



COLLEGE OF HEALTH SCIENCES
SCHOOL OF PUBLIC HEALTH
MASTER OF PUBLIC HEALTH

**EVALUATING THE EFFECTIVENESS OF RISK COMMUNICATION
PROCESS AND HEALTH COMMUNICATION MATERIALS PREPARED
FOR CHOLERA OUTBREAK IN ADDIS ABABA, ETHIOPIA**

BY

NARDOS GELANA (BSC.)

**A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF
ADDISABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES, SCHOOL
OF PUBLIC HEALTH IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTERS OF PUBLIC HEALTH
(MPH) IN HEALTH PROMOTION AND HEALTH EDUCATION**

Dec, 2020

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Acronyms

AWD	Acute watery diarrhea
CDC	Communicable disease control
CERC	Crisis and emergency risk communication
EPHI	Ethiopian public health institute
ERC	Emergency risk communication
HEWs	Health extension workers
IHR	International Health Regulation
MOH	Ministry of health
NIV	Nipha virus
OCV	Oral cholera vaccine
RCCE	Risk communication and community engagement
SBCC	Social and behavior change communication
SARS	Severe acute respiratory syndrome
WHO	World health organization
UNICEF	United Nations Children's Fund

Abstract

Background: Since 1970, different parts of Ethiopia have been recurrently affected with cholera outbreaks. During such public health emergencies, timely and correct information can support people at risk to take appropriate protective actions, prevent disease and injury, decrease unnecessary care-seeking, and facilitate relief and recovery attempts. As risk communication activities are complex and costly usually, evaluation assessment are the best approach to advance risk communication interventions and to enhance the feature of health communication materials.

Objectives: This study aims to evaluate the effectiveness of risk communication process and health communication materials done for cholera outbreak at Addis Ababa, Ethiopia.

Methods: the study is conducted at Addis ketema sub-city, Addis Ababa Ethiopia. The study used community-based cross-sectional design using mixed method. A total of 605 adults were selected using systematic random sampling for quantitative data and 7 purposely selected adults for In-depth interview and 3 key informants were interviewed for qualitative data. Data were collected using a pre-tested structured interviewer-administered questionnaire, semi-structured interview guides and checklist. Five printed communication materials and three cholera spots were selected randomly from the available materials for evaluation. Quantitative data were analyzed using SPSS version 25. A multiple linear regression analysis was done to identify predictors for knowledge for cholera and P-value < 0.05 was used to declare the statistical significance. Qualitative data were entered into open code version 4.02 for analysis and then analyzed using thematic analysis.

Result: The response rate of this study was 96.1%. Respondents exposed for cholera related messages and outbreak information were 71.8% and 52.7% respectively. Respondents have moderate knowledge for cholera with (M=14.72 and SD \pm 4.02) with (0-34) scale range. Socio-demographic variables, sources of health information, exposure for cholera messages & outbreak information variables explained the variance in knowledge about cholera by 44.5%. Both TV & radio cholera spots were found as simple and easy to understand and printed health communication materials score low quality. Poor documentation, lack of data management system and less attention given for risk communication activities were seen as a gap in the risk communication process done for cholera outbreak (2019) in Addis Ababa, Ethiopia.

Conclusion: as this study revealed that risk communication messages has effect in increasing individuals' knowledge on disease and its prevention. Even though the cholera spots were found to be simple and easy to understand the quality of printed materials were low and less attention given for the risk-communication activities affect the effectiveness of the risk-communication process. Therefore, strengthening risk communication and materials development process is very important to bring desired effects in disease prevention strategies and for effective emergency responses in the future.

1. Introduction

1.1 Background

Cholera is an acute intestinal infection which is caused by consumption of contaminated food or water by the bacterium called *Vibrio cholera* and if not treated it rapidly leads to severe dehydration and death. ⁽¹⁾ Since 1970, different parts of Ethiopia have been recurrently affected with cholera outbreaks. ⁽²⁾

An outbreak refers to an increase, regularly unexpected cases of a disease beyond the endemic level in the population within a limited geographic area or may extend over a much wider area and may last for a long period. ⁽³⁾ Effective risk communication is one of the vital components of outbreak management. WHO states risk communication as the conversation of actual information, guidance, and thoughts between specialists and people fronting risks to their well-being, economic or social safety. ⁽⁴⁾

Under IHR, risk communication aimed at public health disasters includes the variety of communication capacities essential for the preparation, response and recovery phases of a serious public health incident to enhance informed decision making, positive behavior change and the maintenance of trust. ⁽⁵⁾ When the public is at risk of actual or potential health threat, treatment preferences may be inadequate, direct interventions may take time to organize and resources may be few. Therefore, health communication interventions often stances as the most essential public health tool in risk management. ⁽⁶⁾

During outbreak management, health communication interventions are an important component in managing any infectious disease. The scope of health communication also comprises disease prevention, health protection, promotion, health care strategy, emergency response and improvement of life quality and health of individuals within the community. ⁽⁷⁾ CDC also stated that health communication interventions increase audience knowledge and awareness of any health-related issues and determine the benefits of behavior changes to public health problems.

Ethiopian Minister of Health has developed Public Health Emergency Communication Guide to support the emergency response through Risk Communication and Social and Behavior Change Communication (SBCC) including social mobilization, and advocacy. ⁽⁸⁾

As part of the cholera outbreak response in Addis Ababa, the Ethiopian Red Cross Society collaborating with MOH and other partners were working on social mobilization and other communication activities including mass education using printed materials to ensure awareness in good health and hygiene practices in two targeted sub-cities namely Addis ketema and Bole sub-city. ⁽⁹⁾ Besides this, during cholera outbreak response MOH and EPHI collaborating with other stakeholders have developed different health communication materials including TV and Radio spots on cholera and its prevention methods.

1.2 Statement of the problem

Emergency risk communication is an essential element for public health emergency preparation and response for public health crisis, such as emergent infectious diseases, environmental and natural disasters, which need effective communication. ⁽¹⁰⁾ In addition to this, risk communication and health communication interventions are essential to lowering morbidity and mortality due to infectious diseases by raising awareness, providing knowledge, changing attitudes and intending to contribute to potential behavior change. ⁽¹¹⁾

Efforts for disease outbreak control should actively communicate with and include the public to be more effective. Effective risk communication program will ensure that accurate information is provided quickly, via an authoritative, reachable source with a clear and understandable message. ⁽¹²⁾

A lack of available information during public health emergencies leads to estimation and seeking information from less credible sources which also results in misinformation and rumors. Additionally, emergency situations almost all the time decrease the possibility of effective decision making. Therefore, having effective communication in place will alleviate this problem to some degree. ⁽⁴⁾ People are not likely to change their behavior or attitudes if they lack trust on the source of risk information. Lack of trustworthiness is often related to incompetence, poor performance, incomplete and withholding of information.

Studies show that disease outbreak responses generally focus on medical aspects than the communication issues which might be neglected. ⁽¹³⁾ Even though focusing on medical response during outbreak management is important, the need for effective risk communication and well-structured health communication interventions must be considered.

Health communications during disease outbreaks should effectively instruct, notify, and encourage proper self-protective behavior, inform risk information, develop trust in officials and dispel rumors among the community. ⁽¹⁴⁾ Studies show that risk communication messages frequently fail to reach targeted communities, including those who are at risk of a health problem. ⁽¹⁵⁾ These show that, there is a gap in planning effective risk communication and failure on targeted audience analysis during material development.

After a disease outbreak, it is suggested that the outbreak response assessment must be undertaken including risk communication to determine strengths and weaknesses and to improve planning for better preparedness and response for future outbreaks. ⁽¹⁶⁾

Even though risk communication is a new emerging concept, it is an essential part of any emergency response and should be well-established and planned to tell people what health risks they face, and what actions they should take to keep their health and lives. ⁽¹⁷⁾ Despite recurring cholera outbreaks in Ethiopia, a little has been informed on outbreak response assessments including risk communication and health communication interventions. And there is no enough data that shows the risk communication activities done for the outbreak, health communication interventions done and assessment of its impact on disease prevention in Ethiopia.

As risk communication activities are complex and costly usually, evaluation assessment are the best approach to advance risk communication interventions. Therefore, this study will evaluate the effectiveness of the risk communication process and health communication materials prepared for the cholera outbreak in Addis Ababa including the knowledge level on cholera among peoples living in Addis Ababa.

1.3 Significance of the study

Effective risk communications and materials allow people most at risk to realize and adopt protective behaviors and experts to listen and address people's concerns and needs. The impact of this communication is also important in changing the community's attitude and increasing their knowledge on the prevention of health problems.

So that, the information which will be obtained from this evaluation study will provide insights about the risk communication process, challenges, and communication interventions done during the outbreak. Since it is a newly emerging research area in Ethiopia, the findings will inform the MOH and other stakeholders about the effectiveness of the risk communication process and development of health communication materials during the outbreak response for future emergency response programs. It would also help health promotion experts to make effective health communication interventions for cholera prevention in the future by assessing the gap in communication and knowledge level of the community towards cholera.

2 Literature review

2.1 Global burden of Cholera

Cholera is an important public health problem globally. It is closely associated with poverty, poor sanitation and lack of clean drinking water.⁽¹⁸⁾ According to the WHO-UNICEF joint annual report in 2017, peoples, those residing in overcrowded areas with limited safe drinking water and proper hygiene, including unplanned mass expansion are the most at risk populations for cholera. The report also indicates that, globally over two billion individuals drink contaminated water sourced from fecal contamination and 663 million people had no access for safe water in 2015.⁽¹⁹⁾

In addition to those factors, movements due to conflicts, natural disasters, and extreme climatic changes will create favorable conditions for cholera outbreaks in many settings across the globe which makes cholera to be a highly sensitive issue and indicator for poverty and poor living conditions.⁽²⁰⁾

A report done by STOP cholera initiative in 2016, estimated that about 2.86 million cholera cases were resulting in approximately ninety five thousand deaths in sixty nine endemic countries per year and countries including India, Ethiopia, Nigeria, Haiti, Tanzania, Kenya, Congo and Bangladesh estimates of more than 100,000 cases per year.⁽²¹⁾

In 2018, the WHO report estimated cases of cholera ranged from 1.4 - 4 million, and cholera death from 21,000 - 143, 000.⁽²²⁾ However, worldwide the cholera burden is underrated because of factors such as low recording, inadequate epidemiological surveillance and absence in capability of laboratory. Another study done on global burden of cholera shows that, the cholera problem is highest in southern Asia and Africa, with around ninety nine percent of the cases taking place in Africa continent, South-East Asia and Eastern Mediterranean Region.⁽²³⁾

UNICEF report shows that, nearly half of the countries in the Southern and Eastern Africa region have been affected by cholera outbreaks from the beginning of 2019. Among these, more than 10,437 cholera or AWD cases with 35 cholera deaths were reported in ten countries which includes Angola, Burundi, Kenya, Malawi, Mozambique, Somalia, Zambia, Tanzania, Zimbabwe, and Uganda.⁽²⁴⁾

2.2 Cholera/AWD outbreak in Ethiopia

Ethiopia have been regularly affected by cholera outbreaks since 1970. Following some years of absence, in 1993 cholera reappeared in Ethiopia in the city of Harari, Oromia region, Somali and in Addis Ababa. ⁽²⁾

Reports showed that the occurrence of some cholera epidemics was not announced by the Ethiopian government due to fear that agricultural export might suffer. ⁽²⁵⁾ From 2014 to the end of 2015, the AWD outbreak has occurred in Kenya affecting near to 7000 cases of morbidity and over 100 deaths, which later moved to Ethiopia after distributed over a year. ⁽²⁶⁾ During this time, AWD was reported in Ethiopia for the first time in districts of Ethiopian Somali and Oromia close to the Ethio-Kenyan border.

A report from Ethiopian Public Health Institute shows that, there were around 2,145 nationally and 25 suspected AWD cases in Addis Ababa in June 2016 and during the outbreak, an AWD disease response plan was launched by Addis Ababa city Administration Health Bureau to control the distribution. ⁽²⁷⁾ Another report from WHO in 2016 stated that all the ten sub-cities from Addis Ababa have reported cases during the AWD outbreak. ⁽²⁸⁾

A study done to assess risk factors related to cholera outbreak in Addis Ababa showed that, drinking street supplied water and holy water, eating raw meat, partially roasted meat, vegetable salad or unboiled fresh milk, food consumption at a street vendor or restaurant, lack of access to latrine and tap water as most common type of water source are statistically significant risks for cholera during the outbreak. ⁽²⁹⁾

In 2017, WHO Ethiopian country office reported that, between January and December, a cumulative total of 48,814 cases and 880 deaths have been reported from nine regions in Ethiopia. ⁽³⁰⁾ The AWD outbreak also occurred in 2018 with a total of 3090 cases reported from five regions, namely Oromia, Dire Dawa, Somalia, Tigray, and Afar. ⁽³¹⁾ In addition to these outbreaks, recently Ethiopia faced a Cholera outbreak in 2019. According to July 2019 WHO Weekly report, 688 cases of cholera with 23 confirmed and 15 related deaths have been informed from April to June from 5 regions in Ethiopia, including Addis Ababa administrative city.

Addis Ketema and Kality sub-cities were mainly affected with the outbreak which accounts for more than 50% of the cases reported in Addis Ababa and contaminated water sources were found as the main risk factor for the outbreak. ⁽⁹⁾ During this outbreak, the MOH of Ethiopia officially announced cholera cases and outbreak in regions and Addis Ababa.

2.3 Outbreak communication strategies and principles

Communication has become as important as laboratory investigation and epidemiological surveillance in controlling outbreak. WHO and CDC have developed outbreak communication guide manuals that provide an evidence-based framework and best practices to communicate on behalf of an organization which response to public health crises. ⁽⁴⁾

The CDC emergency and crisis risk-communication manual state six principles of effective emergency and risk communications, which include being first, being right, being credible, expressing empathy, promoting action and showing respect. The manual also helps to make sure that inadequate resources to be managed well and to do the best at every stage of an emergency response. ⁽³²⁾

Credibility refers to honesty and truthfulness during crises. The main principle of communication during outbreak is communicating in means that form, retain or return trust between the community and outbreak managers. Lacking this trust, the public will not be certain of the health information which is communicated by health experts during an outbreak. ⁽³³⁾

A qualitative study done in US on public perceptions about Trust in Emergency Risk Communication finds that, there was a general lack of trust and assurance in the government's ability to effectively respond to an emergency and this distrust seems to be rooted in the perception that the government has not done enough to prepare for an attack and the belief that government officials withhold important information and are dishonest at times. ⁽³⁴⁾ This shows that developing and maintaining mutual trust relationships with the public and government officials is important to ensure effective risk communication.

Announcing information early or being first is also an important principle which prevents rumors and misinformation. For the public members, Communicating information rapidly is essential because emergencies are time-sensitive and the primary source of information often becomes the preferred source. ⁽⁴⁾

A study done on exploring risk communication experiences for the post-Ebola outbreak in Sinoe and Grand Kru countries stated that, the health promotion team was responded timely by disseminating messages in less than twenty four hours which helped community members to take actions in protecting themselves and their families which resulted in the rapid interruption of the outbreak. ⁽¹¹⁾ This implies proactive communication of real or potential health risks is important in informing the affected population and minimizing an infectious disease threat.

The accuracy of risk communication or being right establishes credibility. Information in communicating risk can include what is known, what is not known, and what is being done to fill in the gaps. WHO also recommends ongoing transparency for maintaining the public's trust during an outbreak including timely and comprehensive information. ⁽³⁵⁾

Expressing Empathy is also one of the risk communication principles because suffering during emergencies should be acknowledged in words. Addressing what people are feeling, and the challenges they face builds trust and rapport. Align with this communicating with respect is mostly important when the public feel vulnerable to promote cooperation and rapport. ⁽³⁶⁾ In Promoting Action, risk communication messages should be meaningful for peoples to do calms anxiety, to help restore order, and to promote some sense of control.

In Ethiopia, FMOH has also developed a Public Health Emergency Communication Guide by adapting the WHO Outbreak Communication Guidelines and CDC's Crisis and Emergency Risk Communication manual. The communication guide aimed to provide conceptual pathways and planning steps for responders dealing with public health emergency communication to support the emergency response through Risk Communication and Social and Behavior Change Communication (SBCC) including social mobilization and advocacy. ⁽⁸⁾ The manual also states the communications to be done at a different phase of the emergencies which are at preparedness, alert/initial, response, and evaluation phases.

2.4 Risk communication process during disease outbreaks

Risk communication for an emergency is gradually recognized as important for preparing for and responding to public health emergencies which is proved by its inclusion as one of the International Health Regulations' eight core capacities needed by WHO member states to support national and international systems for identifying and taking action to public health problems.⁽³⁷⁾

Every disaster, emergency or crisis progresses in different phases. Therefore risk communication efforts and priorities should line up with these phases, and communicators need to adapt and react according to each phase with specific kinds of information need to be created. According to the CDC manual for risk communication, the emergency risk communication process evolve through four phases in every emergency, which are namely preparation, initial, maintenance, and resolution (recovery).

During the preparation phase, the risk communication process involves activities such as developing partnerships and building relationships with organizations and community stakeholders, drafting and testing messages with different populations, creating risk communication plans, Select and train spokespersons and engaging communities in preparedness planning.⁽³²⁾

Risk communication during the initial phase of an emergency involves expressing empathy, providing simple explanations of risk, promoting action and establishing the organization's credibility. A study conducted in Liberia to explore risk communication experiences in post- Ebola outbreak stated that, during the outbreak intervention, the country incident management system coordinate various risk communication approaches including risk assessment, understanding community risk perception, advocacy meetings, targeted community engagements, inter-personal communication and media engagements to seek communities' support and participation in the response.⁽¹¹⁾ The study also described that risk communication increased trust in the health system contrary to the perceptions showed during the Ebola outbreak.

On maintenance phase communication includes ensuring if the community understands ongoing risks and actions they can take to reduce risk or harm, providing more background information, segmenting audiences, encouraging public support and cooperation with a response and recovery efforts and addressing misunderstandings, rumors, and unclear facts.

A qualitative study conducted to explore residents' beliefs and perceptions about the Nipah virus and prevention messages during an outbreak in Bangladesh found that, peoples primarily thought that the cause for the outbreak were supernatural forces and continued taking raw sap despite messages from local health experts to stop because the first messages did not explain that bats were the cause of the virus.⁽³⁸⁾ After interactive communication strategy using local language participants replied that they understood how the virus could be spread and would desist from raw sap intake and retain safe behaviors while caring for patients.

Another study done to describe risk and outbreak communication for post severe acute respiratory syndrome in Taiwan shows that, the risk communication system in the city was well-established and a closer relationship with the mass media has been developed according to the WHO principles of effective risk communication.⁽³⁹⁾ In the resolution phase, risk communication activities include motivating people to take action or remain vigilant, promoting community preparedness for possible future crises, a discussion between organization and partners, documenting, sharing lessons learned from the response and evaluating communication plans. The reporting and documenting final activities will be used as an input for future emergency responses.

2.5 Effects of Emergency risk communication and materials

The National Cancer Institute and CDC defines health communication as the use of communication approaches to inform and encourage individual and public decisions that improve health.⁽⁴⁰⁾ Successful health communication programs involve more than the production of messages and materials.

Health communication interventions also use research-based approaches to form the products and determine the channels that deliver them to the right intended audiences and to increase the intended audience's knowledge and awareness of a health issue, problem, or solution.⁽⁴¹⁾

For emergency management communication messages must be direct and effectively speak to the audience. A qualitative study done to explore communication with the public about emerging health threats in US showed that members of the general public have a limited understanding on infective disease outbreaks and during an outbreak participants will turn to the broadcast media for emergency information and wanted to know how to avoid exposure, identify symptoms, and treat effects.⁽⁴²⁾

Effective emergency messages, therefore provide people with the information they need to protect themselves and help to maintain public confidence. Emergency risk communication materials have significant role in the disease outbreak management as they increase awareness about disease condition, available facilities, encourages people to use services such as vaccination, welfare initiatives and counseling.⁽⁴³⁾

A study done to assess the effect of information sources on Ebola specific knowledge and behavior during the Ebola outbreak in Sierra Leone finds that, exposure to any type of information source about Ebola was statistically significantly associated with increased knowledge and protective behaviors during the EVD epidemic.⁽⁴⁴⁾ Health information in communication strategies is important in increasing knowledge and changing behavior during emergency preparedness and disease outbreaks.

A study done on media Use and Communication during Pandemic Influenza A virus in the US found that, 23% of the participant was able to access the information they wanted immediately and participants with information exposure were more initiated to perform protective behaviors when compared with the non-exposed individuals.⁽⁴⁵⁾

Effective health communication interventions recognize and arrange audience segments, provide systematically created messages from reliable sources and address audiences through familiar channels. Also, emergency communication messages for the public and affected communities during an emergency should aim to educate, save lives, and decrease risks.⁽⁴⁶⁾ Therefore, health communications have a great effect on the public to prepare for and respond to a health threat by creating awareness and recommending protective behaviors.

2.6 Conceptual framework

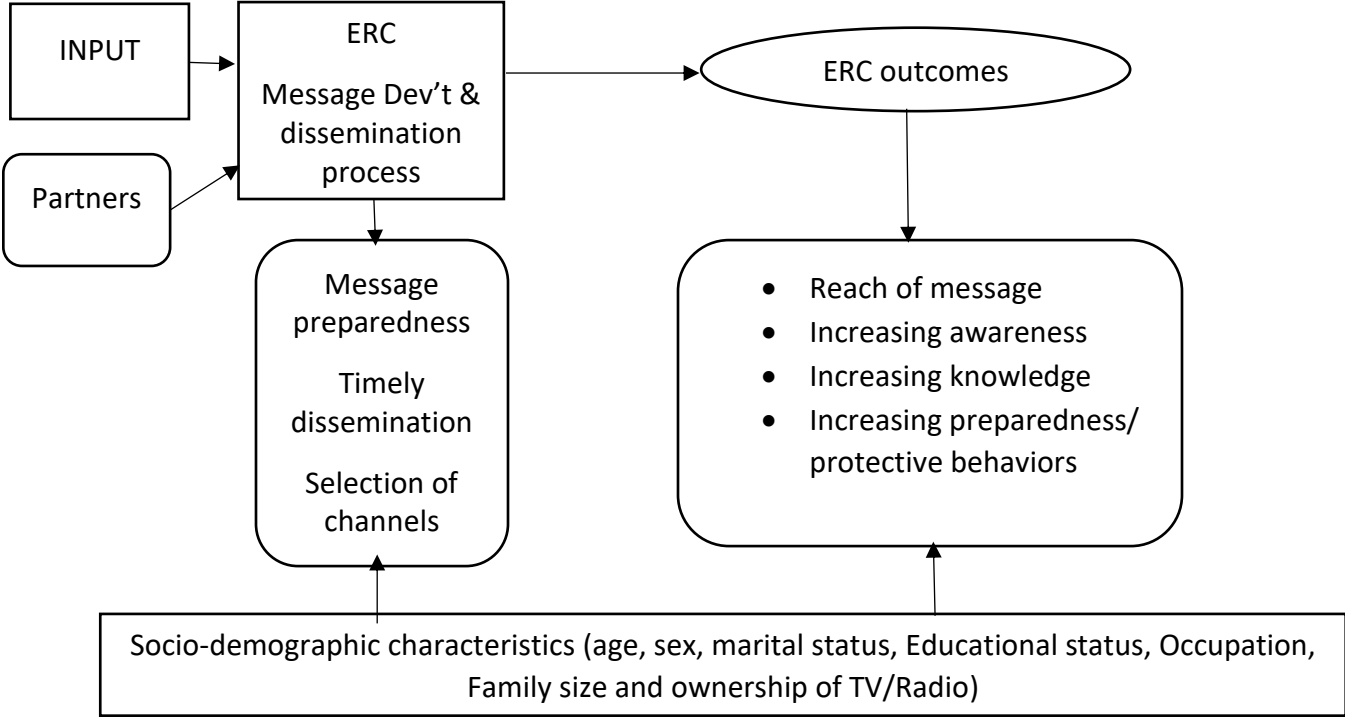


Figure 1: Conceptual framework: adopted from CDC conceptual model for ERC (10)

3 Objectives

3.1 General objective

- To evaluate the effectiveness of risk communication process and health communication materials prepared for cholera outbreak (2019) in Addis Ababa, Ethiopia 2020.

3.2 Specific objective

- To explore the risk communication process done for cholera outbreak (2019) in Addis Ababa
- To evaluate the quality of communication materials prepared for the cholera outbreak in Addis Ababa
- To assess the cholera prevention message exposure among adults living in Addis ketema sub-city, Addis Ababa
- To assess knowledge about cholera among adults living in Addis ketema sub-city, Addis Ababa

4 Methodology

4.1 Study area and period

The study was conducted in Addis Ababa. A.A is the largest and capital city of Ethiopia. Based on the 2019 United Nations population estimation and projection the city has an estimated 2,757,729 population. The city is divided into ten sub-cities. Addis Ketema sub-city was selected for the study among high cholera cases reported sub-cities during the cholera outbreak in 2019.⁽⁹⁾ Addis Ketema Sub-city Administration has an area of 7.41 sq.km with 271,644 Population. The sub-city is found in the northern part of Addis Ababa and has 10 weredas. The study was conducted from May- Jun, 2020.

4.2 Study design

Community based cross-sectional study was conducted using Triangulation design mixed method.

4.3 Population

4.3.1. Source population

For the quantitative study – All adults (with age group >18) living in Addis ketema sub-city.

4.3.2. Study population

For the quantitative study – All randomly selected adults (with age group >18), both males and females from Addis ketema sub-city.

4.3.3 Study participants for the qualitative study

For Key informant interview: - Individuals who participated in risk communication management and material development during the cholera outbreak from MOH and EPHI.

For In-depth interview: - selected adults living in Addis ketema sub-city.

4.4 Eligibility criteria

4.4.1 Inclusion criteria

- Adults with age ≥ 18 living in Addis ketema sub-city

4.4.2 Exclusion criteria

- Individuals with age <18 and who are unable to communicate

4.5 Sample size determination

4.5.1 For the quantitative study

To calculate the number of study participants, a single population proportion formula was used with the following assumptions. Since no study is found on knowledge about cholera in previous studies in Ethiopia, the assumptions of prevalence of 50% ($p = 0.5$) was taken with 95% confidence interval and 5% margin of error. Then, the sample size is calculated as:

$$n = \frac{(Z_{\alpha/2})^2 \times P(1-P)}{d^2}$$

$$\text{Therefore } n = \frac{(1.96)^2 \times 0.5(1-0.5)}{(0.05)^2} = 384$$

A design effect of 1.5 is used to get a representative sample and a 5% non-respondent rate added to the sample size. Therefore, the final sample size was 605 participants.

4.5.2 For the qualitative study

Three participants for key informant interview were interviewed. Two of them were from the Ethiopian public health institute and one was from Ministry of health who participated in the risk communication process and material development during the outbreak. Seven individuals from Addis ketema sub-city were participate for the in-depth interview.

4.6 Sampling procedure

4.6.1. For quantitative study

A multistage random sampling method was used for the selection of study participants. In the first stage among the 10 sub-cities in Addis Ababa city, Addis ketema sub-city is selected randomly among high cholera case reported sub-cities during cholera outbreak (2019). In the second stage among 10 weredas in the sub-city three weredas are selected using simple random sampling method. Again from the kebeles in each selected weredas, seven kebeles are selected randomly and included to obtain the desired sample size. A total of 4234 households are found in the selected kebeles. The sample size is allocated proportionally to all selected kebeles using the total number of households in each kebele. The sampling frame for each Kebele is found from Addis Ketema administration office.

Final households were selected using a systematic random sampling technique by dividing the number of a total household by the allocated sample size to get the sampling interval (K) which is 7. Therefore every 7th households in each Kebele was selected to reach the desired sample size. The study unit were selected from the selected household. In those households one head of the house (if available) or adults with age ≥ 18 were selected randomly. If there was more than one eligible respondent in the house one was selected randomly by lottery method. If there was no eligible participant in the household, data were not collected from the household and it was considered as ineligible and non-response rate.

4.6.2. For qualitative study

Expert Purposive sampling method was used for key informant interview to recruit experts who engaged in risk communication and health communication materials development during the outbreak from MOH and EPHI. For the in-depth interview, a purposive sampling method was used to recruit individuals from selected sub-city. Again five printed health communication materials, two radio spots and one TV spot was used for in-depth interview and for the checklist evaluation. The materials were prepared for cholera prevention and collected from MOH & EPHI emergency operation center.

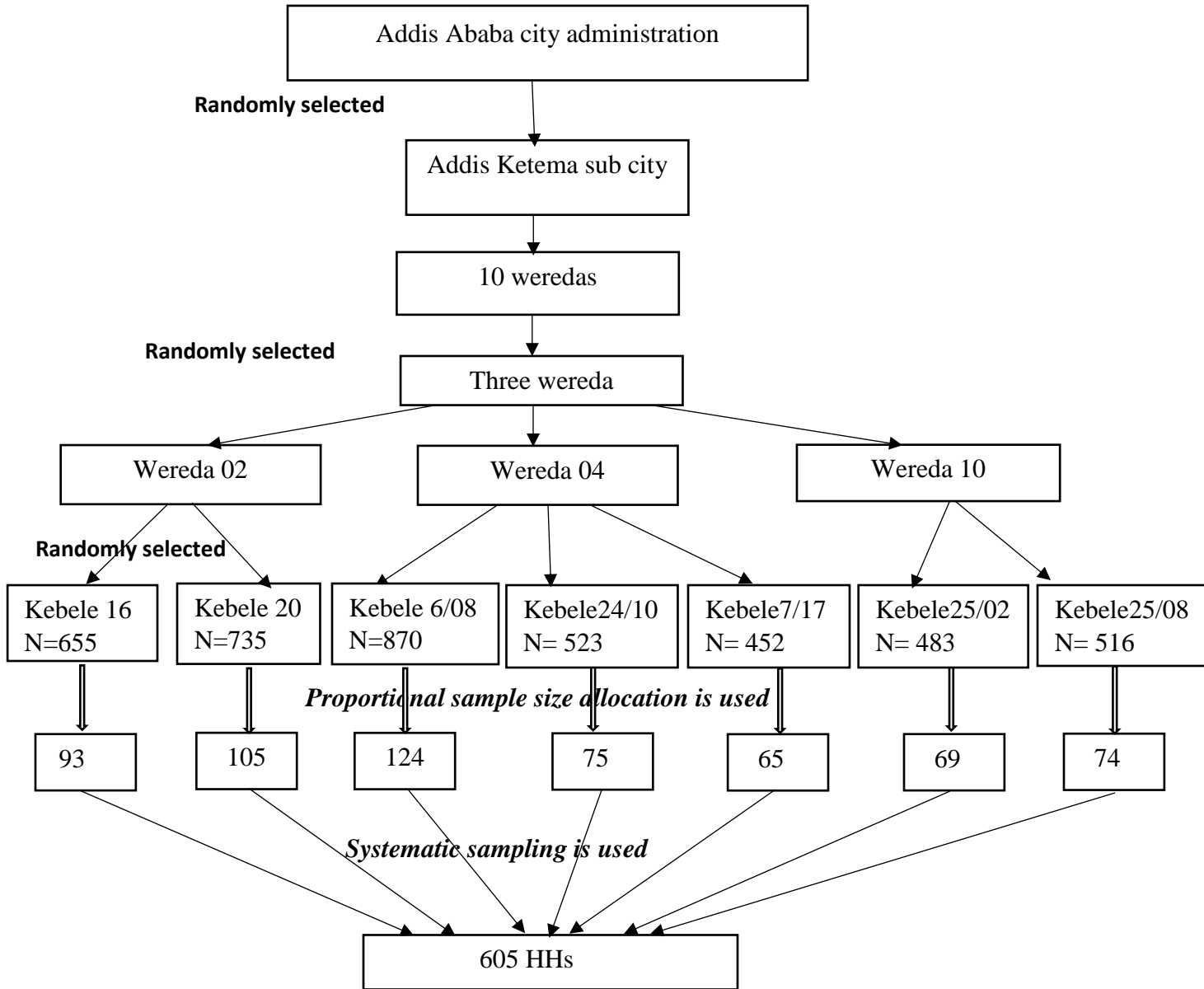


Figure 2: Schematic presentation of sample size allocation in Addis ketema sub-city, Addis Ababa

4.7 Data collection tools

4.7.1. Quantitative data collection tool

A structured interviewer-administered questionnaire with open and closed-ended questions was used for collecting quantitative data. The questionnaire was adapted from knowledge assessment and health communication evaluation literatures to collect data on socio-demographic and household status, source of health information, exposure of messages and knowledge about cholera. The knowledge assessment section assessed about the causes, symptoms, mode of transmission, treatment options, prevention methods, severity and susceptibility for cholera. The questionnaire initially was prepared in English and then translated into Amharic language. The final developed questionnaire was pretested on 5% of sample size one week before data collection on unselected Kebeles. Some adjustment was done to the questionnaire to improve its understandability and clarity.

4.7.2. Qualitative data collection tool

For qualitative data collection key informant & In-depth interview guides and checklist were used. The key informant interview guide was prepared based on the CDC crisis and emergency risk communications manual (CERC) and used to explore the risk communication process. The In-depth interview guide is prepared to evaluate if the emergency communication materials are understandable, attractive, acceptable and persuasive. Both interview guides were prepared in English and then translated to Amharic.

The checklist was used to evaluate the quality of materials using the modified CDC clear communication index score. The Clear Communication Index provides a set of research-based criteria to develop and assess public communication products. It includes 13 items in four major parts. The index assessed materials in 6 areas which include Main Message, Call to Action, language, Behavioral Recommendations, Numbers and Risk. ⁽⁴⁷⁾

4.8 Data collection procedure

4.8.1. For Quantitative data

Twelve experienced health extension workers were participated as a data collectors. Data was collected with face to face interview and two supervisors were supervised the data collectors. Training was given by principal investigator for data collectors and supervisors for one day before the data collection period in every wereda. The training was focused on the objective of the study, detail contents of data collection tools and procedures. The objective of the study was explained for respondents and informed consent was obtained. After data collection, the data collectors submitted the questionnaire for supervisors daily and then the supervisors submitted to the principal investigator on time.

4.8.2. For Qualitative data

Both interviews were conducted by the primary investigator using the interview guides and informed written consent was taken before conducting the interview. All the interview were conducted in Amharic. The interviews were recorded using tape-recorder and then transcribed verbatim and later translated into English for analysis.

4.9 Operational definition and measurements

Knowledge: knowledge about cholera was the dependent variable. Knowledge was assessed by questions focused on cholera causes, symptoms, mode of transmission, prevention methods, severity of cholera & susceptibility for cholera. An individual who answered for the question items correctly was considered as having knowledge about cholera. The correct answers for each knowledge item questions were taken based on WHO recommendation. The knowledge items were added together to had a composite score of total knowledge score and treated as continuous variable. The scoring range of the knowledge item questions was between 0 (minimum) to 34 (maximum). It was calculated by adding the scores of items and if the calculated knowledge composite score is high it is considered as they have high knowledge about cholera and for low composite score, they have low knowledge for cholera.

Exposure of cholera message: - if individuals see/hear messages related to cholera and its prevention for the past 1 year through mass media/ printed materials.

Exposure of outbreak information: - if individuals see/hear messages related to cholera outbreak for the past 1 year through mass media/ printed materials.

Quality of HC materials: - printed health communication materials were evaluated using CDC clear index score. A material which scores 90 or above based on clear communication index score is considered to be easily understandable and can be used by the audience.

4.10 Study variables

4.10.1. Dependent variable

- Knowledge about cholera

4.10.2. Independent variables

- Socio-demographic & economic status of respondents :- Age, Sex, religion, marital status, educational status, occupation, monthly income, family size, availability of TV/Radio
- Exposure of message

4.11 Data processing and analysis

4.11.1. Quantitative data

The quantitative data were checked for its completeness and consistency. Then, data were coded, checked for clarity and entered into Epi data version 3.1 to check and minimize data entry errors. After cleaning, the data were exported to SPSS version 25 for further analysis. Descriptive statistics were presented with mean, standard deviation, frequency and percentage. Chi-square test, independent sample t-test and One-way ANOVA was carried out to see relationship among the variables. The internal consistency among the knowledge items was measured using Cronbach's alpha (α) and was reported greater than 0.60.

Linear regression analysis was used to determine the relationship between the outcome and each independent variables after checking the assumptions. The assumption was assessed using a histogram, linearity by probability plot, and the presence of relationship by scatter plot. After checking the assumptions, simple linear regression was done and Independent variables having P-value of <0.25 in bivariate analysis were entered to multiple linear regressions to control potential confounders.

The summary measures of the estimated unstandardized and standardized regression coefficient (β) with 95% confidence interval were presented and P-value less than 0.05 was used to declare statistical significance. R-square and adjusted R-square (Adj.R²) values were used to assess the goodness of fit of the model.

4.11.2. Qualitative study

The qualitative data were analyzed using thematic analysis. Analysis of qualitative data started and done simultaneously with data collection. Audio recorded interviews were listened repeatedly, transcribed verbatim and translated into English by the interviewer. After transcription, separate code books were developed for both interviewed data and coding and categorization were done with Open Code version 4.02 software. First, relevant words and phrases from transcribed data were used to form codes, and then identified codes were categorized based on their similarities and relation to the objective of the study. Relevant quotations from participants' expressions was used in the presentation of study.

4.12 Data quality control

To maintain data quality, questionnaire and interview guides were well-designed and pre-test was done before actual data collection to ensure simplicity and consistency of the questionnaire. Training was given for data collectors & supervisors on the objectives, contents of the questionnaires, on maintaining confidentiality and privacy of the study subjects. The collected data were reviewed daily by the principal investigator for its completeness, accuracy, and clarity and re-checked for its consistency and completeness before exporting to software. Data was entered into Epi Data entry software to increase data quality management and then exported to SPSS 25.0 for the statistical analysis.

For the qualitative data, note taking, cross-checking and data checking with advisors and peers were done to ensure the dependability of the study. Transferability of the study was assured by selecting participants purposely who fit the study and feedbacks from colleagues and advisors were used to increase the credibility of the study.

4.13 Ethical Consideration

Ethical clearance and approval was obtained from the ethical committee of Addis Ababa University (AAU), college of health sciences school of public health and Addis Ababa public health research and emergency directorate. After that letter of cooperation was written for Addis ketema sub-city health bureau, MOH and EPHI. And finally, letter of cooperation was written for each wereda health office from Addis ketema sub-city health bureau.

Both oral and written informed consent was obtained from each study participant and all participants were informed about the purpose, risk, benefits and their right for a decision on participating in the study. All the information collected from the study participant was made confidential.

4.14 Dissemination of Result

The results of this study will be disseminated for Addis Ababa University College of Health Science, School of public health and department of behavioral health science unit. It will be also shared with Addis Ababa Public health research and emergency management directorate, MOH and EPHI. Furthermore, efforts will be made to submit the manuscript of the research to health communication journals for possible publication.

5 Result

5.1 Quantitative study result

5.1.1 Demographic and socio-economic characteristics of participants

5.1.1.1 Socio-demographic characteristics of respondents

The study was conducted among adults living in Addis ketema sub-city A.A. In this study, among the total of 605 study participants completed response was obtained from 582 participants with the response rate of 96.1%. The mean age of participants was 39.1 with (SD \pm 9.86). Four hundred forty-three (76.1%) participants were females and 23.9% of them were males. Out of the participants, 391 (67.2%) were married, 272 (46.7%) were orthodox and 156 (26.8%) of them were Muslim. Regarding educational status, 164 (28.2%) participants attained primary school, 142 (24.4%) attained secondary school and 116 (19.9%) of them were able to read and write. According to the occupational status of the participants, 206 (35.4%) were housewives, 24.1% were a private employee and 13.7% were government employees. The mean income was 2678.36 ETB with SD of 1774.80.

Table 1: Socio-demographic characteristics of study participants in Addis Ketema sub-city, Addis Ababa, Ethiopia, 2020.

Variables	characteristics	Frequency (N=582)	Percentage (%)
Age in years	20-34	244	41.9
	35-49	261	44.8
	50-64	77	13.2
Sex	Male	139	23.9
	Female	443	76.1
Religion	Muslim	156	26.8
	Orthodox	272	46.7
	Protestant	127	21.8
	Catholic	27	4.6
Marital status	Single	88	15.1
	Married	391	67.2
	Divorced	26	4.5
	Widow	77	13.2

Educational status	Unable to read and write	64	11.0
	Able to read and write	116	19.9
	Primary school	164	28.2
	Secondary school	142	24.4
	Technical	57	9.8
	University/higher education	39	6.7
Occupation	Government employee	80	13.7
	Private employee	140	24.1
	Merchant	72	12.4
	Daily laborer	21	3.6
	Housewife	206	35.4
	Student	11	1.9
	Other (includes unemployed)	52	8.9

5.1.1.2 Household characteristics of respondents

The highest proportion of households 427 (73.4%) consisted of 2 to 5 family members and 26.6% of the households consisted of more than 6 members. Regarding the source of drinking water, 353 (60.7%) of the households use unboiled tap water, 22.2% of them use filtered water and 10.7% of them use boiled tap water. More than half of the households 299 (51.4%) use shared (public) toilet and 29.4% of households had pit latrine with a cement slab. It was also showed that only a small proportion of the households (2.2%) had no toilet. In the majority of households, 407(69.9%) handwashing water and soap were not available near the toilet. On the availability of TV and Radio, the majority of respondents 96.7% have functional TV and 45.4% of them have functional radio.

Table 2: Household characteristics of study participants in Addis Ketema sub-city, Addis Ababa, Ethiopia, 2020

Variables	Characteristics	Frequency (N=582)	Percentage (%)
No of individuals in the house	2-5 members	427	73.4
	≥6 members	155	26.6
Source of drinking water	Piped water not boiled	353	60.7
	Piped water boiled	62	10.7
	Filtered water	129	22.2
	Bottled/packageged water	13	2.2
	Other	25	4.3
Type of toilet	Pit latrine with cement slab	171	29.4
	Pit latrine without cement slab	78	13.4
	Flush connected to septic pits	21	3.6
	Shared or public toilet	299	51.4
	No toilet or open defecation	13	2.2
Availability of water and soap near the toilet	Yes	175	30.1
	No	407	69.9
Availability of TV	Yes	563	96.7
	No	19	3.3
Availability of radio	Yes	264	45.4
	No	318	54.6

5.1.2 Exposure of cholera messages

Respondents gave multiple responses regarding the source of health information. TV got the highest rate 521(89.5%) followed by Health extension workers 36.3% and Radio 29.0%. Obtaining health information from other health professionals and Social media was 19.4% & 14.9% respectively.

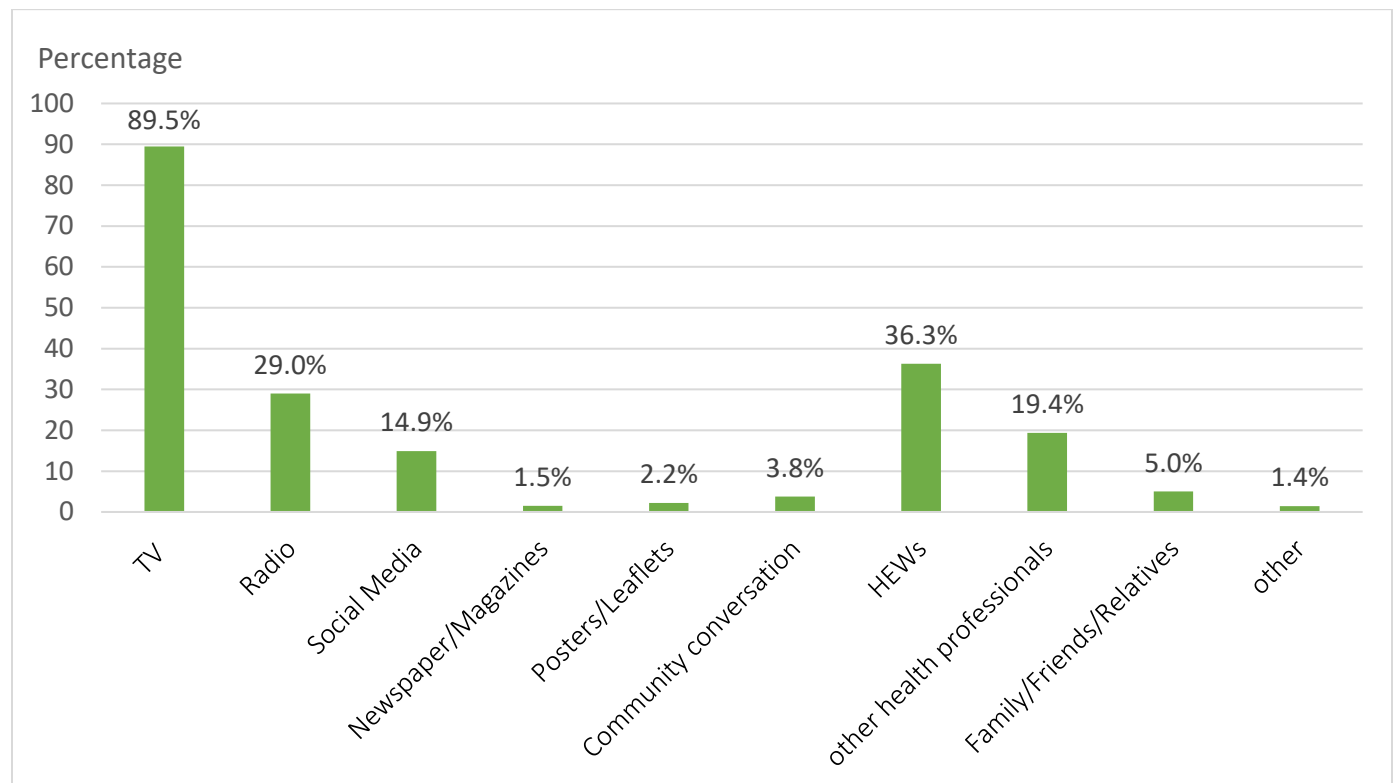


Figure 3: Sources of health information among study participants in Addis Ketema sub-city, Addis Ababa, Ethiopia, 2020

Respondents who watch television daily was found to be high at 92.8%. Respondents using social media on a daily base were found to be 14.3% and respondents who didn't use social media were 70.6%. On the other hand, respondents who listen to Radio daily were less compared to social media users at 13.1% and 59.6% of them didn't listen at all.

Among respondents who had a TV (563), 540 of them watch regularly. On the contrary, it was found that among individuals who had a radio (264), only 76 respondents listen regularly.

From the total of respondents, 418(71.8%) have been exposed to cholera/AWD messages in the past one year. This study showed that the majority of respondents 326 (78%) seen those messages from TV, 45.5% of them got from HEWs and 20.6% of them listened from Radio.

A chi-square test was conducted to see the association between exposure to the cholera messages and availability of TV and radio in the households. It was found that exposure to cholera message has a significant association with ownership of TV ($X^2=15.71$, $p<0.001$) but had no significantly associated with the availability of radio. The exposure level of messages among respondents watching TV daily was 73.3% and 77.6% for regular radio listeners. The Exposure level was also found to be high among the female respondents (75.8%) compared to males (59.0%).

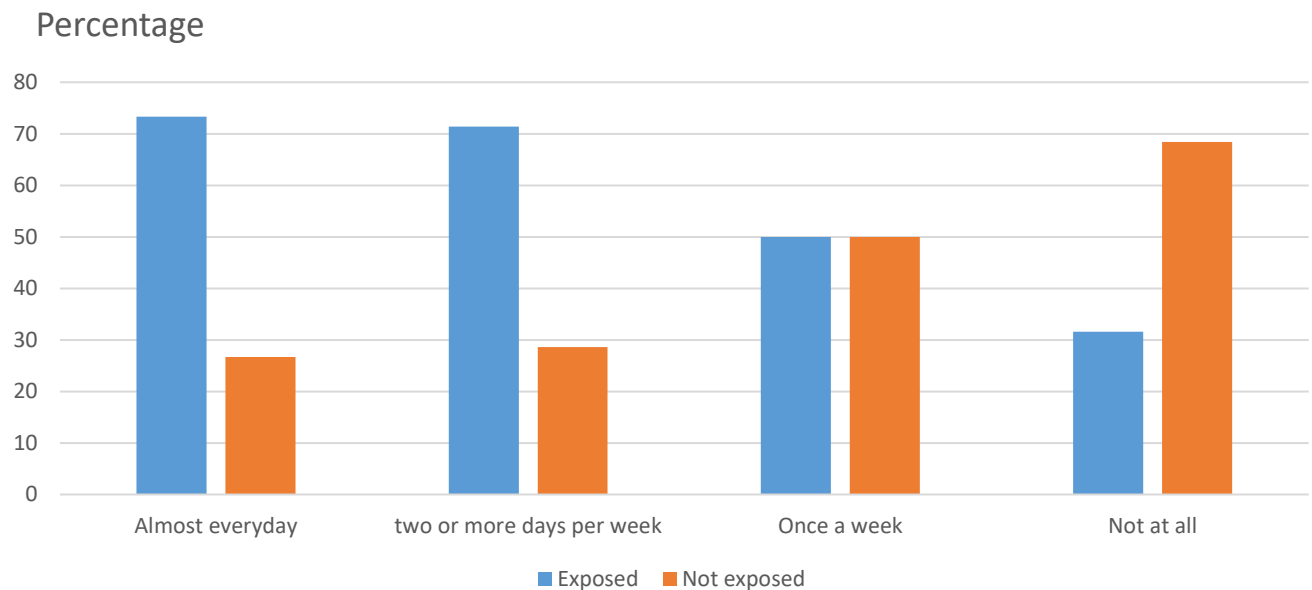


Figure 4: Exposure of cholera message and TV viewership among respondents, in Addis Ketema sub-city, Addis Ababa, Ethiopia, 2020

Respondents were also asked about information related to the cholera outbreak in Addis Ababa and it was found that 307 (52.7%) of the respondents heard/seen information about the cholera outbreak in Addis Ababa. Whereas, 47.3% of them didn't get any information about the outbreak even though they were living in a high cholera-prevalence area with the last outbreak recorded in 2019. Among the respondents exposed to information related to the cholera outbreak, (67.1%) of them seen from TV followed by HEWs (34.9%) and from Radio with (20.8%).

Among the transmitted cholera related messages, respondents mostly recall "Proper handwashing" with the highest rate at 60.0%. The other main messages recalled by respondents who were exposed to cholera messages were "Boiling of water" and "keeping toilet clean" at 50.0% and 25.6% respectively.

Table 3: Main messages recalled by respondents in Addis Ketema sub-city, Addis Ababa, Ethiopia, 2020

Messages	N	Percentage
About proper hand-washing	251	60.0
Boiling of water	209	50.0
Keeping toilet clean	107	25.6
Eating food while it	59	14.1
Cholera causes watery diarrhea and repeated vomiting	44	10.5
Washing vegetables and fruits	39	9.3
Safe food hand	35	8.4
How to use ORS	27	6.5
Seeking health care during symptoms	8	1.9
How to treat diarrhea at home	4	1.0

**Multiple answers possible*

5.1.3 Knowledge about Cholera

This section assessed the respondent's knowledge about cholera. Respondents were asked about the causes, symptoms, mode of transmission, treatment option, severity & susceptibility of cholera, and prevention methods for cholera. The overall knowledge score for cholera was moderate with mean 14.72 and SD ± 4.02 out of 34 knowledge scores. The knowledge score for each knowledge items and descriptive analysis result is reported with four section as follow.

5.1.3.2 Knowledge about causes & symptoms of cholera

The knowledge score for causes of cholera was range (0-5). The overall knowledge score for cholera causes was low with mean 1.31. Among the total respondents, 49.1% of them mentioned at least one cause for cholera and 28.9% of them mentioned two cholera causes. Whereas, 14.1% of the respondents didn't mentioned the correct causes for cholera. Among the respondents who correctly answered the causes for cholera, majority of them 60.0% indicated "drinking contaminated water" and 27.8% of them indicated "unhygienic disposal of excreta and refuse" as a cause for cholera.

The mean knowledge score for cholera symptoms was 1.59 out of 2, which indicates respondents have moderate to high knowledge on common symptoms for cholera. More than half of the respondents (66.2%) mentioned the two common symptoms for cholera, 26.8% of them mentioned one common symptom and 7.0% of them didn't mention the common symptoms for cholera.

According to descriptive result, majority of them (84.4%) correctly responded that “Watery diarrhea” as a common Symptom for cholera followed by “repeated vomiting” with 74.7%. as shown in the table below.

Table 4: Knowledge items responses on cause and symptoms of cholera among respondents in Addis Ketema sub-city, Addis Ababa, Ethiopia, 2020

Variable	Items	N*	Percentage (% yes responses)
Cause of cholera	Drinking contaminated water	349	60.0
	Unhygienic disposal	162	27.8
	Poor hygiene	150	25.8
	Eating rotten food	87	14.9
	Unwashed fruits and vegetables	52	8.9
	Don't know	55	9.5
	Other (Rain, cold climate...)	28	4.8
Symptoms of cholera	Watery diarrhea	491	84.4
	Repeated vomiting	435	74.7
	Fever	85	14.6
	Tiredness	48	8.2
	Loss of appetite	29	5.0
	Weight loss	24	4.1
	Dry mouth	5	0.9
	Don't know	34	5.8
	Other (headache, shivering...)	33	5.7

* Multiple responses possible, N=582

5.1.3.3 Knowledge on mode of transmission and treatment for cholera

The knowledge score on mode of transmission of cholera was range from 0 to 4. The mean score for knowledge on mode of transmission was 0.82. This indicates that, respondents have low knowledge on mode of cholera transmission. Among the total respondents, 57.0% of them correctly answered that cholera can be transmitted from person to person. Out of these respondents 35.2% of them indicated one mode of transmission and only 4% of them indicated more than two MOT for cholera.

According to the descriptive result, 20.8% of the respondents correctly answered that cholera can be transmitted through contact with infected person body fluid, 14.2% of them mentioned handshaking of infected person, 10.2% of them mentioned faeco-oral transmission, and 29.2% of them indicated that they didn't know the mode of transmission for cholera.

Regarding knowledge on cholera treatment, the score was range from 0 to 7. The mean knowledge score on cholera treatment was 4.09 which indicates a moderate knowledge. Among the total respondents, 87.8% of them correctly answered that cholera is a curable disease. When respondents asked about what they think they can do for themselves or family members with watery diarrhea and vomiting, majority of them choose going to health center (89.2%) followed by using homemade sugar-salt solution (26.3%) and using ORS (14.8%). Regarding the treatment place for cholera majority of the respondents 97.6% responded to health facility. On the treatment options 71.8% of them indicated going to health center and 22.3% of them indicated using ORS as summarized on the table 5.

Table 5: Knowledge items responses on MOT and treatment of cholera among respondents in Addis Ketema sub-city, Addis Ababa, Ethiopia, 2020

Variables		Questions items	N*	Percentage (% yes responses)
Knowledge on cholera transmission	Person to person transmission	Yes	332	57.0
		No	250	43.0
	Mode of transmission	Through contaminated food/water by infected fecal matter	34	10.2
		Sharing of toilet facilities	105	31.6
		Handshaking of infected person	47	14.2
		Contact with infected person body fluid	69	20.8
		Through air	35	10.5
		Don't know	97	29.2
Knowledge on cholera Treatment	Cholera is curable	Yes	511	87.8
		No	26	4.5
		Don't know	45	7.7
	Treatment place	Health facility	568	97.6

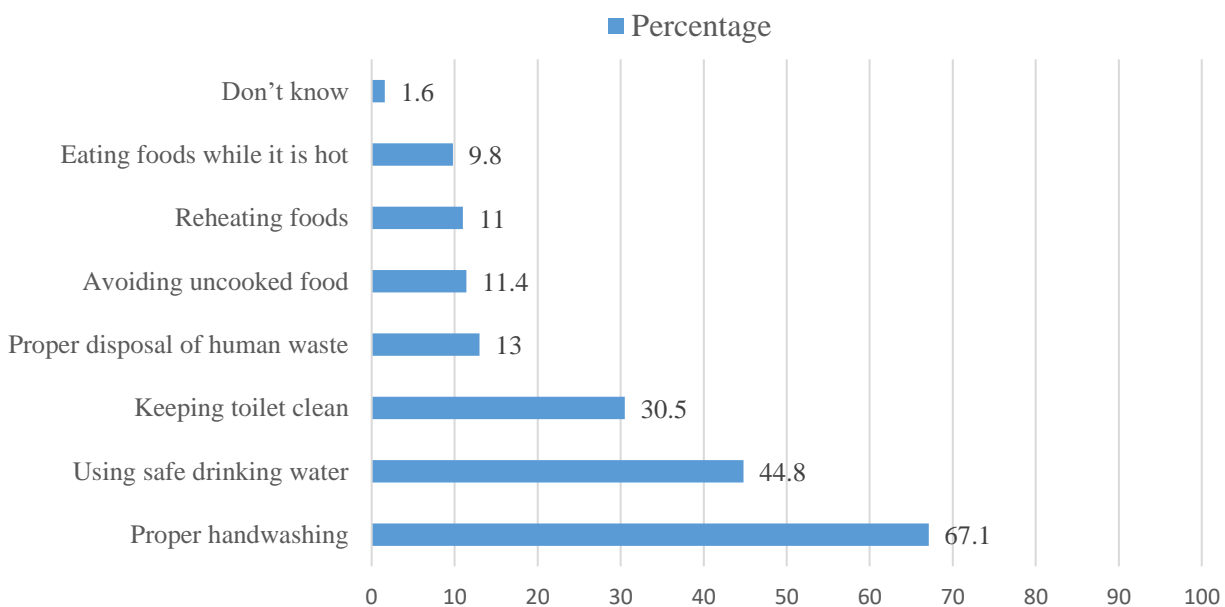
	Home	41	7.0
	Don't know	11	1.9
Treatment options	Using ORS	130	22.3
	Going to health center	418	71.8
	Traditional medicines	15	2.6
	Prayer	22	3.8
	Don't know	57	9.8

N=582

* Multiple responses possible

5.1.3.4 Knowledge on cholera prevention

The knowledge score on cholera prevention ranged from 0 to 9. Overall, knowledge on cholera prevention was low with mean 2.93 out of maximum scale score of 9. Majority of the respondents 570 (97.9%) correctly answered that cholera is a preventable diseases. However, out of these respondents 24.2% of them were able to indicate more than three cholera prevention methods. According to the descriptive analysis 67.1% of them mentioned proper handwashing followed by using safe drinking water 44.8% as cholera prevention methods.



*Multiple responses possible, N=570

Figure 5: Responses on cholera prevention methods among respondents in Addis Ketema sub-city, Addis Ababa, Ethiopia, 2020

5.1.3.5 Knowledge on susceptibility and severity of cholera

The mean knowledge score for cholera susceptibility was 0.47 out of one item. Respondents have moderate knowledge on cholera susceptibility. Among the total respondents, 46.7% of them answered the correct answer that cholera can affect everyone. 36.4% of them stated that cholera affects children and 24.1% of them respond that cholera affects older people.

On the other hand, the mean knowledge score for severity of cholera was 3.48 out of six items which indicates moderate to high knowledge. This was measured using prompted recall measure. When respondents asked about the seriousness of cholera if left untreated, among the given 6 items 34.2% of them correctly answered 4 items and 16.3% of them were able to indicate the six items correctly. Among the total respondents, majority of them 93.8% indicated that cholera may lead to body weakness, 44.3% of them indicated unconsciousness and only 35.9% of them stated that cholera may lead to death.

Table 6: Summary of knowledge scores among respondents in Addis Ketema sub-city, Addis Ababa, Ethiopia, 2020

Knowledge Items	Total number of correct items	Mean	Standard deviation	Min	Max	Score Range
Knowledge on cause of cholera	5	1.31	0.833	0	5	5.00
Knowledge on symptoms	2	1.59	0.619	0	2	2.00
Knowledge on MOT	4	0.82	0.859	0	4	3.00
Knowledge on treatment	7	4.09	1.060	0	7	7.00
Knowledge on prevention	9	2.93	0.935	0	9	6.00
Knowledge on susceptibility	1	0.47	0.499	0	1	1.00
Knowledge on severity	6	3.48	1.601	0	6	6.00

Total mean score M= 14.72, SD±4.02, Cronbach's alpha =0.689, N= 582

5.1.4 Relationship between Knowledge and independent variables

Since the distribution of the variables are normally distributed, a parametric test is used to see the mean difference between the independent variables with knowledge. An independent samples t-test and One-way ANOVA was conducted to determine if there is a difference in mean score. An independent sample t-test was done to determine the mean score for two groups of independent variables and One-way ANOVA was conducted to see the difference among the mean of the three and above groups of independent variables to the knowledge for cholera.

According to an independent t-test analysis, there was a statistically significant difference between male and female respondents in mean knowledge scores for cholera, ($t(580) = -2.988$, $P < 0.005$, 95% CI = -1.92347, -.39760). The mean values indicate that female respondent had more knowledge on cholera ($N = 443$, $M = 15.0023$) than males ($N = 139$, $M = 13.8417$). An independent samples t-test among exposed and non-exposed respondents for cholera messages found that, there was a significant difference in score between the two groups, ($t(580) = 11.514$, $P < 0.001$, 95% CI = 3.19633, 4.51105). The mean knowledge score among the exposed group ($N = 418$, $M = 15.8110$) was higher than the non-exposed ($N = 164$, $M = 11.9573$).

Table 7: Summary of an independent samples t-test on knowledge with socio-demographic variables and exposure level among respondents in Addis Ketema sub-city, Addis Ababa, Ethiopia, 2020

Variables	N	Mean	SD	t-value	p-value	95% CI		Mean difference	
						Lower	Upper		
Sex	Male	139	13.841	4.06	-2.988	0.003	-1.923	-0.397	-1.160
	Female	443	15.002	3.97					
Cholera messages	Exposed	418	15.811	3.60	11.514	<0.001	3.196	4.511	3.853
	Not-exposed	165	11.957	3.71					
Outbreak information	Exposed	307	16.146	3.58	9.702	<0.001	2.399	3.617	3.008
	Not-exposed	275	13.138	3.89					

N=number of respondents, SD=standard deviation

One-way ANOVA was done for the socio-demographic characters with more than two categories. The One-way ANOVA analysis indicates that educational status, occupational status and marital status of participants had a significant effect on knowledge for cholera. The educational status of participants had a significant effect on knowledge for cholera with, (F (5,576) =10.725, mean square =160.15, P < 0.001). The mean value indicate that participants with higher education (N= 39, M= 16.76), secondary education (N=142, M= 16.16) and technical level (N=57, M= 15.15) had more knowledge than primary education (N= 164, M= 14.25), able to read & write (N=116, M=13.51) and unable to read & write (N= 64, M= 13.31).

The result of post hoc test indicate that, participants with higher educational level and secondary education level had a significant mean difference from participants who are unable to read & write, who are able to read & write and primary educational level but not significant with technical education level.

According to One way ANOVA analysis, occupational status of participants had a significant effect on cholera knowledge with, (F (6,575) =5.403, mean square =83.636, P < 0.001). The mean value difference shows that, students (N= 11, M=16.63), government employee (N= 80, M= 16.47) and private employee (N= 140, M= 15.02) had more knowledge than housewives (N= 206, M= 14.55), others (includes unemployed) (N= 52, M=13.78), merchants (N= 72, M= 13.52) and daily laborer (N=21, M= 13.19). The post hoc comparison revealed that government employee had a significant mean difference from the merchants, housewives, daily laborer and others (includes unemployed). But not significant with private employee and students.

Table 8: Summary of one-way ANOVA for socio-demographic variables with knowledge on cholera among the among respondents in Addis Ketema sub-city, Addis Ababa, Ethiopia, 2020

Variables	F	Mean square	P-value
Educational status	10.275	160.15	P<0.001
Occupational status	5.403	83.63	P<0.001
Marital status	4.871	77.28	P<0.005

5.1.5 Linear regression Analysis

After checking the assumptions of linear regression analysis, both simple and multivariable linear regression was done to show the significance of each independent variable in predicting knowledge for cholera.

5.1.5.2 Simple linear regression

The socio-demographic variables, household characteristics and exposure level for cholera message & outbreak information were analyzed in bivariate analysis. From the socio-demographic variables & HH characteristics, age, sex, marital status, educational status, occupation and availability of TV were significant at different degree of $P < 0.05$. But religion and availability of radio were not significant in predicting knowledge for cholera. The significance of exposure in the prediction of knowledge for cholera was also assessed by bivariate regression analysis. It was found that most source of health information, frequency of watching TV, frequency of using social media, exposure for cholera message and outbreak information were significant in predicting knowledge for cholera. (*Table 10 & 11*)

5.1.5.3 Multiple linear regression

Multivariable linear regression analysis was used to see the effect of the independent variables on knowledge for cholera. The final regression model indicated that 44.5% of the variability of knowledge for cholera was explained by the independent variables ($R^2=0.445$, $Adj.R^2=0.403$, $F\text{-change} = 10.57$, $P<0.001$). On checking multicollinearity effect between the independent variables frequency of watching TV were found to have collinearity with availability of TV and it was excluded from the multivariable regression model analysis.

According to the multivariable analysis, sex of respondents ($\beta = 1.298$, $P=0.001$, $95\%CI=0.523$ to 2.074), primary education ($\beta=1.186$, $P=0.02$, $95\%CI=0.186$ to 2.187), secondary education ($\beta = 2.670$, $P<0.001$, $95\%CI=1.554$ to 3.786), technical ($\beta = 2.306$, $P=0.001$, $95\%CI=0.979$ to 3.632), higher education ($\beta = 2.926$, $P=0.001$, $95\%CI=1.281$ to 4.571), private employee, ($\beta = -1.204$, $P=0.009$, $95\%CI= -2.104$ to -0.303), merchants ($\beta = -1.778$, $P=0.001$, $95\%CI= -2.861$ to -0.694), housewives ($\beta = -1.154$, $P=0.014$, $95\%CI= -2.074$ to -0.234), others (unemployed) ($\beta = -1.963$, $P=0.001$, $95\%CI=-3.130$ to -0.797), those who gets health information from TV ($\beta = 1.849$, $P<0.001$, $95\%CI=0.830$ to 2.869), health information from HEW ($\beta = 0.911$, $P=0.006$, $95\%CI = 0.256$ to 1.566), exposure for cholera messages ($\beta = 3.077$, $P<0.001$, $95\%CI = 2.420$ to 3.733), and

exposure for outbreak information ($\beta = 1.644$, $P < 0.001$, 95% CI = 1.058 to 2.231) were statistically significant with knowledge for cholera. This result implies that knowledge for cholera increased by 1.298 units among female respondents compared to males. The effect of educational status on knowledge will increase by 1.186 units for those with primary education, 2.670 units for those with secondary education, 2.306 units with technical education & 2.926 units with those with higher education level as compared to those who are not able to read & write.

On the other hand, the effect of occupational status on knowledge for cholera will decrease by 1.204 units for private employee, 1.778 units for merchants, 1.154 units for housewives and 1.963 units for others (including unemployed) compared to government employees. The effect of source of health information on knowledge for cholera increased by 1.849 units for those who gets health information from TV and 0.911 units for those who gets health information from HEWs as compared to others sources of health information. The effect of exposure for cholera messages on knowledge for cholera increased by 3.077 units among exposed group compared to non-exposed. Similarly, the effect of exposure for outbreak information on knowledge for cholera increased by 1.644 units among exposed group compared to non-exposed.

Table 9: Predictors of knowledge for cholera on multiple linear regression analysis among, respondents in Addis Ketema sub-city, Addis Ababa, Ethiopia, 2020

Variables (N=582)	Value	B	β	P-value	95% CI	
					Lower	Upper
Age in Years		-0.007	-0.017	0.713	-0.044	0.030
Sex	Male (ref)					
	Female	1.298	0.138	0.001*	0.523	2.074
Religion	Catholic (ref)					
	Muslim	0.029	0.003	0.967	-1.332	1.389
	Orthodox	0.065	0.008	0.922	-1.233	1.362
	Protestant	0.565	0.058	0.417	-0.803	1.933
Marital status	Married (ref)					
	Single	-0.044	-0.004	0.925	-0.968	0.879
	Divorced	-0.112	-0.006	0.865	-1.406	1.182
	Widowed	-0.731	-0.062	0.103	-1.610	0.149
Educational status	Unable to read & write (ref)					
	Able to read & write	0.347	0.035	0.489	-0.638	1.333
	Primary	1.186	0.133	0.020*	0.186	2.187
	Secondary	2.670	0.285	P<0.001*	1.554	3.786
	Technical	2.306	0.171	0.001*	0.979	3.632
Occupational status	Higher/university	2.926	0.182	0.001*	1.281	4.571
	Gov't employee (ref)					
	Private employee	-1.204	-0.128	0.009*	-2.104	-0.303
	Merchant	-1.778	-0.146	0.001*	-2.861	-0.694
	Daily laborer	-1.515	-0.070	0.066	-3.129	0.099
	Housewife	-1.154	-0.137	0.014*	-2.074	-0.234
	Student	-1.43	-0.048	0.182	-3.531	0.674
Other	-1.963	-0.139	0.001*	-3.130	-.797	
Functional TV	Yes	1.360	0.060	0.126	-0.385	3.104
	No (ref)					
Functional radio	Yes	0.047	0.006	0.893	-0.644	0.739
	No (ref)					

Source of health information	Television	1.849	0.141	P<0.001*	0.830	2.869
	Radio	0.057	0.006	0.878	-0.674	0.789
	Social media	0.774	0.069	0.169	-0.330	1.877
	Newspaper/magazine	1.397	0.043	0.209	-0.785	3.579
	Poster/Leaflets	0.372	0.014	0.684	-1.423	2.168
	Community conversation	0.836	0.040	0.239	-0.558	2.230
	HEWs	0.911	0.109	0.006*	0.256	1.566
	Other health professionals	0.658	0.065	0.064	-0.038	1.354
	Friends/family	0.636	0.034	0.306	-0.584	1.855
Frequency of listening radio	Everyday	0.218	0.018	0.657	-0.743	1.179
	Two or more days per week	0.934	0.063	0.087	-0.136	2.004
	Once a week	0.315	0.028	0.493	-0.588	1.218
	Less than once a week	0.893	0.043	0.212	-0.511	2.297
	Not at all (ref)					
Frequency of using Social media	Everyday	0.398	0.035	0.504	-0.772	1.569
	Two or more days per week	0.518	0.039	0.333	-0.532	1.567
	Once a week	1.123	0.060	0.088	-0.168	2.415
	Less than once a week	1.377	0.020	0.545	-3.084	5.838
	Not at all (ref)					
Exposure for cholera message	Yes	3.077	0.344	P<0.001*	2.420	3.733
	No (ref)					
Exposure for outbreak information	Yes	1.644	0.204	P<0.001*	1.058	2.231
	No (ref)					

β = Unstandardized regression coefficient, β = Standardized regression coefficient

*Statistically significant = $p < 0.05$, ref. = Reference category

$R^2 = 0.445$, Adjusted $R^2 = 0.403$, F change = 10.570, $P = < 0.001$

5.2 Qualitative study result

5.2.1 Quality of cholera spots prepared for cholera outbreak (In-depth Interview result)

The findings of this section are presented with six categories including participant's socio-demographic characteristics, comprehension, self-involvement, attraction, acceptance, and call to action. Three cholera spots (One TV spot & two radio spots were used for the IDI)

Participant's socio-demographic characteristics

Study Participants were adults who were living in Addis ketema sub-city. A total of seven participants who were selected purposively were interviewed and asked about their opinion on spots prepared for cholera prevention. Participant's age range was from 20-58 years and four of them were females. Among the participants, two of them were diploma holders, two were college students and three of them drops out secondary education. Three participants were private employee, one was government employee, two of them were students and one was a housewife.

Table 12: Background information of IDI participants on quality of cholera spots in Addis Ketema sub-city Addis Ababa, Ethiopia, 2020

Participants' characteristics	Number	
Age	20-39	5
	40-59	2
Sex	Male	3
	Female	4
Educational Status	Secondary	3
	Diploma and above	4
Occupation	Student	2
	Private employee	3
	Government employee	1
	Housewife	1
Marital Status	Single	3
	Married	4

Comprehension

In this category respondent's reflections on the presentation of the spots and their understanding of the messages were summarized. Almost all participants reported that the message was about cholera prevention and the importance of keeping personal hygiene. Most of them said that the messages teaches how to prevent cholera for the community.

"It is about cholera and the main thing it says that when cholera occurs we should go to the health center..." (IDI 6: 33yrs old female participant)

Another participant also reflects the following:

"I observed that it is an advertisement to teach the community about cholera." (IDI 4: 58yrs old male participant)

Majority of the participants reported that the messages transmitted on the spots were clear and easy to understand. They also mentioned that they got the message as a useful information.

"... I understand it well. The main thing I understand is protecting hygiene, not consuming raw foods...and we should eat vegetables after washing thoroughly, there is nothing difficult for me and everything is clear and useful. (IDI 1: 52yrs old female participant)

Self-involvement

In this section respondents reflect about the target audiences in which the message is directed for. Most of the participant stated that the message is directed for all people. The reason they mentioned was, the messages are prepared to decrease the spread of the disease and to promote prevention among the community as cholera is an infectious disease.

"It is for us, for our community and it is to prevent the disease, and to teach the people about handwashing and protecting their hygiene." (IDI 4: 58yrs old male participant)

Participants also mentioned that these messages are prepared for everyone due to poor practice in keeping personal hygiene and environment. On the other hand, few participants reflected that the messages were targeted for those people who are living in poor hygienic area.

"...I think it is prepared for us especially for those who are living in this area, because mostly the disease affects a community like this. Because we are living in a very sophisticated environment. I think it is for us." (IDI 1: 52yrs old female participant)

Attraction

Almost all of the participants declared that they liked the spots and messages transmitted. Most of them mentioned that they were attracted to the messages and how the messages were presented.

“Yeah, I like about the fluid that we can prepare at home. Because until I get a pharmacy I can prepare this solution at home and use it as they teach us.” (IDI 6: 33yrs old female participant)

Another participant also reflected as follow:

“Well, I like their tone when they talk and way of presenting the message...” (IDI 5: 24yrs old male participant)

Most of the participants reported that the messages were not new for them and they remembered that they hear those messages during the cholera outbreaks. Whereas, other participants claimed that they got new information from the spots.

“Um...most of us didn't know how to prepare ORS at home. So, the message teaches how to prepare a simple solution at home to replace fluid loss when diarrhea occurs. So, this gives me new information.” (IDI 2: 20yrs old female participant)

The other participant also said:

“There is nothing different. During that time this message was transmitted due to the outbreak and now it is disappearing. But as time passed we may forget this message. So, it helps me to remember this again...” (IDI 7: 35yrs old female participant)

Acceptance

In this section, it was tried to figure out if respondents have any different idea on the spots that they didn't accept and that may not be accepted by their community. Most of the respondents reported that the tone of the message was so fast and people with old age may not understand it well.

“For example, they were talking fast...and as I am young, I can understand the message easily, but this can be challenging for old aged peoples as they hear and understand slowly. I think the message is prepared for all so, it will be better if they talk a bit slowly.” (IDI 2: 20yrs old female participant)

One participant also reflected on the message presentation as follow:

“The first thing is the way of its presentation. For example, it is fast and maybe some peoples can’t hear it at fast. And the second one is I think it has some kind of classical music and thus it make it difficult to hear the message and I don’t think it will be helpful to get the main concept too.” (IDI 3: 39yrs old male participant)

Few participants also reflected that these messages should be transmitted consistently on regular base on a radio to be effective and the spots should be incorporated with full information about the disease rather than being specific on one topic. So that, they will be more informed and protect themselves.

“Based on this material, I think it will be useful for us if they also tell us about how cholera occurs, its cause, and how much it affects the community.” (IDI 6: 33yrs old female participant)

On accepting and understanding the message among the community members, most of the participants reported that others will understand and accept the messages as the way they do and they may not think differently. In contrary, few participant mentioned that there may be a difference on accepting and understanding the message in their community, as peoples think differently and have different opinion.

One participant described like this:

“...there may be some peoples who think that they may not be affected by this disease as they are living in urban areas, and they may think that cholera occurs only in rural areas. So, this type of peoples are may be careless and will not take care of themselves.” (IDI 5: 24yrs old male participant)

Call to Action

This section summarizes participant’s approach towards the recommended behaviors on the spots and benefits they may achieve from those desired behaviors. Participants were also asked if they were encouraged to share the messages with others in their community.

Almost all of the respondents reported that, the message recommended them to prevent themselves from cholera. Mostly, they mentioned that the message is asking them to keep hygiene, proper hand washing, and also to seek immediate health care when they have diarrhea and other symptoms.

“The message tells us that, we should take every protections to prevent ourselves from the disease. Um...especially before we prepare foods we should wash our hands appropriately and we should eat foods like meat and fish after cooking them well. And also I understand that to wash vegetables and fruits before we eat them.” (IDI 1: 52yrs old female participant)

Two participants said that the message encouraged them on how to prepare home solution easily to prevent fluid loss when diarrhea occurs.

“... I understand how to prepare a home solution with 6 spoon sugar, lemon, and water if someone is affected by diarrhea and vomiting, and when ORS is not available. And also we should go to the health center to see a Doctor while taking the solution.” (IDI 2: 20yrs old female participant)

All of the participant reflected that they are willing to share the message they hear for their neighbors and friends to protect them from the disease. They also believed that practicing these recommended behaviors will protect them from cholera and enables them to get a healthy life.

One participant reflected as follow:

“Being healthy...because it is for me if I protect myself, my family, and my surrounding will be prevented from the disease. And also drinking clean water and keeping toilets clean are very useful. Mainly, here in our area, we are living nearly together and it will be better if we hear those messages to keep our health.” (IDI 4: 58yrs old male participant)

5.2.1 The risk-communication process done for cholera outbreak (2019) in Addis Ababa (Key Informant interview result)

In this section, key informants who were working in the risk-communication team during cholera outbreak (2019) were interviewed about their experience on the whole risk-communication process. The findings were summarized with six major categories. Three participants were interviewed including one team coordinator and two team members from the risk-communication unit.

Risk-communication System

An emergency operation center (EOC) was launched by Ethiopian public health institute during the cholera outbreak. Participants mentioned that, as the surveillance team confirmed the outbreak, a cholera section was activated in the EOC. They also reported that the risk-communication team was working in the cholera section as a sub-unit for the emergency response.

“...there is a RC unit that I coordinate and it was founded as a unit starting from 2016 due to drought and other outbreaks during that time.” (KII 3: Team coordinator)

The national risk-communication and community engagement technical group involved different professionals both from the government and other partners. Some of them were health education professionals, media professionals and other social science professionals who have experience with health communication activities.

“Well, within the team there are media professionals, public relation professionals, health education and promotion experts, and also there are professionals from WHO and UNICEF emergency health communication development programs.” (KII 3: Team coordinator)

Preparation during the outbreak

The risk-communication unit was working based on an emergency preparedness response plan (EPRT) which was prepared at the national level. During the initial phase of the outbreak they prepared communication plan at national and regional level, because the outbreak was occurred in A.A and in all regions except Gambella. A separate plan was also prepared for A.A including detailed activities by involving different partners.

“...there were different organizations... what we did at first was, we had a partner mapping process as national and regional level. So, we will identify our partners and after we identified, we will plan together on which area they are going to help us for both the region and national levels. We were working by sharing each other.” (KII 1: Team member)

The main objectives of the risk-communication activities during the outbreak were creating awareness about cholera and enabling the community to prevent themselves from the outbreak.

“The first objective was to empower the community and enabling them to interact with protective behaviors. So that, they will be engaged and take responsibility to protect themselves.” (KII 3: Team coordinator)

During message development information for inputs were gathered from the surveillance team and by doing rapid assessments on the affected areas. In addition to this, message contents were developed by identifying the gap from previous materials which were prepared during other cholera outbreaks.

“..We had experience from the 2016 outbreak and we started by doing assessments on affected areas because the causes for the outbreak for every affected area were different. For example, the causes can be infected water from the river or it can be from a water pipe and also it can be contact with an infected person...so, we focused on the source of the causes and we prepared the messages based on our findings from the assessment.” (KII 2: Team member)

They also reported that rapid assessments were done in between the outbreak on two sub-cities in A.A. After identifying the preferred source of information in the community they have prepared revised materials. As participants reported, this communication materials were not pretested within the community due to the emergency situation.

“...after we draft the messages there will be In-house pre-testing. And sometimes we made a pre-test, but in situations like this due to the emergency we did In-house pre-testing like discussing with the technical working group. Then, we sum up the ideas and used them. We haven't done a full pre-testing due to the emergency.” (KII 1: Team member)

Message dissemination process

Prepared messages and other reports related to the outbreak was disseminated to the public using different approaches. The common way for transmitting the messages was sharing daily updates and new information using daily brief on radio and TV news. Press releases and press-conferences with higher officials and health professionals were also used to transfer messages on regular bases.

“We had a daily brief and a press release on media for daily case report and every Tuesday there was a press conference @ 10 am with a regular base. In addition to this, by preparing live programs on daily news we were transmitting new updates for the public and also media brief with experts were prepared on health-related TV programs like “Tenawo bebeto” and ‘Tena Yistelegne Ethiopia”. (KII 3: Team coordinator)

To ensure trust and credibility among the community information were announced early for the public using news and other media platforms.

“...yeah communicating first is the main thing in risk-communication. So, information and reports were combined and delivered early and daily at the time. Especially, every week on our press-release detailed information was transmitted on the media for the public and we tried to be trusted sources of information.” (KII 2: Team member)

Participant’s also reflected that they used all media to transfer their messages by giving trainings and orientation on how to communicate risk to the public. Both government and private channels were involved on message dissemination in A.A and at regional level. Channel preference assessment was also done at A.A to identify the media choice of peoples during the outbreak.

“Almost we used all media especially those with high coverage and audience including private channels. For example here in A.A children and their caregivers were choose Kana TV as their preferred channel. So, like this, we identified the channels and used media mix to display our messages.” (KII 3: Team coordinator)

Other means of channels including social media platforms were also used to reach the public. It was also mentioned that the high cost for broadcasting messages and using prime time were challenges on messages delivery.

“...we were paying for airtime to transfer our messages which was high costs. And it was so challenging for us because we should use a prime time to transmit our messages. For example, one of the prime time was lunch and dinner time in our case and most of the peoples were not happy to transmit our messages about acute diarrhea and vomiting at that time. So, we prepared a press-releases every week and the media professionals were coming and engaged with us.” (KII 2: Team member)

Community Engagement

The risk communication team was working on engaging the community on message preparation and other interventions using different social networks. They were preparing panel discussions with community members, In-house health educations, working with “Edir leaders” and other influential persons. In Addis Ababa, they were mainly focused on the most affected sub-cities. They tried to figure out the root cause of the outbreak in those sub-cities to take appropriate interventions.

“...we have conducted a rapid assessment on two selected sub-cities. Then, when we see the root causes for the outbreak, there was food contamination in some area. I remember the case for Addis Ketema sub-city was due to the Ramadan season many people were fasting and foods were prepared and distributed at the same time in the area. So due to that, the case was shooting rapidly. And when we see the case of Akaki sub city it was shooting due to contaminated river water. Some peoples used that water and transmitted for others. So, with the identified root causes, we tried to design interventions specifically.”(KII 2: Team member)

Beside awareness creation, the risk-communication team was also involved in providing service for the community.

“...due to its slum area, many peoples in the affected area were living together in one house and it was not comfortable to protect their hygiene. So, immediately we tried to empower them by availing the service like giving water treatment chemicals with proper demonstration and health education at the household level. And also, with the help of partners we were teaching on personal hygiene using mobile vans.” (KII 3: Team coordinator)

On addressing misinformation and rumors the team used feedback systems including free call centers and media scanning platforms. Participants also mentioned that they prepared media monitoring team to scan false information and tried to address them during their press-releases.

“We had a media monitoring team that monitors the media, ministry media, and also social media. So, after the team identified the misinformation then, we will identify its channel that reaches many people and we were announcing them during our press-conference for the public. And also there was a surveillance team on the affected areas that monitor rumors working with community HEWs. So, by using their information we were drafting and preparing messages.” (KII 1: Team member)

Participants also reported that, they were working with community members and leaders to address rumors related to the outbreak.

“For example, during that time as we know, there was also an EBOLA outbreak. So, there was a misinformation saying that it was an Ebola outbreak, not cholera, and also they were saying that the government is not taking proper measures to control the outbreak. Therefore, we tried to discuss some of them with the community by contacting those persons who transmitted fake news and tried to minimize the influence by engaging them to work with us.” (KII 3: Team coordinator)

Monitoring and Evaluation system

The planning and monitoring team in the unit was working on documenting daily activities, reports and other communications together and they were using those documented files for reporting and review meetings. Lack for a data server and not documenting lesson learned stories regularly in every outbreaks were mentioned as the main problem in their documentation and data management system.

“...during that time very short lesson learned stories were written. We didn't document them very well as a form of documents rather than reporting them during our meetings.” (KII 1: Team member)

Every planned actions, materials and activities were evaluated during the two weeks report by the team members.

Participants also mentioned that even though they planned to evaluate risk-communication activities at the end, it was not done as expected.

“...evaluation was done for the cholera response as a whole. When we say evaluation we evaluated the success of every region like lessons learned and what were the challenges and the like. But as I know specifically we didn’t evaluate the impact of risk-communication and whether it was successful or not.” (KII 1: Team member)

“Actually timely evaluation was not done after the outbreak was over. We were just evaluating our daily activities but we didn’t evaluate the risk communication process as a specific section.” (KII 3: Team coordinator)

The reasons mentioned by participants were overloading of tasks and the occurrence of other outbreaks. And they reported that the cholera response was evaluated as a whole including all sections in the emergency operation center.

“At the national level, a post-outbreak review was done for our input here in A.A even though it is not published and disseminated for the public. Because, on that year there were an IDP sites in many areas and there were many outbreaks in the country like malaria and chikungunya. So, as much as possible every response was reviewed at EOC level and it was reviewed as a whole emergency response.” (KII 3: Team coordinator)

Challenges and way forward

The risk-communication team faces many challenges during such emergency response activities. Some of the challenges were related to bureaucracy problems and financial issues. Participants reported that budget allocated for risk-communication activities were very less to produce and disseminate their materials.

“Yeah....there was a bureaucracy problem. Normally during other times, we were bidding tender to produce prepared audio and video spots and we have been facing financial problems every time due to the bureaucracy. And again when we came to this emergency, such problems limited our speed to reach the community as quick as possible because of the challenges we faced to produce and disseminate our materials.” (KII 1: Team member)

They also reported that, infrastructure problems and lack of enabling environment related to water supply and sanitation influences their activities. In addition to this, the less attention given for risk-communications, considering risk-communication as a public relations, and insufficient human-power in the unit were other challenges faced during the emergency response.

“Yeah, one of our big challenge was, there was a misunderstanding of Risk-communication among the decision-makers. And naturally, it is a backbone for any emergency response but in practice, less attention was given for Risk-communication activities and this makes us to work more advocacy on it.” (KII 3: Team coordinator)

To overcome those challenges the unit tried to engage partners for mobilizing resources and they were giving orientations for media and public relation professionals about risk-communication and community engagement. They also tried to solve problems related to water supply in A.A incorporating with other government agencies.

“...for children living on the street, we were advocating to use existing infrastructures like “blue latrine” services arranged by A.A hygiene and beauty agency for free. And we request the MOH to supply water tanks even though it wasn’t its responsibility and we tried to supply water access in some selected areas in A.A”. (KII 3: Team coordinator)

Participants suggested some way forwards related to risk-communication approach and future responses. Due to the gap on documentation and data management, they recommended the need for strong documentation system for risk-communication activities in the future.

“...the first thing that we should focus on is documentation and data formatting. Documentation was an overlooked activity every time which underestimates our work. When an outbreak occurs everybody will try to get those data in his way and even there was a time that we started from scratch. And for these reasons, whenever an emergency happened peoples who engaged in previous outbreaks will be called or the new person will start to organize the team again. Therefore, there should be a regular reporting system and strong documentation system for risk communication activities nationally because it has many impacts on data quality and emergency response.” (KII 2: Team member)

It was also recommended that to consider risk-communication as a specific section including in the behavioral and communication courses at higher education levels. Because of the emergency situation risk-communication activities need skilled professionals for rapid response.

“... Public health or health promotion departments should teach risk communication and community engagement as one subject by giving attention to get many professionals. Because risk-communication differs from regular health communication activities due to its emergency and the need for a rapid response.” (KII 3: Team coordinator)

5.2.2 Quality of printed health communication materials prepared for cholera outbreak (Checklist Result)

Five randomly selected printed health communication materials prepared for cholera/AWD prevention were evaluated using a checklist. The materials were prepared for the general public by MOH, EPHI and other partners together. The checklist assessed the materials based on the revised CDC clear index score sheet which used to assess public communication materials. It contains four parts namely: Main message call to Action & Language, Behavioral recommendation, Numbers and Risk that score out of 6, 2, 2 and 3. The total score was out of 100. Material that score 89 or below shows that the material need improvement. The result of the evaluation shows that all of the materials scored below 89, which needs improvement. (Annex 13).

PART A

Main message and call to Action

The main message that most of the materials transmitted was about cholera disease and its prevention methods. The main messages was written on the top and end section of the materials even though not all of the materials had identified main message content specifically. When the main message are written on the top or first section of the material, audiences can find it more easily and quickly. Most of the materials tried to describe about cholera disease, its symptoms and prevention methods. Only the first leaflet material stated the risks that lead to cholera disease.

The materials include more than one calls to action for the target audiences. For example, in the first, second & forth materials, it is stated that if symptoms like watery diarrhea and repeated vomiting occurs the person with the symptoms should immediately go to nearby health center or call to the free hotlines (952/8335). And also in most materials other options for managing diarrhea and vomiting including taking ORS and how to prepare home sugar-salt solutions for water loss replacement were stated.

Language

Both the main messages and call to action on the materials was presented in the active voice and words that target audiences' use. But some of the words used on the materials were not familiar with the general public (target audience) and can make them confused. For instance words like “treated water” and “life-saving substance” are not clearly defined and can't be understood easily. In addition to this, on the first material which gives general information about cholera the most important information which shows how the disease transmission occurred was described using a diagram which can't be easily understood with all target audiences. Such ways of presentation may need further explanations and guidance so that, audiences can easily understand the information appropriately.

PART B

Behavioral recommendation

Most of the materials included more than one behavioral recommendations to prevent cholera and to reduce its transmission like proper handwashing, eating food while it is hot, washing vegetables and fruits thoroughly, using proper and clean toilet, to use clean and safe drinking water and the like.

In most of the materials the importance of this behavioral recommendations was not explained very well. Providing enough information about the recommended behaviors will help the target audience to make informed decisions. The recommended behaviors was also presented using different images. For instance hand washing, washing vegetables and toilet use was supported with an images in most of the materials. In all of the materials, specific directions/ procedure on how to perform the recommended behaviors was not included like how to wash hands and how to treat a water for drinking.

PART C

Numbers

Most of the materials used bullets and number list for the recommended behaviors. And the presented numbers are always used by the primary audience. All of the materials didn't use decimals, fractions and percentages which can challenge audiences to understand the meaning and lead to conduct mathematical calculations.

Material 2: Leaflet about Acute Watery Diarrhea

The calculation for the score was:-

Part A=5/6 Part B=2/2 Part C =2/2 Part D =2/3

Total Score =11/13*100=84.6 based on the index scoring the material needs improvement because the score result is still below 89.

Material 3: Poster about cholera prevention methods

The calculation for the score was:-

Part A=6/6 Part B=1/2 Part C =2/2 Part D =0/3

Total Score =9/13*100=69.2 based on the index scoring the material needs improvement because the score result is below 89.



Material 4: Poster about water treatment

The calculation for the score was:-

Part A=3/6 Part B=1/2 Part C =2/2 Part D =1/3

Total Score = $10/13 \times 100 = 76.9$ based on the index scoring the material needs improvement because the score result is below 89.

Material 5: Banner about cholera prevention

The calculation for the score was:-

Part A=5/6 Part B=1/2 Part C =1/2 Part D =1/3

Total Score = $8/13 \times 100 = 61.5$ based on the index scoring the material needs improvement because the score result is below 89.

6 Discussion

This study evaluated the risk-communication process that takes place during cholera outbreak at Addis Ababa in 2019. The result of this study revealed that, exposure for cholera related message and outbreak information in the past one year was 71.8% and 52.7% respectively. This implies that the risk-communication messages related to the outbreak information were communicated less compared to cholera prevention messages. Effective risk-communication is the most valuable element in public health emergency responses and it should cover both the risks and actual health problems.

The finding of this study showed that, 78% of the respondents exposed for cholera messages from Television and TV was the most preferred source of health information. It is also stated on the qualitative study, that rapid assessments were done on channel preference in selected sub-cities. Public TV channels with high coverage rate were used to transmit the risk-communication messages during the outbreak. Selecting the right and most referred communication channels is necessary on delivering risk-communication messages effectively.⁽³³⁾

Most of the risk-communication messages and programs during the outbreak were transmitted through TV using press-conference and other health related TV shows. This finding is in lined with the study conducted at Haiti that television was the most preferred forms of communication for receiving cholera messages.⁽⁴⁸⁾

In this study, exposed respondents mostly recalled messages related with “Hand washing” and “Toilet hygiene”. Those main messages were also seen in some of the communication materials and reflected by participants in qualitative study. Participants also mentioned that they remembered the cholera spots which transmitted during the outbreak. This implies that, delivering consistent messages repeatedly may lead the audience to remember the key messages and to increase their understanding on the communicated health problems.

The outcomes of effective risk communication also includes increasing awareness and knowledge among target audiences. This study shows that, respondents have moderate knowledge about cholera and its prevention. The finding was higher than the finding of the study conducted in Tanzania.⁽⁴⁹⁾

This knowledge difference may be due to the effect of the risk-communication activities done in this specific area and the recent history of the outbreak in the study area.

According to this study, 60% of the respondents knew that cholera can be caused by drinking contaminated water and this finding is in agreement with study conducted in South Africa where majority of respondents reported drinking water from contaminated sources as a cause for cholera.⁽⁵⁰⁾ This study revealed that respondents have moderate to high knowledge on cholera symptoms. 66.2% of respondents mentioned that watery diarrhea and repeated vomiting as common symptoms of cholera. However, this finding was lower than studies conducted in Kenya and Tanzania.⁽⁵¹⁾⁽⁵²⁾

The result of this study shows that, respondents have low knowledge regarding mode of transmission for cholera. Only 57% of the respondents knew that cholera can be transmitted from person to person. It was also seen that messages related with cholera transmission were less likely presented in the communication materials.

In the present study, it was found that respondents have moderate knowledge on cholera treatment and majority of respondents knew that cholera is a curable disease. On cholera treatment options, 97.6% of the respondents knew that cholera can be treated at health facility and only 22.3% of them knew that the use of ORS for cholera treatment. The reason for this difference may be respondents have general knowledge on cholera treatment and this finding was in lined with the study conducted in South Africa.⁽⁵⁰⁾

Even though most of the communication materials and spots prepared on cholera prevention methods, it was found that respondents have low knowledge on cholera prevention methods. Majority of them didn't indicated more than two cholera prevention methods. 67.1% of the respondents stated proper handwashing as cholera prevention method and the finding was comparable with study conducted in Haiti.⁽⁴⁸⁾

The study found that, the mean score knowledge for cholera was high among female respondents than males. This discrepancy may be due to the fact that most of the females are housewives and can spent more time obtaining health information from mass media such as TV and radio. This finding is also seen in the post-outbreak study conducted in Iran.⁽⁵³⁾

As education is primarily important and related to knowledge it was found that educational status of respondents has a significant difference in cholera knowledge. Respondents with higher educational level had better knowledge on cholera compared to Illiterates. This finding is also align with a study conducted in Bangladesh.⁽⁵⁴⁾

From the multiple linear regression result, it was found that knowledge has a positive statistically significant association with sex, educational status, source of health information and exposure but negatively associated with occupational status. The result of this study revealed that, knowledge for cholera increased by 1.849 for those respondents who obtain health information from TV and increase by 0.911 for those obtain from HEWs. This may be related to choosing TV as the most preferred source of health information by majority of the respondents. It was also seen in the qualitative study that cholera prevention messages were given for the community with the help of HEWs in the area.

Knowledge for cholera increased by 3.077 among exposed respondents than non-exposed. This could be due to the additive effect of exposure of messages on existing knowledge. It is also reported that in qualitative result that participant's gain new information from the spots and most of them remembered that they exposed to the spots and easily identified the main messages. The outcome of message exposure on knowledge also seen in other studies.⁽⁵⁵⁻⁵⁷⁾

The result of the qualitative study revealed that, the risk-communication activities were done by specific RCCE unit since 2016. Risk-communication requires to be carefully planned, applied and combined with emergency management activities and processes. In this study it was found that, a separate communication plan was derived for A.A from the national communication plan and messages were prepared after doing rapid assessments on affected areas. This will help to identify key problems in the areas and to set priorities for the message development process. The implication of risk-assessment and identifying community risk-perception for successful emergency response was seen in study conducted in Liberia.⁽¹¹⁾

Pre-testing materials with members of target audience will help to determine whether the messages achieves the communication objectives or not. However, in this study pre-testing of messages was not done with the community members (target group).

As participants reflected, due to the emergency situation pre-testing of materials were done within the technical group itself. Similar problem is also seen in study conducted on evaluating mass media messages at Addis Ababa.⁽⁵⁸⁾

As emergencies are time-sensitive, communicating information quickly is crucial. So that, the first source of information usually becomes the preferred source.⁽³²⁾ In the present study, it is reported that daily updates and new information related to the outbreak were delivered early for the public using daily briefs and press-releases and the unit tried to be trusted source of information. Trust and source of information were seen as essential factors for risk-communication to be reliable and effective in other studies.⁽⁵⁹⁾

Evidences suggest that television and radio are the most broadly used mass-media and immediate channels of communication during an emergency.⁽³³⁾ During the outbreak, both government and private TV channels were used for message dissemination. Channel preference assessment was also done in A.A and some social media platforms were used for delivering messages during the outbreak. This assessment will help to identify the most preferred means of communication for the target audiences and to increase the reaching of messages. The role of media in preventing infectious disease during outbreaks is also seen in study conducted in Nigeria.⁽⁶⁰⁾

The international Crisis and Emergency Risk communication (CERC) manual stated community engagement as a strategy to understand the cultural context of the community and to build trust in developing materials during emergencies.⁽³²⁾ In this study, it is found that the risk communication unit tried to engage community leaders and other influential person during mass-education. It was also mentioned that beside awareness creation and health education activities, availing sanitation services and materials for the community were supplied collaborating with other government agencies. Such activities may help to build trust and to increase the credibility of the organizations among the community.

On addressing rumors and uncertainties during the outbreak, feedback system with free call center and media scanning platforms for scanning fake news from social media were used by the risk communication unit. Identified rumors and false perceptions were addressed during their press-releases and media briefing for the public.

Addressing rumors and misconceptions early will help to resolve misunderstandings and to clear-up messages for keeping information accurate. It was also reported in other studies that risk communication need to be open, honest and need to acknowledge uncertainties to be effective and successful.⁽⁵⁹⁾

The International Health Regulations (2005) indicated that all WHO Member states to develop risk communication capacities as a core capacities and states those capacities to regularly assessed and evaluated through external evaluation.⁽⁶¹⁾ Finding from this study shows that, even though evaluation is planned for the risk communication activities it was not done at the end of the outbreak. The occurrence of other outbreaks and overloading of tasks were mentioned as a reason for this gap. Incorporating evaluation results and feedbacks from partners and communities will help to improve ongoing and future emergency responses.

The bureaucracy problems including lack of attention for the risk communication activities, lack of enough budget for material production and lack of professionals in the field were the major challenges for the risk communication process. It was also found that, the problem with poor documenting and data management system influenced and affect the risk communication work. A study conducted in Liberia showed that the successful risk communication strategies including various risk communication approaches helped for effective disease control during Ebola outbreak.⁽¹¹⁾ Strengthening risk communication with community involvement activities will bring successful and effective impact in the overall emergency responses.

The result of the clear index score shows that, the quality of the materials score is low. Which indicates that, the materials need improvement and further need assessments. Most of the materials didn't incorporate enough information about the disease and its prevention methods. This gap is also reflected from participant that, they need more clarification and detail information on the disease from the spots. Most of the communication materials and spots were found to be clear and easy to understand. However, using unfamiliar words on the messages and problems on spot presentations were found to be a problem. The use of inappropriate words, and problems on message designs also seen on other evaluation studies.⁽⁵⁸⁾⁽⁶²⁾

7 Strength and Limitation

Strength: - The study used holistic evaluation approach to evaluate the whole risk communication process in different dimensions. The study is guided by CDC and WHO emergency & risk communication guidelines to evaluate the risk communication process & communication materials. This make the study to be evidence-based and comprehensive.

Limitation: - This study didn't use baseline data and comparison group. Therefore, it was not possible to evaluate the communication effect before and after the intervention. Even though interviewer- administered questionnaire is used for quantitative study it was based on participant self-report through interviews and there is a chance of introducing social desirability bias. The study used health extension workers as data collectors in the community and this may result interviewer (information) bias.

8 Conclusion

This study evaluated the effectiveness of the risk communication process during the cholera outbreak (2019) in Addis Ababa. The study revealed that the exposure level for risk communication messages related to the outbreak information was low. Due to the less attention given for risk communication activities in the emergency response center, every planned activities were not done timely including evaluation. This may affect the development of the risk communication field and future emergency responses.

The risk communication messages were prepared using rapid assessment and previous material sources. However, the quality of the printed health communication materials scored below the standard and the materials didn't incorporate with enough information about the disease and its transmission methods. This may implies that, target audiences will not be fully informed about the disease and it will be difficult to get the desire effect at the end. Gaps has been seen in pre-testing materials, data management and documentation for risk communication activities. For effective health communication, there must be a need assessment in every process and strong documentation system for reporting and evaluation.

The study also identified that respondents have moderate knowledge for cholera and those respondents who have been exposed for cholera related messages are more knowledgeable than non-exposed. This may indicate that, increasing the exposure of risk communication messages have effect in increasing individuals knowledge towards the health problem. Sex of respondents, educational status, occupation, source of information, exposure for cholera message & outbreak information were a predictors for knowledge for cholera.

Therefore, the result of this study will be useful to increase and strength the risk communication activities which will be prepared for a disease outbreaks and its impact for future emergency responses and cholera prevention and control programs.

9 Recommendation

For MOH and EPHI: - attention should be given for risk communication and community engagement section in the emergency operation center and health communication materials should be prepared based on strategic communication principles. The health communication materials should also incorporate enough information about the specific health problem.

For The risk communication unit: - the unit should build strong documentation system and data management for each communication activities and monitoring and evaluation should be implemented based on the plan for risk communication activities during emergency responses.

For Higher educations :- Risk communication and community engagement should be given as a specific course in higher education centers to get more professionals and to strength the risk communication field.

For Researchers: - further researches should be conducted on cholera as it is epidemic infectious disease in the country. In addition, experimental studies are necessary to evaluate the effect of communication and causality.

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Annexes

Annex 1: Tabulated presentation of bivariate analysis

Table 10: Bivariate analysis of socio-demographic variables & HH characteristics in predicting knowledge for cholera among respondents in Addis Ketema sub-city, Addis Ababa, Ethiopia, 2020

Variables (N=582)	Value	β	P-value	95% CI		R^2	Adj. R^2
				Lower	Upper		
Age in Years		-0.084	<0.001	-0.116	-0.051	0.042	0.041
Sex	Male (ref)					0.015	0.013
	Female	1.161	0.003	0.398	1.923		
Religion	Catholic (ref)					0.005	0.000
	Muslim	-1.261	0.133	-2.908	0.385		
	Orthodox	-1.046	0.198	-2.640	0.549		
	Protestant	-0.696	0.415	-2.370	0.978		
Marital status	Married (ref)					0.025	0.020
	Single	0.891	0.058	-0.032	1.814		
	Divorced	-0.967	0.231	-2.552	0.617		
	Widowed	-1.359	0.006	-2.334	-0.383		
Educational status	Unable to read & write (ref)					0.085	0.077
	Able to read & write	0.205	0.734	-0.977	1.387		
	Primary	0.938	0.100	-0.181	2.056		
	Secondary	2.849	<0.001	1.707	3.992		
	Technical	1.845	0.009	0.463	3.228		
	Higher/university	3.457	<0.001	1.915	4.999		
Occupational status	Gov't employee (ref)					0.053	0.043
	Private employee	-1.454	0.009	-2.537	-0.371		
	Merchant	-2.947	<0.001	-4.202	-1.692		
	Daily laborer	-3.285	0.001	-5.179	-1.390		

	Housewife	-1.922	<0.001	-2.940	-0.904		
	Student	0.161	0.899	-2.324	2.646		
	Other	-2.687	<0.001	-4.063	-1.310		
Functional TV	Yes	5.157	<0.001	3.361	6.953	0.052	0.050
	No (ref)						
Functional radio	Yes	0.358	0.286	-0.300	1.015	0.002	0.000
	No (ref)						

Table 11: Bivariate analysis of exposure variables in predicting knowledge for cholera among respondents in Addis Ketema sub-city, Addis Ababa, Ethiopia, 2020

Variables (N=582)	Value	β	P-value	95% CI		R^2	Adj. R^2
				Lower	Upper		
Source of health information	Television	2.495	<0.001	1.444	3.545	0.036	0.034
	Radio	-0.763	0.038	-1.483	-0.044	0.007	0.006
	Social media	2.026	<0.001	1.122	2.930	0.032	0.031
	Newspaper/magazine	1.182	0.382	-1.473	3.837	0.001	0.000
	Poster/Leaflets	2.406	0.033	0.196	4.615	0.008	0.006
	Community conversation	-0.045	0.959	-1.764	1.674	0.000	-0.002
	HEWs	0.387	0.265	-0.294	1.068	0.002	0.000
	Other health professionals	0.978	0.020	0.153	1.803	0.009	0.008
	Friends/family	-0.074	0.924	-1.580	1.433	0.000	-0.002
	Other	-1.876	0.190	-4.687	0.935	0.003	0.001
Frequency of listening radio	Everyday	-0.025	0.961	-1.027	0.976		
	Two or more days per week	0.466	0.457	-0.763	1.695	0.005	-0.002
	Once a week	-0.267	0.577	-1.207	0.672		

	Less than once a week	1.230	0.156	-0.472	2.933		
	Not at all (ref)						
Frequency of watching TV	Everyday	5.136	<0.001	3.344	6.928		
	Two or more days per week	3.063	0.014	0.632	5.493	0.061	0.056
	Once a week	2.158	0.458	-3.549	7.865		
	Not at all (ref)						
Frequency of using Social media	Everyday	1.996	<0.001	1.067	2.925		
	Two or more days per week	1.864	0.001	0.781	2.947	0.052	0.045
	Once a week	2.292	0.003	0.785	3.800		
	Less than once a week	2.364	0.397	-3.108	7.836		
	Not at all (ref)						
Exposure for cholera message	Yes	3.854	<0.001	3.196	4.511	0.186	0.185
	No (ref)						
Exposure for outbreak information	Yes	3.008	<0.001	2.399	3.617	0.140	0.138
	No (ref)						

Annex 2: Study Information Sheet

My name is I am a data collector for Nardos Gelana. She is conducting a study on evaluation of risk communication and health communication materials during the cholera outbreak in Addis Ababa for the partial fulfillment of a master's in Health Promotion and Health Education at Addis Ababa University. The objective of this study is to evaluate the risk communication and health communication interventions undertaken during the cholera outbreak and to assess the knowledge of the community about cholera. Therefore, the study will contribute to strengthening the risk communication management by providing insight into the role of health communications in outbreak management for further disease prevention programs.

Study site and period; - the study will be conducted in Addis ketema sub-city from May-Jun, 2020 GC.

Benefit: - There will be no direct benefit to you, however, the information you provide will have great importance to conduct this research.

Risk- There is no risk or harm for participating in the study. You will be asked about what you know about cholera and there is no right or wrong answer.

Procedures: You are selected by chance for this study and I kindly invite you to participate in this study. If you agree to participate, you will be interviewed with some guided questions about the research and yourself. The interview will take 15-20 minutes.

Participation: - You have the right to choose not to take part in this study and your participation is based on your willingness. If you choose to take part, you have the right to stop the interview at any time. If you are willing to participate or refuse or decide to withdraw later, you will not be subjected to any problems.

Confidentiality: - The information that you provide will be kept confidential by using codes and locking the data. No one will have access to the non-coded data except the investigator. The data will not be used for purposes other than this study.

Whom to Contact: - If you have any questions, you may contact the person stated below.

Nardos Gelana - Tele: +251921545402

Email: nardiyegelana2008@gmail.com

Annex 3: Informed Consent form

I confirmed that I understand the objectives and conditions of the study that I give my consent to be part of the study. I have been given the necessary information about the research and I have understood that it is my right to terminate participation in the interview at any time. The proposal has been explained to me in the language I understand.

Informed consent Certified by:-

Participant

Signature_____ Date_____

Interviewer

Name_____ Signature_____

Date of interview _____ Time started _____ Time completed _____

Checked by: Supervisor:

Name _____ Signature_____

Annex 4: English version of questionnaire sheet

Section 1: Identification

Code Name of a data collector

Name of wereda Name of supervisor

Name of Kebele

Date Time started Time completed

Section 2A: Socio-demographic information			
No.	Questions	Categories	
001	Age in years	_____	
002	Sex	Male -----1 Female -----2	
003	What is your religion?	Muslim-----1 Orthodox-----2 Protestant-----3 Catholic-----4 Other (specify)-----33	
004	What is your marital status?	Single -----1 Married -----2 Divorced -----3 Widow-----4	
005	What is your educational status?	Unable to Read and write-----1 Able to Read and write -----2 Primary school -----3 Secondary school -----4 Technical -----5 University / higher education -----6	
006	What is your occupation?	Government employee-----1 Private employee -----2 Merchant -----3 Daily laborer -----4 Housewife -----5 Student -----6 Other(specify)-----33	

007	How much is your average household income monthly (Ethiopian Birr)?		
Section 2B: Household characteristics			
008	How many individuals live in your house?		
009	What is the source of drinking water in your house?	Unboiled tap water -----1 Boiled tap water -----2 Tank water -----3 Filtered water ----- 4 Bottled (packaged) water -----5 Other (specify) ----- 33	
010	What is the type of toilet in your house?	Pit latrine with cement slab -----1 Pit latrine without cement slab ----- 2 Flush, connected to septic pits -----3 Shared/ public toilet -----4 No toilet/ open defecation -----5 Other (specify) ----- 33	
011	Is handwashing water and soap available near the toilet?	Yes ----- 1 No ----- 2	
012	Do you have a functional TV?	Yes -----1 No -----2	
013	Do you have a functional Radio?	Yes -----1 No -----2	
Section 3: Exposure			
101	What is your preferred source for health information? (Multiple answers is possible) Circle all mentioned don't read	Television -----1 Radio ----- 2 Social media -----3 Newspaper Or Magazine -----4 Poster/Leaflets -----5 Community Conversation -----6 Health Extension Worker----- 7 Other Health Professionals-----8	

		Family/Friends/Relatives-----9 Other (Specify) -----33	
102	How often do you listen to the radio?	Almost Every day-----1 Two or more days per week -----2 Once a week-----3 Less Than Once a week----- 4 Not At All----- 5	
103	How often do you watch TV?	Almost Every day-----1 Two or more days per week -----2 Once a week-----3 Less Than Once a week----- 4 Not At All----- 5	
104	How often do you use social media?	Almost Every day-----1 Two or more days per week -----2 Once a week-----3 Less than once a week-----4 Not At All----- 5	
105	In the past 12 months, have you seen/heard any information about Cholera /AWD?	Yes -----1 No -----2	If no skip Question no 106 & 107
106	From where did you see/heard the information? (Multiple responses possible)	TV -----1 Radio -----2 Social media -----3 Newspaper or Magazine-----4 Posters/Leaflets-----5 Community conversation-----6 Health extension workers-----7 Other health professionals-----8 Other (specify)-----33	

107	<p>What was the main message in the information you saw or heard?</p> <p>(multiple answers are possible)</p> <p>Circle all mentioned don't read</p>	<p>Cholera causes watery diarrhea and repeated vomiting-----1</p> <p>About proper hand washing -----2</p> <p>Safe food handling practice-----3</p> <p>Washing vegetables and fruits thoroughly-----4</p> <p>Eating food while it is still hot -----5</p> <p>Boiling of drinking water -----6</p> <p>How to treat diarrhea at home-----7</p> <p>Using of ORS -----8</p> <p>Keeping toilets clean -----9</p> <p>Seeking health care during cholera symptoms ----- 10</p> <p>Other (specify) ----- 33</p>	
108	<p>In the past 12 months, have you seen/heard about Cholera /AWD outbreak in Addis Ababa?</p>	<p>Yes -----1</p> <p>No -----2</p>	<p>If no skip question no 109</p>
109	<p>If yes, from where did you see/heard the information?</p> <p>(Multiple responses possible)</p>	<p>TV -----1</p> <p>Radio -----2</p> <p>Social media -----3</p> <p>Newspaper or Magazine-----4</p> <p>Posters/Leaflets-----5</p> <p>Community conversation-----6</p> <p>Health extension workers-----7</p> <p>Other health professionals-----8</p> <p>Other (specify)-----33</p>	
Section 4: knowledge about cholera			
201	<p>What do you think are the causes for Cholera/AWD?</p> <p>(Multiple answers is possible)</p> <p>Circle all mentioned don't read</p>	<p>Drinking contaminated water-----1</p> <p>Unwashed fruits & vegetables ----- 2</p> <p>Eating rotten food -----3</p> <p>Unhygienic disposal of excreta and refuse----- 4</p> <p>Poor hygiene/handwashing----- 5</p> <p>Don't know----- 66</p> <p>Other (specify)----- 33</p>	

202	<p>What do you think are the Symptoms for cholera? (Multiple answers is possible)</p> <p>Circle all mentioned don't read</p>	<p>Watery diarrhea -----1 Repeated vomiting -----2 Fever -----3 Dry mouth ----- 4 Tiredness-----5 Loss of appetite -----6 Weight loss-----7 Don't know----- 66 Other (specify) ----- 33</p>	
203	<p>Who do you think can be affected by cholera/AWD? (Multiple answers is possible)</p>	<p>Children-----1 Young age people-----2 Older people-----3 Females -----4 Males -----5 Everyone ----- 6 Don't know-----66 Others (specify)-----33</p>	
204	<p>Do you think cholera can be transmitted from person-to-person?</p>	<p>Yes -----1 No -----2</p>	<p>If no, skip Question no 205</p>
205	<p>If yes, how do you think cholera can be transmitted? (Multiple answers is possible)</p> <p>Circle all mentioned don't read</p>	<p>Through contaminated food/water by infected fecal matter-----1 Through houseflies -----2 Sharing of toilet facilities ----- 3 Handshaking of infected person -----4 Contact with infected person body fluid -5 Through air-----6 Don't know -----66 Other (specify)-----33</p>	
206	<p>What do you think you can do for yourself or your family members with watery diarrhea and vomiting? (Multiple answers is possible)</p>	<p>Go to health facility -----1 Use oral rehydration solution -----2 Use homemade sugar-salt solution---3 Prayer -----4 Don't know-----66 Other (specify) ----- 33</p>	

207	Do you think cholera/ AWD is a curable disease?	Yes -----1 No -----2 Don't know-----66			
208	Where do you think a person with cholera/AWD can be treated? (Multiple answers is possible)	Home -----1 Treatment center/ health facility ----2 Don't know ----- 66 Other(specify)----- 33			
209	How do you think cholera/AWD can be treated? (Multiple answers is possible) Circle all mentioned don't read	Using Oral rehydration solution -----1 Rice water ----- 2 Home-made saline solution-----3 Plain water ----- 4 Go to health facility -----5 Traditional medicines -----6 Prayer -----7 Home rest without remedies -----8 Don't know -----66 Other (specify)----- 33			
210	What do you think is the severity (harmfulness) of cholera if left untreated? (Read the lists, multiple answers is possible)	Yes	No	Don't know	
1	Can leads to dryness of skin	1	2	66	
2	Can leads to sunken eyeball	1	2	66	
3	Can leads to weight loss	1	2	66	
4	Can leads to body weakness	1	2	66	
5	Can leads to unconsciousness	1	2	66	
6	Can leads to death	1	2	66	
211	Do you think AWD/ Cholera is preventable?	Yes -----1 No -----2 Don't know ----- 66			If no skip Question no 212

212	<p>If yes, can you mention the prevention methods for cholera? (Multiple answers is possible)</p> <p>Circle all mentioned don't read</p>	<p>Proper handwashing with soap & water--1 Using safe drinking water ----- 2 Reheating food thoroughly ----- 3 Avoiding uncooked food ----- 4 Eating food while it is still hot ----- 5 Washing vegetables & fruits ----- 6 Proper disposal of human waste -----7 Keeping toilet clean----- 8 Praying ----- 9 Do not know ----- 66 Other (specify)-----33</p>	
-----	---	---	--

Annex 5: Interview guide for key informant interview

Code _____

Date: _____ Name of Office _____

Sex: _____ Position /responsibility in the office: _____

Educational background _____ Work experience _____

Introduction: Good morning/afternoon. My name is Nardos Gelana. I am MPH student of HP&HE in Addis Ababa University and I am conducting study on evaluating risk communication and health communication materials during cholera outbreak. One of the objective of the study is to explore the risk communication process and to evaluate the materials prepared during the outbreak. So, I am here to discuss your experience on risk communication during cholera outbreak in Addis Ababa.

I will take notes so that I can remember all of your important comments, but your name or personal details won't be attached to anything you share with me. The interview will be recorded and you can stop the interview at any time or skip any questions you do not want to answer. Do you have any questions for me? If No, Is it okay to continue?

601. During the cholera outbreak, was there a risk-communication team in your office? Probe if yes when was it founded? Can you specify the professionals involved?

602. What was the objectives of the risk communication during the outbreak?

603. Did you develop any partnership? If yes, who were involved in the risk communication process?

604. Did you prepare a risk communication plan during the outbreak? Probe if yes, does it include community engagement?

605. How did you draft and test risk communication messages? Probe did you pre-test the materials?

606. What have you done on media engagement and channel selection? Probe, which media did you choose and why?

607. What have you done to ensure the credibility of your organization?

608. What activities are done on building trust and engaging the affected population? Probe how?
609. How did you communicate uncertainty associated with the risks during the outbreak?
610. How was an ongoing risk or any update related to the outbreak explained for the public?
611. Were there any rumors during the outbreak? Probe how did you managed it?
612. Have you done an action review after the outbreak? Probe if yes, who were involved?
613. How was your documentation throughout the risk communication process? Probe did you document lessons learned during the process?
614. What challenges have been faced in the risk communication process? Probe what mechanisms have you taken to overcome those challenges?
615. Have you done evaluation for the risk communication activities? Probe if yes, how was it? And who were involved?
616. Do you have anything to add?

Thank you!

Annex 6: In-depth interview guide

Code: _____

Date of Interview: _____ Health communication Material: _____

Background data:

Wereda/Kebele: ____/____ Age: _____ Sex _____

Marital status _____ Educational status: _____

Occupation: _____

Introduction

Good morning/ afternoon. My name is Nardos Gelana. I am MPH student of HP&HE in Addis Ababa University. I am here to discuss with you on some health communication materials and I want to hear your views and opinions about the materials. There is no right or wrong answer to the questions I'm going to ask. Although the discussion will be recorded with tape-recorder and it will remain confidential. Your participation for this discussion is completely voluntary and at any time you can leave the discussion. Are you willing to continue the discussion?

Questions

01. What do you think the material is about?
02. To whom do you think this message is directed? Why?
03. Is it easy to understand for you? If no why?
04. Is there anything you like? If yes, which aspect do you like?
05. Is there anything you dislike? Why?
06. Is there anything in the message that is difficult to believe?
07. What do you think this message is asking you to do?
08. What benefit do you think you can receive if you adopt the recommended behavior?
09. What new/different information did you get?
10. Would you share this new information with others? Why/why not?
11. Do you think people in your community will think differently if they see/read this material? How?
12. Is there any additional thing you would like to add?

Annex 7: CDC clear index score sheet checklist

Name of the material: _____

	Questions	Score	
		Yes (1)	No (0)
	Part A: Core		
	Main message and call to Action		
1	Does the material contain one main message statement?		
2	Is the main message at the top, beginning, or front of the material?		
3	Does the material include one or more calls to action for the primary audience?		
	Language		
4	Do both the main message and the call to action use the active voice?		
5	Does the material always use words the primary audience uses?		
6	Is the most important information the primary audience needs summarized in the first paragraph or section?		
	Part A score	Total	/6
	Part B: Behavioral recommendation		
7	Does the material include one or more behavioral recommendations for the primary audience?		
8	Does the material explain why the behavioral recommendation(s) is important to the primary audience?		
	Part B score	Total	/2
	Part C: Numbers		
9	Does the material always present numbers the primary audience uses?		
10	Does the audience have to conduct mathematical calculations? (here yes scores “0” and No scores as “1”)		
	Part C score	Total	/2
	Part D: Risk		
11	Does the material explain the nature of the risk?		
12	Does the material address both the risks and benefits of the recommended behaviors?		
13	If the material uses numeric probability to describe risk, is the probability also explained with words or a visual?		
	Part D score	Total	/3

Annex 8: Amharic version of a subject information sheet

የመረጃ መስጫ ሰነድ

ጤና ይስጥልኝ ስሜ ይባላል። እኔ ለተማሪ ናርዶስ ገላና ተወካይ መረጃ ሰበሰቢ ነኝ። ናርዶስ ገላና በአዲስ አበባ ዩኒቨርሲቲ የህብረተሰብ ጤና አጠባበቅ ትምህርት ክፍል የጤና ማበልፀግና የጤና አጠባበቅ ትምህርት ድህረ ምረቃ ተማሪ ስትሆን በአዲስአበባ ተከሰቶ በነበረው የኮሌራ ወረርሽኝ ላይ የነበረውን ቅድመ አደጋ ተግባቦቶች እና የጤና መልእክቶች ምዘና ላይ መመርቂያ ጽሁፏን እየሰራች ትገኛለች። የጥናቱ ዋና አላማም በኮሌራ ወረርሽኝ ጊዜ የተሰሩትን ቅድመ አደጋ ተግባቦቶች ፣ የጤና መልእክቶች እና ህብረተሰቡ ስለኮሌራ ያለውን እውቀት መመዘን ነው። ስለዚህም ይህ ጥናት ለተጠናከረ የቅድመ አደጋ ቁጥጥር የጤና ተግባቦት ስራዎች ያላቸውን አስተዋጾ በማሳየት ረገድ እና ለወደፊት በሽታን በመከላከል ስራዎች ላይ አስተዋጾ ያበረክታል።

የጥናቱ ቦታ እና ጊዜ: ጥናቱ የሚካሄደው በአዲስ ከተማ ክፍለከተማ ሲሆን መረጃውም ከ ሚያዚያ እስከ ግንቦት 2012 የሚሰበሰብ ይሆናል።

ጠቀሜታ: በዚህ ጥናት ላይ በመሳተፎ የሚያገኙት ቀጥታ ጥቅም የለም። ነገርግን የሚሰጡን መረጃ ይህን ጥናት ለማካሄድ ከፍተኛ ጠቀሜታ አለው።

አደጋ: በዚህ ጥናት ላይ በመሳተፎ የሚደረስበት ምንም አይነት አደጋም ሆነ ጉዳት አይኖርም። ስለ ኮሌራ በሽታ የሚያወቁትን ብቻ ይመልሳሉ።

ቅደምተከተል: እርሶ በዚህ ጥናት እንዲሳተፉ በ አጋጣሚ የተመረጡ ሲሆን በጥናቱም እንዲሳተፉ በአክብሮት እጠይቃለሁ። ለመሳተፍ ከተስማሙ ስለራስዎ እና ከጥናቱ ጋር በተገናኘ የተወሰኑ ጥያቄዎችን ይጠየቃሉ። ቃለመጠይቁም ከ 15-20 ደቂቃ ይወስዳል።

ተሳትፎ: የእርሶ ተሳትፎ በፍቃደኝነት ላይ የተመሰረተ ሲሆን ያለመሳተፍም መብት አልዎት። በቃለ መጠየቁ ወቅት ጥያቄዎችን መመለስም ሆነ የማይፈልጉትን ጥያቄ አለመመለስም ይችላሉ። ቃለ መጠየቁንም በማንኛውም ሰዓት ማቋረጥም ሆነ ማስቆም ይችላሉ። በዚህም የሚደርስብዎት ምንም አይነት ጉዳት አይኖርም።

ሚስጢራዊነት: እርሶ የሚሰጡን ማንኛውም መረጃ የግል መረጃን ጨምሮ በሚስጥር የሚያዝ ሲሆን ከ ጥናቱ ባለቤት ውጪም ማንም ሰው አይጠቀምበትም። የሚሰጡንም መረጃ ከዚህ ጥናት ውጪ ለሌላ አላማ አይውልም።

ጥያቄ ካልዎት እና ተጨማሪ ማብራሪያ ከፈለጉ ከስር በሚገኘው አድራሻ ላይ የተጠቀሰውን ሰው ማግኘት ይችላሉ።

ስም። ናርዶስ ገላና

ስልክ +251921545402

ኢ-ሜል: nardiyegelana2008@gmail.com

Annex 9: Amharic version of informed consent

የፍቃደኝነት ማረጋገጫ ሰነድ

የጥናቱን አላማ እና ስለጥናቱ የተደረገልኝን ገለጻ የተረዳሁ ሲሆን በጥናቱም ላይ ለመሳተፍ መስማማቴን እገልጻለሁ። ቃለመጠይቁንም በማንኛውም ሰአት የማቋርጥ መብት እንዳለኝ ተረድቻለሁ። የጥናቱም ገለጻ በሚገባኝ ቋንቋ ተብራርቶልኛል። መስማማቴንም በፊርማዬ አረጋግጣለሁ።

የፍቃደኝነት ሰነዱን ያረጋገጡት

የ ተሳታፊው :

ፊርማ _____ ቀን _____

የ ቃለመጠይቁ አቅራቢ:

ስም _____ ፊርማ _____

ቀን _____ የተጀመረበት ሰአት _____ የተጠናቀቀበት ሰአት _____

ያረጋገጠው ሱፐርቫይዘር:

ስም _____ ፊርማ _____

Annex 10: Amharic version Questionnaire

ክፍል 1: መለያ

ኮድ የመረጃ ሰብሳቢው ስም

ወረዳ የሱፐርቫይዘሩ ስም

ቀበሌ

ቀን የተጀመረበት ሰዓት የተጠናቀቀበት ሰዓት

ክፍል 2: -ሶሺዮሎጂያዊ መረጃ

No.	ጥያቄ	መደብ	
001	ዕድሜ	_____	
002	ጾታ	ወንድ -----1 ሴት -----2	
003	ሃይማኖትዎ ምንድነው?	ሙስሊም-----1 ኦርቶዶክስ----- 2 ፕሮቴስታንት-----3 ካቶሊክ-----4 ሌላ (ይግለጹ)-----5	
004	የጋብቻ ሁኔታዎ ምንድነው?	ያላገባ/ች-----1 ያገባ/ች -----2 የተፋታ/ች -----3 ባል/ሚስት የሞተበት/ባት-----4	
005	የትምህርት ደረጃዎ ምን ያህል ነው?	ማንበብ እና መጻፍ የማይችል/የማትችል ----1 ማንበብ እና መጻፍ የሚችል/የምትችል -----2 የመጀመሪያ ደረጃ -----3 ሁለተኛ ደረጃ ----- 4 ቴክኒክ እና ሙያ -----5 ዩኒቨርሲቲ /ከፍተኛ የትምህርት ተቋም-----6	

006	የስራዎ ሁኔታ ምንድን ነው?	የመንግስት ሰራተኛ-----1 የግል ሰራተኛ -----2 ነጋዴ -----3 የቀን ሰራተኛ -----4 የቤት እመቤት -----5 ተማሪ -----6 ሌላ(ይገለጹ)-----33	
007	አማካይ የቤተሰብዎ ገቢ በየወሩ ስንት ነው?(በኢትዮጵያ ብር)		
ክፍል 3: አጠቃላይ የቤት ውስጥ መረጃ			
008	በመኖሪያ ቤት ውስጥ ስንት ግለሰቦች ይኖራሉ?		
009	በቤት ውስጥ ለመጠጥ ዉሃ የምትጠቀሙት የቱን ነው?	ያልተፈላ የቧንቧውሃ ----- 1 የተፈላ የቧንቧውሃ----- 2 የታንክር ውሃ----- 3 በማጣሪያ የተጣራ ውሃ ----- 4 የታሽገ ውሃ -----5 ሌላ (ይግለጹ) -----33	
010	በቤት ውስጥ የሚገኘው የመጻዳጃ ቤት ምን ዓይነት ነው?	በሲሚንቶ የተገነባ የመጻዳጃ ጉድጓድ -----1 በሲሚንቶ ያልተገነባ የመጻዳጃ ጉድጓድ -----2 የውሀ ማፍሰሻ ያለው በሴራሚክ የተሰራ መጻዳጃ ቤት ----- 3 የጋራ/ የሕዝብ የመጻዳጃ ቤት -----4 የመጻዳጃ ቤት የለም -----5 ሌላ (ይግለጹ) ----- 33	
011	በመጻዳጃ ቤትዎ አቅራቢያ የአጅ መታጠቢያ ዉሃ እና ሳሙና አለ?	አዎ-----1 የለም -----2	
012	በቤትዎ ውስጥ የሚሰራ ቴሌቪዥን አለ?	አዎ-----1 የለም -----2	

013	በቤትዎ ውስጥ የሚሰራ ፊደላዎች አለ?	አዎ -----1 የለም -----2	
ክፍል 4: የመረጃ ተጋላጭነት			
101	እርስዎ የሚመርጡት የጤና መረጃ ምንጭ የቱ ነው?	ቴሌቪዥን-----1 ፊደላዎች-----2 የማህበራዊ ድረ-ገጽ -----3 ጋዜጣ/መጽሔት-----4 በራሪ ወረቀት/ፖስተር-----5 የማህበረሰብ ውይይት -----6 የጤና ኤክስፔንሽን ሰራተኛ-----7 ሌሎች የጤና ባለሙያዎች-----8 ቤተሰብ/ጓደኛ/ዘመድ-----9 ሌላ (ይግለጹ) ----- 10	
102	ፊደላዎን ምን ያህል ጊዜ ያዳምጣሉ?	በየቀኑ -----1 በሳምንት ሁለት ቀን እና ከዚያ በላይ -----2 በሳምንት አንድ ቀን ቢያንስ -----3 በሳምንት ከአንድ ጊዜ በታች ----- 4 በፍጹም አላዳምጥም -----5	
103	ለምን ያህል ጊዜ ቴሌቪዥን ይመለከታሉ?	በየቀኑ -----1 በሳምንት ሁለት ቀን እና ከዚያ በላይ -----2 በሳምንት አንድ ቀን ቢያንስ -----3 በሳምንት ከአንድ ጊዜ በታች -----4 በፍጹም አልመለከትም -----5	
104	የማህበራዊ ድረ-ገጽ ለምን ያህል ጊዜ ይጠቀማሉ?	በየቀኑ -----1 በሳምንት ሁለት ቀን እና ከዚያ በላይ -----2 በሳምንት አንድ ቀን ቢያንስ -----3 በሳምንት ከአንድ ጊዜ በታች -----4	

		በፍጹም አልጠቀምም -----5	
105	ባለፈው አንድ ዓመት ውስጥ ስለኮሌራ ወይም አተት የሰሙት/የተመለከቱት መረጃ አለ?	አዎ -----1 የለም -----2	የለም ከሆነ ጥያቄ 106 እና 107ን ይለፉት
106	መረጃውን ከየትኛው የመረጃ ምንጭ ነው የሰሙት/የተመለከቱት? (ከአንድ በላይ መልስ ይቻላል)	ቴሌቪዥን-----1 ሬድዮ-----2 በማህበራዊ ሚዲያ/ በኢንተርኔት-----3 ጋዜጣ/መጽሔት -----4 በራሪ ወረቀት/ፖስተር -----5 የማህበረሰብ ውይይት -----6 የጤና ኤክስፐርት/ሰራተኛ-----7 ሌሎች የጤና ባለሙያዎች -----8 ሌላ (ይግለጹ) -----33	
107	በተመለከቱት ወይም በሰሙት መረጃ ላይ የተላለፈው ዋና መልእክት ምን ነበር? (ከአንድ በላይ መልስ ይቻላል) የተጠቀሱትን ሁሉንም አክብብ	የኮሌራ በሽታ አጣዳፊ ተቆማጥ እና ትውክት እንደሚያስከትል - -----1 ስለ እጅ-መታጠብ ----- 2 ስለ ምግብ አዘገጃጀት እና አመጋገብ-----3 አትክልት እና ፍራፍሬዎችን በአግባቡ ስለማጠብ-----4 ምግብን በትኩስነቱ ስለመመገብ -----5 ውሃን አፍልቶ መጠጣት-----6 በቤት ውስጥ አጣዳፊ ተቆማጥን ስለማከም ----- 7 አካላትን ስለመጠቀም----- 8 የመጸዳጃ ቤትን ንጽህና ስለመጠበቅ----- 9 የኮሌራ በሽታ ምልክቶች ሲታዩ ወደ ህክምና መሄድ---10 ሌላ (ይግለጹ) ----- 33	

108	<p>ባለፈው አንድ ዓመት ውስጥ ስለኮሌራ ወይም አተት ወረርሽኝ በአዲስ አበባ መከሰቱን የሰሙት/የተመለከቱት መረጃ አለ?</p>	<p>አዎ -----1 የለም -----2</p>	<p>የለም ከሆነ ጥያቄ 109ን ይለፉት</p>
109	<p>መረጃውን ከየትኛው የመረጃ ምንጭ ነው የሰሙት/የተመለከቱት</p> <p>(ከአንድ በላይ መልስ ይቻላል)</p>	<p>ቴሌቪዥን-----1 ሬድዮ-----2 በማህበራዊ ሚዲያ/ በኢንተርኔት-----3 ጋዜጣ/መጽሐት -----4 በራሪ ወረቀት/ፖስተር -----5 የማህበረሰብ ውይይት -----6 የጤና ኤክስፐርት ሰራተኛ-----7 ሌሎች የጤና ባለሙያዎች -----8 ሌላ (ይግለጹ) ----- 33</p>	

ክፍል 4: ስለ ኮሌራ እውቀት

201	<p>የኮሌራ/አተት በሽታ በምን ምክንያት የሚከሰት ይመስልዎታል?</p> <p>(ከአንድ በላይ መልስ ይቻላል)</p> <p>የተጠቀሱትን ሁሉንም አክብብ</p>	<p>ንጹህ የመጠጥ ውሃ አለመጠጣት-----1 በደንብ ያልታጠቡ አትክልቶች እና ፍራፍሬዎች -----2 ያልበሰሉ ምግቦችን መመገብ -----3 ንጹህናውን ባልጠበቀ ስፍራ መጸዳዳት-----4 ንጹህናን አለመጠበቅ/ እጅን በአግባቡ አለመታጠብ-----5 አላውቅም----- 66 ሌላ (ይግለጹ)----- 33</p>	
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202	<p>የኮሌራ/ አተት በሽታ ምልክቶች ምን ምን ይመስልዎታል?</p> <p>(ከአንድ በላይ መልስ ይቻላል)</p> <p>የተጠቀሱትን ሁሉንም አክብብ</p>	<p>ተቅማጥ-----1 አጣዳፊ ትውከት-----2 ትኩሳት -----3 የአፍ መድረቅ----- 4 ድካም-----5 የምግብ ፍላጎት መቀነስ-----6</p>	
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		የሰውነት ክብደት መቀነስ-----7 አላውቅም-----66 ሌላ (ይግለጹ) -----33	
203	በኮሌራ በሽታ የሚጠቃው ማን ይመስልዎታል? (ከአንድ በላይ መልስ ይቻላል)	ህጻናት/ልጆች-----1 ወጣቶች-----2 በእድሜ የገፉ ሰዎች-----3 ሴቶች-----4 ወንዶች-----5 ሁሉም ሰው----- 6 አላውቅም-----66 ሌላ (ይግለጹ) ----- 33	
204	ኮሌራ በሽታ ከሰው ወደሰው የሚተላለፍ ይመስልዎታል?	አዎ -----1 አይደለም -----2	አይደለም ከሆነ ጥያቄ 205ን ይለፉት
205	አዎ ከሆነ ኮሌራ በምን መልኩ ከሰው ወደ ሰው የሚተላለፍ ይመስልዎታል? (ከአንድ በላይ መልስ ይቻላል) የተጠቀሱትን ሁሉንም አክብብ	በበሽታው በተያዘ ሰው በተበከለ ምግብ/ውሃ -----1 በቤት ውስጥ በሚገኙ ዝንቦች ----- 2 የመጸዳጃ ቤቶችን መጋራት -----3 በበሽታ የተያዘውን ሰው እጅ በመጨበጥ----- 4 በበሽታ ከተያዘው ሰው የሰውነት ፈሳሽ ንክኪ-----5 በአየር ----- 6 አላውቅም-----66 ሌላ (ይግለጹ) ----- 33	
206	በእርስዎ ወይም በቤተሰብዎ አባላት ላይ አጣዳፊ ተቅማጥ እና ትውከት ቢከሰት ምን የሚያደርጉ ይመስልዎታል? (ከአንድ በላይ መልስ ይቻላል)	ወደ ጤና ተቆም መሄድ -----1 አኦርኬስ መጠቀም -----2 በቤት ውስጥ ከስኳር እና ጨው የሚዘጋጅ ፈሳሽ መጠቀም ----- 3 መጻለይ -----4 አላውቅም-----5 ሌላ (ይግለጹ) ----- 6	

207	ኮሌራ/አተት ሊድን የሚችል በሽታ ነው ብለው ያስባሉ?	አዎ -----1 አይደለም-----2 አላውቅም----- 66			
208	በኮሌራ/አተት የተጠቃ ሰው የት መታከም የሚችል ይመስልዎታል? (ከአንድ በላይ መልስ ይቻላል)	በቤት ውስጥ -----1 በጤና ተቋም-----2 አላውቅም-----66 ሌላ (ይግለጹ)----- 33			
209	የኮሌራ/አተት በሽታን እንዴት ማከም የሚቻል ይመስልዎታል? (ከአንድ በላይ መልስ ይቻላል) የተጠቀሱትን ሁሉንም አክብብ	አኦርኬስ በመጠቀም-----1 የሩዝ ውሃ በመጠቀም -----2 በቤት ውስጥ ከጨው በሚዘጋጅ ፈሳሽ ----- 3 ውሃ በመጠጣት ----- 4 ወደ ጤና ተቋም በመሄድ----- 5 በባህላዊ ሕክምና ----- 6 በፀሎት ----- 7 ያለመድሐኒት በቤት ውስጥ እረፍት በመውሰድ---8 አላውቅም-----66 ሌላ (ይግለጹ) ----- 33			
210	የኮሌራ/አተት በሽታ ህክምና ካልተደረገለት የሚያደርሰው ጉዳት ምን ይመስልዎታል? (የተዘረዘሩትን ያንብቡላቸው) (ከአንድ በላይ መልስ ይቻላል)	አዎ	አይደለም	አላውቅም	
1	የቆዳ መሽብሽብን/ መድረቅን ያስከትላል	1	2	66	
2	የዓይን መሰርጎድን ያስከትላል	1	2	66	
3	የሰውነት ክብደት መቀነስን ያስከትላል	1	2	66	
4	የሰውነት ድካምን ያስከትላል	1	2	66	
5	ራስን ለመሳት ይዳርጋል	1	2	66	
6	ለሞት ይዳርጋል	1	2	66	

211	የኮሌራን በሽታ መከላከል የሚቻል ይመስልዎታል?	አዎ -----1 አይደለም-----2 አላውቅም----- 66	አይደለም ከሆነ ጥያቄ 212ን ይለፉት
212	የኮሌራ/ አተት በሽታን መከላከያ ዘዴዎች ምን ይመስልዎታል? (ከአንድ በላይ መልስ ይቻላል) የተጠቀሱትን ሁሉንም አክብብ አታንብብ	እጅን በውሃና በሳሙና መታጠብ-----1 ንፅህናው የተበቀ የመጠጥ ውሃ መጠቀም ----- 2 ምግብን በደንብ አብስሎ መመገብ -----3 ያልበሰሉ ምግቦችን አለመውሰድ -----4 ምግብን በትኩረት መመገብ -----5 አትክልት እና ፍራፍሬዎችን በደንብ ማጠብ-----6 በተገቢው ስፍራ መጸዳዳት -----7 የመጠጥ ቤትን ንጽህና መጠበቅ----- 8 መጠጥ -----9 አላውቅም-----66 ሌላ (ይግለጹ) -----33	

Annex 11: Amharic version of Key informant interview guide

አጠቃላይ መረጃ

ኮድ _____

ቀን _____ የመ/ቤቱ ስም _____

ጾታ _____ የስራ ድርሻ _____

የትምህርት ደረጃ _____ የስራ ልምድ _____

መግቢያ

ጤና ይስጥልኝ፣ ስሜ ናርዶስ ገላና ይባላል። እኔ በ አዲስ አበባ ዩኒቨርሲቲ በ Health education and promotion ድህረ ምረቃ ተማሪ ስሆን በ 2011 በአዲስአበባ ተከስቶ በነበረው የኮሌራ ወረርሽኝ ላይ የነበረውን ቅድመ አደጋ ተግባቦቶች እና የጤና መልእክቶች ምዘና ላይ መመርቂያ ጽሁፌን እየሰራሁ እገኛለሁ። የጥናቴ አንዱ አላማም በወረርሽኙ ወቅት ጊዜ የተሰሩትን ቅድመ አደጋ ተግባቦቶች የጤና መልእክቶች መመዘን ነው። ስለሆነም በዚህ የተገኘሁት በዚሁ ጉዳይ ላይ ስለተሰሩት ስራዎች ለመወያየት ነው።

በቃለመጠይቁ ጊዜ ድምጽ መቅረጫ መሳሪያና ማስታወሻ እጠቀማለሁ ነገር ግን ስም ወይም ማንነት የሚገልጹ ነገሮች ሚስጥርነቱ እንደ ተጠበቀ ነው። በማንኛውም ሰአት ቃለ መጠይቁን ማቋረጥ ወይም መመለስ የማይፈልጉትን ጥያቄ መተው ይችላሉ። መጠየቅ የምትፈልጉት ነገር አለ? ከሌለ ለመቀጠል ፍቃደኛ ናችሁ?

ጥያቄዎች

601. በኮሌራ ወረርሽኝ ጊዜ የቅድመ አደጋ ተግባቦቶች (risk-communication) ላይ የሚሰሩ ቡድን ነበረ? ከነበረስ መቼ ተቋቋመ? የተካተቱስ ባለሙያዎችስ እነማን ነበሩ?

602. በወቅቱ የነበረው የቅድመ አደጋ ተግባቦት ስራ አላማዎው ምን ነበር?

603. በቅድመ አደጋ ተግባቦቶች (risk-communication) ስራዎች ላይ መ/ቤታችሁ ከሌሎች አጋር ድርጅቶች ጋር ግንኙነት (partnership) ነበረው? ከነበረውስ እነማን ናቸው በስራው ላይ ተሳትፎ የነበራቸው?

604. በወረርሽኙ ወቅት ለሚሰሩ የቅድመ አደጋ ተግባቦቶች ስራዎች አስቀድሞ እቅዶች ነበሩ? ከነበሩስ ህብረተሰቡን የሚያሳትፉ ነበሩ?

605. የቅድመ አደጋ ተግባቦት መልእክቶችን እንዴት ነበር የተነደፉት ወይም የተዘጋጁት? ስትራቴጂክ የሆነ እቅድስ ነበረ?

606. ሚዲያውን ከማሳተፍ እና ከመምረጥ አንጻር ምንምን ስራዎች ተሰርተዋል? መልእክቶቹን ለማስተላለፍስ የተመረጡት ሚዲያዎች የትኞቹ ነበሩ? ለምን?

607. በህብረተሰቡ ዘንድ የመስሪያ ቤታችሁን አመኔታ ለመጨመር ምንምን ስራዎች ተሰርተዋል?

- 608. በወረርሽኝ ወቅት የተጠቁትን የህብረተሰብ ክፍሎች ከማሳተፍ አንጻር ምን ምን ስራዎችን አከናውናችኋል? እንዴት?
- 609. ከ ወረርሽኝ ጋር የተያያዙ እርግጠኛ ያልሆኑ መረጃዎችን እንዴት ነበር የተቆጣጠራችሁት?
- 610. በየወቅቱ የነበሩ አዳዲስ መረጃዎችን እና ከበሽታው ተጋላጭነት ጋር የተያያዙ መረጃዎችን ለህብረተሰቡ እንዴት ነበር የምታደርሱት?
- 611. በወረርሽኝ ወቅት የተሰሙ አሉባልታዎች (ከእውነታው የራቁ መረጃዎች) ነበሩ? እንዴትስ ነበር የተቆጣጠራችሁት?
- 612. ወረርሽኝ ካበቃ በኋላ በተሰሩት ስራዎች ላይ ግምገማ አድርጋችኋል? ከተደረገሰ እነማን ነበር የተሳተፉት?
- 613. በቅድመ አደጋ ተግባቦቶች ስራዎች ሂደት ላይ የነበራችሁ የመረጃ ሰነድ አያያዝ ምን ይመስል ነበር? በሂደቱ ውስጥ የተገኙ ትምህርቶችስ ዶክመንት ተደርግው ተይዘዋል?
- 614. በሂደቱ ውስጥ የገጠማችሁ ችግር ነበረ? እንዴትስ ፈታችሁት?
- 615. የምዘና ሂደቱስ እንዴት ነበር? እነማን ተሳትፈው ነበር?
- 616. የሚጨምሩት ሃሳብ አለ?

አመሰግናለሁ።

Annex 12: Amharic version of In-depth interview guide

አጠቃላይ መረጃ

ኮድ _____

ቀን _____ የጤና ተግባቦት መረጃ መሳሪያ _____

የግል መረጃ

ወረዳ/ ቀጠና _____/ _____ ጾታ _____

የትምህርት ደረጃ _____ የስራ ድርሻ _____

መግቢያ:

ጤና ይስጥልኝ፣ ስሜ ናርዶስ ገላና ይባላል። እኔ በ አዲስ አበባ ዩኒቨርሲቲ የጤና ማበልጸግ እና ተግባቦት ድህረ ምረቃ ተማሪ ነኝ። አሁን ከእርሶ ጋር በተወሰኑ የጤና ተግባቦት መረጃ መሳሪያዎች ላይ ውይይት እናደርጋለን። ስለ መረጃዎቹ ያልዎትን እይታ እና ግላዊ አመለካከት መስማት እፈልጋለሁ። ቃለመጠይቁ በድምጽ መቅረጫ መሳሪያ የሚቀዳ ሲሆን መረጃውም በሚስጥር ይያዛል። በዚህ ቃለ መጠይቅ ላይ የሚኖርዎት ተሳትፎ ሙሉ በሙሉ በፍቃደኝነት ላይ የተመሰረተ ሲሆን በማንኛውም ሰአት ላይ ማቋረጥም ይችላሉ። ቃለ-መጠይቁን ለመቀጠል ፍቃደኛ ናችሁ?

ጥያቄዎች

1. ይህ የመረጃ መሳሪያ ምን ይመስልዎታል?
2. መልእክቱ ለማነው የተዘጋጀው? ለምን?
3. ለእርሶ ለመረዳት ቀላል ነው? ካልሆነ በምን ምክኒያት?
4. ከውስጡ የወደዱት ነገር አለ? ካለስ የትኛው?
5. ከውስጡ የጠሉት(ያልተመችዎት) ነገር አለ? ለምን?
6. በመልእክቱ ላይ ለማመን የሚከብድ ነገር አለው?
7. መልእክቱ ምን እንዲያደርጉ የሚጠይቁት ይመስልዎታል?
8. መልእክቱን ቢተገብሩት ምን ጥቅም የሚያገኙ ይመስልዎታል?
9. አዲስ ወይም የተለየ ምን መረጃ አገኙበት?
10. ይህን መረጃ ለሌሎች ያጋራሉ? ለምን?
11. በአቅራቢያህ ያሉ የህብረተሰብ ክፍሎችህ ይህን መረጃ ቢመለከቱ ወይም ቢያነቡ በተለየ መልኩ የሚያስቡ ይመስልዎታል? እንዴት?
12. መጨመር የሚፈልጉት ነገር አለ?

አመሰግናለሁ።

Annex 13: CDC clear index score sheet result

Checklist assessment for material 1: (Leaflet about cholera disease)

	Questions	Score	
		Yes (1)	No (0)
	Part A: Core		
	Main message and call to Action		
1	Does the material contain one main message statement?		0
2	Is the main message at the top, beginning, or front of the material?		0
3	Does the material include one or more calls to action for the primary audience?	1	
	Language		
4	Do both the main message and the call to action use the active voice?	1	
5	Does the material always use words the primary audience uses?	1	
6	Is the most important information the primary audience needs summarized in the first paragraph or section?		0
	Part A score	Total 3 /6	
	Part B: Behavioral recommendation		
7	Does the material include one or more behavioral recommendations for the primary audience?	1	
8	Does the material explain why the behavioral recommendation(s) is important to the primary audience?	1	
	Part B score	Total 2 /2	
	Part C: Numbers		
9	Does the material always present numbers the primary audience uses?	1	
10	Does the audience have to conduct mathematical calculations? (here yes scores "0" and No scores as "1")		1
	Part C score	Total 2 /2	
	Part D: Risk		
11	Does the material explain the nature of the risk?	1	
12	Does the material address both the risks and benefits of the recommended behaviors?	1	
13	If the material uses numeric probability to describe risk, is the probability also explained with words or a visual?		0
	Part D score	Total 2 /3	

Calculation for the score: Part A=3/6 Part B=2/2 Part C =2/2 Part D =2/3

Total Score =9/13*100=69.2

Checklist assessment for material 2: (Leaflet about AWD)

Questions		Score	
Part A: Core		Yes (1)	No (0)
Main message and call to Action			
1	Does the material contain one main message statement?	1	
2	Is the main message at the top, beginning, or front of the material?	1	
3	Does the material include one or more calls to action for the primary audience?	1	
Language			
4	Do both the main message and the call to action use the active voice?	1	
5	Does the material always use words the primary audience uses?	1	
6	Is the most important information the primary audience needs summarized in the first paragraph or section?		0
Part A score		Total 5 /6	
Part B: Behavioral recommendation			
7	Does the material include one or more behavioral recommendations for the primary audience?	1	
8	Does the material explain why the behavioral recommendation(s) is important to the primary audience?	1	
Part B score		Total 2 /2	
Part C: Numbers			
9	Does the material always present numbers the primary audience uses?	1	
10	Does the audience have to conduct mathematical calculations? (here yes scores "0" and No scores as "1")		1
Part C score		Total 2 /2	
Part D: Risk			
11	Does the material explain the nature of the risk?	1	
12	Does the material address both the risks and benefits of the recommended behaviors?	1	
13	If the material uses numeric probability to describe risk, is the probability also explained with words or a visual?		0
Part D score		Total 2 /3	

Calculation for the score:

Part A=5/6 Part B=2/2 Part C =2/2 Part D =2/3

Total Score =11/13*100=84.6

Checklist assessment for material 3: (Poster about cholera prevention methods)

Questions		Score	
Part A: Core		Yes (1)	No (0)
Main message and call to Action			
1	Does the material contain one main message statement?	1	
2	Is the main message at the top, beginning, or front of the material?	1	
3	Does the material include one or more calls to action for the primary audience?	1	
Language			
4	Do both the main message and the call to action use the active voice?	1	
5	Does the material always use words the primary audience uses?	1	
6	Is the most important information the primary audience needs summarized in the first paragraph or section?	1	
Part A score		Total	6 /6
Part B: Behavioral recommendation			
7	Does the material include one or more behavioral recommendations for the primary audience?	1	
8	Does the material explain why the behavioral recommendation(s) is important to the primary audience?		0
Part B score		Total	1 /2
Part C: Numbers			
9	Does the material always present numbers the primary audience uses?	1	
10	Does the audience have to conduct mathematical calculations? (here yes scores "0" and No scores as "1")		1
Part C score		Total	2 /2
Part D: Risk			
11	Does the material explain the nature of the risk?		0
12	Does the material address both the risks and benefits of the recommended behaviors?		0
13	If the material uses numeric probability to describe risk, is the probability also explained with words or a visual?		0
Part D score		Total	0 /3

Calculation for the score:

Part A=6/6 Part B=1/2 Part C =2/2 Part D =0/3

Total Score = $9/13 \times 100 = 69.2$

Checklist assessment for material 4: (Poster about water treatment)

	Questions	Score	
		Yes (1)	No (0)
	Part A: Core		
	Main message and call to Action		
1	Does the material contain one main message statement?	1	
2	Is the main message at the top, beginning, or front of the material?	1	
3	Does the material include one or more calls to action for the primary audience?	1	
	Language		
4	Do both the main message and the call to action use the active voice?	1	
5	Does the material always use words the primary audience uses?	1	
6	Is the most important information the primary audience needs summarized in the first paragraph or section?	1	
	Part A score	Total	6 /6
	Part B: Behavioral recommendation		
7	Does the material include one or more behavioral recommendations for the primary audience?	1	
8	Does the material explain why the behavioral recommendation(s) is important to the primary audience?		0
	Part B score	Total	1 /2
	Part C: Numbers		
9	Does the material always present numbers the primary audience uses?	1	
10	Does the audience have to conduct mathematical calculations? (here yes scores "0" and No scores as "1")		1
	Part C score	Total	2 /2
	Part D: Risk		
11	Does the material explain the nature of the risk?	1	
12	Does the material address both the risks and benefits of the recommended behaviors?		0
13	If the material uses numeric probability to describe risk, is the probability also explained with words or a visual?		0
	Part D score	Total	1 /3

Calculation for the score:

Part A=6/6 Part B=1/2 Part C =2/2 Part D =1/3

Total Score = $10/13 * 100 = 76.9$

Checklist assessment for material 5: Banner about cholera prevention

Questions		Score	
Part A: Core		Yes (1)	No (0)
Main message and call to Action			
1	Does the material contain one main message statement?	1	
2	Is the main message at the top, beginning, or front of the material?	1	
3	Does the material include one or more calls to action for the primary audience?	1	
Language			
4	Do both the main message and the call to action use the active voice?	1	
5	Does the material always use words the primary audience uses?	1	
6	Is the most important information the primary audience needs summarized in the first paragraph or section?		0
Part A score		Total	5 /6
Part B: Behavioral recommendation			
7	Does the material include one or more behavioral recommendations for the primary audience?	1	
8	Does the material explain why the behavioral recommendation(s) is important to the primary audience?		0
Part B score		Total	1 /2
Part C: Numbers			
9	Does the material always present numbers the primary audience uses?		0
10	Does the audience have to conduct mathematical calculations? (here yes scores "0" and No scores as "1")		1
Part C score		Total	1 /2
Part D: Risk			
11	Does the material explain the nature of the risk?	1	
12	Does the material address both the risks and benefits of the recommended behaviors?		0
13	If the material uses numeric probability to describe risk, is the probability also explained with words or a visual?		0
Part D score		Total	1 /3

Calculation for the score:

Part A=5/6 Part B=1/2 Part C =1/2 Part D =1/3

Total Score = $8/13 * 100 = 61.5$

CURRICULUM VITAE

1. PERSONAL INFORMATION

Full Name: NARDOS GELANA ADERA

Date of birth: July 22, 1994 G.C

Sex: Female

Place of birth: Addis Ababa, Ethiopia.

Nationality: Ethiopian

Marital Status: Single

Address: Email: nardiyegelana2008@gmail.com

Phone No: +251921545402

2. EDUCATIONAL BACKGROUND

Educational Level	Name of Institution	Year
Elementary school(1-8)	Success primary School, A.A	2000-2004 G.C
	New Generation primary school, A.A	2005-2008 G.C
High School (9-12)	Merit Academy	2009-2010 G.C
	Alfa secondary school	2011-2012 G.C
Higher Education	Wollega University, Oromia Region Ethiopia	2013-2016 G.C

3. QUALIFICATIONS

- Attending master/postgraduate education in Public Health with specialty in Health Promotion and education at School of Public Health, College of Health Sciences, Addis Ababa University (Since October 2018)
- BSc. in Nursing (2013-2016) at College of Health Science, Wollega University, Ethiopia (Graduated with great distinction)

4. WORK EXPERIENCE

- I have worked as a Junior health professional (Nurse) at MCM (Korean Hospital) Addis Ababa from Jan to May, 2017 G.C
- I have served as clinical Nurse in St. Paul's Hospital Millennium Medical College Addis Ababa, Ethiopia from June 2017- Nov 2018 G.C
- I have attended an internship at WHO/ ETH country office in Emergency department for three months from Aug14-Nov13, 2019.

5. SKILLS

- Good communication skill
- Good computer skill like MS word, excel, MS Power point

6. TRAINING AND CERTIFICATE

- ✓ Certificate for completion of training on Compassionate, Respectful and Caring Health Workforce in 2018.
- ✓ Certificate for the completion of online training on GB UN to Serve with Pride - Zero Tolerance (Multilingual) (A WHO Training) in 2019.
- ✓ Certificate for completion of training on Process evaluations of complex healthcare Interventions: Investigating Implementation in Context in 2020
- ✓ Certificate for completion of the COVID 19 Clinical Management online course organized by Ministry of Health Ethiopia, 2020
- ✓ Trained and certified on "Scientific writing and communication" prepared by AAU and NORHED project on October, 2020.

7. HOBBY AND INTERESTS

- Reading books, listening music
- Socializing with friends and Team

8. LANGUAGE

- Proficient in speaking, listening and writing in English and Amharic

9. REFERENCE

1. **Dr. Eshetu Girma** (Ph.D., Associate professor of Health promotion and health communication, school of public health, AAU)

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Declaration

I, the undersigned, declare that this thesis is my original work in partial fulfillment of the Requirement for the degree of Masters in Health Education and Health promotion and has not been presented for master's degree in this or any other university. All source of materials used for this thesis have been fully acknowledged.

Name: Nardos Gelana (BSc.)

Date. _____ Signature _____

Approval of the primary Advisor

This thesis has been submitted to School of Public Health, Addis Ababa University with my approval as the university advisor.

Name of the primary advisor: Dr. Eshetu Girma (Ph.D, Associate Professor)

Date. _____ Signature _____