	Total	363	100	355	100
Unimproved water source	No	202	55.6	183	51.5
	Yes	161	44.4	172	48.5
	Total	363	100	355	100

5.4.2 Water treatment status

The majority of the respondents in model households 193(53.2%) used home based water treatment before they use for drinking purpose while 155(43.7%) from non-model households treat water.

5.4.3 Water storage apparatus

The majority of the respondents in both groups uses water transport apparatus in a covered container (351(96.7%) for model and 333(93.8%) for non-model households) and they use jerrycan as their main storage for drinking water (215(81.4%) for model and 213(84.5%) for non-model households) (Table 10).

Table 10 Household domestic water supply conditions in health extension model and non-model kebeles of Getta district, Southern Ethiopia, 2018.

Variables	Categories	Model Kebele		Non-Model Kebele	
		No	%	No	%
Water transport apparatus	In a covered Container	351	96.7	333	93.8
	In un Covered Container	12	3.3	22	6.2
	Total	363	100	355	100
	Separated apparatus for drinking water	No	99	27.3	105
	Yes	264	72.7	250	70.4
	Total	363	100	355	100
Type of material for drinking water storage	Jerrycan	215	81.4	211	84.4
	Clay Pot	6	2.3	7	2.8
	Plastic Buckets	41	15.5	32	12.8
	Iron Bucket	2	0.8		
	Total	264	100	250	100
Cover status of drinking water storage	No	23	8.7	31	12.4
	Yes	241	91.3	219	87.6
	Total	264	100	250	100
Time needed to fetch water from the source	Less than 30 minute	253	69.7	260	73.2
	30 minute or Longer	110	30.3	95	26.8
	Total	363	100	355	100
Quantity of water collected per day	<=7.5L	141	38.8	145	40.8
	>7.5L	222	61.2	210	59.2
	Total	363	100	355	100

5.5 BEHAVIORAL CONDITIONS

5.5.1 Hand washing Practice

Regarding hand washing Practice, 21 (5.8%) from model and 51(14.4%) for non-model households didn't practice hand washing at critical times.

5.5.2 Child Health Characteristics

Of the total 718 index child, 281(77.4%) from model and 269(75.8%) were immunized for Rota vaccines. Almost all of the children from both groups (353(97.2%) from model and 344(96.9%) from non-model) had history of breast feeding (Table 11).

Table 11 Child health characteristics in health extension model and non-model kebeles of Getta district, Southern Ethiopia, 2018.

Socio-demographic Variables	Categories	Model Kebele		Non-Model Kebele	
		No	%	No	%
Immunization status of the child(Rota)	Yes	281	77.4	269	75.8
	No	82	22.6	86	24
	Total	363	100	355	100
Child breast-fed status	No	10	2.8	11	3.1
	Yes	353	97.2	344	96.9
	Total	363	100	355	100
Exclusive breast feeding status	< 6 Month	95	26.2	101	29.4
	up to 6 Month	258	71.1	243	70.6
	Total	353	97.2	344	100
Duration of breast feeding	< 1 year	79	21.8	80	23.3
	1 year and above	274	75.5	264	76.7
	Total	353	97.2	344	100
Child feeding mechanism/hand	No	251	73	242	71.6
	Yes	93	27	96	28.4
	Total	344	100	338	100
Child feeding mechanism/cup and spoon	No	200	58.1	213	63
	Yes	144	41.9	125	37
	Total	344	100	338	100
Child feeding mechanism/cup	No	320	93	316	93.5
	Yes	24	7	22	6.5
	Total	344	100	338	100
Child feeding mechanism/bottle	No	269	78.2	221	65.4
	Yes	75	21.8	117	34.6
	Total	344	100	338	100
Child feeding mechanism/eat by himself or herself	No	227	66	231	68.3
	Yes	117	34	107	31.7
	Total	344	100	338	100

5.5.3 Child stool disposal

Regarding child stool disposal mechanism 88(24.2%) from model household and 128 (36.1%) from non-model households practice child stool openly.

5.6 Bivariate and Multivariate Logistic Regression Analysis Results

In bivariate logistic regression analysis, Household being non-model, Absence of latrine availability, Improper solid and liquid waste disposal, Drinking water without treatment, Improper child stool disposal, Mothers with the history of diarrhea, Unimmunized children for Rota vaccine and Family size of greater than five were candidate for multivariate analysis.

Hierarchical logistic regression technique was used to assess the relative effect of the explanatory variable on the outcome variable. To avoid an excessive number of variables and unstable estimates in the subsequent model, only variables with p-value less than 0.05 were considered for the final regression model (Table 12).

Table 12 bivariate and multivariate logistic regression analysis result in model and non-model kebeles of Getta district, Southern Ethiopia, 2018

Variables	Categories	Cross tabulation Result		Bivariate & Multivariate Logistic Regression Analysis Result	
		No & % of diarrhea occurrence		COR(95%CI)	AOR(95%CI)
		No	Yes		
Kebele By Model Status(N=718)	Model	327(55)	36(30)	1	1
	Non-Model	271(45)	84(70)	2.815 (1.846,4.295)	2.545 (1.553,4.172)
Availability of Latrine(N=718)	No	50(8)	31(26)	3.818 (2.313,6.300)	3.074 (1.625,5.862)
	Yes	548(92)	89(74)	1	1
Solid Waste Disposal(N=718)	Unimproved	170(28)	56(47)	2.203 (1.476,3.287)	
	Improved	428(72)	64(53)	1	
Liquid Waste Disposal(N=718)	Improper	285(48)	78(65)	2.040 (1.356,3.067)	
	Proper	313(52)	42(35)	1	
Water Treatment Status(N=718)	No	293(49)	77(64)	1.864 (1.242,2.798)	
	Yes	305(51)	43(34)	1	
Child Stool Disposal (N=718)	Improper	162(21)	54(45)	2.202 (1.473,3.293)	2.195 (1.323,3.643)
	Proper	436(73)	66(55)	1	1
Maternal History of Diarrhea(N=718)	No	526(88)	87(72.5)	1	1
	Yes	72(12)	33(27.5)	2.771 (1.731,4.435)	2.316 (1.287,4.168)
Child Immunization(N=718)	Yes (By respo)	245(41)	55(46)	1	1
	Yes(By Card)	242(41)	8(7)		
	No	111(18)	57(47)	2.287 (1.483,3.527)	2.449(1.483,4.043)
Family Size(N=718)	<=5	322(54%)	57(47.5%)	1	
	>5	276(46%)	63(52.5%)	1.289 (0.871,1.910)	

5.6.1 Multivariate Logistic Regression Analysis Result

The multivariate analysis result showed that Household being non-model, Absence of latrine, improper child stool disposal, maternal history of diarrhea and Child Immunization for Rota vaccine showed statistically significant associations with diarrhea occurrence.

Keeping other factors constant, Children from non-model families were 2.5 times more likely (AOR=2.545; 95%CI: 1.553-4.172) to have diarrhea as compared to children from model families and those children from households who didn't have latrine were 3 times more likely. Regarding child stool disposal, children from households with improper child stool disposal had 2 times higher chance (AOR=2.195; 95%CI: 1.323-3.643) of getting diarrhea when compared to children whose families practiced proper refuse disposal. Pertaining maternal history, children from mothers who had history of diarrhea were 2.3 times more likely (AOR=2.316; 95%CI: 1.287-4.168) to have diarrhea as compared to those children whose mothers who had not history of diarrhea.

Unimmunized children for Rota vaccine were 2.4 times more likely to have diarrhea as compared to immunized children (AOR=2.449; 95%CI: 1.483-4.043).

6. DISCUSSION

The prevalence of diarrhea in under-five children whose families were non-model for health extension program was more prone than children whose families were model for the programme. Comparing with other studies, in Sheko district rural community among health extension model and non-model families, (6.4% and 25.5% respectively)(7), in rural area of Shebedino, Southern Ethiopia (19.6 %, (95% CI: (16.8, 22.4))(11) .The reason behind these differences of diarrhea prevalence in the study area may be due to the quality of Model Kebele declaration, certification and follow-up after declaration and also the way of life of the two communities difference. The prevalence in this study is however higher as compared with ODF kebeles diarrhea prevalence in India, 2.72%(29).

Children whose families were non-model for health extension programme were more likely to develop diarrhea when compared to children whose families were model for health extension programme. Health promotion and education supported by demonstration on personal hygiene, water supply safety measure and waste management are important to prevent diarrhea. Model family has created synergy on these things for their better health. Non-model families however are suffering from diarrheal disease, which was particularly pervasive in the conditions of poor personal hygiene and poor sanitation practice. Similar finding is observed with other studies, Sheko district, Southwest Ethiopia(7) and Hawassa, Southern Ethiopia(22).

Improved access to safe and clean toilets can reduce human fecal contamination in the environment by preventing open defecation, and by installing barriers between human feces and the environment. Capture and containment of human feces by toilets should reduce the amount of fecal contamination in the environment(30).In this study children from households who didn't have latrine were more likely to have diarrhea as compared to those who have latrine. This is in agreement with other studies, Jijiga district, Somalia Region(12), Bahir dar zuria district Northwest Ethiopia (10),Benshangul Gomz Regional state (18), Farta District, North West Ethiopia(9) and Hadaleala district, Afar Region(13) and Amhara Region(21) Northwest Ethiopia. The absence of latrine in the household is a notion of the sanitary conditions and as such an indication of the possibility of transmission of the pathogen through fecal contamination.

Children whose families practiced improper refuse disposal were more likely to develop diarrhea when compared to children whose families practiced proper refuse disposal. This result is consistent with other reports from, Sheko district, Southwest Ethiopia(7), Bensahngul gumz Regional state(18) and Kersa district, Eastern Ethiopia(20) where environmental sanitation most often linked with the diarrhea is refuse disposal. Poor refuse disposal is implicated to direct contact with human excreta when the child starts to crawl, and easily accessible for vector and rodents, which are means of diarrhea transmission so refuse disposal had important role in diarrhea in the study area.

Children from mothers who had history of diarrhea were more likely to have diarrhea as compared to those children whose mothers had not have history of diarrhea. This may be explained by the fact that maternal morbidity may be considered as a feature of disease exposure in a family. This is because mothers are food handlers of the family, and also they are usual childcare providers. Moreover, the care of the child may be compromised if the mother herself is sick; Mother's exposure to diarrhea may also indicate poor hygienic practice in the household that results in disease incidence for the child/children. Similar finding is observed in other studies, Shebedino district, Southern Ethiopia(11), and Jijiga district, Somalia Region (12) and Hawassa, Southern Ethiopia(22).

Rotavirus vaccine provides protection against one of the most common causes of childhood diarrhea-related death. In this Study unimmunized children for Rota vaccine were more likely to have diarrhea as compared to immunized children. Similar finding is observed with other studies, Amhara Region(21), Jimma Town, South West Ethiopia(32) and Farta district, North West Ethiopia(8).

STRENGTH & LIMITATION OF THE STUDY

STRENGTH OF THE STUDY

- Observation has been carried out to assess practice of latrine utilization

LIMITATION OF THE STUDY

- The study design which measure the exposure and out come at the same time, which cannot measure the cause and effect relationship (Maternal history of diarrhea)

7. CONCLUSION AND RECOMMENDATION

7.1 CONCLUSION

- The result of this study showed the prevalence of childhood diarrhea was high among non-model families.
- The variation in the level of diarrheal morbidity was well explained by the effect of health extension program (being non-model), absence of latrine, improper child stool disposal, maternal history of diarrhea and unimmunized child for Rota vaccine.
- Diarrhea among under-five children was significantly reduced among families who fully implemented basic health packages. The finding suggests that being a model HH can have a negative impact on diarrhea morbidity among under-five children.

7.2 RECOMMENDATION

7.2.1 To Woreda Health Office

- The district health office should do better to improve services i.e. vaccination, latrine presence at household level and proper utilization , proper refuse disposal mechanism.
- The model household training need to be scaled up in order to decrease under-five diarrheas in the community.

7.2.2 To Researchers

- Further investigate on the impact and role of being model as comprehensive package on prevention against diarrheal disease occurrence is recommended.

REFERENCE

1. Sustainable T, Goals D. The Sustainable Development Goals Report. 2017.
2. Pneumonia and diarrhoea.
3. Findings K. One is too many. 2016;
4. Survey H. Ethiopia. 2016.
5. Wang H, Tesfaye R, Ramana GN V, Chekagn CT. Ethiopia Health Extension Program.
6. Wash ONE, Program N, Document P. FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA ONE WASH NATIONAL PROGRAM A Multi-Sectoral SWAp. 2013.
7. Hashi A, Kumie A, Gasana J. Prevalence of Diarrhoea and Associated Factors among Under-Five Children in Jigjiga District , Somali Region , Eastern Ethiopia. 2016;233–46.
8. Gedamu G. Magnitude and Associated Factors of Diarrhea among Under Five Children in Farta Wereda ,. 2017;25:199–207.
9. Bitew BD, Woldu W, Gizaw Z. Childhood diarrheal morbidity and sanitation predictors in a nomadic community. 2017;1–8.
10. Tambe AB, Nzefa LD, Nicoline NA. Childhood Diarrhea Determinants in Sub-Saharan Africa: A Cross Sectional Study of Tiko-Cameroon. 2015;229–43.
11. Gebru T, Taha M, Kassahun W. Risk factors of diarrhoeal disease in under-five children among health extension model and non-model families in Sheko district rural community , Southwest Ethiopia : comparative cross-sectional study. 2014;14(1):1–6.
12. Asnakew DT, Teklu MG, Woreta SA. Prevalence of diarrhea among under-five children in health extension model households in Bahir Dar Zuria district ,. 2017;4:1–9.
13. Tamiso A, Yitayal M, Awoke A. Prevalence and determinants of childhood diarrhoea among graduated households , in rural area of Shebedino. 2014;2(3):243–51.
14. Getu D, Gedefaw M, Abebe N. Childhood Diarrheal Diseases and Associated Factors in the Rural Community of Dejen District , Northwest. :1–13.
15. Mohammed AI, Zungu L. Environmental health factors associated with diarrhoeal diseases among under-five children in the Sebeta town of Ethiopia Environmental health factors associated with diarrhoeal diseases among under- five children in the Sebeta town of Ethiopia. South African J Infect Dis [Internet]. 2016;53(December 2017):1–8. Available from: <http://dx.doi.org/10.1080/23120053.2016.1156876>
16. Abera A. iMedPub Journals A Cross Sectional Study on the Incidence and Risk Factors of Diarrheal Illness among Children Under-five Years of Age in Debre Berhan Town , Ethiopia Study area. 2016;1–6.

17. Wakigari R, Regassa W, Lemma S. Assessment of Diarrheal Disease Prevalence and Associated Risk Factors in Children of 6-59 Months Old at Adama District Rural. 2015;
18. Mihrete TS, Alemie GA, Teferra AS. Determinants of childhood diarrhea among under-five children in Benishangul Gumuz Regional State , North West Ethiopia. *BMC Pediatr* [Internet]. 2014;14(1):1–9. Available from: *BMC Pediatrics*
19. Thiam S, Diène AN, Fuhrmann S, Winkler MS, Sy I, Ndione JA, et al. Prevalence of diarrhoea and risk factors among children under five years old in Mbour , Senegal : a cross-sectional study. 2017;1–12.
20. Mengistie B, Berhane Y, Worku A. Prevalence of diarrhea and associated risk factors among children under-five years of age in Eastern Ethiopia : A cross-sectional study. 2013;3(7):446–53.
21. Azage M, Kumie A, Worku A, Bagtzoglou AC. Childhood diarrhea in high and low hotspot districts of Amhara Region , northwest Ethiopia : a multilevel modeling. *J Heal Popul Nutr* [Internet]. 2016;1–14. Available from: <http://dx.doi.org/10.1186/s41043-016-0052-2>
22. Berhe F, Berhane Y. Under five diarrhea among model household and non model households in Hawassa , South Ethiopia : a comparative cross-sectional community based survey. 2014;
23. Gedefaw M, Takele M, Aychiluhem M, Tarekegn M. Current Status and Predictors of Diarrhoeal Diseases among Under-Five Children in a Rapidly Growing Urban Setting : The Case of City Administration of Bahir Dar , Northwest Ethiopia. 2015;(May):89–97.
24. Ayalew AM, Mekonnen WT, Abaya SW, Mekonnen ZA. Assessment of Diarrhea and Its Associated Factors in Under-Five Children among Open Defecation and Open Defecation-Free Rural Settings of Dangla District , Northwest Ethiopia. 2018;2018.
25. Determinants of acute diarrhoea among children under five years of age in Derashe
Determinants of acute diarrhoea among children under five years of age in Derashe District , Southern. 2014;(September 2013).
26. MORBIDITY OF DIARRHEAL DISEASE AMONG CHILDREN AGED UNDER. 2016;
27. PREVALENCE AND ASSOCIATED FACTORS OF DIARRHEA AMONG UNDER-FIVE CHILDREN IN LAELAY-MAYCHEW DISTRICT , TIGRAY REGION , ETHIOPIA
29. Chakma T, Godfrey SAM, Bhatt J, Rao P V, Meshram P, Singh SB. Cross-sectional health indicator study of open defecation-free villages in Madhya Pradesh , India. 2012;27(3).
30. 2014 water & health conference: where science meets policy. 2014.

31. Tamiso A. Prevalence and Determinants of Childhood Diarrhoea among Graduated Households, in Rural Area of Shebedino District, Southern Ethiopia, 2013. *Sci J Public Heal.* 2014;2(3):243.
32. African E, Journal M. DETERMINANTS OF DIARRHOEAL DISEASES: A COMMUNITY BASED STUDY IN URBAN SOUTH WESTERN ETHIOPIA A. MEKASHA and A. TESFAHUN. 2003;80(2):77–82.

ANNEX

QUESTIONNAIRE IN ENGLISH

PART ONE: INFORMATION SHEET

A QUESTIONNAIRE PREPARED TO CONDUCT ASSESSMENT OF DIARRHEA IN UNDER-FIVE CHILDREN IN HEALTH EXTENSION MODEL AND NON-MODEL KEBELES RURAL COMMUNITY OF GETTA WOREDA, SOUTH ETHIOPIA, 2018: COMPARATIVE CROSS SECTIONAL STUDY.

Form of oral consent before conducting interview.

Introduction; Good morning/afternoon, my name is ----- and I am one of the data collectors for the study being conducted by Jimma University, Institute of Health Department of Epidemiology on assessment of diarrhea in under five children in Health Extension Model and Non-Model households in Getta woreda, You have been selected to be included in this study. I would like to inform you that you and I would have a short discussion concerning this study. Before we go to our discussion, I will request you to listen carefully to what I am going to read to you about the purpose and general condition of the study and tell me whether you agree or disagree to participate in this study.

Objective: To assess diarrheal morbidity in under-five children in Health Extension Model and Non-Model households from March 01 to 26, 2018 in Getta woreda, south-east Ethiopia.

Benefit of the study:

- The result can be used as a baseline for further studies that can be done in this area.
- The result will be used in planning, resource allocation and monitoring purpose.
- The study is important to provide information about better understanding of the benefit of being model households approach in the prevention of diarrheal disease in under-five children.

Harm of the study: the study has no any harm without taking the participant's time during interview and discussion.

Rights of the participant:

- The participant can stop participating in the study at any time.
- During the review and interview, the participant can ask questions which are not clear

Confidentiality: your name will not be mentioned in the questionnaire and the information that you will give us will be kept confidential and only used for research purpose. _However your honest answers to interview questions will help us better understand the magnitude of diarrheal disease in Health Extension Model and Non-Model households in Getta woreda. I am requesting you to respond honestly for interview questions and your participation is voluntary.

Are you willing to participate in the study? 1-Yes 2 - No

If the answer is yes, thanks! Conduct the interview. If the answer is no, say thanks!

THANKS YOU FOR YOUR COOPERATION.

Interviewer's name ----- signature ----- Date of interview -----

Supervisor's name ----- signature ----- Checked on date-----

Complete 1 Incomplete 2 other (specify) -----

Identification

01 Kebele Code No _____

02 Questionnaire identification number _____

If you have any question, you can contact the following person with these addresses

- Abdi Reshid (Mob no 0912779404) (Email: areezareez635@gmail.com)

PART TWO: QUESTIONNAIRES

Q. No.	Questions	Alternative choices and Coding	Skip to
PART I: SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS			
Q101	Relation of the respondent to the index child (a child with recent diarrhea history or the youngest child)	Mother1 Caretaker2	
Q102	Age of the mother/caretaker	_____ (years)	
Q103	Family size	_____ (persons per household)	
Q104	Number of under-five children in the HH	_____	
Q105	Marital status of the mother/caretaker?	Never married 1 Married 2 Divorced/separated 3 Widowed 4	
Q106	Educational level of mother/caretaker?	No formal education 1 Primary education (1-8) 2 Secondary education (9-12) 3 More than secondary education 4	
Q107	Educational level of the father?	No formal education 1 Primary education 2 Secondary education 3 More than secondary education 4	
Q108	Ethnicity of Mother/caretakers?	Gurage..... 1 Silte..... 2 Hadya 3 Sidama 4 Other (specify) _____... 99	
Q109	Religion of Mother/caretakers	Muslim 1 Orthodox 2 Protestant 3 Catholic 4 Other (specify) _____... 99	
Q110	Occupation of the mother/caretaker?	Housewife only 1 Farming or livestock 2 Merchant/Trade 3 Private Organization employee 4 Government employee 5 Daily laborer 6 Other (specify) _____... 99	
Q111	What is the average monthly net income from you and your spouse's earnings? (in ETB)	-----	
Q112	For how much time you lived in this area	< 6 month 1 6-12 month 2 1-2 years 3 More than 2 years 4	
PART II HOUSEHOLD ENVIRONMENTAL HEALTH CONDITION			

A. SANITATION AND HYGIENE			
Q201	Do you have a latrine?	Yes 1 No 2	If No skip to Q215
Q202	Ownership of the latrine?	Privately owned 1 Shared with neighbors 2	
Q203	What type of latrine does your household have? (Observe)	Pit latrine without slab/open pit.... 1 Pit latrine with slab 2 Ventilation improved latrine 3 Other (specify) _____... 99	
Q204	Years since latrines constructed	< 6 months 1 6 months to 2 years 2 2-3 years 3 > 3Years 4	
Q205	Do you defecate in the open after latrine constructed?	Yes 1 No 2	If no skip to Q207
Q206	What is the reason to practice open defecation	Because it is pleasurable 1 Because it is comfortable 2 Because of culture/religion 3 Latrine is not hygienic 4 Other (specify): _____ ... 99	
Observe the following (observation checklist)			
Q207	Is the footpath to the latrine free from any barrier?	Yes 1 No 2	
Q208	Is faeces seen around the pit hole or seat or floor of latrine?	Yes 1 No 2	
Q209	Is faeces seen on the wall or block of latrine?	Yes 1 No 2	
Q210	Are there faeces in the compound?	Yes 1 No 2	
Q211	Does the latrine have superstructure for privacy (presence of roof & wall) ?	Yes 1 No 2	
Q212	Is there a hand washing facility near the latrine?	Yes 1 No 2	If No skip to Q216
Q213	Does the hand washing facility have water?	Yes 1 No 2	
Q214	Is there soap, detergent, or ash placed?	Yes 1 No 2	
Q215	If the family has no latrine where do you defecate or dispose human waste?	Open field1 Forest 2 Farm side 3 Open bodies of water /River side ...4 Other (specify) _____... 99	
Q216	Why do you prefer to practice open defecation?	Material to construct latrine is not available 1 Cost of latrine construction is expensive 2	

		Because it is pleasurable 3 Because it is comfortable 4 Because of culture/religion 5 Other (specify) _____... 99	
Q217	How do you dispose household's solid waste?	Pit 1 Open field 2 Burning 3 Garbage can 4 Other (specify) _____... 99	
Q218	How do you dispose household's liquid waste?	Pit 1 Open field 2 Dispose to latrine 3 Collect to container 4 Other (specify) _____... 99	
Q219	Does the HHs Shared with domestic animals	Yes-----1 No.....2	

B. DOMESTIC WATER SUPPLY

Q220	What are the main sources of water for drinking for the Household (Multiple response possible)	Piped system 1 Protected well/Spring 2 Unprotected well/Spring 3 River/stream water 4 Other (specify) _____... 99	
Q221	Time taken to fetch drinking water from the water source (round trip)	Water on premises 1 Less than 30 minutes 2 30 minutes or longer 3 Don't know 88	
Q222	Quantity of water collected by the HH per day?	_____ liter	

PART III: BEHAVIORAL ASPECTS

Q301	Do you use soap/ash in yesterday hand washing?	Yes 1 No 2	
Q302	When do you wash your hands with soap/ash? (DO NOT read options; Circle all answers attempted by the respondents)	After visiting latrine 1 After cleaning child's buttock 2 Before preparing food 3 Before eating 4 Before feeding a child 5 Other (specify) _____... 99	
Q303	Do you treat water used for drinking?	Yes1 No 2	
Q304	How did you transport the collected drinking water to the house yesterday?	In a covered container 1 In an uncovered container 2 Other (specify) 99	
Q305	Do you have a water storage used only for storing drinking water?	Yes 1 No 2	If no skip to Q310
Q306	Type of the drinking water storage container?	Jerry cans 1 Clay Pots 2 Plastic bucket 3	

		Iron bucket 4 Other (specify) _____... 99	
Q307	Does the drinking water storage container have a lid or fitted cover? (Observe)	Yes 1 No 2	
Q308	Does the child ever breast-fed?	Yes 1 No 2	If No skip to Q314
Q309	For how many months the child fed with breast milk only?	< 6 month 1 Up to 6 month 2 I don't know 88	
Q310	For how long did you breastfed your child?	<1 Year 1 ≥ 1 Years 2	
Q311	What do you use to feed the child?	Hand1 Cup and spoon 2 Cup 3 Bottle 4 Eat by himself/herself 5 Other (specify) _____... 99	
Q312	The last time when your youngest child passed stool, what was done to dispose the stool?	Used latrine1 Put/inside in latrine 2 Put/inside in to ditches or drain.... 3 Left in open spaces / Rinse away.... 4 Bury in the yard 5 Other (specify) _____... 99	

PART IV INFORMATION ON THE INDEX CHILD

Index child:- a child with recent diarrhea history or the youngest child with diarrhea history in the past two week will be selected as index child if more than one child in the household.

Diarrhea: - a child with diarrhea or frequent loose stool at least 3 times in 24 hours as evidenced from mother/caregiver 2 weeks prior to the survey.

Q401	Sex of the index child (a child with recent diarrhea history or the youngest child)	Male1 Female2	
Q402	Age of the index child (in Months)	0-5 month 1 6- 11 month 2 12 - 23 month 3 24- 35 months 4 Greater than 35 months 5	
Q403	Birth order of the child	— th child	
Q405	Do you (the mother/caretaker) have a history of Diarrhea in the past two weeks?	Yes 1 No 2	
Q406	Is the child immunized for Rota vaccine? (for child > 6 weeks, see card, if no card available ask them to recall)	Yes (by the response of the respondent).....1 Yes (by checking card) 2 No 3	If No skip to Q408
Q407	How many Rota vaccines were given?	Rota vaccine dose 1..... 1 Rota vaccine dose 2 2	

Q408	Among under-five children is there a child with diarrhea in the past 15 days?	Yes 1 No 2 Do not know/not sure 88	If no/don't know finished
Q409	How many days the diarrhea persists? (days)	
Q410	How many times a day he/she passes stool?	Three times 1 More than three 2 Do not know/not sure 88	
Q411	The type of Diarrhea that the child had	Watery 1 Blood and mucus 2 Acute watery diarrhea 3 Don't know 88	
Q412	What actions do you take to treat/stop the Diarrhea? (More than one answer is possible)	Take him/her to health institution... 1 Take him/her to traditional healer...2 Increase feeding 3 Give him/her ORS 4 Give him/her cereal based fluids... 5 Stop/decrease feeding 6 Homemade treatment 7 Other (specify)_____ ... 99	

Thank You!!!

QUESTIONNAIRE IN AMHARIC

በአማርኛ የተዘጋጀ መጠይቅ

መግቢያ

ይህ የመረጃ ቅፅ የሚዘጋጀው ለሚጠናው ጥናት አስፈላጊ ማብራሪያ ለመስጠት ነው። የጥናቱ ዋና አላማ ምርምሩ በሚካሄድበት አካባቢ በጌታ ወረዳ ውስጥ በሚገኙ ከአምስት ዓመት በታች ያሉ ህፃናት ላይ የሚከሰተውን የተቅማጥ በሽታ በጤና ኤክስፔንሽን ሞዴል በሆኑና ባልሆኑ ቀበሌዎች መካከል ያለውን ልዩነት ማየት/ማነፃፀር ሲሆን እንዲሁም በምን ምክንያት ሊከሰት እንደቻለ ለማወቅ እና ለችግሩ መፍትሄ ለመጠቀም የሚያስችል ነባራዊ ሁኔታ ለማጥናት ነው።

የጥናት ዋና ተመራማሪ፡ አቶ አብዱ ረሺድ

የጥናቱ ዓላማ፡

የጥናቱ ዋና አላማ ምርምሩ በሚካሄድበት አካባቢ በጌታ ወረዳ ውስጥ በሚገኙ ከአምስት ዓመት በታች ያሉ ህፃናት ላይ የሚከሰተውን የተቅማጥ በሽታ በጤና ኤክስፔንሽን ሞዴል በሆኑና ባልሆኑ ቀበሌዎች መካከል ያለውን ያለውን ልዩነት ማየት/ማነፃፀር ሲሆን እንዲሁም በምን ምክንያት ሊከሰት እንደቻለ ለማወቅ እና ለችግ መፍትሄ ለመጠቀም የሚያስችል ነባራዊ ሁኔታ ለማጥናት ነው። ከጥናቱ የሚገኘው ዉጤት በየደረጃው ለሚመለከታቸው አካላት በማድረስ ለችግሩ መፍትሄ የሚሆን የትግበራ እቅድ ዝግጅት እንዲያደርጉ በመረጃ የተደገፈ ሙያዊ አስተያየት በመስጠት በተቅማጥ በሽታ የሚጎዱ ህፃናትን ለመታደግ እንዲያግዝ ድጋፍ ለማድረግ ነው።

በጥናቱ መሳተፍ ስለሚያስገኘው ጠቀሜታ

በጥናቱ እርሰዎ በመሳተፍዎ አሁን የሚገኝ/የሚሰጥ ጥቅም እንደሌለ ልግልፅለዎት እወዳለሁ ነገር ግን ይህ ጥናት ተጠናቶ ካለቀ በኋላ የተገኘውን መረጃ መሰረት አድርጎ የሚመለከታቸው አካላት እንዲያወቁት በማድረግ አስፈላጊ የሆነ ችግሩን የሚፈታ የእቅድ እና የአተገባበር እስትራቴጂ ዝግጅት እንዲደረግ ሙያዊ ድጋፍ ለማድረግ ዝግጁ መሆናችንን እንገልጻለን።

በጥናቱ መሳተፍ ሊፈጥረው የሚችለው ተፅዕኖ/ምቹት ስለመኖሩ

በጥናቱ እርሰዎ በመሳተፈዎ/ኛ ምንም ዓይነት ችግር እንደማያመጣ ለመጠቀስ እወዳለሁ። ምን አልባት የማቀርብልዎትን ጥያቄዎች ለመመለስ የተወሰነ ሰዓት ልወስድብዎት እችላለሁ። በጥያቄዎቹ የሚሰጡኝን ማንኛውንም ዓይነት መረጃ ለማንም የማይደርስ መሆኑን እና ሚስጥራዊነቱ የተጠበቀ መሆኑን ልገልፅልዎት እወዳለሁ።

የተሳታፊው የፈቃደኝነት ቅጽ

ከዚህ ቀጥሎ የተሰጠኝን መረጃ በሚገባኝ ቋንቋ አንብቤ ወይም ተነቦልኝ በትክክል ተረድችያለሁ

- የምሰጣቸው መረጃዎች በሚስጥር እንደሚያዙ
- ጥናቱ ምንም አይነት ጉዳት እንደማያደርስብኝ
- ጥያቄወ ካልተሰማኝ ማቋረጥ ወይም ወደሌላ ጥያቄ መዝለል እንደምችልና ማንም ሰው ሊያስገድደኝ እንደማይችል
- ጥናቱ ምክንያት ምንም አይነት ጉዳት ሊያደርስብኝ እንደማይችል

የአጥኝዉ ስም፡ አብዱ ረሺድ 0912779404 (Email: areezareez635@gmail.com)

ከላይ የተሰጠኝን መረጃ በሚገባኝ ቋንቋ አንብቤ ወይም ተነቦልኝ በትክክል ከተረዳሁ በኋላ በጥናቱ ለመሳተፍ ፈቃደኛ ሆኛለሁ።

ተ.ቁ	ጥያቄዎች	አማራጭ መልሶችና ኮድ	ዝለል
ክፍል I: መሰረታዊ የሆኑ የማህበራዊና የግል መረጃዎችን የሚመለከቱ ጥያቄዎች			
ጥ101	ይህን ጥያቄ የምትመልሱ ግለሰብ በተቅማጥ ከተጋለጠው ልጅ ጋር ያላቸው ግንኙነት	1- እናት 2- ተንከባካቢ/ሞግዚት	
ጥ102	የእናት እድሜ (በአመት);	_____	
ጥ103	የቤተሰብ አባላት ብዛት(በአንድ ቤት የሚኖሩ)	_____	
ጥ104	በቤት ውስጥ ያሉ ከ5 ዓመት ዕድሜ በታች ህፃናት:	_____	
ጥ105	የትዳር ሁኔታ?	1. ያገባ 2. ያላገባ 3. የተፋታ 4. በሞት ምክንያት የፈረሰ ትዳር	
ጥ106	የእናት የትምህርት ደረጃ?	1. መደበኛ ትምህርት ያልተማሩ 2. የመጀመሪያ ደረጃ (1-8) 3. ሁለተኛ ደረጃ (9-12) 4. ከሁለተኛ ደረጃ በላይ	
ጥ107	የአባት የትምህርት ደረጃ?	1. መደበኛ ትምህርት ያልተማሩ 2. የመጀመሪያ ደረጃ (1-8) 3. ሁለተኛ ደረጃ (9-12) 4. ከሁለተኛ ደረጃ በላይ	
ጥ108	የእናት(ተንከባካቢ/ሞግዚት) ብሄር ?	1. ጉራጌ 2. ስልጤ 3. ሃድያ 4. ሲዳማ 5. ሌላ(ቢገለጽ) _____ 99	
ጥ109	የእናት(ተንከባካቢ/ሞግዚት) ሃይማኖት ?	1. ሙስሊም 2. ኦርቶዶክስ 3. ፕሮቴስታንት 4. ካቶሊክ 5. ሌላ(ቢገለጽ) _____ 99	
ጥ110	የእናት(ተንከባካቢ/ሞግዚት) ስራ?	1. የቤት እመቤት 2. አርሶ-አደር 3. ነጋዴ 4. የግል 5. የመንግስት ስራተኛ 6. የቀን ስራተኛ 7. ሌላ(ቢገለጽ) _____ 99	
ጥ111	የቤተሰቡ አማካኝ ወርሃዊ ገቢ ስንት ነው?	-----	
ጥ112	ለምን ያህል ጊዜ እዚህ አካባቢ ኖረዋል	1. < 6 ወር 2. 6-12 ወር 3. 1-2 አመት 4. ከሁለት ዓመት በላይ	

ክፍል 2 በቤተሰብ ደረጃ የአካባቢ ጤና ሁኔታዎች			
A. የአካባቢ ንጽህናና የጤና አጠባበቅ (ሃይጅንና ሳኒቴሽን)			
ጥ201	በቤት ውስጥ/አካባቢ ሽንት ቤት አለ ወይ?	1. አለ 2. የለም	መልሱ አይ ከሆነ ወደ ጥ 215 ዝለል
ጥ202	ለጥያቄ ቁጥር 1 አለ ከሆነ መልሱ የመጻፍኛ ቤቱ የባለቤትነት ሁኔታ?	1. የግል 2. ከጎረቤት ጋር በጋራ	
ጥ203	ለጥያቄ ቁጥር 1 አለ ከሆነ መልሱ ምን አይነት ሽንት ቤት ነው ያለው? (ይታይ)	1. Pit latrine without slab/open pit 2. Pit latrine with slab 3. Ventilation improved latrine 4. ሌላ(ቢገለጽ) _____ 99	
ጥ205	መጻፍኛ ቤቱ ከተገነባ ምን ያህል ጊዜ ሆነው;	1. < 6 ወር 2. ከ 6 ወር እስከ 2 አመት 3. ከ2-3 አመት 4. ከሶስት አመት በላይ	
ጥ206	ሽንት ቤት ከሰራችሁ በኋላ ሜዳ ላይ ተጸዳድተው ያውቃሉ?	1. አዎ 2. አይ	
ጥ207	ለጥያቄ ቁ 206 መልሱ አው ከሆነ ሜዳ ላይ የሚጸዳዱበት መክንያት ምንድን ነው?	1. ም/ቱም አሰደሳች ስለሆነ 2. ም/ቱም ምቹ ስለሆነ 3. ም/ቱም ባህል ስለሆነ 4. ም/ቱም መጻፍኛ ቤቱ ንጹህ ስላልሆነ 5. ሌላ(ቢገለጽ) _____ 99	
ከስር የተዘረዘሩትን ጥያቄዎች በማየት የሚሞላ			
ጥ208	ወደ ሽንት ቤት የሚወስድ የእግር ዱካ ምቹ ነው?	1. አለ 2. የለም	
ጥ209	በሽንት ቤቱ ወለል/ቀዳዳ ዙርያ/መቀጫ ላይ ሽንት/ሰገራ አለ?	1. አለ 2. የለም	
ጥ210	በሽንት ቤቱ ግድግዳ ወለል ላይ ሽንት/ሰገራ አለ?	1. አለ 2. የለም	
ጥ211	በግቢው ላይ የሚታይ ሽንት/ሰገራ አለ?	1. አለ 2. የለም	
ጥ212	መጻፍኛ ቤቱ ከለላ አለው(ጣሪያ ፣ ግድግዳ እና በር) ?	1. አለ 2. የለም	
ጥ213	የእጅ መታጠቢያ በመጻፍኛ ቤቱ አቅራቢያ አለ?	1. አለ 2. የለም	መልሱ አይ ከሆነ ወደ ጥ ቁ 216 ዝለል
ጥ214	የእጅ መታጠቢያው ውሃ አለው?	1. አለ 2. የለም	
ጥ215	የእጅ መታጠቢያው ሳሙና ፣ አሞ ወይም አመድ አለው?	1. አለ 2. የለም	
ጥ216	ቤተሰቡ መጻፍኛ ቤት ከሌለው የት ነው የሚጸዳዱት?	1. ሜዳ ላይ 2. ጫካ ውስጥ 3. የእርሻ ማሳ ወውስጥ	

		4. ወንዝ ውስጥ 5. ሌላ(ቢገለጽ) _____ 99	
ጥ217	ለምንድ ነው ሜዳ ላይ የሚጸዳዱት?	1. ለመጸዳጃ ቤት ግንባታ የሚሆኑ ግብዓቶች አለመኖሩ 2. ለመጸዳጃ ቤት ግንባታ የሚሆኑ ግብዓቶች ውድ መሆን 3. ምክንያቱም አስደሳች ስለሆነ 4. ምክንያቱም ምቹ ስለሆነ 5. ምክንያቱም ባህል ስለሆነ 6. ሌላ(ቢገለጽ) _____ 99	
ጥ218	የደረቅ ቆሻሻን እንዴት ታስወግዳላችሁ?	1. ጉድጓድ ውስጥ በመቅበር 2. ሜዳ ላይ 3. በማቃጠል 4. በቆሻሻ ማስቀመጫ በማስቀመጥ 5. ሌላ(ቢገለጽ) _____ 99	
ጥ219	የፍሳሽ ቆሻሻን እንዴት ታስወግዳላችሁ?	1. ጉድጓድ ውስጥ በመጨመር. 2. ሜዳ ላይ 3. ሽንት ቤት ውስጥ በመጨመር 4. በቆሻሻ ዕቃ በማስቀመጥ 5. ሌላ(ቢገለጽ) _____ 99	
ጥ221	ሰውና እንስሳት በጋራ ነው የሚኖሩት	1. አው 2. አይ	
የቤት ውስጥ ውሃ አቅርቦትና አጠቃቀም			
ጥ222	ለመጠጥ ውሃ የምትጠቀሙበትን ውሃ የምታገኙት ከየት ነው? (ከአንድ በላይ ምርጫ ይቻላል)	1. ቧንቧ ውሃ 2. የጎለበተ ምንጭ/የጉድጓድ ውሃ 3. ያልጎለበተ ምንጭ/የጉድጓድ ውሃ 4. የወንዝ /ወራጅ ውሃ 5. ሌላ(ቢገለጽ) _____ 99	
ጥ223	ለመጠጥ የምትጠቀሙት ውሃ ለማምጣት ከቤታችሁ ምን ያህል ደቂቃ ይወስዳል?	1. በአቅራቢያ 2. ከ 30 ደቂቃ በታች 3. 30 ደቂቃ በላይ 4. አላውቅም	
ጥ224	ለቤት በቀን ምን ያህል የውሃ መጠን ታገኛላችሁ (በሊትር)	_____ ሊትር	
ክፍል 3: BEHAVIORAL ASPECTS (ልማድን የሚመለከቱ ጥያቄዎች)			
ጥ301	በትላንትናው እለት እጅዎትን በሳሙና(አመድ) ታጥበዋልን?	1. አው 2. አይ	መልሱ አይ ከሆነ ወደ ጥ 303 ዝለል
ጥ302	መቼ ነው እጅዎትን በሳሙና(አመድ) የታጠቡት? (አማራጮቹ እንዳይነበብላቸው፣ የመለሱት መልስ ብቻ ይከበብ)	1. ከሽንት ቤት መልስ 2. ህጻናትን ካጸዳዱ በኋላ ምግብ ከማዘጋጀት በፊት 3. ምግብ ከመመገባቸው በፊት	

		4. ህጻናት ከመመገባቸው በፊት 5. ሌላ(ቢገለጽ) _____ 99	
ጥ303	ለመጠጥ የምትጠቀሙትን ውሃ ታክሙታላችሁ?	1. አዎ 2. አይ	
ጥ304	በትላንትናው ዕለት ለመጠጥ አገ/ት የሚውለውን ውሃ በምን ዓይነት ዕቃ ነው ያንጓዙት	1. ዝግ በሆነ መያዣ 2. ዝግ ባልሆነ መያዣ 3. ሌላ(ቢገለጽ) _____ 99	
ጥ305	ለመጠጥ ውሃ ብቻ የተለየ ዕቃ አለዎት	1. አው 2. አይ	መልሱ አይ ከሆነ ወደ ጥ 310 ዝለል
ጥ306	ለውሃ ማጠራቀሚያ ምን ትጠቀማላችሁ:	1. ጀሪካን 2. እንሰራ 3. ፕላስቲክ ባልዲ 4. ባለብረቱ ባልዲ 5. ሌላ(ቢገለጽ) _____ 99	
ጥ307	ለውሃ ማጠራቀሚያ የምትጠቀሙት እቃ ክዳን አለዉደ? (ይታይ)	1. አው 2. አይ	
ጥ308	በምን መልኩ ነው ውሃ ከመቅጃው የሚቀዱት	1. በማጥለቅ 2. በማንቆርቆር 3. ሌላ(ቢገለጽ) _____ 99	
ጥ309	ህጻን ጡት አጥብተው ያውቃሉ?	1. አው 2. አይ	መልሱ አይ ከሆነ ወደ ጥ 314 ዝለል
ጥ310	ለምን ያህል ጊዜ የእናት ጡት ብቻ አጥብተዋል?	1. < 6 ወር 2. አስከ 6 ወር 3. አላውቅም 88	
ጥ311	ለምን ያህል ጊዜ የእናት ጡት አጥብተዋል??	1. <1 አመት 2. ≥ 1 አመት	
ጥ312	ህጻኑን ተጨማሪ ምግብ መመገብ የጀመሩት መቼ ነው (ከ 6 ወር ለበለጠ ልጅ ብቻ የሚጠየቅ)	1. < 6 ወር 2. 6 ወር ላይ 3. >6 ወር 4. አላውቅም 88	
ጥ313	ህጻኑን በምን መልኩ ነው የሚመግቡት?	1. በእጅ በማጉረስ 2. በኩባያ(ስኒ) እና በማንኪያ 3. በኩባያ(ስኒ) 4. በጡጦ 5. በራሱ/ሷ 6. ሌላ(ቢገለጽ) _____ 9	
ጥ314	ለመጨረሻ ጊዜ ህጻኑ ከተጸዳዳ በኋላ የህጻኑን ዓይነት-ምድር እንዴት ነው ያስወገዱት	1. መጸዳጃ ቤት የጠቀማል 2. መጸዳጃ ቤት ውስጥ በመጨመር 3. ጉድጓድ ውስጥ ማስቀመጥ 4. ሜዳ ላይ በመወርወር 5. አርቆ በመቅበር	

		6. ሌላ(ቢገለጽ) _____ 99	
ክፍል 4 በተቅማጥ የተጠቃውን ልጅ የሚመለከቱ ጥያቄዎች			
ጥ401	የህጻኑ/ኗ ጾታ	1. ወንድ 2. ሴት	
ጥ402	የህጻኑ/ኗ እድሜ(በወር)	1. 0-5 ወር 2. 6- 11 ወር 3. 12 - 23 ወር 4. 24- 35 ወር 5. ከ 35 ወር በላይ	
ጥ403	ህጻኑ/ኗ ለቤተሰቡ ስንተኛ ልጅ ነው/ናት	_____ ኛ	
ጥ405	እናት-የዋ/ተንከባካቢዋ ከ 15 ቀን በፊት በተቅማጥ ታመው ነበር	1. አው 2. አይ	
ጥ406	የህጻኑ/ኗ የሮታ ክትባት ተከትበዋል	1. አዎ (በተጠያቂው ምላሽ) 2. አዎ (ካርድ በማየት) 3. አልተከተበም	መልሱ አይ ከሆነ ወደ ጥ 408
ጥ407	ምን ያህል የሮታ ዶስ ተሰጥቷቸዋል?	1. አንድ ዶዝ 2. ሁለት ዶዝ	
ጥ408	ባለፉት 15 ቀናት ውስጥ በተቅማጥ የተያዘ ህጻን አለ	1. አዎ 2. አይ 3. አላውቅም	አይ ከሆነ ጥያቄውን ጨርሰዋል
ጥ409	ተቅማጡ ለምን ያህል ቀን ቆይቷል? (ቀናት)	
ጥ410	በቀን ውስጥ ምን ያህል ጊዜ ያስቀምጠው ነበር?	1. 3 ጊዜ 2. ከ 3 ጊዜ በላይ 3. አላውቅም 88	
ጥ411	ህጻኑ/ኗ ምን አይነት ተቅማጥ ነበር የያዘው/የያዛት	1. Watery 2. Blood and mucus 3. Acute watery diarrhea 4. Don't know ... 88	
ጥ412	ተቅማጡን ለማቆም ምን አይነት መፍትሄ ወስደዋል	1. ወደ ጤና ተቋም መውሰድ 2. የባህል ህክምና ቦታ በመወሰድ 3. የሚመገበውን ምግብ በመጨመር 4. ORS በመስጠት 5. የስራስር ምግቦችን በመስጠት 6. የሚመገበውን ምግብ በማቆም/በመቀነስ 7. የቤት ውስጥ ህክምና 8. ሌላ(ቢገለጽ)	

አመሰግናለው!!!